



# DAFNE

A **D**ecision-**A**lytic **F**ramework to explore the  
water-energy-food **N**exus in complex and transboundary  
water resources systems of fast growing developing countries

## **MODELS OF ENVIRONMENTAL POLICY IN THE OMO-TURKANA AND ZAMBEZI BASINS**

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## EXECUTIVE SUMMARY

**Importance of institutional frameworks to environmental sustainability in international waters.** Adoption of a suitable legal and policy framework in common pool resources such as international river basins is critical in order to avoid or contain a *tragedy of the commons* dynamic that can result in environmental degradation. The impacts of environmental degradation in Africa's trans-boundary basins – including the Omo-Turkana and Zambezi – may be particularly severe given the importance of water-related ecosystems to provision of a range of vital services. It is therefore critical to identify the suitability of current institutional frameworks applying to the environment, and to identify ways in which they can be strengthened in order to enhance the potential for environmental sustainability.

**Aims of this report.** The objective of this report is to review the environmental legal and policy frameworks in the Omo-Turkana and Zambezi basins, in order to propose models of institutional reform in the two basins that can contribute to more sustainable outcomes. Drawing on documents in the water, agriculture, energy and environmental sectors, existing legal and policy frameworks were examined to determine the importance given to environmental issues and the extent of synchronization across riparian states in each basin. Policy alternatives were finally formulated based on identified gaps and limitations, with the overall aim of strengthening the institutional framework in a manner that contributes to greater environmental sustainability. Based on this, a set of environmental flow indicators and a no-net-loss policy framework were developed. Ultimately, it is envisioned that the policy-oriented analysis and resultant alternatives contained in this report can be complemented with the analysis of ecosystem services undertaken in Work Package 3, to feed into the formulation of the decision analytic framework of the DAFNE project

**Updating the DoA focus of the D4.2 report.** Aims outlined related to D4.2 in the Description of Activities (DoA) covered an ambitious set of points that relied on progress in WP2, especially with regard to data collection, which will not be completed until well after finalization of D 4.2. As such, this deliverable directs and expands its focus to identifying different institutional options for trans-boundary water policy and governance that may enhance environmental sustainability, building on current management strategies, which are reflected in existing national and transboundary laws and policies in the different riparian countries and at a transboundary level. Consistently with description in the DoA, a critical thrust of this report is focused on the degree to which laws and policies are aligned to foster sustainable development and achieve nexus outcomes. Also consistently with description in the DoA, management strategies that enable sustenance of ecosystem services are elaborated.

**Key environmental issues in the two basins.** While the order of importance of environmental issues may not be exactly the same, there appears substantial similarity in the key environmental issues in the two basins. In this report, key environmental target issues are: i) fish and aquaculture, ii) forests, iii) wetlands, iv) biodiversity, v) wildlife. Fish and wetlands, in particular, provide critical ecosystem services in both the Omo-Turkana and Zambezi basins. Sustainability of all five environmental concerns are under threat, due to factors such as climate change, proliferation of invasive species like water hyacinth, and flow alterations associated with water resources development.

**Methods.** National and transboundary law and policy documents from the water, agricultural, energy and environmental sectors in the two basins were compiled. Overall, more than 400 documents were collected. However, following removal of duplicates and documents focused only on administrative or financial issues, only 252 documents were included in the analysis. A classification framework was developed, into which laws and policies were categorized in order to examine them in terms of: i) extent or depth of coverage of key environmental issues, ii) degree of alignment in coverage of environmental issues across countries in each basin, iii) level of harmonization in consideration of the environment between laws and policies inside vs. outside the environmental sector.

**Extent of coverage to environmental issues.** The coverage of environmental issues varied across the legal and policy frameworks of countries in the two basins. In the Omo-Turkana, Kenya generally has a more developed institutional framework - applied to the five identified environmental issues – than Ethiopia. Transboundary attempts to address environmental issues are mostly absent at the Omo-Turkana basin level, but the two countries participated in relevant regional frameworks such as the 2006 East African Community (EAC) *Protocol on environment and natural resources management*. In the Zambezi basin, transboundary environmental policies exist but their depth and coverage are limited. In the Zambezi, coverage of fish, forests and wildlife across the law and policy frameworks of the basin's countries is reasonable to good. Reference to fisheries are the focus of a specific transboundary water law: the 1999 *Protocol on Economic and Technical Co-operation between the Government of the Republic of Zambia and the Government of the Republic of Zimbabwe concerning the management and development of fisheries on Lake Kariba and transboundary waters on Zambezi River*. Coverage of wetlands and biodiversity is somewhat piecemeal and fragmented.

**Consistency of coverage of environmental issues within the two basins.** While there were a range of points on which legal and policy frameworks were synchronized among countries in the two basins, unfortunately a number of differences remain. In the Omo-Turkana, suggestions for greater harmonization can be focused on: types of fishing gear that are legal; modalities of licensing for fishing; legislation related to wetland regulation and protection; legislation related to habitat rehabilitation for biodiversity conservation; regulation of invasive species. In the Zambezi, suggestions for better harmonization across countries include: types of fishing gear that are legal; seasons in which fishing is allowed; institutional frameworks for sustainable wetland management; forest-type specific conservation; classification of species depending on their protection and Red List threat status. More broadly, alignment of policy concerning fish (and indeed other environmental concerns) with evidenced realities may have scope for improvement.

**Consistency of coverage of environmental issues across sectors.** Relevant legislation in non-environmental sectors could do more to internalize the environmental impacts they produce. In the Omo-Turkana, reference to environmental issues in energy and agricultural legislation tends to be general; irrigation expansion is subjected to Environmental Impact Assessments (EIAs), which is positive, but even here environmental concerns need to be considered more in detail. Water sector legislation tends to focus on reducing harm and pollution. Again, environmental and ecosystem functions and services should be covered by legislation more explicitly. In the Zambezi, legislation of countries' water sectors may possess inconsistencies in approaches for certain environmental issues such as wetlands. Further, focus on environmental issues within legislation of the energy and agriculture sectors is often only general; environmental coverage in such sectoral legislation could be more specific. More broadly, specific transboundary guidelines or policy on environmental concerns in both basins is weak.

**Formulation of environmental policy alternatives.** While there are numerous opportunities for policy changes that can contribute to improved environmental outcomes, three environmental policy alternatives were formulated to achieve an effective conservation of the environment, the key ecosystems and the related ecosystem services in the two basins:

- **Formation of Transboundary Frontier Conservation Areas (TFCAs) to govern Lakes Malawi/Nyasa and Turkana.** The spatial coverage of different types of protected areas and their protecting effect on the ranges of fish, amphibians, mammals and birds on the watershed level were examined to identify hotspot areas where species occur that are not covered by different types of protected areas. Lake Malawi/Nyasa and Turkana emerged as at-risk areas, where the level of protection or conservation reflected in policy is not consistent with the importance of fish and other biodiversity found in the environment. We therefore propose a strengthened policy framework through creation of TFCAs for the two lakes that requires transboundary agreements and law enforcement but brings potential benefits in terms of sustained fisheries, capacity building and increased touristic attraction.

- *Implementation of environmental flows for fish sustainability and hyacinth flushing.* Restoring variability of flows as well as the connectivity within river channels are basic requirements in both basins to enable fish to complete their essential behaviours and thus sustain their populations as a food source for humans. The most straightforward policy recommendation to reach this aim is not to build new dams and to remove existing ones. If this is not possible, policies are required that prescribe engineering measures to allow fish migration upstream as well as flow releases mimicking seasonal flooding. Such extensive flood pulses can equally help to minimize negative effects from invasive water hyacinths by flushing them out of the river system.
- *Adoption of a mechanism for environmental conservation in the two basins in the context of basin-wide RBOs.* This mechanism could be tailored to monitoring, adoption of common standards, and ironing out the policy and legislation inconstancies pointed out above. Further, the mechanism could work to facilitate agreement on or convergence toward priority conservation geographies and value and priority accorded to key environmental issues. The mechanism could also work to enable cross-sectoral dialogues aimed at upstream incorporation of environmental concerns into sectoral planning, to achieve more sustainable outcomes. While the Zambezi may have a 'head start' on adoption of such a mechanism given its history of cooperation, fewer riparians in the Omo-Turkana may also present an opportunity there.



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## Abbreviations

BMU:	Beach Management Unit
CBD:	Convention on Biological Diversity
DAF	Decision Analytic Framework
EAC:	East African Community
EIA:	Environmental Impact Assessment
GDP:	Gross Domestic Product
EPLG:	Hong-Kong Guangdong Environmental Protection Liaison Group
GEF:	Global Environment Facility
ICPDR:	International Commission for Protection of the Danube River
ICPE:	International Commission for the Protection of the Elbe
KAZA:	Kavango-Zambezi
NBSAP:	National Biodiversity and Strategic Action Plan
NGO:	Non-Governmental Organization
PIF:	Policy and Investment Framework
RAMSAR:	RAMSAR Convention on Wetlands
RBO:	River Basin Organization
REDD:	Reduced Emissions from Deforestation and Forest Degredation
SADC:	Southern Africa Development Community
TBBL	Transboundary / Basin level
TFCA:	Transfrontier Conservation Area
ZAMCOM:	Zambezi Watercourse Commission
ZRA:	Zambezi River Authority
ZRB:	Zambezi River Basin

**Country Abbreviations<sup>1</sup>**

AGO	Angola
BWA	Botswana
ETH	Ethiopia
KEN	Kenya
MWI	Malawi
MOZ	Mozambique
NAM	Namibia
SSD	South Sudan
TZA	Tanzania
UGA	Uganda
ZMB	Zambia
ZWE	Zimbabwe

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<sup>1</sup> Country codes follow the UN standard



## 1. INTRODUCTION

**Adoption of a comprehensive policy framework is critical for transboundary environmental resources given the potential for unclear property rights to result in environmental degradation.** Broader notions related to common pool resources (e.g., Hardin 1968; Wade 1987; Ostrom et al. 1999; Dietz et al. 2003; Marothia 2003; Anderies and Jansen 2013) suggest that common access to a shared resource may lead to over-exploitation of that resource and environmental degradation. Hardin (1968) pointed to common accessibility of natural resources as a contributor to over-exploitation. Wade (1987) stated that people will not restrain their use of a common-pool resource without an external enforcer. Yetim (2002) described how the unilateral exploitation of transboundary waters can lead riparians to extract water from the watercourse at rates above average replenishment. Giordano (2003) stated that nations may have an incentive to overexploit certain transboundary water resources, because the benefits of use (e.g. irrigation, hydropower) accrue to one nation while the costs (e.g., reductions or alterations to river flow) may be passed on to other riparians. Notably, however, literature on common pool resources also highlights how the presence of an accepted governing mechanism can reduce overuse and negative externalities. Ostrom et al. (1999), for example, stated that effective rules limiting access and defining users' rights and duties prevents overuse. Sarker et al. (2008) posited that regulations, monitoring and imposition of penalties comprise the main instruments to mitigate adverse externalities issues in transboundary waters. Fischhendler et al. (2011) stated how international environmental regimes may be designed to internalize externalities. Anderies and Jansen (2013) said that institutions help mitigate the overexploitation of common-pool resources.

**There is a particular danger of environmental degradation in Africa's transboundary basins given the importance of the aquatic ecosystems to provision of a range of services.** Water-related ecosystems provide a range of provisioning, regulating, supporting and cultural services in Africa (McCartney et al., 2010). The importance of ecosystems is evident in the Omo-Turkana and Zambezi River Basins. In the Omo-Turkana, the fish population in Lake Turkana appears under threat due to upstream developments (Jeppe, 1989; Ojwang et al., 2010). Further, changing flood cycles may affect ecologies that many depend on for their livelihoods, in both Ethiopia and Kenya (Avery, 2012). In the Zambezi, it is estimated that between 30 and 35 million people depend on ecosystem services for their livelihoods; the aggregate value of such ecosystem services has been estimated of at least 1.3-1.6 billion USD (McCartney and Nyambe, 2017). The basin nonetheless faces land degradation and an altered flow regime, which adversely affect the conditions of aquatic ecosystems within the Zambezi (McCartney and Nyambe, 2017).

**Little work has been done to identify how existing policy frameworks in transboundary basins can be modified to improve environmental conservation.** Some work (Gerlak, 2004; Sanchez and Roberts, 2014; Abdul-Baten and Titimur, 2015; Atkinson and Domske, 2015) has been done to understand how water policy in transboundary basins can better address environmental issues. Gerlak (2004) outlined the contributions that the Global Environment Facility (GEF) has made toward environmental conservation in the Danube Basin and Black Sea region. Sanchez and Roberts (2014) discussed experiences with environmental programs in transboundary river basins, among other issues. Al-Baten and Titimur (2015) examined environmental challenges associated with transboundary water management in the Ganges and proposed greater ecosystem orientation to policies. Atkinson and Domske (2015) reviewed some case studies of IWRM implementation in transboundary basins and highlighted ways in which improved environmental protection was achieved. While marking important progress, this body of work stops short of outlining a suite of specific reforms to the institutional frameworks of particular basins that could enhance environmental conservation.

**The objective of this report is to assess coverage of environmental concerns in the Omo-Turkana and Zambezi institutional frameworks, and to propose institutional alternatives that can contribute to more sustainable outcomes in the two basins.** The report first reviews literature on environmental issues in the two basins, in order to inform the development of a framework

for evaluating the suitability of current laws and policies in the two basins for environmental conservation and sustainable outcomes. Laws and policies in the two basins are then classified in this framework, and their suitability is assessed against three criteria:

- Extent of coverage to identified environmental issues in the two basins
- Degree of institutional alignment within basins
- Level of cohesion between policies of environment and non-environmental sectors

Based on the identified gaps and limitations in existing institutional frameworks, three alternatives or models for institutional reform were elaborated. These alternatives are focused on creation of TFCAs around lakes Malawi/Nyasa and Turkana, implementation of flow alterations to enhance fish sustainability and flush water hyacinth, and adoption of binding basin-specific legal frameworks for transboundary environmental conservation. Ultimately, it is envisioned that alternatives contained in this report can be complemented with the analysis of ecosystem services undertaken in Work Package 3, to feed into the formulation of the decision analytic framework of the DAFNE project

**Updated DoA focus of this report.** Aims outlined related to D4.2 in the Description of Activities (DoA) covered an ambitious set of points that relied on progress in WP2, especially with regard to data collection, which will not be completed until well after finalization of D4.2. As such, this deliverable directs and expands focus on certain elements of the DoA namely:

- Reviewing current management strategies, which are reflected in existing national and transboundary laws and policies in the different riparian countries and at a transboundary level, in order to provide an informed foundation for proposing reforms and options to policy that can enhance environmental sustainability
- Examining the degree to which laws and policies are aligned across countries and sectors to foster sustainable development and achieve nexus outcomes.
- Applying a model of environmental policy (based on legal principles and norms) that gauges suitability of existing legal and policy frameworks according to i) the degree to which they match with environmental issues, ii) degree to which they are harmonized across countries in basins, and iii) degree to which they are coherent across sectors. Determination of policy limitations, gaps and misalignment is presumed to result in environmental vulnerability. Comprehensive, coherent legal and policy coverage to environmental issues is presumed to result in a conducive, more effective, policy context for environmental sustainability.
- Based on identified deficiencies in current environmental policy framework, three policy alternatives are elaborated. One of such alternatives is focused on satisfying environmental flows (e-flows) and sustaining ecosystem services.

## 2. BACKGROUND

### 2.1 DEFINING AND CONCEPTUALIZING ENVIRONMENT IN WATER RESOURCES MANAGEMENT

**Environment and Ecosystems.** In its broadest sense, the environment comprises all natural and physical resources including people and communities that affect all social, economic, aesthetic and cultural conditions (COE, 1993; EPA, 1994). *Environment* refers to water, air, soil and their interrelationship as well as all relationships between them and any living organisms (Larsson 1999; FAO, 2017). *Ecosystem* is defined as the interacting system of a biological community (biotic factors) with its non-living environmental surroundings (abiotic factors) (WB, 2008; Jitendra Kumar Saurabh Dubey, 2011; Burkhard et al., 2012). Despite nuanced differences in the orientation of the two terms (*environment* is intended to refer more to surroundings where organisms live, *ecosystem* is intended to emphasize the interactions between the environment and the organisms), practical use has often seen ecosystem progressively supplanting environment without always implying a difference in meaning.

**Environment as part of Water Resource Management.** Water (resources) management has been defined as ‘the application of structural and non-structural measures to control natural and man-made water resources systems for beneficial human and environmental purposes’ (Grigg, 1996). Water management has traditionally considered the effects of management decisions on the environment (*water for nature*), but is increasingly also considering the impacts of the environment on water (*nature for water*; Leendertse et al., 2009). Environmental Impact Assessment (EIA) tools are one way in which environmental concerns are considered in water projects. EIA tools serve to assess the environmental and social impacts of water resource investments. Determination of flow volumes required by the environment – i.e., e-flows – constitutes another way in which the environment is incorporated into water management (Smakhtin et al., 2004). Assessment of e-flows identifies the required quantity, and distribution of flow patterns at a point or along the length of a river to enable sustainability of environmental resources (WWF 2012). Increasingly, e-flows are also being considered in terms of ecosystem services and benefits to society. In terms of what is meant by the environment in this context of e-flows, Hirji & Davis (2009) refer to water-dependent ecosystems; Mohile and Gupta (2005) suggested that e-flows should include direct evapotranspiration through forests, wetlands and other relevant ecologies. In this report, we utilize an interpretation of environment that is consistent with treatment of the concept in water resources management, as just described: ecosystems dependent on water such as forests, wetlands as well as resources such as fish, biodiversity and wildlife.

**Existing Water Withdrawal by Sector in the Omo-Turkana and Zambezi.** As elaborated in D2.1, there are important volumes of water withdrawal across both the Omo-Turkana and Zambezi Basins (Table 1). Nonetheless, when compared against annual surface flow of more than  $20 \cdot 10^9$  m<sup>3</sup> in the Omo-Turkana and more than  $100 \cdot 10^9$  m<sup>3</sup> in the Zambezi, the overall level of withdrawal in both basins is currently presently not high; ca. 7% in the Omo-Turkana and ca 6% in the Zambezi. As expected, most water withdrawal is for agriculture in both basins. In the Omo-Turkana, most water is used in Ethiopian portions of the basin. In the Zambezi, most water is used in Malawian, Zambian and Zimbabwean portions of the basin. Ultimately, however, aggregated water withdrawal across sectors still leaves considerable scope for satisfaction of e-flows in both basins. Hence the consideration of e-flows in the context of the Omo-Turkana and Zambezi basins – shown in Box 1 – reveals e-flows to currently be satisfied in most portions of the two basins.

Table 1 – Water Withdrawal by sector, Omo-Turkana and Zambezi Basins in  $10^6$  m<sup>3</sup> for the year 2010  
[Source: World Resources Institute, 2014].

River Basin	Country	Sector			Total
		Agriculture	Domestic	Industry	
Omo- Turkana	Ethiopia	910.3	156.0	10.2	1,076.6
	Kenya	187.6	68.9	11.1	267.6
	Total	1,098.0	224.9	21.3	1,344.2
Zambezi	Angola	0.0	16.3	11.7	28.0
	Botswana	0.5	1.3	0.8	2.5
	D. R. Congo	0.1	1.7	1.7	3.5
	Mozambique	110.8	53.3	12.6	176.7
	Malawi	1,108.7	202.1	78.9	1,389.7
	Namibia	12.1	4.6	0.9	17.6
	U. R. Tanzania	24.9	28.3	0.3	53.5
	Zambia	1,703.6	387.8	262.8	2,354.2
	Zimbabwe	929.4	457.4	311.1	1,697.9
	Total	3,890.1	1,152.7	680.7	5,723.5

**Environmental institutions and Non-Binding Frameworks.** Instruments which regulate the use of environmental resources are often contained within non-binding frameworks, so-called ‘soft law’. Transboundary law-making often results in the formation of non-binding ‘soft-law’ agreements due to difficulty in enforcement and in achieving consensus between countries. Non-binding frameworks can be viewed as a declaration of intent by a state government to provide further regulation on a particular issue or to pave the way towards the development of legislation. The absence of legal ‘teeth’ may nonetheless constrain the implementation and enforcement of the framework.

### Box 1—Water for Nature: Environmental Flows in the Omo-Turkana and Zambezi Basins.

Water storage reservoirs that often facilitate hydropower development enable harnessing of multiple complementary benefits including irrigation, water supply (municipal, industrial and agricultural), flood control and recreational opportunities. However, alongside these benefits well-known detrimental effects occur, including loss of free-flowing river habitat, blockage of fish migration routes, trapping of sediment and reduced water quality in reservoirs and downstream river reaches. Related to these direct effects, other impacts include the interruption of flooding regimes and geomorphological processes that maintain aquatic habitat diversity downstream, which are required to sustain healthy riverine ecosystems. From healthy ecosystems comes a plethora of ecosystem goods and services including fish spawning grounds, fertile agricultural land, and natural flood attenuation; all of which are of direct benefit for people. Variable flows are crucial for keeping these ecosystems in a healthy state. For example, regular inundation of floodplains provides nutrient rich sediment that contributes toward fertile soils (Tilmant et al., 2010).

In both the Omo-Turkana and Zambezi basins, efforts have been made to identify the proportion of water needed to satisfy environmental flow requirements (Figure 1, Smakhtin and Eriyagama, 2008) according to the following ecologic management classes:

- A: Natural rivers with minor modification of in-stream and riparian habitat.
- B: Slightly modified and/or ecologically important rivers with largely intact biodiversity and habitats despite water resources development and/or basin modifications.
- C: The habitats and dynamics of the biota have been disturbed, but basic ecosystem functions are still intact. Some sensitive species are lost and/or reduced in extent. Alien species present.
- D: Large changes in natural habitat, biota and basic ecosystem functions have occurred. A clearly lower than expected species richness. Much lowered presence of intolerant species. Alien species prevail.

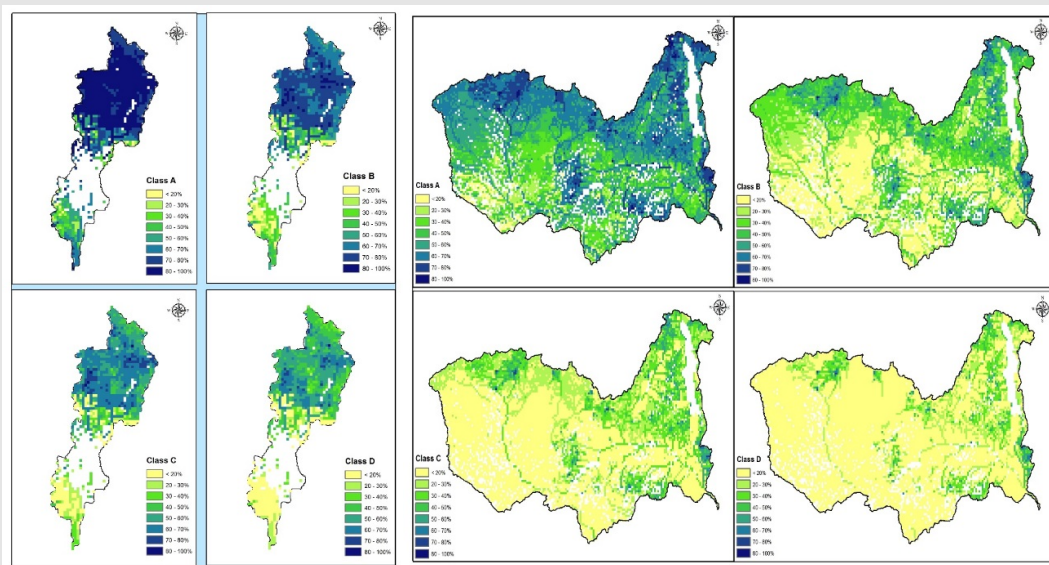


Figure 1 – Proportion of area in the Omo-Turkana and Zambezi Basins in different e-flow classes (Smakhtin and Eriyagama, 2008)



Overall, most of the area of the Omo-Turkana and Zambezi basins are in reasonably good condition. There are nonetheless hot spots of environmental concern in both basins. While upstream portions of both basins appear in a generally reasonable state, these same portions of both basins possess areas in which provision of water to satisfy e-flows is not fully achieved.

In the Zambezi, e-flows have been investigated in several past efforts (Beilfuss, 2006; Ronco et al., 2010; Tilmant et al., 2010; Deltarus/GIZ, 2011). It was found that flow patterns that more closely mimic the natural regime (i.e., the solid line in Figure 2) lead to a range of benefits for freshwater fisheries, wildlife diversity, wetlands, and flood-recession agriculture among other things (Beilfuss et al., 2006). Several studies (Tilmant et al., 2010, 2012, 2017) explored the potential to re-operate the Zambezi's dams to achieve improved e-flows. These efforts have found substantial scope for improved environmental conditions – with relatively moderate impacts on hydropower production – if the basin's reservoirs are collectively operated using a systems approach.

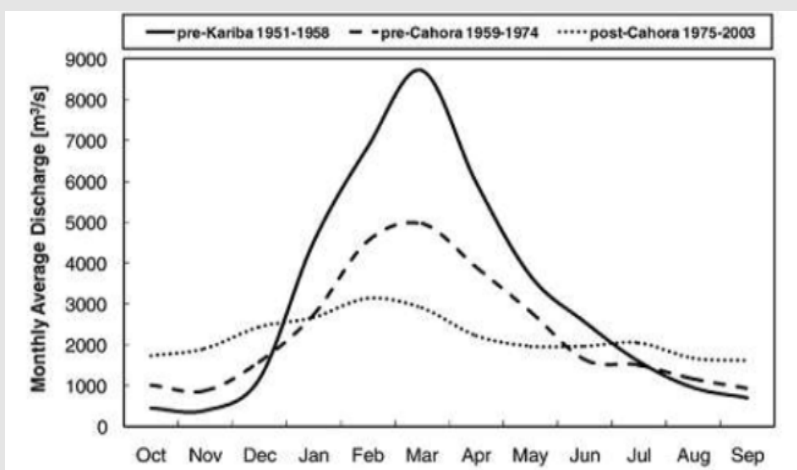


Figure 2 – Flow Patterns in the Zambezi, Tete (Ronco et al., 2010)

## 2.2 ENVIRONMENTAL ISSUES IN THE OMO-TURKANA BASIN

IWMI library resources and internet searches were used to identify literature on environmental issues within the Omo-Turkana. Review of this literature led to identification of several major environmental concerns in the Omo-Turkana basin. The most significant issues identified, which will form the environmental issues analysed in the Omo-Turkana basin within this report, are fisheries and aquaculture, forests, wetlands, biodiversity, and wildlife. The importance of these environmental issues is consistent with the important ecosystems identified in the two basins, further elaborated in Work Package 3.

**Fisheries and Aquaculture.** Lake Turkana is home to more than 60 species of fish. The Lake and its tributaries are important sources of food and fulfil socio-economic needs for local populations. Fish are an important element in the river ecosystem and a major food, livelihood and employment source for riparian communities. Fish are reliant on the hydrological cycle, including flood volumes and periods of inundation, changes to flow water flow may, therefore, have profound impacts on fish ecology. Some of the non-endemic fish present in Lake Turkana do not breed in the lake, but migrate up the Omo river and other affluents to breed. The fisheries of Lake Turkana may be affected by the development of activities within the Basin during filling of upstream reservoirs (Avery, 2014b), particularly the Gibe III project. However, no studies to date have suggested that existing dams (including Gibe III) will block migration routes and it seems that they are located sufficiently far upstream to make this unlikely.

**Forests.** There are expansive grasslands and forests within the Omo-Turkana Basin. There is an extraordinary diversity of indigenous pastoral and agro-pastoral economies within the region dependent on these ecosystems. There is evidence that vegetation and forests have been cleared within the Omo river basin due to human activity (Avery & Eng, 2012). Both northern and southern riparian forests contribute to the Lower Basin's high biodiversity. The dominant species of higher altitude zone forests, such as those near the Mago, Mui and Mara tributaries, are different from those in the lower, meandering portion of the river (Gritzner, 2008).

**Wetlands.** Wetlands occupy between 4-6% of land in Kenya (MEMR 2012) and 2% in Ethiopia (Amsalu & Addisu 2014). Lake Turkana is a major wetland resource in Kenya and is crucial for the livelihoods of local communities, survival of biodiversity, and the provision of a number of vital ecosystem services. However, Lake Turkana, as well as many other wetlands contained within the basin, currently face challenges of degradation and many require restoration (IUCN, 2017). The importance of wetlands in the Omo-Turkana is consistent with the importance of wetlands to rural livelihoods and biodiversity evidenced throughout Africa (Rebelo et al, 2010). The Lotikipi Swamp, a shared resource for communities of Kenya, Uganda, South Sudan and Ethiopia, provides vital pastureland during the dry season (MEMR, 2012) and has potential to be impacted by developments within the basin.

**Biodiversity.** Ethiopia and Kenya are considered to be two of the most biodiversity-rich nations in the world (Ethiopia: Gebretsadik 2016, Kenya: MEWNR 2015). In the Omo-Turkana basin, biodiversity is reflected in a variety of game, bird and fish species, including large populations of Nile Crocodiles. However, Ethiopia is also one of the world's most degraded biodiversity hotspots (Getu, 2012). The biodiversity in Lake Turkana is under increasing pressure from development activities, as well as population increase, over-grazing, illegal fishing and wildlife poaching (IUCN, 2017).

**Wildlife.** The Lower Omo Valley contains a number of wildlife protected areas, including the Omo and Mago National Parks, Tama and Chelbi Wildlife Reserves and the Murule and Wellshet Sala Controlled Hunting Areas. Large wildlife populations have been recorded in recent years in the Lower Basin, although many have now become severely depleted. The Lower Omo grasslands have traditionally been home to eland, Buell's Zebra, lion, leopard, cheetah and elephant amongst others. In addition, the riparian forest and woodland areas support a rich wildlife population including hippo, elephant, crocodile, at least three species of primates, kudu, bushbuck, waterbuck leopard, and a wide variety of bird species. The trend has not been positive, however, reflected in elimination of wide range of microhabitats and their biota as well as changes in feeding patterns and the reproduction of fauna throughout riverine, floodplain and delta environments (Gritzner, 2008).

**Threats to environmental resources.** One major threat to the environmental resources of the Omo-Turkana is irrigation expansion associated with impending water resources development. This may alter flow downstream and lead to a range of consequences including potentially reduced fish catch and water availability in the Turkana Lake area. Another major threat to the environmental resources of the basin is salinity. Lake Turkana is the fourth largest lake in Africa and is the most saline (IUCN, 2017). Its waters are 2.5 times saltier than the recommended level for drinking water, the impact of which is demonstrated by the wide number of lakeshore communities with skeletal fluorosis (IUCN, 2017). The annual flood of freshwater from the Omo river – with associated fluctuations in lake levels – is vital to ensuring the biological and physical integrity of Turkana's waters (Carr, 2017). Salinity levels are already critical for a number of fauna and have reached extinction level for molluscs. Salinity levels may continue to rise, should the developments on the Omo result in a reduction of annual floods and the flow into Lake Turkana (Carr, 2017). As a result, possibilities for recession agriculture, fish population, potable water quality and ability of live-stock watering may be affected (Avery, 2013; Gritzner, 2008; Avery & Eng, 2012).

## 2.3 ENVIRONMENTAL ISSUES IN THE ZAMBEZI RIVER BASIN

IWMI library resources and internet searches were used to identify and compile literature on environmental issues within the Zambezi Basin. Review of this literature led to identification of several major environmental concerns in the Zambezi Basin. While the degree and order of importance of

environmental issues did not necessarily match those of the Omo-Turkana, the main issues were the same. For consistency, the environmental issues are presented in the same order as they were presented above: fisheries and aquaculture, forests, wetlands, biodiversity and wildlife.

**Fisheries and Aquaculture.** There are approximately 85 species of fish in the upper Zambezi river and 80 in the Kafue River. The diversity of Lake Kariba and Lake Malawi/Nyasa's fish populations rival those of any natural or artificial lake in the world (World Bank, 2010). Fish are both vital to the maintenance of ecosystems and essential to the preservation of local livelihoods (Hoguane & Armando, 2015; Ribeiro, 2009; Shela, 2000, World Bank, 2010). The Zambezi River provides diverse habitat for various aquatic species due to the availability of wetlands, estuaries, deltas and mangroves (World Bank, 2010). Fisheries are heavily exploited throughout the Zambezi basin (Tweddle, 2010). In recent years, almost all of the fisheries within the Zambezi river system have experienced a reduction in the number of larger, more valuable species (such as the Tilapias) and serious drops in catch rates, largely as a result of overfishing (Tweddle et al., 2015). As a result, the use of environmentally damaging fishing gears has risen. Ultimately, the management of fishery resources is complex and in many of the Zambezi countries the legislation, policies and regulations have been noted to be outdated (AU-IBAR, 2016). Multiple users are active within transboundary watercourses and are subject to different rules and responsible to different authorities.

**Forests.** A total of 75% of the Zambezi Basin land area is covered with forest and bush which is a vital source of livelihood by local communities. The Zambezi teak forests are the most prominent resource and are shared by five of the Zambezi Basin States (Angola, Botswana, Namibia, Zambia and Zimbabwe). The forests serve an economic purpose, as a source of commercially profitable timber as well as offering educational, scientific and aesthetic value. Local communities depend on the resource for building materials and firewood and charcoal. Forests, along with wetlands and floodplains, also help to regulate river flows (Box 2).

**Wetlands.** Wetlands are some of the most productive and environmentally sensitive ecosystems within the Zambezi Basin (McCartney et al., 2016; ZAMCOM, 2016). Wetlands act as major resources for flora and fauna, as well as providing vital services for indigenous communities through fisheries and flood recession agriculture. However, the aggregate value of wetland ecosystems is often underestimated and the expected benefits from wetland development projects placed ahead of preservation (Seyam et al, 2001). There is significant potential to harness the value of wetlands by using integrated approaches to wetland management.

**Biodiversity.** The Zambezi biome covers 95 percent of the total Zambezi basin area, it is home to more than 6,000 species of flowering plants, 650 species of birds and more than 200 species of animals (ZAMCOM, SADC & SARDC, 2015). Biodiversity is an economic driver of the Zambezi River Basin, mainly through the tourism industry. Across the Zambezi Basin States approximately 18 percent of total land area falls within protected areas (SADC/SARDC, 2012) consisting of gazetted forests and national parks. Many of those protected areas transcend international boundaries, necessitating the need for coherent management of transboundary national resources within the basin.

**Wildlife.** Wildlife is an important asset for local communities and for environmental sustainability. The population of wild animals in the ZRB has substantially decreased due to hunting, poaching, and extensive habitat destruction (World Bank, 2010). Further, a paucity of incentives has resulted in a low contribution to wildlife management by local communities (Hiscock, Matiza-Chiuta and Lash, 1996). FAO (2007), Ndebele-Murisa et al., (2011) and Ribeiro (2009) cite poaching and other illegal hunting as harmful to wildlife. Within the basin, the Kavango-Zambezi Trans Frontier Conservation Area (KAZA TFCA) formed by Angola, Botswana, Namibia, Zambia and Zimbabwe seeks

to serve as an anchor for economic integration, poverty alleviation and social and economic development. The KAZA aims to sustainably manage the Kavango Zambezi ecosystem through harmonization of policies, strategies and practices across the partner countries.<sup>2</sup>

**Threats to the environmental resources in the Zambezi.** One major threat to environmental resources in the Zambezi is climate change. Climate change adversely affects the environment within the basin by causing droughts and changes in rainfall and runoff patterns. The occurrence of droughts and floods harming the agricultural and livestock production, crop and fishery harvest as well as wildlife population (ZAMCOM, 2015; ZAMCOM et al., 2016). Current projections show substantial decrease in precipitation and extension of dry periods which in turn increase evaporative losses and contribute to expansion of phytoplankton and waterweeds (Ndebele-Murisa et al., 2011; Tumbare, 2015; World Bank, 2010). Impending water resources development may also trigger flow alterations with potentially significant impacts on a range of ecosystem services (World Bank, 2010; ZAMCOM, SADC, & SARDC, 2015). Finally, proliferation of water hyacinth – particularly in the Lower Zambezi – threatens environmental resources including a RAMSAR site (de Bruyne et al., 2017).

**Box 2—Nature for Water: the flow-regulating functions of ecosystems in the Zambezi Basin (McCartney et al., 2013)**

By affecting transpiration and evaporation and influencing how water is routed and stored in a basin, forests, wetlands and floodplains play a crucial role in the hydrological cycle. A major role widely attributed to them is regulating flows (i.e., both attenuating floods and maintaining flow during dry periods). However, these services are seldom, if ever, explicitly factored into the planning and management of water resources. One reason for the failure to include them is lack of understanding of the hydrological functions occurring, their dynamic nature, and the interaction of these functions with the catchments in which the ecosystems are located. Very often, it is unclear exactly which functions are performed and how these functions change over time (i.e., between seasons and between years). Furthermore, both the lack of quantitative information and a recognized method to incorporate them into decision-making processes, make it very difficult to integrate natural hydrological functions into the planning and management of water resources.

An IWMI Research Report (McCartney et al., 2013) summarizes the findings of a literature review conducted to find evidence of the flow regulating functions of the major ecosystems in the Zambezi River Basin. It describes a pragmatic approach for quantifying the flow regulating functions of floodplains, headwater wetlands and miombo forests in the basin. The method utilizes observed streamflow records and flow duration curves to derive a simulated time series of flow in the absence of the ecosystem. This can then be compared with an observed time series to evaluate the impact of the ecosystem on the flow regime. The method has been applied to 14 locations in the basin. Results indicate that the different ecosystems affect flows in different ways. Broadly: i) floodplains decrease flood flows and increase low flows; ii) headwater wetlands increase flood flows and decrease low flows; iii) miombo forest, when covering more than 70% of the catchment, decreases flood flows and decreases low flows. However, in all cases there are examples which produce contrary results and simple correlations between the extent of an ecosystem type within a catchment and the impact on the flow regime were not found.

<sup>2</sup> See The Memorandum of Understanding Concerning the Establishment of the Kavango-Zambezi Transfrontier Conservation (KAZA MoU) between Angola, Botswana, Namibia, Zambia and Zimbabwe, December 2006 and The Treaty on the Establishment of the Kavango-Zambezi Transfrontier Conservation Area (KAZA Treaty), 2001

### 3. METHODS

#### 3.1 DATA COLLECTION

**Collection of legal documents.** Environmental law and policy texts from each of the basin countries and regions of the Omo-Turkana and Zambezi formed the primary data utilized in this analysis. Legal documents were obtained via the DAFNE database and governmental websites. Online searches were used to supplement those documents that the DAFNE database provided, which was limited to legal documents in the water sector. The extended search targeted legal and policy documents covering each of the non-environmental issues on which this report focused, namely water, energy and agriculture. These documents were included in order to identify the level of coverage of environmental issue within the legal and policy texts which relate to other sectors. A standardized search procedure was used to maximize uniformity, as follows:

1. Search of the DAFNE database for relevant law and policy
2. Search of national government or individual ministry/agency websites of each member state for documents relating to i) environmental laws and policies in the environmental sectors covered (fish and aquaculture, forests, wetlands, etc.) ii) extended search for policies relating to energy, agriculture and water.
3. General search using Google with search terms as follows: [country name] + environmental sector + policy OR law
4. Search of online legal databases FAOLEX (United Nation's [UN] Food and Agricultural Legislation database) and ECOLEX (Joint initiative of IUCN, UNEP and FAO), using the same search terms
5. Search for academic literature using Google Scholar, using the same search terms

**Filtering documents.** In total, 423 documents were collected from countries and regions<sup>3</sup> of the Omo-Turkana and Zambezi basins. Those documents were subsequently filtered based on five main parameters (2). This first parameter excluded documents which focused on administrative aspects of relevant legislation. In other words, this parameter excluded documents that focused on the regulatory procedure of the administrative process and/or the assigning of the management positions of natural resources.

Table 2 - Total number of excluded documents

Parameter	Number of excluded documents
Administration	99
Duplicates and Repealed Versions	25
Various documents focused on extraneous issues e.g. navigation, liabilities for animals' eradication	24
Reports	12
Financial	11
<b>TOTAL</b>	<b>171</b>

**Other criteria for exclusion.** The second parameter was duplicates which contained old versions of documents and repealed documents. The most updated versions of the legal documents were used in this report, most of which already contained all amendments. The third parameter excluded various texts which were not relevant for the purpose of this research, such as those on vessel management, liabilities in case of animal eradication, and environmental impact assessment control. The fourth parameter excluded reports, which typically provided relevant information but were more background in nature rather than directly contributing to a legal and policy framework. The

<sup>3</sup> East African Community (EAC) and Southern African Development Community (SADC)

fifth parameter excluded documents relating to finances reflecting fees payment, tariffs establishment and access to market and trade. Ultimately, 171 documents were excluded from the classification. A final set of 252 documents were therefore classified (Table 3): 217 laws and 35 policies. 45 documents pertained to the Omo-Turkana, and 207 to the Zambezi.

Table 3 – The number of documents collected and classified within each riparian country of Omo-Turkana and Zambezi river basins

No.	Country/Basins	Number of collected documents	Number of classified documents
1.	Zambia	32	14
2.	Zimbabwe	28	13
3.	Tanzania	42	30
4.	Namibia	53	38
5.	Mozambique	37	18
6.	Malawi	38	28
7.	Botswana	42	24
8.	Angola	52	36
9.	Ethiopia	41	26
10.	Kenya	52	18
11.	Regional and Transboundary laws (Zambezi)	5	5
12.	Regional and Transboundary laws (Omo-Turkana)	1	1
	<b>Total</b>	<b>423</b>	<b>252</b>

### 3.2 CLASSIFICATION OF DOCUMENTS

**Classification parameters.** The laws and policies collected were stratified according to a set of basic and technical parameters (Table 4). The basic parameters provide the general information about the legal and policy documents. A set of six parameters were used including the name of the document, year and country, which are self-explanatory. The nature of the document details the type of the legal document, namely either law or policy. The next parameter, scale, defines the national or transboundary scale to which document refers. The last parameter, sector, captures the sector to which a document belongs (e.g., environment, water, agriculture, energy).

**Technical parameters.** Subsequently, the documents were classified according to six technical parameters: five environmental issues (fish and aquaculture, forests, wetlands, biodiversity, wildlife). Within each issue, a subset of key elements was considered as means to reveal the depth and range of coverage on the issue.

**Fish and Aquaculture.** The first parameter was focused on fish and aquaculture resources. It had eight main elements: the establishment of both a legal and policy framework; protected zones; closed fishing seasons; limitation on the number of licenses/permits granted; aquatic biodiversity; aquaculture; limitations of fishing gear; and consideration of traditional use.

**Forests.** The second parameter is forests, which covered six elements: the establishment of a legal and policy framework, definition of forest resources; establishment of forest reserves and protected areas; afforestation; species conservation/biodiversity; and license for use of protected forests and reserves on certain grounds.

**Wetlands.** The third parameter is wetlands. The elements of focus were the following: establishment of both a legal and policy framework; protection zones/Ramsar sites; consideration of traditional use and explicit provisions for species conservation/biodiversity.

**Biodiversity.** The fourth parameter is biodiversity, reflected in six main elements. They are: establishment of both legal and policy framework; protection zones; maintenance and regulation of flora and fauna; invasive alien species; habitat loss; community management structure.

**Wildlife.** The fifth parameter is wildlife, subdivided into four main elements: measures for safeguarding wildlife; establishment of legal and policy framework; protection zones; protected species/biodiversity; established 'buffer zone' and regulation of hunting of protected species/in protected areas under certain conditions.

Table 4 – Classification framework, Environmental Issues in Omo-Turkana and Zambezi River Basins.

	Parameters	Explanation
<b>Basic</b>	Name of the document	Self-explanatory
	Nature of the document	The type of legal document e.g. laws and policies.
	Year	Self-explanatory
	Country/Basin	Self-explanatory
	Scale	Definition of the national or transboundary scale of the legal documents' allocation
	Sector	Self-explanatory
<b>Technical</b>	Fish and Aquaculture	Establishment of both a legal and policy framework; the establishment of protected zones; closed fishing seasons; limitations on the number of licenses/permits granted; aquatic biodiversity; aquaculture; limitations of fishing gear; and consideration of traditional use.
	Forest	Establishment of a legal and policy framework, definition of forest resources; establishment of forest reserves and protected areas; afforestation; species conservation/biodiversity; and license for use of protected forests and reserves on certain grounds.
	Wetlands	Establishment of both a legal and policy framework; protection zones/Ramsar sites; consideration of traditional use and explicit provisions for species conservation/biodiversity
	Biodiversity	Establishment of both legal and policy framework; protection zones; maintenance and regulation of flora and fauna; invasive alien species; habitat loss; community management structure.
	Wildlife	Measures for safeguarding wildlife; establishment of legal and policy framework; protection zones; protected species/biodiversity; established 'buffer zone' and regulation of hunting of protected species/in protected areas under certain conditions.

### 3.3 LIMITATIONS

The documents available across each of the countries varied widely. The form of legal documents also varied between the civil law systems of Angola, Ethiopia and Mozambique and the mixed (common law and civil law) systems of the other basin countries. The differing legal systems, as well as the language barriers in Angola and Mozambique made relevant texts within those countries more difficult to locate. In the case of Angola and Mozambique, where the majority of texts were in Portuguese, partial translations and secondary sources were relied upon. As a result, the analysis of these countries may not be as comprehensive. In addition, legal and policy texts – as well as supporting literature – relating to the Omo-Turkana basin tend to be less advanced than the Zambezi, which constrained the depth of analysis of the Omo-Turkana.

### 3.4 ANALYSIS

Three analyses were conducted. A first analysis determined the extent of consideration of environmental components through the laws and policies in both basins, in order to reveal depth of coverage as well as gaps/omissions. A second analysis determined whether the approaches taken are harmonized or aligned at the national and transboundary levels across countries in the basins. A third analysis stratified documents according to sector in order to identify how the energy, agriculture and water sectors treat the environment. While each analysis drew on all documents, the primary aim was to identify and mine documents that provided information most relevant to a specific issue or element. In practice, this meant that the first two analyses relied more heavily on environmental sector documents, whereas the third analysis by its nature utilized documents across all sectors (environment, water, agriculture, energy).

**Depth of Consideration.** In order to understand the depth of consideration afforded to each of the environmental issues in the basins, depth of coverage to each issue was examined. For each environmental issue, the first task was to establish whether both a legal and policy framework were in place, to provide a degree of uniformity across the analysis of each issue. If an issue (e.g., aquaculture and fish) possessed a legal and policy framework devoted to it, a check mark as indicated was inserted (Table 5). Subsequently, depth of coverage to particular elements was evaluated on a graduated spectrum from not mentioned to mentioned, to partly to fully regulated. Specific elements vary according to issue, which were elaborated above (Table 3).

Table 5 – Assessing Depth of Coverage

Sign	Interpretation
✓	Possesses a devoted legal and policy framework
-	Not mentioned within policy or legislation
+	Mentioned
++	Partly Regulated: regulations provided but some relevant details missing.
+++	Regulated: regulated with details which are clear and concise

**Determining alignment across countries and scales.** Using the information gathered in the first analysis, a comparison was conducted on coverage of the environmental issues both within each of the environmental sectors and across scales. The key points of alignment and key points of divergence across each of the basin countries within each environmental sector were identified.

**Exploring congruity between the environment and non-environmental sectors.** Key non-environmental texts were analysed for any mention of the environmental sectors which are the focus of this research. A search was conducted within each document for the words: fish and aquaculture, forest, wetlands; biodiversity; wildlife. Where none of the key environmental issues were found, any coverage of the environment was searched for more broadly, in the form of word searches of conservation, preservation, pollution and protection. The number of times each word is mentioned throughout the document was noted, as were relevant provisions identified as a result of each search.



## 4. DEPTH OF POLICY COVERAGE TO ENVIRONMENTAL ISSUES

### 4.1 OMO-TURKANA BASIN

**Fisheries and Aquaculture.** The legal and policy frameworks which apply to fisheries and aquaculture provide some level of coverage in Kenya and Ethiopia (Table 6). Kenya has in place an updated and comprehensive legislative framework. However, Ethiopia's legal and policy framework is not as extensive, often lacks specificity and fails to provide adequate detail for the coverage of key elements such as aquatic biodiversity. Legislation applied to both coastal and inland fisheries in Kenya, and only to inland fisheries in Ethiopia as the country has no coast. While one transboundary water agreement (MoU) has been concluded on the Omo-Turkana, it is not believed to devote attention to fish.

Table 6 – Coverage of Fish and Aquaculture in Omo-Turkana Basin

	Ethiopia	Kenya	Transboundary/Basin
<i>Establishment of both legal and policy framework</i>			-
<i>Protected zones</i>	+	++	-
<i>Closed fishing seasons</i>	+	++	-
<i>Limitation on number of licenses/permits granted</i>	-	+++	-
<i>Aquatic biodiversity</i>	+	+++	-
<i>Aquaculture</i>	+++	+++	-
<i>Limitations of Fishing Gear</i>	+	+++	-
<i>Consideration of Traditional Use</i>	+	+++	-

Lack of coverage to fish and aquaculture at a transboundary/basin level reflects a significant omission given that Lake Turkana crosses an international border and provides an important source of livelihoods to surrounding communities. Further, management structures for fisheries may not accommodate the movement of fishers, particularly within inland water resources, such as Lake Turkana. For instance, the establishment of Beach Management Units (BMUs) as a community management structure rests upon a static management geography, which does not always align with the methods of local communities who change location based on fish populations. There would therefore appear to be a need for a more comprehensive framework which takes into consideration the fishing patterns of local communities and provides an integrated structure at both lake and basin level.

**Forests.** The legal and policy regimes in Kenya and Ethiopia provide relatively similar levels of coverage to forestry resources, on aggregate. Kenyan legislation nonetheless possesses both a more recent set of legislation, including both a legal and policy framework (Table 7). Further, while management of Kenya's forests rests with the Kenya Forest Service (Established under the Forests Act 2005<sup>4</sup>), the management of Ethiopian forests is devolved to regional governments under the broader guidance of the Ministry of Agriculture and Rural Development.

While Kenya is a member of transboundary instruments with the East Africa Community which are relevant to forests, such as the EAC Protocol on Environment and Natural Resource Management (2006), no specific agreement exists between Kenya and Ethiopia. The Kenya National Forest Programme gives due reference to this gap, stating that management of transboundary forest resources remains a challenge and emphasizing the need to develop regional partnerships to control transboundary forest crimes, though nothing has been done to achieve this since 2005.

<sup>4</sup> Forests Act 2005 (Act No. of 2005), Section 4 (Kenya)

Table 7 – Coverage of Forests in Omo-Turkana

	Ethiopia	Kenya	Transboundary/Basin
<i>Establishment of both legal and policy framework</i>	-		-
<i>Definition of forest resources includes wild animals</i>	-		-
<i>Establishment of forest reserves and protected areas</i>	++	++	-
<i>Afforestation</i>	++	++	-
<i>Explicit provisions for species conservation/biodiversity</i>	++	++	-
<i>License for use of protected forests and reserves permitted on certain grounds</i>	+++	+++	-

**Wetlands.** Policy and legislation relating to wetlands differs considerably between the riparian states of Kenya and Ethiopia (Table 8). While Kenya has a specific wetland policy in place, coverage in Ethiopia is only provided through policies relating to other environmental sectors. It is difficult for the multiplex of measures required for the adequate protection of wetlands to be offered as a secondary mention within legislation which is tailored to a separate environmental issue. The disparity in legislation could therefore result in imbalanced protection for the wetlands of the Omo River and Lake Turkana (MEMR, 2012).

There are no basin level agreements within the Omo-Turkana basin which apply to wetlands. While Kenya has been party to the Ramsar Convention since 1990, Ethiopia is yet to sign up to the convention. As a result, wetlands present in Ethiopian portions of the Omo-Turkana basin may be at-risk.

Table 8 – Coverage of Wetlands in Omo-Turkana

	Ethiopia	Kenya	Transboundary/Basin
<i>Establishment of both Legal and Policy Framework</i>	-		-
<i>Protection zones/RAMSAR Sites</i>	+	+++	-
<i>Consideration of Traditional Use</i>	-	+++	-
<i>Explicit Provisions for species conservation/biodiversity</i>	+	+++	-

**Biodiversity.** Biodiversity is not adequately covered within the Omo-Turkana Basin, with neither Kenya nor Ethiopia having a biodiversity legal or policy framework in place (Table 9). In the context of the developments on the Omo River, the Omo and Mago National Parks, Tama Community Conservation Area and Murulle Controlled Hunting Area may undergo major changes to their boundaries. In light of these changes, opportunity will arise for habitat loss and inadequate protection of flora and fauna, putting vulnerable species at risk, should appropriate protection not be put in place.

No specific basin level agreements which cover biodiversity are present within the Omo-Turkana. Both countries are nonetheless party to the Convention on Biological Diversity (CBD). It is interesting to note that Ethiopia has submitted two National Biodiversity and Strategic Action Plan (NBSAP) to support CBD implementation (2006, 2015) since its ratification, while Kenya has only

submitted one (1999). Therefore, while provisions which are detailed in national legislation within Kenya may be more comprehensive than Ethiopia, government acknowledgement and support for a framework regarding biodiversity is also evident in Ethiopia.

Table 9 – Coverage of Biodiversity in Omo-Turkana Basin

	Ethiopia	Kenya	Transboundary/Basin
<i>Establishment of both legal and policy framework</i>	-	-	-
<i>Protection zones</i>	+++	+++	-
<i>Maintenance and regulation of flora and fauna</i>	-	++	-
<i>Invasive Alien Species</i>	-	+	-
<i>Habitat Loss</i>	-	++	-
<i>Community Management Structure</i>	++	+++	-

**Wildlife.** The legislative framework governing wildlife management in Kenya is recently enacted, comprehensive, and provides strict penalties for offences relating to wildlife. The Ethiopian framework, on the other hand, is less comprehensive and relies on the protection of wildlife management areas at a federal level (Table 10).

There are no agreements which provide basin level coverage of wildlife within the Omo-Turkana Basin. Both states are, however, signatories of the 1992 *Lusaka Agreement on Co-operative Enforcement Operations directed at Illegal Trade in Wild Flora and Fauna (signed by Ethiopia, signed and ratified by Kenya)*. The Lusaka Agreement nonetheless does not impose any binding obligations on signatory states, leaving progression of wildlife legislation to the initiative of individual states.

Table 10 – Coverage of Wildlife in Omo-Turkana

	Ethiopia	Kenya	Transboundary/Basin
<i>Establishment of both legal and policy framework</i>	-		-
<i>Protection zones</i>	+++	+++	-
<i>Protected species/biodiversity</i>	++	+++	-
<i>Established 'buffer zone'</i>	-	-	-
<i>Provision which allows hunting of protected species/in protected areas under certain conditions</i>	+++	+++	-

## 4.2 ZAMBEZI BASIN

**Fisheries and Aquaculture.** While all of the countries within the ZRB now have at least some level of legal coverage for the management of fisheries, coverage is limited and differences between riparian countries are vast (Table 11). An example of such differences can be seen on Lake Kariba where Zimbabwean gill net fisherman can use five gill nets which are at least 104mm in mesh size and measuring 100m long, whereas on the Zambian side fishers can use as many gill nets as they wish, which are a minimum of 76 mm with no limitation imposed on length (Nyikahadzoi et. al, 2017). Further, Lake Kariba has been actively managed from the Zimbabwean side while the Zambian side has remained unrestricted (AU-IBAR, 2016). Priority in Zambia has been

given to employment, while priority within Zimbabwe has been given to conservation, resulting in the priority of one riparian state comprising the welfare of the other (Nyikahadzoi et. al, 2017). Zambia's Fishery regulations fundamentally aim to provide food security and ensure employment for rural communities.<sup>5</sup> Further differences can be seen in the fishing gear specifications.<sup>6</sup> Evidenced realities – which could be interpreted as fairly unsustainable – come despite the establishment of the 1999 *Protocol on Economic and Technical Co-operation between the Government of the Republic of Zambia and the Government of the Republic of Zimbabwe concerning the management and development of fisheries on Lake Kariba and transboundary waters on Zambezi River*. Within the framework of the Protocol, a Joint Technical Committee was established to manage, conserve and regulate the exploitation of fisheries resources, as well as monitor the aquatic environment and support technical cooperation on fisheries matters and control alien species (FAO, 2016).

Table 11 – Coverage of Fish and Aquaculture in the Zambezi Basin ÷

	AGO	BWA	MWI	MOZ	NAM	TZA	ZMB	ZWE	TBBL <sup>7</sup>
<i>Legal and policy framework</i>		- (legal only)		- (legal only)			- (legal only)	- (no specific law or policy)	
<i>Protected zones</i>	++	+	+++	+	+++	+++	+	+	-
<i>Closed fishing seasons</i>	-	++	+++	+	+++	+++	+	+	-
<i>Limitation on number of licenses/permits granted</i>	-	-	+	-	+++	-	-	+	-
<i>Aquatic biodiversity</i>	+	-	+++	+	+++	+++	+	+	+
<i>Aquaculture</i>	+	-	++	++	+++	+++	+	-	+
<i>Limitations of Fishing Gear</i>	-	+	++	+	+++	+++	+	++	-
<i>Consideration of Traditional Use</i>	-	-	++	++	-	+++	+	+++	-

Less developed regulation of fisheries is evidenced where the management of the issue falls under the purview of a government department with other priorities. For instance, the management of fisheries in Zimbabwe falls under the Zimbabwe Parks and Wildlife Management Authority, a department of the Ministry of Environment and Tourism and the fisheries sector in Botswana, similarly, falls under the jurisdiction of the Department of Wildlife and National Parks within the Ministry of Wildlife, Environment and Tourism. Both countries possess two of the least developed policies for fish protection and aquatic biological sustainability. In Malawi and Zambia, however, which have slightly more developed frameworks, fisheries are managed within their own department. In Mozambique and Namibia, full ministries are devoted to fisheries and therefore the countries have

<sup>5</sup> This can be demonstrated by the fact that the number of fisherman per area is not subject to limitation, while in Zimbabwe fishing areas and the number of fisherman are subject to limitations. Further, in Zimbabwe only 63% of fishable water is available while the rest is closed and reserved for tourism and fish stock replenishment (Nyikahadzoi et. al, 2017)

<sup>6</sup> No maximum length of net in Zambia, Zimbabwe limited to 100m, no limit on the number of nets per fisher in Zambia, Zimbabwe limited to 5. (Nyikahadzoi et. al, 2017)

<sup>7</sup> Transboundary / Basin level

quite comprehensive institutional frameworks (Mosepele & Kolawole, 2017). Part of evidenced differences may result from the reality that certain countries possess coasts while others do not. Nonetheless, existing legislative frameworks may not be sufficient to ensure the protection and conservation of fisheries within the Zambezi basin, or to regulate the growing aquaculture industry in many of the basin countries.

As previously mentioned, the 1999 Protocol provides a legal basis for establishing an institution for technical cooperation between Zambia and Zimbabwe focusing on the management and development of fisheries on Lake Kariba (Nyikahadzoi, 2017). However, it is not clear to what extent the Protocol and the Technical Committee thereof has had an impact on fisheries management. The *Agreement on the action plan for the environmentally sound management of the Common Zambezi River system* (hereinafter '1987 Environmental Agreement') is also significant and states that special attention should be given to fisheries, the creation of fish farms and the management of fish genetic resources.<sup>8</sup> The agreement also states that there must be cooperation in the assessment and utilisation of fisheries to achieve the highest rational utilisation on a sustainable basis.

In addition, the Zambezi Watercourse Commission (ZAMCOM) aims to coordinate the cooperative management and development of the Zambezi watercourse in a sustainable manner. ZAMCOM was enacted through the ZAMCOM Agreement<sup>9</sup> which was signed by the majority of basin states in 2004 and entered into force in 2011, ratified by all basin states with the exception of Zambia. The ZAMCOM Agreement aims to promote the equitable and reasonable utilisation of the water resources of the Zambezi Watercourse as well as the efficient management and sustainable development thereof.<sup>10</sup> The Agreement links to the provisions developed in Article 3 of the SADC Revised Protocol on Shared Watercourses including the precautionary principle and the need to assess transfrontier impacts.<sup>11</sup> The agreement provides further recognition of transboundary impacts, stating that member states must take all appropriate measures to 'prevent, eliminate, mitigate or control adverse transboundary impacts'.<sup>12</sup> While the agreement does not give reference to any specific environmental sector, the overarching framework does impose the aforementioned key environmental principles on member states and national legislation should, therefore, be shaped according to those principles moving forward.

In addition, the SADC Protocol on Fisheries should be noted. It requires parties to 'seek a rational and equitable balance between social and economic objectives' by providing legal, administrative and enforcement measures that protect the fishing rights, tenure and fishing grounds of artisanal and subsistence fishers, and consider the needs of disadvantaged fishers.<sup>13</sup> The Protocol does not provide any specific regulations, but rather dictates provisions which should be enacted at a national or regional level, which would result in the harmonization of legal and policy frameworks across the region. State Parties are requested specifically to develop and nurture small-scale commercial fisheries due to their important economic and social benefits.<sup>14</sup> Member states agreed under the Protocol on Fisheries to take appropriate measures to regulate the use of living aquatic resources and to protect these resources from over-exploitation, as well as to build capacity for the sustainable utilization of those resources. Obligations for implementation of the protocol rests on individual member states.

<sup>8</sup> Agreement on the action plan for the environmentally sound management of the Common Zambezi River system signed at Harare, 28 May 1987

<sup>9</sup> Agreement on the Establishment of the Zambezi Watercourse Commission (ZAMCOM Agreement), signed 13th July 2004, in force June 2011

<sup>10</sup> Agreement on the Establishment of the Zambezi Watercourse Commission (ZAMCOM Agreement), signed 13th July 2004, in force June 2011, Articles 12 and 13

<sup>11</sup> Agreement on the Establishment of the Zambezi Watercourse Commission (ZAMCOM Agreement), signed 13th July 2004, in force June 2011, Article 12

<sup>12</sup> Agreement on the Establishment of the Zambezi Watercourse Commission (ZAMCOM Agreement), signed 13th July 2004, in force June 2011, Article 14(3)(b)

<sup>13</sup> SADC Protocol on Fisheries, (signed 2001, entered into force 2009), Article 12(1)

<sup>14</sup> SADC Protocol on Fisheries, (signed 2001, entered into force 2009), Article 12 (2)

**Forests.** A plethora of legal and policy instruments aimed at protecting forestry resources exist across the Zambezi Basin (Table 12). Participatory forest management dominates the forest conservation narrative. While community participation approaches involve people and may therefore secure higher levels of buy-in, some such as Murphree (2000) state that the problem with community-based forest management programmes is not that they do not work, but rather that they have not been tried vigorously enough. A difference can be noted between Tanzania, which has demonstrated a successful model of community participation in forest management, by empowering local communities as managers and providing them with opportunity to champion forest conservation, compared to other states which have treated the local community as mere users and thus provided little incentive for the effective management of resources. In many instances, local communities do not have the money required to apply for required licenses and permits and as a result have no choice but to end up ‘illegally’ harvesting forest resources (Campbell et. al, 2007).<sup>15</sup> Some current and emerging challenges for forest management such as climate change, payment for ecosystem services and Reduced Emissions from Deforestation and Forest Degradation (REDD) are not reflected in the legal frameworks due to the age of the legislation and policies. Ultimately, a clear system may be required to ensure that indigenous groups are able to access forest resources for both subsistence and economic gain while ensuring sustainability.

At the basin level, the 1987 Environmental Agreement gives reference to the significance of forest resources, calling for the establishment of a basin-wide unified monitoring system for forestry (as well as a number of other sectors) and for cooperation in the conservation of wood resources to increase supply on a sustainable basis and reduce the rate of deforestation. The Agreement also advocates campaigns to persuade local communities, schools and individuals to provide forest protection and fuelwood plantation for themselves.

The SADC Forestry Protocol should also be noted. The Protocol aims to promote the development, conservation, sustainable management and utilization of all types of forests and trees as well as trade in forest products throughout the SADC region.<sup>16</sup> It was followed by the formation of the SADC Forestry Strategy (2010-2020).<sup>17</sup> The Protocol gives focus to local participation and community management of forestry resources throughout, calling for state parties to ensure that they ‘create incentives for sustainable forest management’ and ‘give interested and affected parties the right to participate in decision-making regarding natural forests and forests on public or state land...’.<sup>18</sup> State parties are also called upon to, where appropriate, establish programmes and enter into agreements to promote the cooperative and integrated management of transboundary forests and protected areas.<sup>19</sup>

**Wetlands.** There has been a piecemeal approach to wetland management in the ZRB. The majority of Zambezi Basin States do not have laws or policies in place which focus centrally on wetlands.<sup>20</sup> Rather, protection offered to such areas is found within other environmental laws and policies, creating a fragmented approach across the basin with differing levels of coverage within each State. As reference to wetlands is, generally, only contained within laws and policies which have focus on other issues, their needs can become lost in the overarching objectives of the sectoral environmental law or policy within which they are contained.

<sup>15</sup> It is estimated that 10% of fees and licenses are collected in Zambia and in Tanzania 25% (Campbell et. al, 2007)

<sup>16</sup> SADC, Protocol on Forestry (signed 2002 entered into force 2009). Gaborone: SADC, 2002. Article 2

<sup>17</sup> SADC, Forestry Strategy: 2010-2020. Gaborone: SADC

<sup>18</sup> SADC Protocol on Forestry (signed 2002 entered into force 2009), Article 5(1) and Article 11(1)(c). Community-based forest management is also the focus of Article 12.

<sup>19</sup> SADC Protocol on Forestry (signed 2002 entered into force 2009) Article 14

<sup>20</sup> Some focus to wetlands may nonetheless also be achieved through strategies produced as part of RAMSAR process, noted below.

Table 12 – Coverage of Forests in Zambezi Basin

	AGO	BWA	MWI	MOZ	NAM	TZA	ZMB	ZWE	TBBL
<i>Establishment of both legal and policy framework</i>	- (legal only)			NO (legal only)	-			- (legal only)	-
<i>Definition of forest re-sources includes wild animals</i>	Un-known	-		Unknown				-	-
<i>Establishment of forest re-serves/ protected areas</i>	++	+++	+++	+++	+++	+++	+++	+++	-
<i>Afforestation</i>	-	-	+++	+	+++	++	+++	-	+
<i>Explicit provisions for species conservation/biodiversity</i>	Un-known	+++	+++	+	+++	++	+++	-	-
<i>License for use of protected forests/ reserves permitted on certain grounds</i>	+	+++	+++	+++	+++	+++	+++	+++	+

With exception of reference to the existing inadequate protection of wetlands and the need to co-operate in their management and protection that was stipulated in the 1987 Environmental Agreement, there are no basin level agreements which relate specifically to wetlands within the ZRB (Table 13). Non-specific wetland protection is present within the SADC Revised Protocol on Shared Watercourses (2000) which places an obligation on states to jointly protect and preserve the ecosystem of a shared watercourse.<sup>21</sup> At an international level, all Basin States, except Angola<sup>22</sup>, are parties to the Ramsar Convention.<sup>23</sup> The Ramsar Convention aims to ensure the 'conservation and wise use of all wetlands through local and international actions and international co-operation as a contribution towards achieving sustainable development throughout the world'.<sup>24</sup> Parties to the agreement agree to establish protected areas for wetland conservation, as well as the exchange of information and implementation of the Convention, particularly in cases where wetland areas extend over the territories more than one Contracting Party.<sup>25</sup> The degree to which this is reflected in legislation of basin states is open to debate, particularly given the lack of wetland specific provisions within national legislation. Nonetheless, the RAMSAR Framework may provide a foundation on which specific actions can be elaborated and pursued moving forward.

<sup>21</sup> SADC, Revised Protocol on Shared Watercourses (signed 7 August 2000, in force 22 September 2003)

<sup>22</sup> While Angola is not yet a party to the convention, wetland sites have already been identified, see Regional Overview of the Implementation of the (Ramsar) Convention and its Strategic Plan in Africa < [https://www.ramsar.org/sites/default/files/documents/library/cop12\\_doc09\\_summary\\_africa\\_e.pdf](https://www.ramsar.org/sites/default/files/documents/library/cop12_doc09_summary_africa_e.pdf)>, Ramsar COP12, Doc.9

<sup>23</sup> Convention on Wetlands of International Importance especially as Waterfowl Habitat (11 ILM 963 signed 2 February 1971 in force 21 December 1975) (Ramsar Convention).

<sup>24</sup> Ramsar, 'The Ramsar Convention and Its Mission' (ramsar.org, 2016) <<http://www.ramsar.org/about/the-ramsar-convention-and-its-mission>>

<sup>25</sup> Ramsar Convention, Articles 4 and 5

Table 13 – Coverage of Wetlands in Zambezi Basin States

	AGO	BWA	MWI	MOZ	NAM	TZA	ZMB	ZWE	TBBL
<i>Establishment of both Legal and Policy Framework</i>	-	-	-	-	-	- (policy only)	-	-	-
<i>Protection zones/Ram-sar Sites</i>	+	+	++	++	+	+++	++	+	-
<i>Consideration of Traditional Use</i>	-	-	++	-	++	++	++	+	-
<i>Explicit Provisions for species conservation/biodiversity</i>	+	++	++	++	++	++	++	+	-

**Biodiversity.** Legislation on biodiversity in Zambezi basin states is variable (Table 14). While some states have clear legislative frameworks for biodiversity conservation, others are reliant on its protection through cross-sectoral policies. This fragmentation with which biodiversity is covered has often constrained the formulation of clear implementation or monitoring mechanisms. As a result, responsibilities for the enforcement of such provisions are scattered across sectors and not always coherently articulated. Many countries possess dated frameworks which do not give sufficient reference to the emerging issues related to biodiversity such as habitat loss and invasive species. The main challenges to biodiversity, such as unsustainable utilization, pollution, alien invasive species and habitat loss, are agreed across the National Biodiversity Action Plans of each Zambezi Basin state, yet few countries have any specific provisions to address such challenges.

At the regional level, the SADC Regional Biodiversity Strategy (2006) (RBS) is an agreement covering biodiversity. The Strategy highlights weak institutional legal frameworks as the primary constraint in implementing biodiversity initiatives and aims for a holistic approach to biodiversity.<sup>26</sup> The RBS states that national legal frameworks have not been effective, particularly in relation to the proliferation of alien invasive species. The SADC legal framework is also criticized for having weak coverage of biodiversity protection.<sup>27</sup> Due to the absence of a biodiversity specific framework at SADC level, the enactment of the RBS rests on the NBSAPs.<sup>28</sup> However, given that most NBSAPs are policy frameworks with no legal enforceability, it appears unlikely that this would be a successful means of implementation. The more recent Regional Biodiversity Action Plan 2013 (RBAP) acts as an implementation mechanism for the RBS through the provision of an implementation plan which dictates key actions and time frames.

A number of the SADC Protocols are relevant to the overarching goals of biodiversity, including the Protocol on Forests<sup>29</sup>, Protocol on Fisheries<sup>30</sup> and Protocol on Wildlife Conservation and Law Enforcement. The Wildlife Protocol is most relevant to biodiversity. Conservation of biodiversity through Transfrontier Conservation Areas (TFCAs) is one of the objectives of the protocol; TFCAs can be seen as protected areas within which biodiversity can thrive. However, outside of the establishment of TFCAs, the Wildlife Protocol is restrictive in its application, and the only mention of biodiversity is contained within the Preamble. The Preamble states that conservation and sustainable

<sup>26</sup> SADC, Regional Biodiversity Strategy (2006), Section vii and 12

<sup>27</sup> SADC, Regional Biodiversity Strategy (2006), Section 60

<sup>28</sup> SADC, Regional Biodiversity Strategy (2006), Section 26

<sup>29</sup> SADC Protocol on Forestry (signed 8<sup>th</sup> of March 2002, entered into 17<sup>th</sup> of July 2009)

<sup>30</sup> SADC, Protocol on Fisheries (signed 14<sup>th</sup> August 2001, entered into force 8<sup>th</sup> August 2003)



use of wildlife contributes to biodiversity and sustainable use. The focus of the Protocol is also limited in terms of biodiversity, as both forests and fish are excluded from its scope.<sup>31</sup> As the Wildlife Protocol is the backbone of the formation of the TFCAs, the gaps in coverage which are evident may undermine the goals of the TFCAs.

Table 14 – Coverage of Biodiversity in Zambezi Basin

	AGO	BWA	MWI	MOZ	NAM	TZA	ZMB	ZWE	TBBL
<i>Establishment of both legal and policy framework</i>	-	-	-	-	-	-	-	-	-
<i>Protection zones</i>	+++	+++	+++	+++	+++	+++	+++	+++	-
<i>Maintenance and regulation of flora and fauna</i>	++	-	++	-	-	-	+++	-	-
<i>Invasive Alien Species</i>	-	-	+++	-	-	-	++	-	-
<i>Habitat Loss</i>	+	-	+	-	+	-	++	-	-
<i>Community Management Structure</i>	+	-	+	-	+++	++	++	-	-

At an international level, the 1992 Convention on Biological Diversity (CBD) aims to ensure: the conservation of biodiversity; sustainable use of biodiversity; and equitable sharing of the benefits arising from the use of genetic resources.<sup>32</sup> The CBD makes a number of references to the importance of cooperation between states, emphasizing that biodiversity is a transboundary issue.<sup>33</sup> All ZRB States have signed and ratified the convention.

**Wildlife.** There is some degree of coverage afforded to wildlife across all of the ZRB states (Table 15). However, the strength of that coverage varies, with four states having only a legal framework in place, while the remaining four have both a legal and policy framework. Importantly, Transfrontier Conservation Areas (TFCAs) have been established within the basin, demonstrating some progress towards filling gaps in protection which are evident, particularly around the protection of particular species. TFCAs, defined in the SADC Protocol as ‘an area or component of large ecological region that straddles boundaries of two or more countries, encompassing one or more protected areas as well as multiple resource areas’, have been established throughout the Southern African region. There are five existing or potential TFCAs in the Zambezi Basin.

Of greatest significance to this report is the Kavango Zambezi Transfrontier Conservation Area (KAZA TFCA), which is approximately 520 km<sup>2</sup> in size. The treaty to establish the KAZA TFCA,<sup>34</sup> which encompasses five Zambezi Basin states, namely Angola, Botswana, Namibia, Zambia and Zimbabwe, was signed and enacted in 2011. The treaty states that the purpose of the establishment of the area is to harmonize policies, strategies, and practices for managing the shared natural resources which straddle the international borders of the five partner states. The KAZA TFCA is

<sup>31</sup> SADC, Protocol on Wildlife Conservation and Law Enforcement (1999) (Signed 14<sup>th</sup> of August 1999, in force 30<sup>th</sup> November 2003), Article 2

<sup>32</sup> The Convention on Biological Diversity 31 I.L.M 818 (1992) (In force 29<sup>th</sup> December 1993) (CBD), Article 1

<sup>33</sup> See CBD Articles 17, 18 and 23

<sup>34</sup> Established by the Memorandum of Understanding Concerning the Establishment of the Kavango-Zambezi Transfrontier Conservation Area (KAZA MoU) between Angola, Botswana, Namibia, Zambia and Zimbabwe, December 2006

comprised of 20 National Parks, 85 Forest Reserves, 22 Conservancies, 11 Sanctuaries, 103 Wildlife Management Areas and 11 Game Management Areas (KAZA TFCA, 2015-2020). Various conservation and tourism activities are included within the area, which are also protected (USAID, 2013). In spite of the KAZA TFCA, different legal and policy frameworks for wildlife exist within each of the neighboring countries – resulting in an unfair distribution of benefits among local communities and fragmented system of protection for wildlife. Differences in sentencing has incentivized poachers to operate from particular countries, resulting in dwindling wildlife populations.

Table 15 – Coverage of Wildlife in Zambezi Basin

	AGO	BWA	MWI	MOZ	NAM	TZA	ZMB	ZWE	TBBL
<i>Establishment of both legal and policy framework</i>	- (legal only)		- (legal only)				- (legal only)	- (legal only)	-
<i>Protection zones</i>	++	+++	+++	+++	+	+++	+++	+++	-
<i>Protected species/biodiversity</i>	+	+++	+++	-	+	+++	+++	+++	-
<i>Established 'buffer zone'</i>	-	-	-	++	-	+	+	-	-
<i>Provision which allows hunting of protected species/in protected areas under certain conditions</i>	+++	+++	+++	++	+	+++	+++	+++	-

Finally, a broader agreement worth noting is *the SADC Protocol on Wildlife Conservation and Law Enforcement*, which recognizes the sovereign right of a state to manage its own wildlife resources, but at the same time imposes the responsibility to conserve and sustainably use resources. Article 4 states that the primary objective of the Protocol is to establish common approaches to conservation and sustainable use of wildlife resources within each member states national laws. A list of principles which should be standardized are listed in Article 6 and include: the formation of measures for protecting wild species and their habitats; measures relating to trade in wildlife and wildlife products; the facilitation of community based natural resource management; and economic and social incentives for the conservation and sustainable use of wildlife. States are also obligated to put in place management programmes for the conservation and sustainable use of wildlife and to integrate such programmes into national development plans (Article 7). Reference to the management of transboundary resources is included in Article 4 which states that conservation should be promoted through the establishment of TFCAs. Article 4 also notes that the protocol should help to facilitate the harmonization of legal instruments governing wildlife use and conservation.

## 5. CONSISTENCY IN ENVIRONMENTAL POLICY

### 5.1 OMO-TURKANA BASIN

**Fisheries and Aquaculture.** Despite some alignment in approaches to fisheries, policy differences are apparent on at least four points. First, with regard to fishing gear, there is no specific regulation on the types of gear or size of nets which can be used in Ethiopia. In Kenya, no more

than one net at a time may be used, beach seine nets are banned, and gill nets can be no less than 45mm in stretched diagonal length (Table 16, fish and aquaculture). Second, in Ethiopia, it is merely stated that licenses are required, with little elaboration. In Kenya, licenses are required for industrial fishing, artisanal fishing for commercial purposes and commercial aquaculture. Any person that is fishing only for the purpose of non-commercial subsistence fishing intended to result in the consumption of the fish caught, is exempt from the requirement to have a license and is simply obligated to register with the government. Third, while co-management structures are in place in Ethiopia, they are a relatively new concept and are not as advanced as those established in Kenya. Co-management structures are particularly evident within Kenya, which has provisions in place for the establishment of Beach Management Units (BMU). The BMU operate at a local level and are evidence of the decentralized governance of fisheries. It is prohibited to deprive communities of traditional access to fisheries unless there is good cause and the community has been consulted.<sup>35</sup> Fourth, subsistence, commercial or recreational fishing is still permitted within a national park or reserved fishery area within Ethiopia, as long as a written permit from the authority which is responsible for the administration of the park is given.<sup>36</sup> There is no mention within Kenyan fishing legislation regarding fishing within national parks or reserves, however under the Wildlife (Conservation and Management) Act catching or attempting to catch fish in a national park, without authorisation, is declared an offence.<sup>37</sup> There is no specific mention of closed seasons. In both instances, they can be enacted when required.

There is no mention of the protection of transboundary resources within Kenyan legislation. The Ethiopian proclamation states that the Ministry may negotiate and enter into agreements with neighbouring countries regarding the development of transboundary fishing resources.<sup>38</sup> It also states that development programmes must be drawn up in such a way that they will not have direct or indirect negative impact on fisheries resources constituted in the basin where the programmes or projects are intended to be implemented.<sup>39</sup>

**Forests.** The management of forestry resources between Kenya and Ethiopia is well aligned in most areas. However, one of the key differences is the categorization of forests. In Kenya, forests are categorized as public, community and private forests.<sup>40</sup> In Ethiopia, forests are categorized as state, regional and private (Table 16, forests).<sup>41</sup> While this does not reflect a remarkable difference, greater similarity would have been in place prior to the revision of the Kenyan legislation<sup>42</sup>, when forests were vested in the state and public forests were instead designated as state forests. Ultimately, however, there is little difference in the treatment of the resources.

In Kenya, members of forest communities are permitted to collect, subject to conditions which may be prescribed, forest products which that group has been accustomed to taking other than for the purpose of sale.<sup>43</sup> In Ethiopia, no person can, unless in possession of written permission from the Ministry or appropriate regional body, harvest, cut trees, settle temporarily or permanently, graze domestic animals, carry out hunting activities, carry cutting saws or other tools for cutting trees or keep bee hives or extract honey.<sup>44</sup> However, appropriate bodies (e.g. the Ministry of Natural Resources Development and Environmental Protection or relevant regional body) may allow the use of forest products, including those contained within protected forests.<sup>45</sup>

<sup>35</sup> Fisheries Management and Development Act 2016 (No. 156 of 2016), Section 64 (Kenya)

<sup>36</sup> National Fisheries Development and Utilization Proclamation 2003 (No. 315 of 2003), Section 5 (Ethiopia)

<sup>37</sup> The Wildlife Conservation and Management Act 2013 (No. 47 of 2013), Section 13(3)(j) (Kenya)

<sup>38</sup> National Fisheries Development and Utilization Proclamation 2003 (No. 315 of 2003), Section 9 (Ethiopia)

<sup>39</sup> National Fisheries Development and Utilization Proclamation 2003 (No. 315 of 2003), Section 8 (Ethiopia)

<sup>40</sup> The Forest Conservation and Management Act 2016 (No. 34 of 2016), Section 30 (Kenya)

<sup>41</sup> Forest Development, Conservation and Utilization Proclamation No.542/2006, Section 3 (Kenya)

<sup>42</sup> See Forest Act 2005(No.7 of 2005) (Kenya)

<sup>43</sup> The Forest Conservation and Management Act 2016 (No. 34 of 2016), Section 49 and 52 (Kenya)

<sup>44</sup> Forest Development, Conservation and Utilization Proclamation No.542/2006, Section 14 (Ethiopia)

<sup>45</sup> Forest Development, Conservation and Utilization Proclamation No.542/2006, Section 10 (Ethiopia)

Table 16 – Consistency of coverage on environmental issues, Omo-Turkana

Issue	Points of Alignment	Points of Difference
Fish and Aquaculture	<ul style="list-style-type: none"> <li>• <b>Prohibition of some types of fishing methods</b> use of explosive, poisonous or noxious substances are prohibited in both Kenya and Ethiopia</li> <li>• <b>Aquaculture</b> both countries provide regulation for aquaculture</li> <li>• <b>Closed Seasons</b> neither state declares closed season</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Types of fishing gear</b> no specification provided in Ethiopia, can be regulated at a federal level, while in Kenya net type, size and number are limited</li> <li>• <b>Licenses/permits</b> no clarity of license types provided in Ethiopia, specifically detailed in Kenya. Subsistence fishers subject to different requirements.</li> <li>• <b>Co-management structures</b> both states have co-management structures, but Kenya much more advanced</li> <li>• <b>Prohibition of fishing in national parks and reserves</b> Fishing in National Parks still permitted in Ethiopia, subject to conditions</li> </ul>
Forests	<ul style="list-style-type: none"> <li>• <b>Certain species of trees protected</b> neither countries provides specification of the types of trees protected</li> <li>• <b>Use of forest resources</b> both countries permit the use of forest resources within certain circumstances, although Kenya provides greater allowance to local communities</li> <li>• <b>Fires prohibited</b></li> <li>• <b>Little or no mention of afforestation</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Forests given different titles and degree of protection</b> forests categorized differently between two countries</li> <li>• <b>Definitions of ‘forest produce’ and ‘forest resources’</b> the definition in Kenya can be seen to encompass animals, while the definition in Ethiopia does not</li> </ul>
Wetlands	<ul style="list-style-type: none"> <li>• <b>Acknowledgement of wetland as vital to ecosystem</b> contained within the law and policy framework of both Kenya and Ethiopia</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Protected Zones</b> established specifically for protection of wetlands in Kenya, not in Ethiopia</li> <li>• <b>Lack of legislation specifically relating to wetlands</b> Kenya has specific regulation in place with regards to wetlands, while Ethiopia does not</li> </ul>
Biodiversity	<ul style="list-style-type: none"> <li>• <b>Biodiversity covered in a myriad of environmental frameworks</b> both countries have mention of biodiversity within a number of environmental frameworks</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Level of coverage for biodiversity</b> is relatively comprehensive in Kenya and absent in Ethiopia</li> <li>• <b>Rehabilitation of habitats</b> present within Kenyan legislation, but not Ethiopian</li> <li>• <b>Regulation of flora and fauna</b> more comprehensive in Kenya than Ethiopia</li> <li>• <b>Control and regulation of alien invasive species</b> missing from Ethiopian legislation but covered in the Kenyan framework</li> </ul>
Wildlife	<ul style="list-style-type: none"> <li>• <b>National parks, protected areas established</b> within both Kenya and Ethiopia. Hunting is banned within national parks in both countries.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Conditions/licensing for hunting.</b> Hunting is banned in Kenya while it is permitted with appropriate permit in Ethiopia</li> <li>• <b>Buffer Zones</b> land which acts as a buffer zone in Kenya can be declared a national reserve. There is no mention of buffer zones in Ethiopian legislation.</li> <li>• <b>Protected Species</b> in Kenya are divided into critically endangered, vulnerable, nearly threatened and protected. In Ethiopia protected species are contained in one broad category. There are also differences in the species which are protected, for instance the Leopard can be hunted under specific conditions in Ethiopia, while it is protected as an endangered species in Kenya.</li> </ul>

**Wetlands.** There are few similarities in the regulatory framework applicable to wetlands in the Omo-Turkana Basin (Table 16, wetlands). While Kenya has a specific legal framework with regards to wetlands, soon to be updated, no such framework exists within Ethiopia.<sup>46</sup> Protection from pollution, invasive species, and other forms of degradation are highlighted as a priority in Kenya, while Ethiopian legislation provides no regulation for the management of invasive alien species.<sup>47</sup> The comparatively relaxed attitude of Ethiopia is particularly concerning for Kenya, the downstream neighbor on the Omo-Turkana.

In Kenya, the water minister may declare a wetland to be a protected area and can impose restrictions as considered necessary for the protection of the wetland from environmental degradation.<sup>48</sup> Protected wetlands will be declared where such an area has national and international significance due to its biological diversity; ecological importance; natural heritage or aesthetic value.<sup>49</sup>

Wetlands in Ethiopia are the subject of sparse regulation and it is difficult to compare specific provisions to the comprehensive legislative framework which covers wetlands in Kenya. Overall, while the importance of wetlands is recognized within Section 3.4 of the Environmental Policy of Ethiopia<sup>50</sup>, there is no recognition of the need to establish protected areas around valuable wetlands. Further, translating federal policy into locally relevant and implementable regulations and controls have also constrained Ethiopia's efforts to conserve wetlands (Abebe and Geheb (eds.), 2003).

**Biodiversity.** Despite the establishment of the Institute of Biodiversity Conservation and Research in Ethiopia, regulation of biodiversity is largely absent from legislation (Table 16, biodiversity). The Access to Genetic Resources and Community Knowledge and Community Rights Proclamation<sup>51</sup> aims to promote the 'conservation and sustainable utilization of the countries biodiversity resources' as well as allow communities to obtain fair and equitable access to resources.<sup>52</sup> However, there is little specific detail regarding the use of biological resources.

Conversely, biodiversity is comprehensively covered within the Kenyan legal framework. There is an obligation to identify, prepare and maintain an inventory of biological diversity of Kenya determining which components of biodiversity are endangered, rare or threatened with extinction and propose measures to mitigate those threats.<sup>53</sup> Buffer zones are also to be selected and managed near protected areas<sup>54</sup> and specific measures are given for the prohibition and to control the introduction of alien species.<sup>55</sup> Local communities are represented in the need to integrate traditional knowledge for the conservation of biological diversity, along with mainstream scientific knowledge.<sup>56</sup> Specific regulations regarding the protection of biological diversity are given in the 2006 Environmental Management and Coordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations<sup>57</sup> which prevents any per-

<sup>46</sup> Draft Environmental Management and Coordination (Conservation and Management of Wetlands) Amendment Regulations of 2017 (Kenya)

<sup>47</sup> The Draft Environmental Management and Coordination (Conservation and Management of Wetlands) Amendment Regulations of 2017, Section 4(f) (Kenya)

<sup>48</sup> Environmental Management and Co-ordination Act No. 8 of 1999 (as amended, 2012) Sections 41(2) and (3) (Kenya)

<sup>49</sup> Environmental Management and Co-Ordination (Wetlands, River Banks, Lake Shores and Sea Shore Management) Regulations (2012), Section 8 (Kenya)

<sup>50</sup> The Environmental Policy of Ethiopia 1997 (Ethiopia)

<sup>51</sup> Access to Genetic Resources and Community Knowledge and Community Rights Proclamation 2006 (No. 482 of 2006) (Ethiopia)

<sup>52</sup> Access to Genetic Resources and Community Knowledge and Community Rights Proclamation 2006 (No. 482 of 2006), Section 3 (Ethiopia)

<sup>53</sup> Environmental Management and Coordination Act 1999 (No.8 of 1999) (as amended 2012), Section 50 (Kenya)

<sup>54</sup> Environmental Management and Coordination Act No.8 of 1999 (No.8 of 1999) Section 51(c) (Kenya)

<sup>55</sup> Environmental Management and Coordination Act 1999 (No.8 of 1999) (as amended 2012), Section 51(e) (Kenya)

<sup>56</sup> Environmental Management and Coordination Act 1999 (No.8 of 1999) (as amended 2012), Section 51(f) (Kenya)

<sup>57</sup> Environmental Management and Coordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations 2006 (Ethiopia)

son engaging in any activity which may have an adverse impact on an ecosystem, lead to the introduction of any exotic species or lead to unsustainable use of natural resources, without an environment impact assessment license.<sup>58</sup>

As previously stated, with regard to wetlands, any regulation for the management of invasive alien species is absent from legislation in Ethiopia. Kenyan regulations also provide for the recovery and rehabilitation of threatened species and their habitat<sup>59</sup> and specify mechanisms for conducting the inventory of biological diversity, as well as the continuous monitoring of the status of biological diversity,<sup>60</sup> neither of which are contained within legislation in Ethiopia.

**Wildlife.** Kenyan and Ethiopian policy concerning wildlife bears similarities such as language in its designation of protected areas, creating national parks, marine protected areas, protected wetlands<sup>61</sup> national reserves, conservancies, and sanctuaries.<sup>62</sup> Nonetheless, at least three important differences are apparent: hunting licenses, protected species and buffer zones.

A hunting ban has been in force in Kenya since 1977. Any kind of hunting for sport constitutes an offence and can result in a conviction of up to life imprisonment.<sup>63</sup> Hunting for subsistence also constitutes an offence and can result in imprisonment of up to six months.<sup>64</sup> In fact, Kenya prohibits any activities which could negatively impact on the survival of a protected species.<sup>65</sup> As hunting is not permitted, compensation is paid to local communities that suffer damage, death or injury caused by elephant, lion, leopard, rhino, cheetah, buffalo or hippo, among others.<sup>66</sup> Conversely, hunting in Ethiopia, while banned within National Parks, is still permitted in certain circumstances with the appropriate permit.<sup>67</sup> Foreign tourist hunting licenses can be issued for hunting of wildlife species and are valid for two months. The number of wild animals which can be hunted on the license are determined by the licensing body, dependent on the annual hunting quota and limited to a single animal from each species.<sup>68</sup>

Critically endangered and endangered animals in Kenya include the rhino, zebra, elephant, leopard, cheetah, lion and giraffe.<sup>69</sup> In contrast, Ethiopia still permits hunting of lion, leopard, hippo and buffalo with the appropriate license. Animals which can be hunted by resident hunters are detailed within Ethiopian legislation but are limited to only 8 species in comparison to the tourist list of 54. Protected species in Ethiopia include eland, antelope, giraffe, zebra and elephant. A license can be granted for consumptive wildlife in the form of game farming, ranching, live capture, research including off-take, cropping and culling.<sup>70</sup> However, the species which can be used in game ranching are restricted.<sup>71</sup> This demonstrates that Ethiopia, unlike Kenya, still places reliance on hunting as an economic commodity, particularly through tourism.

While neither Kenya nor Ethiopia specifically designate buffer zones through legislation, Kenyan legislation acknowledges their significance and states that important wildlife buffer zones, migratory routes, corridors, or dispersal areas can be declared as a national reserve.<sup>72</sup> Buffer zones can help to create a barrier around protected areas such as national parks, extending the gap between

<sup>58</sup> Environmental Management and Coordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations 2006, Section 4 (Ethiopia)

<sup>59</sup> Environmental Management and Coordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations 2006, Section 5 (Ethiopia)

<sup>60</sup> Environmental Management and Coordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations 2006, Sections 6 and 7 (Ethiopia)

<sup>61</sup> The Wildlife Conservation and Management Act 2013 (No. 47 of 2013), Section 31 (Kenya)

<sup>62</sup> The Wildlife Conservation and Management Act 2013 (No. 47 of 2013), Section 39 (Kenya)

<sup>63</sup> The Wildlife Conservation and Management Act 2013 (No. 47 of 2013), Section 96 (Kenya)

<sup>64</sup> The Wildlife Conservation and Management Act 2013 (No. 47 of 2013), Section 97 (Kenya)

<sup>65</sup> The Wildlife Conservation and Management Act 2013 (No. 47 of 2013), Section 48 (Kenya)

<sup>66</sup> The Wildlife Conservation and Management Act 2013 (No. 47 of 2013), Third Schedule (Kenya)

<sup>67</sup> Wildlife Development, Conservation and Utilization Council of Ministers Regulations No. 163 of 2008, Section 6 (Ethiopia)

<sup>68</sup> Wildlife Development, Conservation and Utilization Council of Ministers Regulations No. 163 of 2008, Section 18 (Ethiopia)

<sup>69</sup> The Wildlife Conservation and Management Act 2013 (No. 47 of 2013), Section Sixth Schedule (Kenya)

<sup>70</sup> The Wildlife Conservation and Management Act 2013 (No. 47 of 2013), Section 80(3) (Kenya)

<sup>71</sup> The Wildlife Conservation and Management Act 2013 (No. 47 of 2013), Section 80(4) (Kenya)

<sup>72</sup> The Wildlife Conservation and Management Act 2013 (No. 47 of 2013), Section 35(1)(c) (Kenya)

the legal frameworks which run across borders. Given the differences between species which are protected and the hunting regulation in Ethiopia and Kenya, the establishment of transboundary buffer zones with harmonized policies could go some way to reduce the potential for hunting in Ethiopia to impact Kenyan wildlife.

Ethiopia and Kenya are both signatories of *The Lusaka Agreement on Co-operative Enforcement Operations Directed at Illegal Trade in Wild Fauna and Flora* (1992), as previously mentioned. However, while Kenya has ratified the agreement, Ethiopia has not. Nonetheless, the fact that both states are at least signatories of the Lusaka Agreement, means its framework could be used to pave the way towards a more comprehensive transboundary agreement on wildlife between Ethiopia and Kenya. Kenya is also party to *The Arusha Declaration on Regional Conservation and Combatting Wildlife/Environmental Crime* (2014), however Ethiopia is not.

## 5.2 ZAMBEZI RIVER BASIN

**Fish and Aquaculture.** There are at least three clear points of alignment in how Zambezi basin countries approach fish and aquaculture (Table 17, Fish and Aquaculture). First, there are common prohibitions on certain types of fishing. Fishing within national parks and game reserves is generally prohibited within most Zambezi Basin states. The one exception is Malawi, which is silent on the issue. Legislation preventing fishing using any explosive, shocking or poisoning methods is also harmonized across all Zambezi Basin states.

Second, the majority of ZRB states require a license for aquaculture (with the exception of Botswana which has no explicit mention of aquaculture) and provide some general provisions with relation to EIA requirement for aquaculture production. The overall framework developed for aquaculture across the basin is nonetheless not comprehensive and will likely prove insufficient as aquaculture increases to support the increasing demand for fish production (CCARDESA, 2016).

Third, co-management structures are being used within many ZRB countries as a method of countering the limitations which result from centralized governance. With regards to co-management structures, Tanzania has the most developed mechanisms for community management at national level, through the establishment of Beach Management Units (BMU) operated through local authorities and applicable to any water within a locality that can be governed by a local community.<sup>73</sup>

At least three notable differences in the legal and policy framework relating to fisheries are present. A first difference relates to acceptable fishing gear. The type of nets permitted varies across Zambezi Basin states, with some states allowing the use of monofilament and beach seine nets<sup>74</sup>, while others, such as Malawi, restrict the use of certain gear at certain times of the year, i.e. In Lake Malawi/Nyasa beach seine nets cannot be used between 1<sup>st</sup> and 31<sup>st</sup> of December.<sup>75</sup> While the use of mosquito nets has become a problem across the basin, their use is only expressly prohibited within Botswana<sup>76</sup> while legislation in Malawi specifically allows the use of mosquito nets within some watercourses.<sup>77</sup> The size of nets which can be used also varies, for instance gill nets within Botswana are restricted to 150 m<sup>78</sup> while those in Namibia are limited to 100 m.<sup>79</sup>

<sup>73</sup> Fisheries Act 2003 (No.22 of 2003), Section 18 (Tanzania)

<sup>74</sup> Use of Seine nets prohibited in Botswana: Fish Protection Regulations 2008, Section 20; allowed in Malawi: Fisheries and Conservation Management Regulations 2000, Schedule 12 and prohibited in some circumstances in Tanzania: Fisheries Regulations 2005, Section 42(3) and (4) (Tanzania)

<sup>75</sup> Fisheries Conservation and Management Regulations, Schedule 12, Part 4 (Malawi)

<sup>76</sup> Fish Protection Regulations 2008, Section 8(1) (Botswana)

<sup>77</sup> Fisheries and Conservation Management Regulations 2000, Schedule 12 (2) (Malawi)

<sup>78</sup> Fish Protection Regulations 2008, Section 8 (Botswana)

<sup>79</sup> Inland Fisheries Resources Regulations 2003, Section 17 (Namibia)

A second difference relates to periods of closed seasons. The majority of Zambezi Basin states have some provisions regarding closed seasons. In Namibia, closed and open seasons are indicated by signs displayed by the relevant traditional authority or regional council.<sup>80</sup> No one is allowed to fish within those areas unless an open seasons sign is displayed. In other states, such as Malawi, closed seasons are not listed for all fish but for specific species as relates to breeding.<sup>81</sup>

A third difference relates to treatment of fish licenses. While some Zambezi Basin states restrict the number of licenses which can be granted (Namibia)<sup>82</sup>, others permit local subsistence fishers to operate with no license at all (e.g. Angola, Mozambique<sup>83</sup>). In Malawi, three types of local fishing license (commercial, sport and subsistence)<sup>84</sup> exist and three types of commercial (large-scale, small-scale and live fish collection)<sup>85</sup>, while in Tanzania it is simply the case that all fishing vessels must be licensed (both inland and coastal).<sup>86</sup> In Namibia, it is possible for the number of licenses permitted to be reduced if the Minister responsible for inland fisheries (under the Ministry of Fisheries and Marine Resources) is of the opinion that the sustainable utilization of fish is threatened,<sup>87</sup> while in Botswana, there is no limitation on the number of commercial or recreational licenses which can be granted. Not only does the incompatibility of license types give rise to problems when utilizing shared resources, the imposition of license requirements for local fishers in some states places an administrative and costly obligation on fishers which require the license. As a result, many will choose to fish illegally, rather than follow the procedure required to obtain a license (AUIBAR, 2016).

Before concluding discussion on fish, it is worth noting that there is some progress toward cooperative regulation or at least recognition of the importance of transboundary fisheries management across the basin. Tanzania<sup>88</sup>, Namibia<sup>89</sup> and Malawi<sup>90</sup> recognize the need to cooperatively protect, manage and develop resources with neighboring countries – such recognition likely comes in response to the transboundary lakes found in the basin. Cooperation between Zambia and Zimbabwe has also been initiated.

Table 17 – Consistency of coverage on environmental issues, Zambezi

Issue	Points of alignment	Points of difference
Fish & Aquaculture	<ul style="list-style-type: none"> <li>• <b>Prohibition of some types of fishing methods</b> Use of explosive, poisonous or noxious substances are prohibited in all ZRB states.</li> <li>• <b>Aquaculture</b> The majority of ZRB provide regulation of aquaculture require licenses. The only exception is Botswana where aquaculture has no specific regulation.</li> <li>• <b>Prohibition of fishing in national parks and reserves</b> Expressly prohibited in all ZRB States except Malawi.</li> <li>• <b>Co-management structures</b> The majority of ZRB States are using co-management structures to some extent</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Types of fishing gear</b> different sizes of gill nets are allowed, some states expressly restrict the use of Mosquito nets (banned in Botswana, allowed in Malawi in certain circumstances)</li> <li>• <b>Different fishing seasons imposed</b></li> <li>• <b>Licenses/permits: the requirement to have and which type varies across the ZRB.</b> For instance, in Angola subsistence fishers are entitled to catch up to 20kg per person, per day without a license while in Malawi local fishing licenses are required and are split into three categories.</li> </ul>

<sup>80</sup> Inland Fisheries Resources Act 2003 (No.1 of 2003), Section 22 (Namibia)

<sup>81</sup> No person shall fish for rainbow trout between the 1<sup>st</sup> of May and the 31<sup>st</sup> of August in any year, Fisheries Conservation and Management Regulations, Section 37(2) (Malawi)

<sup>82</sup> Inland Fisheries Resources Act 2003 (No.1 of 2003), Section 22(3) (Namibia)

<sup>83</sup> Presidential Decree No. 17 of 2015 establishing competences of the Ministry of Sea, Inland Waters and Fisheries, Sections 30 and 35 (Mozambique)

<sup>84</sup> Fisheries and Conservation Management Regulations 2000, Section 17 (Malawi)

<sup>85</sup> Fisheries and Conservation Management Regulations 2000, Section 18 (Malawi)

<sup>86</sup> Fisheries Act 2003 (No.22 of 2003), Section 17 (Tanzania)

<sup>87</sup> Inland Fisheries Resources Act 2003 (No.1 of 2003), Section 22(3) (Namibia)

<sup>88</sup> National Fisheries Policy 2015, Ministry of Livestock and Fisheries Development, Section 3.15 (Tanzania)

<sup>89</sup> Inland Fisheries Resources Act 2003 (No.1 of 2003), Section 2(1)(c) (Namibia)

<sup>90</sup> National Fisheries Policy 2012 – 2017, Section 4.1 (Malawi)



(Table 17 continued)

Forests	<ul style="list-style-type: none"> <li>• <b>Certain species of trees protected:</b> provision is made within all ZRB states for protection of certain species when required</li> <li>• <b>Use of forest resources</b> use of forest resources for commercial purposes is prohibited across all ZRB states, although use at a local level is dissimilar</li> <li>• <b>Fires</b> prohibited or only permitted within restricted areas within protected forest areas, in all ZRB States</li> <li>• <b>Afforestation</b> little mention or no mention of afforestation across the legislation and policies of the ZRB states.<sup>91</sup></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Definitions of ‘forest produce’ and ‘forest resources’</b> differ between states and give rise to different allowances for the utilization of resources</li> <li>• <b>Categorization of forests</b> forests given different titles and degree of protection. This varying classification prevents a comparison from easily being made across all ZRB States.</li> </ul>
Wetlands	<ul style="list-style-type: none"> <li>• <b>Acknowledgement of wetland as vital to ecosystem</b> the importance of wetlands is covered to some degree within the national legislation of each ZRB state</li> <li>• <b>Lack of legislation specifically relating to wetlands</b> No legislation which specifically applies to wetlands within any ZRB State</li> <li>• <b>Development only granted subject to conditions across the ZRB</b> permission for development on wetlands is either prohibited, or granted only after EIA has been conducted and a permit has been obtained</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Degree of protection appears to vary due to inconsistent cross-sectoral policy</b> The protection offered to wetlands varies across the ZRB due to is fragmented coverage across legal and policy frameworks</li> </ul>
Biodiversity	<ul style="list-style-type: none"> <li>• <b>Biodiversity covered in a myriad of environmental frameworks</b> resulting in a lack of implementation mechanisms</li> <li>• <b>Control and regulation of alien invasive species</b> present within all ZRB States</li> <li>• <b>National Strategy and Action Plan for Biodiversity</b> in place across all ZRB States as a result of obligations under the CBD</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Level of coverage for biodiversity differs across the ZRB</b>, with some countries having a greater inclusion of biodiversity within national laws and policies</li> <li>• <b>Rehabilitation of habitats</b> only Mozambique and Zambia give specific reference to the rehabilitation of habitats</li> </ul>
Wildlife	<ul style="list-style-type: none"> <li>• <b>National parks and protected areas established</b> across all ZRB States</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Conditions/licensing for hunting</b> different types of licenses and conditions within which hunting can take place across the ZRB states</li> <li>• <b>Buffer Zones</b> are mentioned within some ZRB States, but not others</li> <li>• <b>Protected Species</b> the species classified as protected or endangered are different across the basin states</li> <li>• <b>Categories of protected areas</b> are different, with the exception of National Parks which are protected across the ZRB</li> </ul>

**Forests.** There are several commonalities in forest policy across ZRB countries (Table 17, Forests). First, certain tree species are protected. Second, commercial use of forests is prohibited. Third, fires are limited to restricted areas.

Two notable differences in forest policy are nonetheless apparent. First, definitions of forest resources and forest produce vary across the basin, resulting in the rights granted for the utilization of forests relating to different goods. For example, the definitions in Malawi and Namibia cover all

<sup>91</sup> Mentioned in Forestry Act 1997 (No.4 of 1997), Section 36 (Malawi)

living things within a forest and therefore opens space for the hunting of wild animals. Indeed, the definition of forest produce in Malawi specifically mentions hides, horns bones, ivory and meat as included,<sup>92</sup> contradicting the provisions of the National Parks and Wildlife Reserves Act<sup>93</sup> which prohibits the hunting of wild animals within protected areas. When compared with other ZRB States, such as Zambia and Zimbabwe, where definitions of forest produce/resources do not have a wide remit, the differences in definition opens up a gap in the basin legislation, where resources in trans-boundary forests may be permitted for use in different ways either side of the border.

A second difference in forest policy is that categorization of forests – and associated degree of protection – varies across the ZRB. As a result, licenses are granted under different conditions and local communities are able to utilize resources for different purposes. In the majority of ZRB countries, forestry resources cannot be harvested for commercial purposes. While this restriction is enacted for the protection of forest resources and to prevent over-exploitation, it also limits the benefits which local communities can gain from the resources. As a result, any incentive to ensure the protection of the resources is largely removed (Campbell et. al, 2007). As a counter measure, the majority of ZRB States have also enacted community management structures. All ZRB States allow forest communities to use and access forest resources. However, in Zambia this comes with a number of constraints and duties, with limitations placed on what can be harvested and what activities can be conducted.<sup>94</sup> Namibian legislation on the other hand grants a wide remit, especially given the definition of forest produce in Namibia, local communities can be granted access to forest resources including for household fuel and construction of shelter in local communities and their livestock, up to a maximum harvest, as determined by the Director.<sup>95</sup> In Zimbabwe, the Communal Land Forest Produce Act<sup>96</sup> allows inhabitants of communal land to use forest produce for their own use – however this provision remains restrictive since the use of forest resources for any type of economic gain is prohibited.

No basin level agreements exist for the regulation of forestry. The SADC Protocol on Forestry (2002) is, as previously mentioned, the most relevant. While it is positive that the Protocol contains provisions relating to the harmonization of legal and policy framework, as well as the formation of transboundary agreements, the lack of clarification as to what form these agreements will take will likely pose a challenge to its implementation. The transboundary protection of forests is also covered within the Protocol which encourages the formation of programmes and agreements to promote co-operative and integrated management.<sup>97</sup>

**Wetlands.** There are several commonalities in policy treatment of wetlands across the Zambezi Basin (Table 17, wetlands). First, wetlands are widely acknowledged as vital to ecosystems. Second, there is no legislation devoted primarily to wetlands; wetlands rather come up only within related policy frameworks often those of the water sector. Lack of such legislation may constrain uniformity of approach. Third, development on wetlands is in principle only undertaken following EIA and permit issuance.

Despite consistent recognition of wetlands importance and provisions for protection, the extent to which this importance is reflected and provisions are applied is often not straightforward. In Namibia, for example, the Act specifies the protection of riparian zones and states that requirements and measures should be prescribed for ‘the protection of any riparian species if considered of national or strategic importance or if it forms part of wetland resources’.<sup>98</sup> However, the Minister responsible for water affairs may regulate the use of any wetland or dam for specified purposes or the carrying out of specified activities within any wetland or dam, development on the banks of a

<sup>92</sup> Forestry Act 1997 (No.4 of 1997), Section 2 (Malawi)

<sup>93</sup> National Parks and Wildlife Reserves Act 1992 (No.11 of 1992) (as amended by National Parks and Wildlife (Amendment) Act 2017 (No.11 of 2017) (Malawi)

<sup>94</sup> The Forests Act 2015 (No. 4 of 2015) Section 42 (Zambia)

<sup>95</sup> Forest Act No. 12 of 2001 (as amended by the Forest Amendment Act 2005), Section 32(2) (Namibia)

<sup>96</sup> Communal Land Forest Produce Act, Section 4(ii)

<sup>97</sup> SADC, Protocol on Forestry, Article 14

<sup>98</sup> Water Resources Management Act 2013 (No. 11 of 2013) 103(b) (Namibia)

wetland or dam, removal of any material from a watercourse.<sup>99</sup> Similarly, the Guidelines on Sustainable Management of Wetlands established in Tanzania have only partial implementation via legislation. The Environmental Management Act (2004) regulates the sustainable management of wetlands.<sup>100</sup> It is an offence to, without prior authorization or a permit, deposit a substance in a wetland which is likely to have adverse environmental effects or direct or block a river, river bank, lake or lake shoreline or wetland from its natural course.<sup>101</sup> The Water Minister, after consultation with the Minister responsible for land, can make regulations and guidelines for the sustainable management of wetlands.<sup>102</sup> In Malawi, a person may not erect, remove, alter or demolish a structure which is in place over a wetland. Any excavation, drilling, tunnelling or anything which will have an adverse effect on a wetland is banned, no substances which could damage a wetland can be deposited there.<sup>103</sup> However, the authority may carry out any of those activities should it be considered necessary, after conducting an Environmental and Social Impact Assessment to determine the effects of the activity on the wetland.<sup>104</sup> In Zimbabwe, the Minister may declare any wetland to be ecologically sensitive and impose limitations on development in or around that area. No person can, without written permission, drain, reclaim or disturb any wetland by drilling or tunnelling in a manner which has or is likely to have an adverse impact on the wetland or any plant or animal life within it.<sup>105</sup> The drainage of a wetland or wildlife habitat requires an EIA.<sup>106</sup> There is no mention of wetlands within the Environmental Management Act No. 7 of 2007. Therefore, while demonstrating awareness of the ecological importance of wetlands, the majority of ZRB States still permit development on wetlands under certain circumstances.

**Transboundary/Basin.** There only transboundary/basin level agreement which relates to wetlands is the previously mentioned 1987 Environmental Agreement, which acknowledges the needs for cooperation in their protection.<sup>107</sup>

**Biodiversity.** At least three common points are evidenced in policy applying to biodiversity across Zambezi basin countries (Table 17, biodiversity). First, none of the Zambezi Basin states have a legislative framework in place for biodiversity specifically. In all cases, biodiversity is covered by a myriad of other environmental frameworks or policies. Each state does, however, have in place a National Biodiversity Strategy and Action Plan, as required under the Convention on Biodiversity. Similar language is used within the National Strategy and Action Plan for Biodiversity in each state, demonstrating a similar approach to governance and top-level focus where it relates to biodiversity. All of the Zambezi Basin states refer to sustainable, fair, wise or equitable use within the objectives of the strategy and plan.

A second common point relates to alien species. Most basin states give due importance to this issue, expressly regulating its control. Malawi regulates for both the prohibition and-or control of the introduction of alien animal and plant species<sup>108</sup>, particularly eradicating alien species where they may harm ecosystems and habitats.<sup>109</sup> If an alien species does manage to establish itself as an invasive alien species due to the actions of a specific person, that person shall be liable for all costs

<sup>99</sup> Water Resources Management Act 2013 (No. 11 of 2013) Section 101 (Namibia)

<sup>100</sup> Environmental Management Act 2004 (No. 20 2004) Section 55(4) (Tanzania)

<sup>101</sup> Environmental Management Act 2004 (No. 20 2004) Section 55(2)(d) and (e) (Tanzania)

<sup>102</sup> Environmental Management Act 2004 (No. 20 2004) Section 56 (Tanzania)

<sup>103</sup> Environmental Management Act 2017 (No. 19 of 2017), Section 48 (Malawi)

<sup>104</sup> Environmental Management Act 2017 (No. 19 of 2017), Section 48(2) (Malawi)

<sup>105</sup> Environmental Management Act 2002 (No 13 of 2002), Section 113(1) and (2) (Zimbabwe)

<sup>106</sup> Environmental Management Act 2002 (No 13 of 2002), Section 145(11)(b) (Zimbabwe)

<sup>107</sup> Agreement on the action plan for the environmentally sound management of the Common Zambezi River system signed at Harare, 28 May 1987, section 29(k)

<sup>108</sup> Environmental Management Act 2017 (No. 19 of 2017), Section 69(e) (Malawi)

<sup>109</sup> Environmental Management Act 2017 (No. 19 of 2017), Section 71(c) (Malawi)

incurred in the control and eradication of that species.<sup>110</sup> Similarly, Tanzania<sup>111</sup>, Zambia<sup>112</sup> and Zimbabwe<sup>113</sup> have in place provisions for preventing the introduction, or subsequently controlling and eradicating alien species, as needed. Legislation in Namibia, once again, lacks any specific reference to the issue.

Two key points of difference are apparent in biodiversity policy among the Zambezi's riparians. First, level of coverage of biodiversity differs across countries. Five (Malawi, Mozambique, Namibia, Tanzania, Zambia) of the Zambezi Basin states mention biodiversity within either general environmental legislative frameworks or legislation relating to water, wildlife and conservation. Of those, only Malawi requires the maintenance of an inventory of biological diversity detailing threats of distinction as well as mitigation measures.<sup>114</sup> In Angola, the state is obligated to protect the environment as well as species of flora and fauna throughout national territory.<sup>115</sup> Protection of flora and fauna across the remainder of the Zambezi Basin States is contained either within environmental management plans, a criterion for the establishment of protected areas, an issue for which regulations *can* be made<sup>116</sup>, or, in the case of Namibia, receives no mention at all. Buffer zones, more frequently connected to wildlife regulation (see the following section on wildlife), are also relevant for biodiversity, establishing areas in which local communities may continue to utilize resources without impacting the protection and conservation of resources. Yet, only the ability to (not an obligation) establish buffer zones is given in Malawi<sup>117</sup> and Zimbabwe.<sup>118</sup>

A second difference relates to rehabilitation of degraded habitats. Only Mozambique<sup>119</sup> and Zambia specifically note the need to rehabilitate degraded habitats.<sup>120</sup> Mozambique establishes a provision for 'no net loss of biodiversity' in Section 11(2) indicating that public and private entities that are engaged in natural resources in conservation areas or their buffer zones should compensate for any negative impacts.<sup>121</sup> However, this is not replicated in any other Zambezi states.

No basin-level or transboundary biodiversity agreement exists.

**Wildlife.** The major commonality in wildlife policy across Zambezi Basin states is that protected areas for wildlife are established in some form. While all of the Zambezi Basin states afford the highest protection to wildlife in national parks, the additional protected areas vary both in name and character. Game reserves and sanctuaries are the second most common protected areas established and are also protected, although to a lesser extent and penalties are less severe.<sup>122</sup> In Tanzania, Species Management Areas are established for the purpose of protecting any animal or class of animals or their habitat.<sup>123</sup> Zimbabwe legislates for Botanical Reserves and Botanical Gardens<sup>124</sup>; in addition to National parks,<sup>125</sup> Sanctuaries<sup>126</sup> and Safari Areas.<sup>127</sup> Zambia denotes community participation in the formation of Community Partnership Parks<sup>128</sup> and Namibia follows a similar

<sup>110</sup> Environmental Management Act 2017 (No. 19 of 2017), Section 71(10) (Malawi)

<sup>111</sup> The Environmental Management Act 2004 (No. 20 of 2004) Section 67(2)(h) (Tanzania)

<sup>112</sup> Environmental Management Act 2011 (No. 12 of 2011), Section 77 (Zambia)

<sup>113</sup> Environmental Management Act 2002 (No. 13 of 2002) Sections 118 – 127 (Zimbabwe)

<sup>114</sup> Environmental Management Act 2017 (No. 19 of 2017), Section 68 (Malawi)

<sup>115</sup> Environmental Framework Law 1998 (No. 9 of 1998) Section 39 (Angola)

<sup>116</sup> See **Malawi**: Environmental Management Act 2017 (No. 19 of 2017), Section 68(d), **Tanzania**: The Environmental Management Act No. 20 of 2004, Section 161(a), 230(1)(c) and Section 49(2)(a), **Zimbabwe**: Environmental Management Act No. 13 of 2002, Section 116(1)(e)

<sup>117</sup> Environmental Management Act 2017 (No. 19 of 2017), Section 69(c) (Malawi)

<sup>118</sup> Environmental Management Act 2002 (No. 13 of 2002) Section 116 (2)(c) (Zimbabwe)

<sup>119</sup> See Environmental Law 1997 (No. 20 of 1997), Sections 12 (1) and (2) (Mozambique)

<sup>120</sup> Environmental Management Act 2011 (No. 13 of 2011) Section 27(1)(f) (Zambia)

<sup>121</sup> Environmental Law 1997 (No. 20 of 1997) Section 11(2) (Mozambique)

<sup>122</sup> Wildlife Conservation and National Parks Act 1992 (No. 28 of 1992) Section 12 (Botswana)

<sup>123</sup> The Wildlife Conservation Act 2009 (No. 5 of 2009) Section 23 (Tanzania)

<sup>124</sup> Parks and Wildlife Act 1975 (No. 14 of 1975) Section 25 (Zimbabwe)

<sup>125</sup> Parks and Wildlife Act 1975 (No. 14 of 1975) Section 21 (Zimbabwe)

<sup>126</sup> Parks and Wildlife Act 1975 (No. 14 of 1975) Section 25 (Zimbabwe)

<sup>127</sup> Parks and Wildlife Act 1975 (No. 14 of 1975) Section 35 (Zimbabwe)

<sup>128</sup> The Zambia Wildlife Act 2015 (No. 14 of 2015), Section 11 (Zambia)

line in the formation of Conservancies.<sup>129</sup> With each different title comes different levels of restrictions.

Three major differences are apparent in policies concerning wildlife across the Zambezi's countries. First, licenses which can be issued for hunting and their purposes vary. Five types of license can be granted in Malawi: bird, game, hunting, special and visitors.<sup>130</sup> The license permits the hunting of the species which is declared on the license. A game license can only be issued to citizens or residents of Malawi.<sup>131</sup> However, visitors' licenses also authorize the hunting of either birds or game.<sup>132</sup> A hunting license authorizes the hunting of protected species within a national park or wildlife reserve, in connection with a professional hunter's license.<sup>133</sup> Four types of licenses to hunt can be issued in Botswana; a bird license; single game license; small game license or special game license.<sup>134</sup> There are a maximum number of licenses which can be held by any one person, during any season and the number of species which can be hunted is also limited.<sup>135</sup> Open seasons for hunting may also be declared by order published in the Gazette.<sup>136</sup> Permits may also be granted by the Director under certain conditions, a lot of the discretion of which is left up to the Director.<sup>137</sup> Hunting and capturing of partially protected animals is allowed with the appropriate license.<sup>138</sup> In Namibia, the lawful holder of a permit granted by the minister can hunt specially protected game, except for Rhinoceros and Elephant.<sup>139</sup> Limits are set on the number of game which can be killed.<sup>140</sup> In Tanzania, hunting blocks are used to regulate hunting licenses and are allocated for a period of five years and for no more than five different grades and categories.<sup>141</sup> The number of licenses which can be granted is controlled by the Minister responsible for wildlife.<sup>142</sup> Hunting licenses can only be granted<sup>143</sup> to those that have been resident in Tanzania for at least 12 months prior to application.<sup>144</sup> Trophy and subsistence hunting is regulated by orders published in the gazette.<sup>145</sup> Traditional communities can also be granted a license to hunt a specified number of animals for a set period.<sup>146</sup> Special licenses can also be granted for the use of animals for specific purposes, such as educational or cultural activities.<sup>147</sup>

Second, buffer zones are treated differently across the Zambezi Basin states. There is no mention of buffer zones within legislation in Botswana, Malawi, Zambia or Zimbabwe. In Mozambique, buffer zones are used to form a transitional strip between protected areas and multiple use areas, which aim to reduce the impact of human activities on the respective protected area.<sup>148</sup> Buffer zones can also be declared in Tanzania to protect and conserve wildlife resources and their habitats.<sup>149</sup> In Zambia, Game Management Areas (GMAs) were established to effectively act as 'buffer zones' for National Parks. As a result, protected areas which transcend national boundaries could have buffer zones in place around one section of a protected area, but not another. This is the case in the Nyika TFCA, where on the Malawi side no buffer zones are established, while a GMA is

<sup>129</sup> Nature Conservation Ordinance 4 of 1975, Section 18 (Namibia)

<sup>130</sup> National Parks and Wildlife Act 1992 (No. 11 of 1992), (as amended 2017) Section 43 (Malawi)

<sup>131</sup> National Parks and Wildlife Act 1992 (No. 11 of 1992), (as amended 2017) Section 51 (Malawi)

<sup>132</sup> National Parks and Wildlife Act 1992 (No. 11 of 1992), (as amended 2017) Section 52 (Malawi)

<sup>133</sup> National Parks and Wildlife Act 1992 (No. 11 of 1992), (as amended 2017) Section Article 54 (Malawi)

<sup>134</sup> Wildlife Conservation and National Parks Act 1992 (No. 28 of 1992) Section 26 (Botswana)

<sup>135</sup> Wildlife Conservation and National Parks Act 1992 (No. 28 of 1992) Section 32 (Botswana)

<sup>136</sup> Wildlife Conservation and National Parks Act 1992 (No. 28 of 1992) Section 36 (Botswana)

<sup>137</sup> Wildlife Conservation and National Parks Act 1992 (No. 28 of 1992) Section 39 (Botswana)

<sup>138</sup> Wildlife Conservation and National Parks Act No. 28 of 1992, Government of Botswana, Article 18

<sup>139</sup> Nature Conservation Ordinance 4 of 1975, Section 26(1) (Namibia)

<sup>140</sup> Nature Conservation Ordinance 4 of 1975, Section 30 (Namibia)

<sup>141</sup> The Wildlife Conservation Act 2009 (No. 5 of 2009) Section 38(7) and (8) (Tanzania)

<sup>142</sup> The Wildlife Conservation Act 2009 (No. 5 of 2009) Section 39 (Tanzania)

<sup>143</sup> There may be some loopholes to application of this rule. For example, it appears hunting licenses can be acquired and sold onward to others.

<sup>144</sup> The Wildlife Conservation Act 2009 (No. 5 of 2009) Section 43(2) (Tanzania)

<sup>145</sup> The Wildlife Conservation Act 2009 (No. 5 of 2009) Section 44 (Tanzania)

<sup>146</sup> The Wildlife Conservation Act 2009 (No. 5 of 2009) Section 45 (Tanzania)

<sup>147</sup> The Wildlife Conservation Act 2009 (No. 5 of 2009) Section 58 (Tanzania)

<sup>148</sup> Forest and Wildlife Act 1999 (No. 10 of 1999), Section 1 (Mozambique)

<sup>149</sup> The Wildlife Conservation Act 2009 (No. 5 of 2009) Section 22 (Tanzania)

in place on the Zambian side. While local communities are allowed to collect some resources within protected areas on a sustainable basis in Malawi, they are not granted access to the same resources as within the Zambian GMA, where communities are able to benefit from safari hunting. Yet, the effectiveness of GMAs has been limited due to the uses permitted within the area, which range from human settlement to trophy hunting, resulting in habitat loss for wildlife and a reduction in wildlife species (Lindsey et al., 2014).

Third, species deemed to be protected or endangered vary across countries. Elephant and rhinoceros are accorded the strictest legislative protection across all ZRB States. The same cannot however be said of the remainder of ‘the big five’ (lion, leopard, rhinoceros, elephant, buffalo) or indeed for many other endangered species which invariably find themselves on some protected species lists, but not others. For example, hippopotamus and giraffe are protected in Botswana, but not in Zimbabwe. Kudu and eland are protected in Malawi<sup>150</sup>, but not in Tanzania. With the exception of elephant and rhinoceros, the hunting of which has been expressly prohibited in Zambia since 1993,<sup>151</sup> all other game animals can be hunted with the required license. Penalties for hunting protected animals also vary across the ZRB States. In Botswana, the penalty is up to a maximum of 7 years imprisonment or 15 years for rhinoceros.<sup>152</sup> In Malawi the penalty is up to 5 years<sup>153</sup>; in Tanzania it is 10, and the killing of a rhinoceros in Zimbabwe has a penalty of up to 20 years imprisonment.<sup>154</sup> In all of the ZRB States it is an offence to hunt the dependent young of a game animal or protected animal or a female game animal or protected animal accompanied by her young.<sup>155</sup>

Regional agreements apply to wildlife management in the ZRB. The SADC Protocol on Wildlife Conservation and Law Enforcement, as described previously, places obligations on State Parties to take measures as are necessary to ensure the conservation and sustainable use of wildlife, with focus placed on the harmonization of legislation.<sup>156</sup> As it currently stands, with the exception of the formation of TFCAs, no other national legislative agreements have been harmonized with regards to wildlife management. Therefore, despite the Protocol representing one of the most advanced efforts towards regional harmonization of wildlife legislation (particularly at the time of enactment), the resulting uniformity across legal and policy frameworks is yet to come to fruition. Further, the Protocol refers to the conservation and sustainable use of wildlife throughout. In addition to the Protocol, the SADC Law Enforcement and Anti-Poaching Strategy (2017) has been developed in as part of the continuous battle against poaching within Southern Africa. All of the Zambezi Basin states were present at the recent meeting (Price, 2017).

## 6. CONSISTENCY ACROSS SECTORS

### 6.1 OMO-TURKANA BASIN

**Water.** General provision is made for the protection of water resources in Ethiopian and Kenyan water legislation. Under the Kenyan Water Act (2016), it is an offence cause pollution to any water resource which could harm aquatic or non-aquatic life or the environment.<sup>157</sup> The provisions contained within the Environmental Management and Coordination Act 1999 relating to water resources conservation and protection and water pollution control are exercised subject to the relevant provision of the Water Act and only in the event that the water resources regulatory board has failed or neglected to take appropriate action to exercise its powers and functions, therefore

<sup>150</sup> Protected species are defined in the National Parks and Wildlife (Protected Species) (Declaration) Order 1994, Government of Malawi

<sup>151</sup> National Parks and Wildlife (Elephant and Rhinoceros) Regulations S.I.No.81 of 1993

<sup>152</sup> Wildlife Conservation and National Parks Act 1992 (No. 28 of 1992) Section 17 (Botswana)

<sup>153</sup> National Parks and Wildlife Act 1992 (No. 11 of 1992), (as amended 2017) Section 110 (Malawi)

<sup>154</sup> Parks and Wildlife Act 1975 (No. 14 of 1975) Section 128(b) (Zimbabwe)

<sup>155</sup> See **Zambia**: The Zambia Wildlife Act No. 14 of 2015 Section 65(b), **Malawi**: National Parks and Wildlife Act No. 11 of 1992, (as amended 2017) Section 65, **Tanzania**: The Wildlife Conservation Act No. 5 of 2009, Section 56(1),

<sup>156</sup> SADC, Protocol on Wildlife Conservation and Law Enforcement (1999), Article 3(2)

<sup>157</sup> Water Act No. 43 of 2016, Section 143 (Kenya)

demonstrating the precedence of the Water Act over the Environmental Management and Coordination Act.<sup>158</sup>

In Ethiopia, the issuance of permits will be made where proposed use of water does not entail pollution or harmful effects on the water resource and the environment,<sup>159</sup> permits may be changed or amended on the basis of a change in environmental conditions. The Ethiopian Water Policy also covers the environment within its provisions, stating that environmental protection and conservation will be an integral part of water resource management and that EIAs will be conducted in all water resource projects.<sup>160</sup> The policy also states that water quality standards and proper assessment procedures will be established to ensure the preservation and enhancement of aquatic resources.<sup>161</sup> A hydropower policy is provided within the water policy,<sup>162</sup> which aims to enhance efficient and sustainable development of water resources to meet national energy demands. Ensuring that negative impacts of hydropower are mitigated to the greatest extent possible and that positive environmental impacts are exploited, are two key objectives of the policy.<sup>163</sup> No specific mention is made to the specific environmental issues within Ethiopian or Kenyan water laws and policies.

Table 18 – Consideration of environmental issues in sectoral legislation, Omo-Turkana

	Water	Energy	Agriculture
Key Messages	<ul style="list-style-type: none"> <li>• Treatment of the environment is general</li> <li>• Treatment often centered on reducing harm and pollution</li> </ul>	<ul style="list-style-type: none"> <li>• Coverage of the environment is sparse</li> <li>• Coverage of environment is often in the context of externalities of petroleum exploration</li> </ul>	<ul style="list-style-type: none"> <li>• Coverage of the environment within agricultural documents is notable but general</li> <li>• Irrigation expansion to be subjected to EIAs to help foster sustainability</li> <li>• Coverage is limited but includes fish and aquatic life and forests</li> </ul>

**Energy.** Environmental coverage within the energy legislation of Kenya and Ethiopia is sparse. Given the on-going development projects within the basin, a number of which relate to hydropower, there is scant coverage of the environmental issues of any such development within energy law or policy. Indeed, linkages between energy and water are all but absent from the documents reviewed, with the exception of one mention in Kenyan legislation, with relation to petroleum operations.<sup>164</sup> The majority of the energy demands of Ethiopia are still satisfied by biomass, identified as one of the key contributors to deforestation and land degradation.<sup>165</sup>

In Kenya, legislation requires the environment and natural resource conservation to be considered within an application for energy exploration, requiring resources to be conserved in accordance with the Environmental Management and Coordination Act (No. 8 of 1999),<sup>166</sup> licenses and permits must comply with all applicable environmental, health and safety laws.<sup>167</sup> In the event of an incident, whether an accident or by negligence, the person transporting the petroleum shall clean up the polluted or damaged environment at his own expense<sup>168</sup> Similar obligations are in place within

<sup>158</sup> Water Act No. 43 of 2016, Section 156(5) (Kenya)

<sup>159</sup> Ethiopian Water Resources Management Proclamation No. 197 of 2000, Article 14

<sup>160</sup> Ethiopia Water Policy, Section 2.2.2

<sup>161</sup> Ethiopia Water Policy, Section 2.1.3

<sup>162</sup> Ethiopia Water Policy, Section 2.3.3.1

<sup>163</sup> Ethiopia Water Policy, Section 2.3.3.2

<sup>164</sup> Energy Act (2006) No. 12 of 2012, Article 101(3) (Kenya)

<sup>165</sup> Geleto S, Ethiopian Panel on Climate Change, First Assessment Report, Working Group II Water and Energy (2015), 125

<sup>166</sup> Energy Act (2006) No. 12 of 2012, Section 30(1)(b) (Kenya)

<sup>167</sup> Energy Act (2006) No. 12 of 2012, Section 31(2)(a) (Kenya)

<sup>168</sup> Energy Act (2006) No. 12 of 2012, Section 98 (2) (Kenya)

Ethiopia which requires any person intending to generate, transmit or distribute electricity for commercial purposes to notify the authority (Ethiopian Energy Authority) in advance and produce documents evidencing that he has fulfilled environmental protection and safety conditions<sup>169</sup>

Activities must be carried out in compliance with relevant environmental protection laws, and safety, quality and performance standards, as determined by the authority.<sup>170</sup> Equally, regulations relating to petroleum operations must be conducted in accordance with generally accepted standards, including conservation of petroleum and other resources and the protection of human life, property and the environment.<sup>171</sup> Within a petroleum agreement, requirements relating to the environment must be listed.<sup>172</sup> There is no mention within the legislation or policies reviewed of any other sector specific environmental issues, with the exception of one brief mention of water within the Kenyan legislation which states that any person that discharges or allows petroleum or related water to escape into water will be liable for a fine and up to two years imprisonment.<sup>173</sup>

*Agriculture.* Agricultural institutions in Ethiopia and Kenya contain notable coverage of the environment. Agriculture is found in relatively few legally binding Ethiopian legislative frameworks and instead is contained in an array of non-binding policy documents.<sup>174</sup> Ethiopia's Agricultural Sector Policy and Investment Framework (PIF) (2010-2020) addresses the environment in the key issues of agriculture and rural development, stating the need to adopt more sustainable natural resource management and to reverse environmental degradation.<sup>175</sup> The PIF states implementation capacity as the key issue.<sup>176</sup> Some reference to agriculture is contained within the Environmental Impact Assessment Law<sup>177</sup> which provides that irrigation projects which exceed 3,000ha will be subject to an EIA. The logic underlying use of a 3,000ha threshold – below which an EIA is not required – is not clear. Agrarian policy can be seen as one of the major constraints facing the Ethiopian Agricultural Sector (Gebre-Selassie & Bekele, 2012). The lack of agriculture specific regulation misses an opportunity to provide a legislative framework for the sustainable utilization of resources and to legislate for improved agricultural practices.

In Kenya, the Agricultural Sector Development Strategy (2010 – 2020) has specific provision for the improvement of the environment and natural resources.<sup>178</sup> The policy also refers to the development of river basins and large water body resources, stating that the Government will implement a regional development policy and integrated programmes and projects, including projects to increase hydropower generation and areas under irrigation.<sup>179</sup> There is, however, no mention of the formation of, or need for, transboundary agreements with riparian states.

The two main pieces of legislation with relation to agriculture in Kenya is the Agriculture Act No.9 of 1967 (revised 2012, No. 6 of 2012) and the Agriculture and Food Authority Act (No. 13 of 2013). Both pieces of legislation give regard to environmental issues. With regards to water, the importance of the Water Act<sup>180</sup> is stated in the Agriculture Act, declaring that the Water Act should have authority over the Agricultural Act; that regulations and controls can be made for the maintenance of water in a body of water within the meaning of the water act,<sup>181</sup> and that nothing in this act shall prejudice or affect the provisions of the water act and where anything in this act or any rule is inconsistent with any provisions, that provision shall prevail.<sup>182</sup> Breeding of aquatic animals and

<sup>169</sup> Energy Proclamation No. 810 of 2013, Section 6(2) (Ethiopia)

<sup>170</sup> Energy Proclamation No. 810 of 2013, Section 10(2) (Ethiopia)

<sup>171</sup> Petroleum Operations Proclamation No.295 of 1986, Section 14 (Ethiopia)

<sup>172</sup> Petroleum Operations Proclamation No.295 of 1986, Section 9 (Ethiopia)

<sup>173</sup> Energy Act (2006) No. 12 of 2012, Section 101(3) (Kenya)

<sup>174</sup> A full breakdown of the policy documents relevant to the agriculture sector can be found in the Ethiopia's Agricultural Sector Policy and Investment Framework (PIF) (2010-2020), pages 4 and 5 < <http://extwprlegs1.fao.org/docs/pdf/eth149550.pdf> >

<sup>175</sup> Ethiopia's Agricultural Sector Policy and Investment Framework (PIF) (2010-2020), Section 4

<sup>176</sup> Ethiopia's Agricultural Sector Policy and Investment Framework (PIF) (2010-2020), Section 6.3, para 86

<sup>177</sup> Environmental Impact Assessment Law, Proclamation No. 299/2002 (Ethiopia)

<sup>178</sup> Agricultural Sector Development Strategy (2010 – 2020), Section 6.4 (Kenya)

<sup>179</sup> Agricultural Sector Development Strategy (2010 – 2020), Section 6.2 (Kenya)

<sup>180</sup> Water Act No. 43 of 2016 (Kenya)

<sup>181</sup> Agriculture Act No.9 of 1967 (revised 2012, No. 6 of 2012), Section 48(1)(a)(E) (Kenya)

<sup>182</sup> Agriculture Act No.9 of 1967 (revised 2012, No. 6 of 2012), Section 201(Kenya)



plants in Kenyan fishery waters and sea ranching and fish farming in the sea as provided for in the Fisheries Act, falls within the definition of agriculture for the purposes of the legislation.<sup>183</sup> The Cabinet Secretary, on advice of the authority, and in consultation with the National Land Commission, can make general rules for the preservation, utilization and development of agricultural land and aquatic resources in Kenya.

In Kenya, provisions relating to forestry relate to land preservation, requirements, regulations and controls can be made requiring the afforestation or re-forestation of land.<sup>184</sup> These rules shall apply for the purposes of promoting and maintaining farm forest cover of at least 10 per cent of every agricultural land holding and to preserve and sustain the environment in combatting climate change and global warming.<sup>185</sup> With regards to irrigation, the National Irrigation Policy (2015)<sup>186</sup> places emphasis on the expansion of land under irrigation and states that irrigation will comply with environmental protection requirements to ensure ecosystem integrity, agrobiodiversity and environmental conservation.<sup>187</sup>

There is no mention of any of the other environmental issues discussed within this research in the agriculture legislation of Kenya or Ethiopia, with the exception of a brief mention of biodiversity and wetlands within the Kenyan Agriculture (Farm Forestry) Rules, in the context of the rules providing sustainable management of farm forestry for the purposes of protecting both biodiversity and wetland areas, amongst others.<sup>188</sup>

## 6.2 ZAMBEZI RIVER BASIN

**Water.** There is often broad mention of the environment in water sector documents. For example, the Malawi Water Resources Management Act which states that its objective is: 'to allow for the orderly development and use of water resources for all purposes including domestic use, the watering of stock, irrigation and agriculture, industrial, commercial and mining uses, the generation of hydroelectric or geothermal energy, navigation, fishing, preservation of flora and fauna and the recreation in ways which minimize the harmful effects to the environment'.<sup>189</sup> In terms of specific focus on the five environmental issues analyzed, three are prominent within the water legislation and policy analyzed, namely fish and aquaculture, forests, and wetlands which have coverage in the legislation of the majority of Zambezi Basin states. The remaining two – biodiversity and wildlife – have little coverage, with the least coverage being afforded to wildlife.

Table 19 – Consideration of environmental issues in sectoral legislation, Zambezi

	Water	Energy	Agriculture
Key Messages	<ul style="list-style-type: none"> <li>Fish and aquaculture, forests, and wetlands are reflected in institutions</li> <li>Biodiversity and wildlife do not receive focus</li> </ul>	<ul style="list-style-type: none"> <li>Reference to environment is often general, but reasonable emphasis on minimizing pollution</li> <li>Forests receive some focus; fish and aquaculture, wetlands, biodiversity and wildlife receive little focus</li> </ul>	<ul style="list-style-type: none"> <li>The importance of the environment to agriculture is generally recognized</li> <li>Particular emphasis placed on forests</li> <li>Fish and aquaculture, wetlands, biodiversity, wildlife receive only general focus</li> </ul>

<sup>183</sup> Agriculture and Food Authority Act No. 13 of 2013, Section 2(b) (Kenya)

<sup>184</sup> Agriculture Act No.9 of 1967 (revised 2012, No. 6 of 2012), Section 48(1)(b) (Kenya)

<sup>185</sup> Agriculture (Farm Forestry) Rules 2009, Subsidiary L.N. 166/2009, Section 2 (Kenya)

<sup>186</sup> A legal framework for irrigation is also in place in the Irrigation Act of 1966 (Act No. 13 of 1966) and the Irrigation (National Irrigation Schemes) Regulations 1977 (Kenya)

<sup>187</sup> National Irrigation Policy (2015), Section 5.3.6, para 190 (Kenya)

<sup>188</sup> Agriculture (Farm Forestry) Rules 2009, Subsidiary L.N. 166/2009, Section 4 (Kenya)

<sup>189</sup> **Malawi:** Water Resources Management Act No. 2 of 2013, Section 4. Similar provision regarding the importance of water resources across sectors can be seen in **Namibia:** The Water Resources Management Act No. 11 of 2013, Section 3(c) and (d) **Tanzania:** National Water Policy (2002), Section 3.3 and Section 4 and Water Resources Management Act No. 11 of 2009, Section 4(1)(g); **Zambia:** Water Resources Management Act No. 21 of 2011, Section 57(2) and **Zimbabwe:** National Water Authority Act No. 14 of 2002, Section 5(1)(a)(ii)

Fish and aquatic life is covered within water legislation, mainly in relation to the utilization of water resources and prohibiting any pollution which could impact fisheries, as well as other flora and fauna.<sup>190</sup> Legislation in Botswana also gives due recognition of the relationship between different water uses, stating that water rights which are granted for mining, forestry, industrial purposes or the generation of powers shall not be polluted with any matter derived from such use to such extent as to be likely to cause injury either directly or indirectly to public health, livestock, animal life, fish, crops.<sup>191</sup> Similar provision is also contained within legislation in Malawi, which states that the orderly development and use of water resources for all purposes, including fishing, as one of its objectives.<sup>192</sup> The National Water Policy (2002) in Tanzania refers to the importance of fisheries economically and socially and lists the availability of water of an acceptable quality as the main issue and concern.<sup>193</sup> The policy also states that fisheries management is among the set of trans-boundary environmental management issues.<sup>194</sup>

Regulation of forests is covered largely through the regulation of water which can be used for forestry purposes.<sup>195</sup> The National Water Policy of Tanzania and the Zambian Water Resources Management Act also give recognition of the importance of forests to the ecosystem and for genetic resources.<sup>196</sup> Legislation in Malawi demonstrates the importance of water resources over other sectors, stating that in the formation of a water catchment management strategy the authority shall consult with the departments in charge of, respectively, forestry and the environment, and it shall take into account, but shall not be bound by, any relevant prior determination made by either department pursuant to the legislation in force.<sup>197</sup> The legislation also states that wherever the provisions of the Act are inconsistent with the provisions of a) the Environment Management Act; b) the Fisheries Management and Conservation Act; c) the Forest Act; d) the Inland Shipping Waters Act; e) the Waterworks Act; f) the Mines and Minerals Act; or g) any other written law, the provisions in Water Resources Management Act shall apply.<sup>198</sup> Provisions relating specifically to wildlife were largely absent from the documents reviewed, with the exception of the Tanzanian Water Policy which recognizes that extensive irrigation during dry season dries up rivers and therefore disturbs ecosystems and wildlife.<sup>199</sup> It also details the importance of wildlife to GDP and that the depletion of water in some rivers during dry season has disrupted the lives of animals which results in serious consequences to the tourism industry and national economy.<sup>200</sup>

Wetlands are mentioned in the majority of documents reviewed on water resources, mainly relating to the protection of wetland ecosystems.<sup>201</sup> Restrictions are therefore placed on the activities which can be conducted within wetlands, with most Zambezi Basin States requiring a license or permit for development within a wetland.<sup>202</sup> For example, legislation in Namibia gives reference to control of aquatic invasive species and the protection of riparian zones<sup>203</sup>, while legislation in Tanzania recognizes the importance of wetlands for both tourism, fishing, hunting and in the hydrological cycle for flood control, sediment retention and nutrient recycling<sup>204</sup> and acknowledges the challenges of

<sup>190</sup> Water Resources Management Act No. 11 of 2009, Section 103 (Tanzania)

<sup>191</sup> Water Act No. 40 of 1967, Section 17(a)(iii) (Botswana)

<sup>192</sup> Water Resources Management Act No. 2 of 2013, Section 4(b) (Malawi)

<sup>193</sup> National Water Policy (2002), Section 2.8 (Tanzania)

<sup>194</sup> National Water Policy (2002), Section 2.12 (Tanzania)

<sup>195</sup> See **Botswana**: Water Act No. 40 of 1967, Section 8 and Water Regulations S.I. 112, 1969, Article 20; **Malawi**: Water Resources Management Act No. 2 of 2013, Section 85

<sup>196</sup> **Tanzania**: National Water Policy (2002), Section 2.10; **Zambia**: Water Resources Management Act No. 21 of 2011, Section 30(e)

<sup>197</sup> Water Resources Management Act No. 2 of 2013, Section 32(2) (Malawi)

<sup>198</sup> Water Resources Management Act No. 2 of 2013, Section 161 (Malawi)

<sup>199</sup> National Water Policy (2002), Section 1.2 (Tanzania)

<sup>200</sup> National Water Policy (2002), Section 2.9 (Tanzania)

<sup>201</sup> See **Malawi**: Water Resources Management Act No. 2 of 2013, Article 37(1)(b); **Namibia**: The Water Resources Management Act No. 11 of 2013, Section 37(1)(b); **Tanzania**: National Water Policy (2002), Section 2.8 and Water Resources Management Act No. 11 of 2009, Section 37(1)(c) and; **Zimbabwe**: Water Act No. 14 of 2002, Section 46(5)(d)

<sup>202</sup> See **Namibia**: The Water Resources Management Act No. 11 of 2013, Section 101 and **Zambia**: Water Resources Management Act No. 21 of 2011, Section 71(d)

<sup>203</sup> The Water Resources Management Act No. 11 of 2013, Section 102 and 103 (Namibia)

<sup>204</sup> National Water Policy (2002), Section 2.8 (Tanzania)

transboundary environmental management related to water resources – including wetlands and catchment degradation.<sup>205</sup>

Biodiversity is not specifically mentioned in any of the legislation or policy reviewed, except the National Water Policy and the Water Resources Management Act in Tanzania. The policy acknowledges that in-stream flows or e-flows and levels are necessary for riparian biodiversity.<sup>206</sup> It further recognizes the challenges of transboundary environmental management related to water resources – including biodiversity conservation.<sup>207</sup> One of the key objectives of the policy is to have in place a water management system which protects the environment, ecological system and biodiversity.<sup>208</sup> This provision is replicated in the Water Resources Management Act (No. 11 of 2009) which states that protecting biological diversity especially aquatic ecosystems is one of its objectives.<sup>209</sup>

*Energy.* While there is coverage of environmental issues across the legislation and policy of the energy sector in the ZRB, this coverage could be described as somewhat ‘thin’. Provisions which relate to the environment are vague and obligations rest on the prohibition or clean-up of activities which could result in pollution of the environment. Few frameworks outline positive obligations and frame the environment and energy in a progressive manner, providing regulation of what should be done in order to provide true environmental coverage.

More than 30 policy and legislative documents relating to the energy sector were reviewed. The majority of the documents (23) had at least some coverage of the environment.<sup>210</sup> The greatest number of references related to the prevention and treatment of pollution of the environment resulting from energy production. With relation to specific environmental sectors, the greatest number of references related to forestry.<sup>211</sup> There is also ample reference to pollution and ensuring that plans for development include the progressive reclamation and rehabilitation of land disturbed by the extraction and for the minimization of such effect on adjoining water.<sup>212</sup> More specific regulations aim to protect water resources by limiting the exercise of exploration licenses in close proximity to watercourses, for instance the Petroleum (Exploitation and Production) (Act No. 2 of 1991) in Namibia limits the exercise of a license within 100 meters of a watercourse.<sup>213</sup>

Traditional biomass use exceeds 60% in Mozambique, Tanzania and Zambia (REN21, 2015). In Zimbabwe, annual wood fuel consumption equates to a loss of 60 million trees per year, while only 10 million are planted.<sup>214</sup> Across the national energy legislation of all ZRB States there is a relative

<sup>205</sup> National Water Policy (2002), Section 2.12 (Tanzania)

<sup>206</sup> National Water Policy (2002), Section 2.8 (Tanzania)

<sup>207</sup> National Water Policy (2002), Section 2.12 (Tanzania)

<sup>208</sup> National Water Policy (2002), Section 4.3 (Tanzania)

<sup>209</sup> Water Resources Management Act No. 11 of 2009, Section 4(1)(f) (Tanzania)

<sup>210</sup> See, **Angola:** Petroleum Activities Law 2004 (No. 10 of 2004), Sections 7 and 24, Policy and Strategy for National Energy Security 2011 (Decree No. 256/2011), Section IV; **Botswana:** Radiation Protection Act 2006 (No. 22 of 2006), Radiation Protection Regulations S.I. 47 of 2008, S.I. 24 of 2009, Sections 62 and 71, Petroleum (Exploration and Production) Act 1981 (No. 112 of 1981), Section 55(g); **Malawi:** Energy Regulation Act 2004 (No. 20 of 2004), Section 9(2)(h) **Mozambique:** Electricity Act 1997 (No. 21 of 1997), Petroleum Law 2014 (No. 21 of 2014), Regulation on the Environmental Quality and Effluents Release Standards 2004 (Decree 18/2004 as amended by decree 67/2010), Environmental Regulation for Petroleum Operations (Decree 56/2010); **Namibia:** The Petroleum (Exploitation and Production) Act 1991 (No. 2 of 1991) Section 32, The Petroleum (Exploitation and Production) Act 1991 (No. 2 of 1991) (Regulations), Section 5(a)(ii), The Atomic Energy and Radiation Protection Act 2005 (No. 5 of 2005), Sections 22(1)(b), 24(1)(b), The Electricity Act 2007 (No. 4 of 2007) Sections 18(10), 21(1), 21(2)(a)(i) and 33(1)(a); **Tanzania:** The Tanzania Extractive Industries (Transparency and Accountability) Act 2015 (No. 23 of 2015) Section 16(c), Electricity Act No. 10 of 2008, Section 6(1)(f) and 6(2), Energy and Water Utilities Regulatory Authority Act 2011 (No. 11 of 2001) Section 6(f), Rural Energy Act 2005 (No. 8 of 2005) Section 16(6); **Zambia:** Energy Regulation Act 1995 (No. 16 of 1995), Sections 9(4)(c) and 6(e), Petroleum (Exploration and Production) Act 2008 (No. 10 of 2008), **Zimbabwe:** National Electricity Act 2002 (No. 4 of 2002), Section 54(3)(a), Energy Regulatory Act No. 3 of 2011, Section 4(1)(m) and (1)(q), National Energy Policy (2012), Petroleum Act 2006 (No. 11 of 2006) Section 51(3).

<sup>211</sup> See **Botswana:** Petroleum (Exploration and Production) Act 1981 (No. 12 of 1981) Sections 32(i), 35(i)(vi), 46(1)(b)(iv); **Namibia:** The Petroleum (Exploitation and Production) Act 1991 (No. 2 of 1991), Sections 16(b)(ii), 38(2)(f) and 71; **Zambia:** Petroleum (Exploration and Production) Act 2008 (No. 10 of 2008) Sections 32(g)(vi), 52(2)(f), 71(5)(e), 40(f)(ii) and 40(h); **Zimbabwe:** National Energy Policy Zimbabwe, 2012, 28

<sup>212</sup> See **Botswana:** Petroleum (Exploration and Production) Act No. 12 of 1981, Section 35(i)(vi); **Zambia:** Petroleum (Exploration and Production) Act No. 10 of 2008, Section 66(a)(i)

<sup>213</sup> The Petroleum (Exploitation and Production) Act No. 2 of 1991, Section 16(b)(ii) (Namibia)

<sup>214</sup> National Energy Policy 2002, Government of Zimbabwe, 22

absence of legal and regulative frameworks, or policy goals, to address biomass energy use as an issue.<sup>215</sup> Given the severe impact of charcoal and wood-fuel use on deforestation, the sector receives sparse mention across the legal and policy frameworks of the Zambezi, most comprehensively covered within the policy frameworks, rather than through binding legislation.<sup>216</sup>

There are few linkages made between national energy policies and legislation and environmental agreements, such as the reference made regarding forest use in Zambia, which states that licenses cannot be used for exploration in forests unless permission has been gained from the appropriate authority and that there must also be compliance with the relevant provisions of the Forests Act, upon any land declared to be a national forest or local forest, as defined in that act.<sup>217</sup> Provisions such as this are few and far between across energy legislation despite their need for defining how legal provisions relate to one another when competing for use of the same resource.

The remaining environmental issues analyzed – fish and aquaculture, wetlands, biodiversity, and wildlife – have very few references across the documents reviewed. Only two specific references to wildlife were found, in Botswana which prevents activities from taking place in a national park, without permission obtained under Section 15 of the National Parks Act<sup>218</sup> and a provision preventing energy exploration licenses being used in any land within a National Park without complying with the Zambia Wildlife Act.<sup>219</sup> Wetlands were not present within a single energy sector policy or legislative document reviewed. The absence of wetlands throughout the policy exhibits a clear gap through which wetland needs and requirements are impacted.

Of particular significance with relation to hydropower is the Zambezi River Authority (ZRA). The ZRA, established through the 1987 Agreement between the Republic of Zimbabwe and the Republic of Zambia concerning the utilization of the Zambezi River, is a hydropower organization which aims to manage the Zambezi River and Kariba Dam Complex in a sustainable and integrated manner. The ZRA also runs an Environmental Monitoring Programme which consists of monthly, quarterly and bi-annual sampling of the Zambezi River and its tributaries, focusing on monitoring of water quality and control of water weeds. However, there are no specific references to environmental issues within the legal framework of the ZRA, with the exception of overall functions such as ensuring the ‘...effective and efficient use of the waters and other resources of the Zambezi River’.<sup>220</sup>

Under the agreement, the contracting states (Zambia and Zimbabwe) agree to inform each other of proposals for abstraction of water from either the Kariba Dam or other dams which are constructed on the Zambezi River, or the abstraction of water from the sources of the dam or other dams for irrigation or other purposes.<sup>221</sup> It is not however clear to what extent the ZRA has provided coverage for environmental issues within the ZRB.

**Agriculture.** The agricultural policy and legislative framework of each ZRB State contains at least one mention of the environment.<sup>222</sup> General provisions give recognition to the fact that environmentally friendly farming systems, such as conservation farming, afforestation and use of green manure can contribute to a sustainable increase in crop productivity.<sup>223</sup>

<sup>215</sup> Mozambique, Malawi and Tanzania have developed specific targets/policies for biomass energy use see (REN21, 2015)

<sup>216</sup> Biomass receives mention in: **Angola:** Policy and Strategy for National Energy Security Decree No. 256/11, Section IV; **Malawi:** Biomass Energy Strategy 2009; **Mozambique:** Biomass Energy Strategy 2013; **Tanzania:** Biomass Energy Strategy 2014; **Namibia:** National Energy Policy 2017, section 3.5.2

<sup>217</sup> Petroleum (Exploration and Production) Act 2008 (No. 10 of 2008), Section 40(f)(ii)

<sup>218</sup> Petroleum (Exploration and Production) Act 1981 (No. 12 of 1981), Section 46(1)(c)

<sup>219</sup> Petroleum (Exploration and Production) Act 2008 (No. 10 of 2008), Section 40(h)

<sup>220</sup> Agreement between the Republic of Zimbabwe and Republic of Zambia concerning the utilisation of the Zambezi River 1987 (Act No. 17 of 1987, as amended by Act No. 12 of 2001), Article 9(f)

<sup>221</sup> Agreement between the Republic of Zimbabwe and Republic of Zambia concerning the utilisation of the Zambezi River 1987 (Act No. 17 of 1987, as amended by Act No. 12 of 2001), Article 18

<sup>222</sup> Each of the 18 documents reviewed contained provisions relating to the environment.

<sup>223</sup> See Zambia National Agricultural Policy (NAP) 2012-2030, Section 2.2.1 and **Tanzania:** The Grazing Land and Animal Feed Resources Act No. 13 of 2010, Section 18 (c)

Forests receive considerable attention in the agricultural policies of Zambezi basin countries. In Botswana, orders and conservation regulations may prohibit, regulate, require or control the afforestation or re-afforestation of land.<sup>224</sup> Limitations are also placed on the number of 'veld products' which can be harvested which includes non-domesticated, vegetative biological resources that may be used for construction, medical, food, cultural activities and firewood.<sup>225</sup> The National Agricultural Policy of Malawi recognizes agriculture as an important economic activity, promoted as a means of improving soil fertility, reducing soil erosion and helping to address climate change.<sup>226</sup> The policy also gives recognition to deforestation as a problem resulting from increased charcoal and firewood demand due to increasing energy needs.<sup>227</sup> The National Agricultural Policy of Namibia also promotes agroforestry and aims to improve cooperation of agriculture, water and forestry at an international level.<sup>228</sup> The policy further recognizes that not mentioning agro-forestry as an important practice for soil and water conservation is a weakness of the National Forest Policy. Tanzania recognizes that increased livestock populations and human activities have resulted in over exploitation of natural resources, resulting in overgrazing which has in turn led to soil erosion, deforestation, destruction of water sources and environmental pollution.<sup>229</sup> Past Tanzania policy has been to move livestock out of wetlands as grazing was believed to compact soils leading to soil erosion and reduced dry season flow. The forceful removal of pastoralists from wetlands caused a lot of hardship.

The remaining environmental sectors are covered to a lesser degree across the documents. Although fish are mentioned in the majority of agricultural laws and policies, falling within the remit of agriculture, they are not extensively covered.<sup>230</sup> Wetlands,<sup>231</sup> wildlife,<sup>232</sup> and biodiversity<sup>233</sup> have very little coverage across the documents. As it currently stands, the legislative frameworks covering agriculture in Zambezi Basin states are not comprehensive enough to support the complex environmental issues at play. For instance, while there is irrigation potential within the Zambezi Basin and such potential is recognized within most national agricultural policies, this is not matched with any legal enactment to create binding obligations which will ensure environmental issues are appropriately covered, should irrigation projects be developed.

## 7. ENVIRONMENTAL POLICY ALTERNATIVES

***Towards policy alternatives.*** From the wide range of opportunities for policy change that can contribute to improved environmental outcomes, we elaborate three policy alternatives that are of high importance in the context of watershed management: i) formation of TFCAs to conserve lakes Malawi/Nyasa and Turkana, ii) e-flows for benefits that include enhancing fish sustainability and flushing hyacinth, iii) adoption of a mechanism for environmental conservation in the two basins in the context of basin-wide RBOs. Each of these three policy alternatives is outlined in more detail immediately below.

***Improved policy concerning the environment contributes toward economic development.*** As more broadly reflected in Work Package 4 products such as D4.1, improved governance of the environment will lead to greater harnessing of multiple ecosystem services. Indeed, each ecosystem service may relate to several resources and landscapes, and each natural resource may provide various ecosystem services, we can only infer the joint value of ecosystem services from those

<sup>224</sup> Agricultural Resources Conservation Act No. 39 of 1972, Section 16(5)(iv) (Botswana)

<sup>225</sup> Agricultural Resources Conservation (utilization of veld products) Regulations S.I. 89 2006 (Botswana)

<sup>226</sup> National Agriculture Policy (2016), Section 1.2.2 (Malawi)

<sup>227</sup> National Agriculture Policy (2016), Section 1.2.2 (Malawi)

<sup>228</sup> National Agricultural Policy 2015, Section 2, Policy Statements (Namibia)

<sup>229</sup> National Livestock Policy (2006), Section 3.23.3 (Tanzania)

<sup>230</sup> **Botswana:** Agricultural Resources Conservation Act No. 39 of 1972, Section 2(d), **Tanzania:** Agricultural Sector Development Strategy II (ASDS) 2015/2016 – 2024/2025, Strategic Areas for Intervention, Section 1.2(d)

<sup>231</sup> See **Tanzania:** Agricultural Sector Development Strategy II (ASDS) 2015/2016 – 2024/2025, Strategic Areas for Intervention, Section 1.1(d)

<sup>232</sup> One of few wildlife references can be seen in Agricultural Resources Conservation Act No. 39 of 1972, Section 4(2) (Botswana)

<sup>233</sup> See National Agriculture Policy (2016), policy statement 3.1.4 (Malawi)

variables. Thus, for each sector we chose common variables which describe the main types of the ecosystem services, such as raw materials, forest, natural-cultural-mixed heritage sites, biodiversity and habitats (e.g. for fish), terrestrial protected areas, water quality, annual freshwater withdrawals, land uses, and emissions. It is presumed that the proposed policy changes, outlined below, will contribute toward advances in several of these areas.

## 7.1 ALTERNATIVE 1: FORMATION OF TFCAs FOR LAKES MALAWI/NYASA AND TURKANA

**Background on protected areas.** Protected areas are a critical tool for maintaining habitat integrity and species diversity (Geldmann et al., 2013). Target 11 of The Aichi Strategic Plan for Biodiversity<sup>234</sup> aims at 17% of the Earth terrestrial surface to be protected. With a current state of 14.7%, this aim has almost been reached. Yet, in terms of biomes the coverage varies significantly, and many groups of species are unrepresented in protected areas. Therefore, the global protected-area systems are far from complete (Brooks et al., 2004). In particular, connectivity between protected areas needs to be improved (Saura et al., 2017). Transboundary parks are expanding across the globe to overcome the restriction than borders are rarely natural (Busch, 2008; Trillo-Santamaría and Paül, 2016). Carried by the NGO Peace Parks Foundation, southern Africa has a relatively well developed network of Transfrontier protected areas and can therefore serve as a role model for other regions (Büscher, 2010). We explored how effective the coverage of National Parks, TFCA or any other protected area is in terms of covering species richness for the Omo-Turkana and Zambezi basins.

**Types of existing protected areas in Omo-Turkana and Zambezi Basins.** Different categories of protected areas differ strongly in their effectiveness for conservation, depending on how integrative or exclusive they are for other human demands to use land, water and other resources in the same area. National Parks (IUCN category II) are the strictest category in the area as a way to conserve biodiversity and an evident policy pathway as they exclude most other land uses with recreational and scientific uses being the only economic activities permitted. However, according to the World Database of Protected Areas, the Omo-Turkana and Zambezi have a wide range of different protection categories (Table 20 and Table 21; Figure 3 and Figure 4).

Table 20 – Types of protected areas in the Omo-Turkana basin with tentative IUCN category and countries of occurrence. Source: World Database of Protected Areas ([www.protectedplanet.org](http://www.protectedplanet.org))

Designation	IUCN category	Countries of occurrence
Community Wildlife Management Area	VI	UGA
Controlled Hunting Area	VI	ETH
Forest Reserve	IV	KEN, UGA
National Forest Priority Area	IV	ETH
National Park	II	ETH, KEN, SSD, UGA
National Reserve	II	KEN
UNESCO-MAB Biosphere Reserve	NA	ETH, UGA
Wildlife Reserve	IV	ETH, UGA
World Heritage Site	NA	KEN

<sup>234</sup> <https://www.cbd.int/sp/targets/rationale/target-11/>

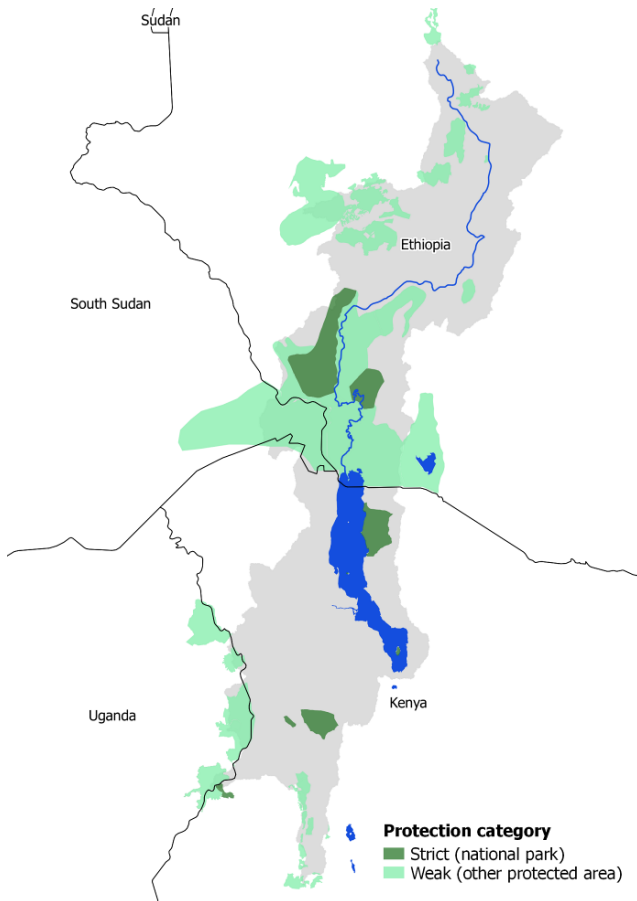


Figure 3 – Protected area system in the Omo-Turkana basin. Categories have been grouped depending on their protection status. Strict are categories I and II of the IUCN (mostly national parks), all other categories of protected areas are considered weak(er).

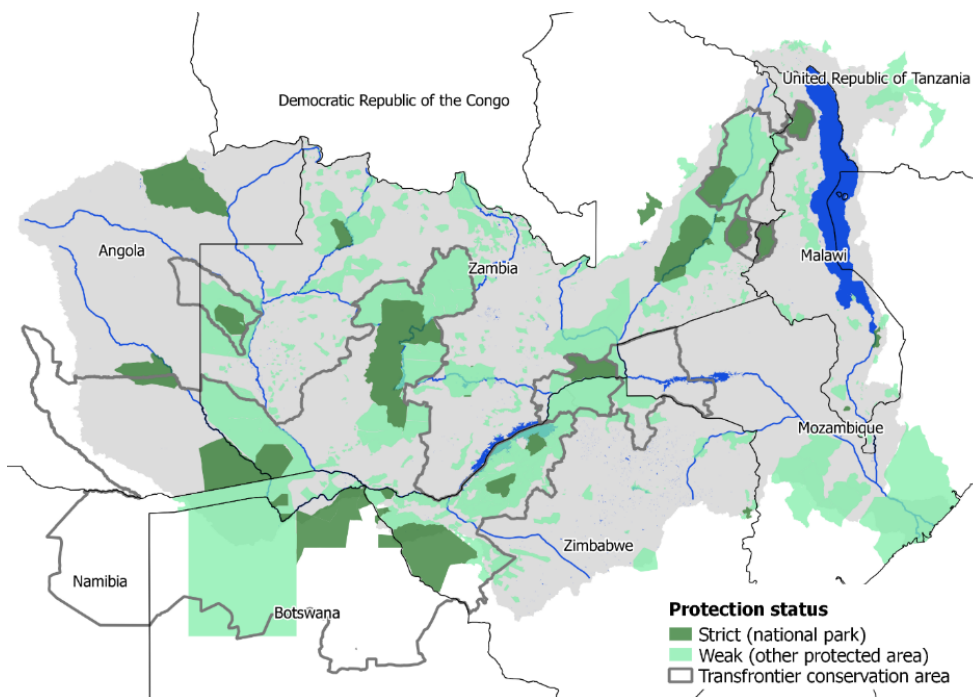


Figure 4 – Protected area system in the Zambezi basin. Categories have been grouped depending on their protection status. Strict are categories I and II of the IUCN (mostly national parks), all other categories of protected areas are considered weak(er). Transfrontier conservation areas (TFCA) are outlined separately.

Table 21 – Types of protected areas in the Zambezi basin with tentative IUCN category and countries of occurrence. Sources: World Database of Protected Areas ([www.protectedplanet.org](http://www.protectedplanet.org)) and Peace Parks Foundation ([www.peaceparks.org](http://www.peaceparks.org))

Designation	IUCN category	Countries of occurrence
Bird Sanctuary	IV	ZMB
Communal Conservancy	VI	NAM
Community Forest	VI	NAM
Concession	VI	NAM
Forest Plantation	VI	TZA
Forest Reserve	IV	BWA, MOZ, MWI, NAM, TZA, ZMB
Game Management Area	IV	ZMB
Hunting Reserve	IV	MOZ
National Park	II	AGO, BWA, MWI, NAM, TZA, ZMB, ZWE
Nature Reserve	IV	TZA
Open area	NA	TZA
Ramsar Site, Wetland of International Importance	NA	BWA, MOZ, NAM, ZMB, ZWE
Recreational Park	V	ZWE
Safari Area	V	ZWE
State Forest	VI	ZWE
Transfrontier Conservation Area	NA	AGO, BWA, MOZ, MWI, NAM, TZA, ZMB, ZWE
Wilderness	IV	ZWE
Wildlife management area	IV	TZA
Wildlife Management Area	IV	ZWE
Wildlife Reserve	IV	MWI
World Heritage Site	NA	BWA, MWI, ZMB, ZWE

**Focus on fish reveals at-risk areas.** For fish as a target group, we calculated the numbers of species that are covered and not covered by a) strict protection categories (national parks), b) any national categories of protected areas (all types) and c) established and planned transfrontier protected areas (only exist in the Zambezi but not in the Omo-Turkana). For each of a), b) and c) we repeated the following procedure based on fish range distribution data from the IUCN Red List (IUCN, 2016) on the watershed level (Lehner and Grill, 2013). We used ArcGIS to calculate, which watersheds have their centroid inside a protected area, using this as a proxy for the majority of the watershed to be covered by protected areas. We then identified the fish species that are covered by protected areas in at least one watershed and summarized them for each watershed. We did the same for those species that are not covered by any protected area and also summarized these species for each watershed. The result are maps for a), b) and c), highlighting the areas where more or less species are protected by the current set up of the respective protection category (Figure 3 and Figure 4). Further information that could be added to this analysis are Red List status (endangered, vulnerable, etc.), endemism and habitat requirements of each group of species (covered and not covered).

**Lakes Malawi/Nyasa and Turkana are at-risk.** The results clearly highlight that the two big natural lakes in each of the basins are the least protected (Figure 5 and Figure 6). Lake Malawi in the Zambezi Basin is almost unprotected but hosts an extremely high amount of fish species. The situation is similar for Lake Turkana, which has only a tiny fraction of its surface protected. Other regions with high amounts of unprotected species for the Zambezi catchment are the coastal region of Mozambique, North Western Zambia close to the border with DRC and the Delta in Mozambique



that has the status as a RAMSAR site but no stricter protection. In the Turkana basin, the area around the Turkwell river is lacking protection for a larger number of species.

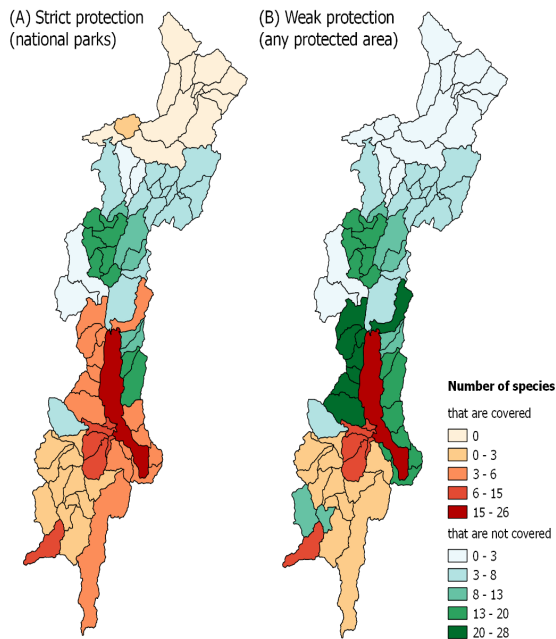


Figure 5 – Counts of fish species depending on their occurrence in at least one watershed that is in its majority covered by a protected area. Shades of green indicate species that are covered, shades of red species that are not covered anywhere in the Turkana basin. A, B and C compare different types of protection.

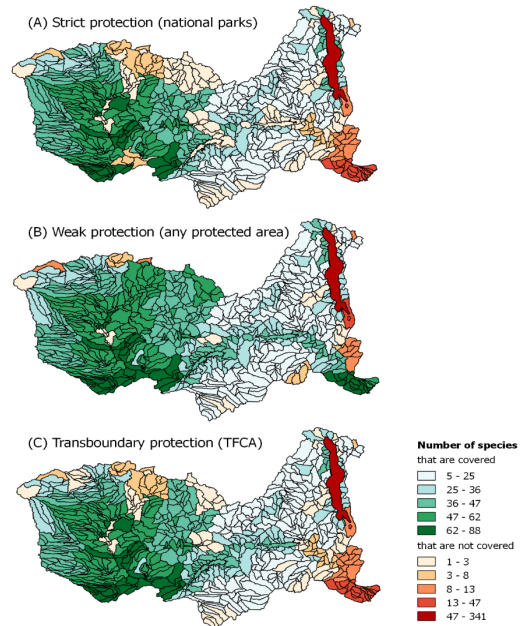


Figure 6 – Counts of fish species depending on their occurrence in at least one watershed that is in its majority covered by a protected area. Shades of green indicate species that are covered, shades of red species that are not covered anywhere in the Zambezi basin. A, B and C compare different types of protection.

**Specific provisions for strengthening the policy framework.** Trans-frontier conservation areas are weaker conservation tools compared to national parks but can still be overall more effective for species conservation (Busch, 2008). Since they are based on international agreements, they are a unique way to foster collaboration between states. In highlighting common interests and dependencies they can even make an important contribution towards long-term peace between states (Barquet et al., 2014). We suggest additional transboundary agreements for lake conservation of both lake Malawi and Turkana. This would provide core benefits in terms of resource management, capacity building and touristic development. Successful implementation, however, would also require the adoption of specific rules to be followed by the countries sharing these lakes.

**Incorporating the TFCAs into broader water policy frameworks.** While the intended TFCA is geographically around the two lakes, it seems clear that many anthropogenic impacts are upstream and outside the boundaries of envisioned lake TFCAs—particularly in the Omo-Turkana. Water quantity and quality requirements for fish and other biodiversity will therefore need to be identified and accepted by the primary upstream riparian nations (Ethiopia and Kenya in the Omo-Turkana, Malawi, Mozambique and Tanzania in the Zambezi) so that such constraints can be incorporated into water management decision-making. Specifically, provision of satisfactory levels of flow for environmental requirements is critical to ensuring the lakes thrive as conservation areas. Given its downstream position, stipulation of e-flows is particularly critical for Lake Turkana. While the relatively lower levels of current and impending developments upstream of Lake Malawi/Nyasa render the urgency of enforcing volumes and timing of e-flows somewhat less than in Turkana, there is still a need to ensure water quality; indeed, the growing agricultural water use upstream of Malawi/Nyasa may compromise the sustainability of several key environmental goods in the lake.

**Enhancing sustainability of an ecosystem service: fish.** Provision of fish for food is an ecosystem service of huge importance to communities that have settled along the lakeshores for exactly that reason. The aim is sharing the limited fish resources between growing human populations and ensuring sustainable use to secure fish stocks for future generations. Harmonized quota are required detailing which species are allowed to be fished where and when. Further, this should be accompanied by uniform restrictions in fishing methods and gear such as mesh size for nets.

**Tapping the potential of an overlooked ecosystem service: tourism.** Tourism is an important factor in financing protected area management and – under certain circumstances – can also benefit local communities. Yet, tourism is a market-based industry and does not come freely as an automatic side effect of protected areas. That means if a destination wants to manage tourism in a sustainable way; it needs to establish professional procedures for marketing and resource management, as well as human labor. A single protected area and even a single country alone often cannot attract sufficient visitors to maintain the tourism business. Unifying natural areas across borders can create a higher visibility and attractiveness, leading to co-benefits for all involved countries. This way, also shared resources used by tourists can be managed more efficiently.

**Capacity building.** Changes in behaviour require clear rules and law enforcement, but also an understanding of the meaning of these rules. Transboundary conservation therefore requires an education component, where people can learn and experience what consequences individual behaviour can have when it is carried out by many people in the same area of influence. Local communities usually have regulatory systems in place that restrict resource use. Transboundary structures can bring members and leaders of communities together to coordinate the use of their communal resources.

## 7.2 ALTERNATIVE 2: ENVIRONMENTAL FLOWS FOR FISH SUSTAINABILITY AND HYACINTH FLUSHING

**E-flows.** E-flow procedures regulate discharges at dams to ensure minimal flow releases and seasonal ‘artificial floods’. While some efforts have been undertaken in the Zambezi basin to explore parameters of e-flows (Box 1 above), implementation of thorough basin-wide regulations and legal requirements are absent both in the Zambezi and Omo-Turkana catchments. Alternative policies are thus needed to maintain biodiversity and ecosystem services in the wider landscape. Wetlands conservation and restoration depends on well-planned environmental flows based on concrete thresholds for both amount and timing of water discharge at dams. Fish also require certain levels of flow at certain times, to ensure sustainability. Discharge policies also have a potential effect on water quality. Invasive floating vegetation becomes dominant in still and slow-flowing waters and can then have a strong negative effect on hydropower production as it blocks the turbines and causes high cleaning costs.

**Flow requirements for fish species.** To better understand flow required for fish conservation, we represented the number of occurrences of free-flowing fish species in a watershed map (Figure 7 and Figure 8). We interpret these maps in relation with existing and planned dam projects in the Omo-Turkana and Zambezi basins. Given that the Zambezi has already been dominated by large dams for a long time, the species distribution has adapted accordingly, with most free-flowing species concentrated in the unregulated upper Zambezi catchment. For the planned dams, critical locations are upstream of Kariba and around lake Malawi, both of which may have negative consequences on fish diversity. The picture for the Omo-Turkana basin is a different one, with highest numbers of free-flowing species located just below the newly created dams Gibe III for hydropower production and at the Kuraz sugar plantation for irrigation. These species, as well as those in lake Turkana itself, might become affected by the dam projects that have just been completed. Efforts of environmental flow management urgently need to be concentrated at these new dams, in order to avoid detrimental consequences on fish populations, both in terms of biodiversity and fisheries as a food source for people.

**E-flows and water quality.** Both water quality and the control of invasive species are typically an element of environmental policies in many of the countries in the Omo-Turkana and Zambezi basins. Building on these elements, we suggest to firmly incorporate water quality and invasive floating vegetation into basin-wide water management decision making. The water hyacinth *Eichhornia crassipes* is considered one of the worlds' worst invasive weeds in terms of ecological and socio-economic impacts due to its capacity to rapidly colonize and dominate tropical freshwater ecosystems (Villamagna & Murphy 2010). Dominance of invasive floating vegetation such as *Eichhornia* is often associated with anthropogenic nutrient inputs (source) but also happened just after filling of new reservoirs (Holm et al. 1969). Once established, shading and enhanced sedimentation provided by the floating plants create hypoxic conditions further stimulating nutrient release from sediments potentially creating a resilient alternative stable ecosystem state (Scheffer et al. 2003; de Tezanos Pinto & O'Farrell 2014). Anoxia caused by monodominant coverage of the water surface can be detrimental to other aquatic species (Khanna et al. 2012), water quality (Sinkala et al. 2002) and thus people who depend on freshwater ecosystems, e.g. for fisheries. In addition, these floating plants obstruct the operations of hydropower stations, physically restrict navigation and fishing, and cause high costs related with their removal (Nang'alelwa 2008).

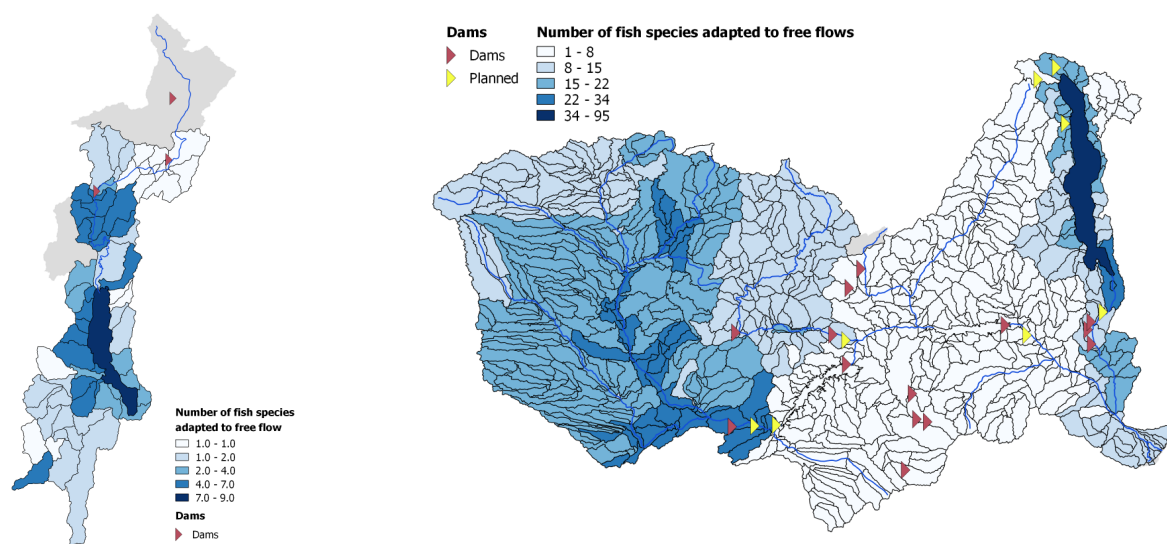


Figure 7 – Counts of fish species that are associated with characteristics of free-flowing rivers in relation with the location of existing dams in the Omo-Turkana basin.

Figure 8 – Counts of fish species that are associated with characteristics of free-flowing rivers in relation with the location of existing and planned dams in the Zambezi basin.

**Aquatic weed invasions and streamflow.** The Zambezi River Basin experiences a pronounced wet season from December to March related to the passage of the Intertropical Convergence Zone. Whereas the dry season characterizes the remaining part of the year (April-March). The precipitation regime is followed by a strong seasonality in the hydrological regime (Figure 9). We reviewed the 31 available high-resolution satellite images (Google Earth) for the mouth of the Marramba River and scored each on scale of 0 to 4 based on the cover of floating macrophytes, with a score of 0 meaning no floating vegetation is visible and a score of 4 corresponding to complete coverage of Marramba surface water (Figure 10). Based on this analysis we deduce that the floating vegetation seems to follow quite well the hydrological regime of the Zambezi (Figure 11). In cases of controlled discharge by dams, this behaviour can be taken into account to effectively control species invasions as part of e-flows management—at least downstream of reservoirs. Inside reservoirs, our observations show that floating vegetation cover decreases in high water periods due to increased discharges at the dam and the associated water movement that impedes clustering of macrophytes. Invasions generally occur after longer periods of low discharge, when turbines



are switched off or run at low power. Constant year-round minimum discharge levels at dams could therefore reduce the risk for floating vegetation cover to become too dominant. In other words, environmental flows can be used to ‘flush’ the river system.

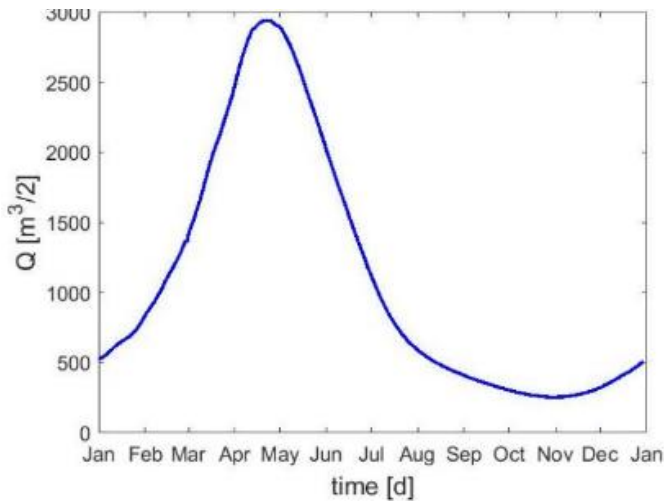


Figure 9 – Mean-year discharge at Victoria Falls station (natural regime).



27/01/2015 (score 0)



20/03/2015 (Score 1)



11/06/2015 (score 3)



15/10/2015 (Score 4)

Figure 10 – Seasonal dynamics in *Eichhornia* cover (bright green) on the Maramba River near Livingstone. This population has direct impacts on the nearby Victoria Falls hydropower station (Source: Digital Globe high-resolution images on Google Earth).

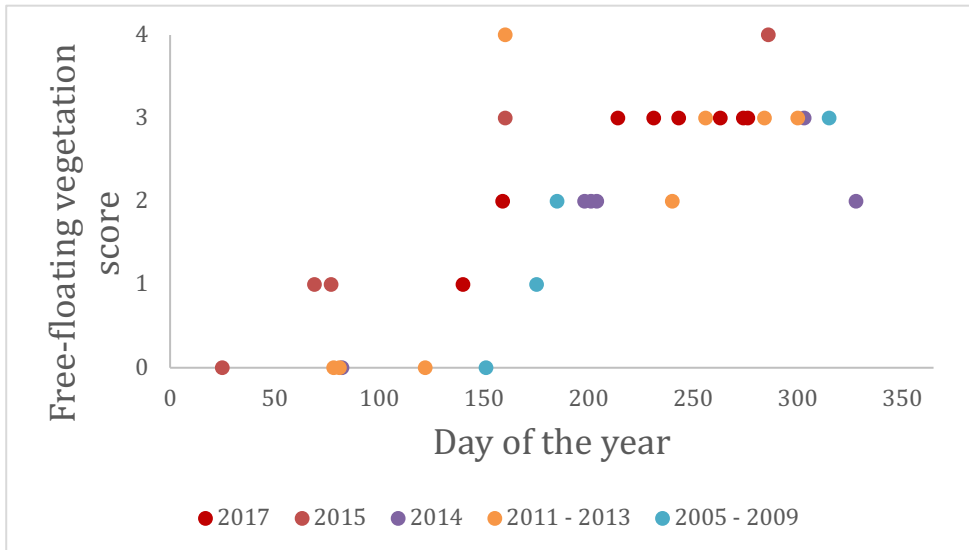


Figure 11 – Floating vegetation coverage of the Maramba river, based on scoring of Google Earth satellite images.

**Policy recommendations for alternate flow releases.** In order for e-flows to be useful, they need to be as close as possible to historical, pre-dam flow regimes. This includes the amount of discharge as well as seasonal high and low flows (Sabo et al., 2017). Fish migration and spawning regimes are adapted to these patterns and many species can show high resilience to extreme events. Yet, permanent modifications of habitat conditions that either lead to changes in the composition of food sources or physically obstruct migration to areas that are crucial for reproduction will have detrimental consequences on fish populations. Key to environmental flow regulations are therefore variability of flows and connectivity (or at least permeability of barriers). Especially the variability is also an important factor for the control of invasive weeds as they need constant stagnant waters and cannot cope with high-flow events.

**Variability.** Recent research has shown that controlled river flows are most successful in sustaining fish populations when they match historical net annual flow anomaly and flood pulse extent, in terms of flood magnitude and duration. This requires a change in focus from the question ‘How much water do we need?’ to ‘When do we need it the most, and when can we spare it?’ (Sabo et al., 2017). For both the Omo-Turkana and Zambezi, this means releases need to be determined not by discharge for energy production, but rather according to seasonally occurring variations. This will inevitably lead to reductions in amount of produced energy, which needs to be buffered by a policy framework.

**Connectivity.** Dams and other river regulations often present obstacles that are impermeable for fish and other aquatic organisms. This blockade can - at least in the upstream direction - only be bridged through engineering measures such as fish ladders. Dams are favoring still-water environments in two ways: Upstream through impoundment and downstream by providing steady, year-round discharge to low lying areas filled with water. These conditions trap sediment and nutrients and favor a certain set of species including invasive floating vegetation. The best way to overcome this environmental degradation is avoidance of new dams and removal of existing ones. Wherever this is politically not feasible, new ways to build dams should be considered that allow full release of water and sediment to flush the river system.

**Fish sustainability, hyacinth flushing, and beyond.** Ultimately, implementation of e-flows which satisfy fish requirements and flush hyacinth will have broader benefits. Indeed, achievement of a flow regime that more closely mirrors the natural flow pattern is likely to bring benefits to wetlands, forests and other environmental resources as well. Implementation of e-flows – particularly moving forward as new dams are constructed – will be therefore be critical to ensuring the sustainability of

services derived from ecosystems. A major potential conflict may nonetheless lie in the impact on the timing of e-flows on firm hydroelectricity production. Greater detail on the relationship between conventional dam objectives such as hydroelectricity production, and ecosystem services in the two basins, can be found in section 7 of Deliverable 3.4.

### 7.3 ALTERNATIVE 3: ADOPTION OF A MECHANISM FOR ENVIRONMENTAL CONSERVATION IN THE TWO BASINS IN THE CONTEXT OF BASIN-WIDE RBOs

**Background: Institutional Reform for environmental conservation in transboundary basins.** Review of past experience reveals at least<sup>235</sup> three transboundary watercourses in which focus has been placed on institutional reform to improve environmental conditions: the Danube, the Elbe, and the Pearl. Focus has been most extensive on the Danube (e.g., Linnerooth, 1990; Margesson, 1997; Gerlak, 2004a; Gerlak, 2004b). Approaches to institutional reform in such transboundary waters can be broadly divided into three groups: i) policy harmonization, ii) new policy development and iii) ecological modernization.

As noted, the Danube experience has been the most extensively examined. Linnerooth (1990) described how deteriorating water quality and other ecological problems drove the need for cooperation among the basin's eight countries, manifested in the formulation of the "Danube Declaration". Specifically highlighted was the need for a multi-purpose water commission and – as highlighted in the Danube Declaration – *harmonization* of various protocols in existence to arrive at a common agreement on what water quality is and how it should be tested. Margesson (1997) described the *Convention on Cooperation for the Protection and Sustainable Use of the Danube River* and the Environmental Programme for the Danube River Basin (EPDRB). Critical to both efforts is coordination in planning across countries. Gerlak (2004a) examined the role of the GEF in the Danube, highlighted how knowledge had been strengthened through GEF involvement yet challenges remained related to realizing practical ecological improvement. Specifically highlighted were *program and policy development* in the form of the International Commission for Protection of the Danube River (ICPDR), protocols on landscape and biodiversity conservation, and a contingency plan for combatting pollution. Gerlak (2004b) reached conclusions similar to her other work, but stressed the role of data and coordination throughout project planning and implementation.

One article (Dombrowsky, 2008) explored the water quality regime contained in the International Commission on the Protection of the Elbe (ICPE). Specifically highlighted were how the two countries sharing the Elbe (Czech Republic, Germany) actually accomplished on-the-ground progress, for example related to enabling fish migration. While the article is careful to point out that some of such progress may have otherwise occurred, it appears that ICPE helped to facilitate progress toward environmental conservation by providing a platform for identification and prioritization of joint actions; further, the commission's public reporting mechanism helped encourage compliance with targets and actions.

Finally, one article (Hills and Roberts, 2001) focuses on resolution of environmental problems in the Pearl River Delta region—shared between Hong Kong and the People's Republic of China (PRC). Environmental problems here have been mainly driven by pollution that has come from rapid industrialization of Guangdong Province, PRC. In response to these challenges, a Hong Kong-Guangdong Environmental Protection Liaison Group (EPLG) was set up to enhance cooperation on environmental management and pollution issues of mutual concern; this was subsequently replaced by a joint working group with a similar focus. A model that has influenced discussions is called *ecological modernization*, which can be interpreted to mean enhancing environmental efficiency of an economy through for example use of cleaner technologies and integration of environmental factors into 'upstream' decision-making.

**Current transboundary consideration of environmental concerns in the two basins.** In the Omo-Turkana, there is limited transboundary dialogue on water-related issues. The environment is

<sup>235</sup> Relevant reform may have also taken place on other shared systems such as the Rhine. Literature on the nature of the process was not identified.

not believed to receive substantial focus. While recent developments in Ethiopian portions of the basin were subjected to Environmental Impact Assessments (EIAs), the degree to which such EIAs involved all concerned countries is unclear. Further, limiting focus to ex-post facto consideration of environmental impacts is unlikely to present opportunities for sincere incorporation of environmental concerns into water resources planning and management in the basin. In the Zambezi, while valuable progress has been made toward basin-wide cooperation reflected in adoption of the 2004 ZAMCOM agreement, specific binding regulation on environmental concerns is believed to be absent.

**Proposed Policy Alternative.** The dearth of impactful transboundary attention to the environment, coupled with evidence of positive environmentally-oriented institutional reform in other shared water systems, calls development or strengthening of transboundary policy in the Omo-Turkana and Zambezi in the context of basin-wide RBOs. Transboundary environmental policy reform could center around creation of a mechanism that covers the following issues:

- Joint and/or harmonized monitoring of prioritized issues, i.e., ecosystem services, such as fish, forests and wetlands
- Agreement on common standards for conservation of each of these issues. Studies could be commissioned to identify and present options that allow riparians to optimally harmonize their approaches to environmental issues.
- Agreement on particular priority geographies in the basins for such conservation. To the extent some priority geographies may be already identified, focus could be devoted to practically incorporating the protection of such geographies into water planning and management through e.g. commitment to e-flow thresholds across countries that ensure their continued viability
- Converge toward agreement on priority accorded to environmental goods and ecosystem services. Preservation of wetlands and biodiversity, for example, may not be fully incorporated into water management decision-making due to ambiguity on the value and associated level of priority that should be accorded to such environmental goods. Improving consensus on their value may better assure such goods a role in discussion and decision-making, along with hydropower and other objectives.
- From WEF to WEEF (Water-Energy-Environment-Food) nexus: A final policy change related to insertion of environmental concerns into sectoral dialogues in energy, agriculture, and water. Sectoral plans, which are often at a national scale, may benefit from early consideration of the environment. To facilitate this process of 'WEEF Nexus', a proposed policy is for RBOs to facilitate dialogues among personnel in environmental sectors in key basin countries and those from sectors of energy, water agriculture. Further, as elaborated in D3.4 and in section 8 below, development of indicators can help to foster incorporation of environmental goods and the services derived from ecosystems into conventional water management decision-making frameworks.

**Omo-Turkana and Zambezi: different starting points.** It should be noted that any effort to foster progress toward adoption of a mechanism in the two basins will start at different points. The Zambezi has a several-decade history of cooperation, in different forms, and a basin-wide RBO currently in existence. This on the one hand presents a foundation for strengthening cooperation, yet on the other may present a barrier as riparians' positions may have hardened over the years. By comparison, cooperation is fairly nascent in the Omo-Turkana. Given that both of the basin's main riparians are transitioning to national basin management, however, key opportunities may present themselves through creation of a joint institution by linking basin management institutions applying to different portions of the Omo-Turkana. The proposed mechanism could fit into this institution.

## 8. IMPLEMENTATION OF ENVIRONMENTAL POLICIES IN THE DECISION ANALYTIC FRAMEWORK (DAF)

### 8.1 RECAPPING

**Common Threads.** The preceding sections of this report revealed several common threads, which lay a basis for proposal of alternatives to current institutional frameworks that define the approaches to environmental issues. The environmental issues of the Omo-Turkana and Zambezi were established, and more than 250 documents from the Omo-Turkana and Zambezi basins were classified and examined to understand how the existing institutional framework responds to these issues. From this understanding, at least five key messages are apparent.

**Critical Environmental Issues.** Fish, forests, wetlands, biodiversity, and wildlife all play critical roles in the Omo-Turkana and Zambezi. Preservation of these resources is important per se, but also as means toward the broader end of harnessing the services that can be derived from them. The state of such resources has already been compromised due to insufficient regulation and protection. In both basins, fish production is likely below levels seen at the past; similarly, wetlands have likely been compromised by somewhat fragment management approaches. Moving forward, environmental resources will be faced with emerging threats such as climate change, water resources exploitation, and proliferation of invasive vegetation species such as water hyacinth.

**Coverage of key issues is often general.** Overall, current coverage of environmental issues in existing institutional frameworks provides a strong foundation for development and implementation of tools and mechanisms that can make more practical contributions to enhancing environmental sustainability. However, the depth of coverage in institutional frameworks tends to remain at a somewhat general level and lacks specificity. Concerning biodiversity in the Omo-Turkana, for example, neither major riparian has a legal and policy framework in place. In the Zambezi, despite considerable progress on transboundary water cooperation, reference to a suite of environmental issues has largely remained at the level of principles.

**Greater Harmonization needed.** There are clearly some major points of alignment in legal and policy documents in both basins. Prohibition of some types of fishing methods, protection of certain trees, and acknowledgement of wetlands as key ecosystems are all common to legal and policy frameworks in both basins. There are nonetheless a range of opportunities to achieve greater harmonization. In both the Omo-Turkana and Zambezi, prominent differences which may benefit from policy harmonization include: *i)* types of fishing gear allowed, *ii)* categorizations of forests, *iii)* degree of protection afforded to wetlands, *iv)* level of policy coverage to biodiversity, and *v)* protected species.

**Greater intersectoral collaboration needed.** In the Omo-Turkana, there is some mention of environmental concerns and impacts in agricultural sector policies. Water sector documents tend to focus on environment in terms of harm avoidance. Reference to environmental impacts in energy documents is sparse. There would, therefore, seem to be considerable scope for greater and more holistic incorporation of environmental concerns into water and energy sectoral policy in the Omo-Turkana. In the Zambezi, the legal and policy framework appears reasonably developed, but constrained by generality. Agriculture sector policies provided only general reference to environmental impacts. Reference to fish, forests, wetlands in water sector documents also tends to be general. Energy sector documents provide little focus to environmental goods other than forests. Ultimately, in both basins, given the impending hydropower development and likely impacts of that development on the environment, greater energy-environment linkages may be warranted.

**Transboundary Basin Cooperation: Key instrument for inclusive approaches remains nascent or limited.** In the Omo-Turkana, transboundary water cooperation remains somewhat nascent and narrow in scope. Many of the environmental challenges outlined throughout this report would be optimally regulated through a transboundary basin framework. Therefore, a key opportunity exists to build on the recently established cooperation, to formulate more robust structures that respond to environmental issues and harmonize approaches across portions of Omo-Turkana that sit in different countries. In the Zambezi, transboundary water cooperation possesses a longer



history yet remains at a fairly general principled level concerning the environment. Here too, there are key opportunities to formulate optimal approaches to environmental conservation by incorporating environmental parameters into a basin-level management framework building on the cooperation currently in existence.

***From Gaps and Limitations, to Opportunities for Policy Development.*** The limitations in current approaches lead to identification of opportunities for policy development or reform. Many of such opportunities lie in adding specificity or detail to the general principles currently in existence. Specifically:

- i. For fish, opportunities may lie in formulating policy in response to specific information regarding migration and habitat requirements of specific species.
- ii. Forests degradation and deforestation may benefit from harmonized categorizations of trees, so that adequate protection – and, to the extent possible, allocation of water – can be provided. Greater use of emerging instruments such as forest certification and payments for ecosystem services may also prove useful.
- iii. More integrated, aligned approaches to wetland conservation may prove useful to enhancing wetland preservation; this may also benefit from planning of e-flows with concrete thresholds for amount and timing of water discharge at dams, possibly considering also dynamic environmental flow schemes.
- iv. Enhancing biodiversity protection may benefit from greater coverage in water sector documents, and related, incorporation of biodiversity targets into water management based on an assessment of habitat quality and connectivity; further establishment of TFCAs may also prove useful.
- v. Wildlife management in the two basins may benefit from alignment of species deemed as protected, greater use of buffer zones and strengthening rules around hunting licenses.

## 8.2 ENVIRONMENTAL INDICATOR SYSTEM FOR THE DAF

World's river streamflow regimes are increasingly impacted by anthropic river regulations and it remains unclear, how resilient river ecosystems are to this change and the related consequences, especially under climate change. Small modifications in the river morphology caused for example by the pillars of a bridge can alter the flow regime of a river, leading to unwanted consequences such as the clogging of the water way by invasive floating vegetation (Figure 12). Precautionary measures and policies are needed to avert that such situations escalate to tipping points, permanent regime shifts in ecosystems. The policy review for the Zambezi and Omo-Turkana basin countries showed a lack of coverage and implementation of nature conservation in national and transboundary legislations. In response to such lack of coverage, three policy alternatives were formulated. As noted above, these are:

- formation of TFCAs to conserve lakes Malawi/Nyasa and Turkana
- e-flows for benefits that include enhancing fish sustainability and flushing hyacinth
- adoption of a mechanism for environmental conservation in the two basins in the context of basin-wide RBOs.

TFCAs, the first of such alternatives, are one policy tool to create “free-flowing sanctuaries” in the overall river system. Yet, we showed that the current network of protected areas in the two river basins is not sufficient to cover the majority of occurring freshwater species. We strongly recommend the development of new TFCAs, but acknowledge that there are limits in enforceability of strict conservation measures. As an integrative tool, environmental flow management is necessary to complement protected areas.



Figure 12 – Mats of floating vegetation clogging the Kafue River in Zambia at the obstacles formed by a bridge. Image taken in the direction of flow on 18/03/2018. (Drone image by ATEC 3D)

The outcome of this report calls for a strong consideration of ecosystems in the decision analytic framework of the DAFNE project and the explicit inclusion of environmental issues into the nexus approach, towards a WEEF nexus. To achieve this goal, we propose policy pathways based on a set of clear environmental indicators. Existing environmental flow measures typically follow the requirements of hydropower production, creating a steady outflow from turbines. Yet, future management needs to make this discharge more dynamic, mimicking natural flow and flooding regimes. Indicators – or their combination - can be used to gauge the success of such environmental flow measures in reducing the risk of permanent regime shifts of local ecosystems.

**Environmental indicators for the DAF.** Typical changes in the water regime following the construction of dams and other obstacles are the impoundment of water upstream, creating new still water environments. The downstream effects are related to the moderation of flows due to year-round regular discharges. This potentially increases the permanence of surface water. These two processes – impoundment and moderation – have quantifiable effects on the physical and chemical characteristics of rivers. In terms of water flow, speed and variability of flood pulses are expected to decrease, as well as connectivity along the river. We hypothesize that these changes come along with increases in temperature, while oxygen levels and turbidity decrease. Eventually, this will affect the coverage and physical conditions of certain habitats with implications for ecosystem processes and species composition (Figure 13).

Ultimately, this gives a set of ten indicators – *flow speed, flow variability, river connectivity, temperature, oxygen, turbidity, wetland area, riparian fragmentation, biological invasions, and richness of species adapted to fast flows* – which need to be considered, either explicitly or through proxies, in the optimisation of the pathways that will be carried out through the DAF and in the post-optimisation simulations that will be carried out by means of the integrated WEF model. In the absence of experimental evidence, which can come only from long-term observations, we assume that a tipping point can be reached, once most or all of these variables deviate more than 20% from natural ranges over the course of a year. We propose that pathways accounting for environmental flow measures aim to develop environmental flow release strategies that reduce such deviations for all but two variables. Modelling first – through the DAFNE methods – and monitoring and stabilizing these indicators – in the post project time – will allow to reconcile the ecosystem services that e-

flows can support (such as fisheries and buffering of biological invasions) with the needs of regulating rivers (such as due to hydropower and irrigated agriculture abstractions).

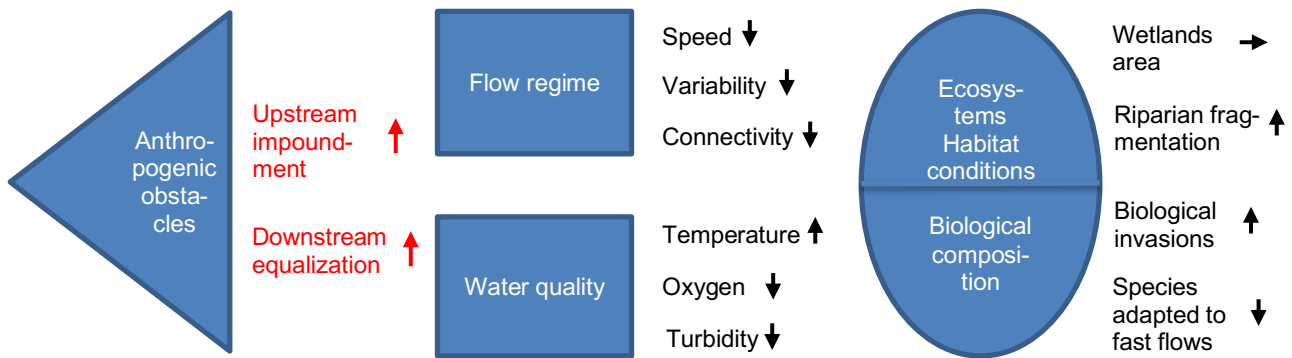


Figure 13 – Processes (red letters and arrows) and environmental flow indicators with hypothesized trends (black letters and arrows) following the placement of anthropogenic obstacles (dams, diversions, bridges) in the river system

### 8.3 OUTLOOK: CREATING AN EFFECTIVE POLICY FRAMEWORK

As noted, three policy alternatives were formulated: i) formation of TFCAs to conserve lakes Malawi/Nyasa and Turkana, ii) e-flows for benefits that include enhancing fish sustainability and flushing hyacinth, and iii) adoption of a mechanism for environmental conservation in the two basins in the context of basin-wide RBOs. Formulation of e-flow policies, the second policy alternative, can benefit from evidence-based predictive ecological frameworks, based on available historical data on water resources, ecosystems and their management (Colloff et al., 2018). In more data-scarce regions, heuristic tools have been developed such as the “Rapid Evaluation Tool for Screening the Potential for Reoptimizing Hydropower Dams” (Thomas and Di Francesco, 2009). Based on a cascade of Yes/No answers, this evaluates if ecosystems, livelihoods, existing flow controls, possible engineering measures and the power generation schedule would allow the “re-operation” of a dam to reach certain environmental goals. However, such an evaluation scheme will fail if economic considerations become too powerful.

In contrast, the Water Framework Directive (WFD) of the European Union is a relatively strong policy instrument to ensure “no-net-losses” in water quality and services. To recover environmental costs incurred from the damage that water uses inflict on the environment, Gárcia de Jalón et al. (2017) propose a three-step methodology to be implemented into the WFD:

- i. Assessing the admissible range of regulated flow regime variability based on historic data
- ii. Estimating the environmental impact of altering magnitude, timing and duration of flows (e.g. using the Indicators of Hydrologic Alteration introduced by Richter et al. [1996]) as a function of deviation from the admissible flow range
- iii. Calculating the environmental costs of flow regulation based on the current unit price of water.

The implementation of the above assessment scheme by means of simulation through the integrated WEF model – providing range of disturbances following a given pathway – and by accounting for the indicators in the DAF will allow to compute the resulting cost of each considered pathway and the consequences of charging them to the water users, based on the “polluter-pays” principle. In practice, this means for example a country who uses water for irrigation, pays more whenever such activities have strong impacts on high flows and low flows. The policy thus creates an incentive to adjust discharge according to an historic regime. The Negotiation Simulation Laboratory (WP6) will explore with the stakeholders the acceptance of such principles and will allow to assess the feasibility of including them in transboundary river agreement elaborated in WP4.

We observe that the application of such a model for the Zambezi and Omo-Turkana case-studies may need to account for strong issues in transboundary governance and limited baseline information of historic and current flows. Agreement on a data collection and sharing provision in the context of a cooperative RBO, as proposed in alternative 3, may help to improve such model going forward. At the present time, however, wherever historical discharge information, representative of natural flow conditions, is available (for the Zambezi see, e.g., Beilfuss [2001] and McCartney [2013]), the DAFNE modelling framework could be used to estimate flow deviations for a selected number of pathways and scenarios. Using current estimates of conventional benefits of water management such as hydropower and agriculture, the decision analytic framework could then use this calculation to take into account environmental costs into the evaluation of different pathways. Given the data-scarcity in the study regions, this approach may need to be extended to other indicators that can be derived from remotely sensed data. That means, also deviations of water temperature, flooding frequency or wetland area from the long-term average would be translated in costs that could be added to water prices. Such an approach could then be included, as suggested above, in the stakeholder negotiation process both preceding the identification of the pathways and following the WEF simulations and DAF optimisations.

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## APPENDIX A

### REFERENCES (LEGISLATION AND POLICIES)

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#### *Ethiopia*

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- SADC, Forestry Strategy: 2010-2020. Gaborone: SADC
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- The Memorandum of Understanding Concerning the Establishment of the Kavango-Zambezi Transfrontier Conservation (KAZA MoU) between Angola, Botswana, Namibia, Zambia and Zimbabwe, December 2006
- The Treaty on the Establishment of the Kavango-Zambezi Transfrontier Conservation Area (KAZA Treaty), 2001
- Agreement on the action plan for the environmentally sound management of the Common Zambezi River system signed at Harare, 28 May 1987
- Agreement on the Establishment of the Zambezi Watercourse Commission (ZAMCOM Agreement), signed 13th July 2004, in force June 2011
- EAC Protocol on Environment and Natural Resource Management (2006)
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- Convention on International Trade in Endangered Species of Wild Fauna and Flora reprinted in 12 I.L.M. 1085 (1973)
- Protocol on Economic and Technical Co-operation between the Government of the Republic of Zambia and the Government of the Republic of Zimbabwe concerning the management and development of fisheries on Lake Kariba and transboundary waters on Zambezi River 1999
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## APPENDIX B

### ENVIRONMENTAL POLICY IN THE OMO-TURKANA

#### Fish and Aquaculture

**Kenya:** Kenya has one of the most extensive and recently updated fisheries legislation. The Fisheries Management and Development Act<sup>236</sup> aims to provide for the conservation, management, and development of fisheries and other aquatic resources to enhance the livelihood of communities' dependant on fishing. The Act places focus on 'long-term sustainable use' ensuring that 'habitat are not overexploited, threatened or endangered' and ensuring that 'biodiversity and genetic diversity in the marine environment is maintained and enhanced'.<sup>237</sup> The Act echoes the restructuring of the Kenyan Government following the enactment of the new constitution in 2010 and decentralises the management of fisheries to county level.<sup>238</sup> Small-scale artisanal fisheries have been under the management of Beach Management Units (BMU) since 2006,<sup>239</sup> which is a system of co-management based on participation of local fishing communities. Under the BMU local communities have exclusive management rights over fish landing sites<sup>240</sup> This local management system has successfully resulted in an increase in the biological diversity of fish (Le Manach et. al, 2015). Section 5(2)(g) also encourages the participation of users of the fisheries resources, and the general community, in the management of fisheries. While Section 29 (2) states that the Act will not prevent the use of fisheries or fisheries resources as it has been the custom of that community to use. Management plans for conservation, development, and sustainable use of each designated fishery within Kenya must be kept and updated.<sup>241</sup> Restrictions on fishing seasons, gear, fishing areas and species of fish, catch quantities and the identification of fragile aquatic ecosystems as well as a structure for their protection can be declared by gazette at any time.<sup>242</sup> Section 35 makes it illegal to fish for, catch, possess, transport, process, buy or sell any species of fish which is declared endangered or threatened with extinction.<sup>243</sup> All fishing vessels operating in Kenya must be licensed and prioritisation for the allocation of licences is given to local vessels.<sup>244</sup> Foreign vessels are only allocated licences if enough resources remain when local exploitation levels are reached.<sup>245</sup> Part VIII of the Act covers aquaculture and states relevant requirements for licensing, interestingly the legislation also states that 'no person shall, by carrying out aquaculture activities, deprive a local community of its traditional access to fishing grounds without good cause and without first consulting the affected community'.<sup>246</sup> Section 73 further details that aquaculture practices must ensure the protection of transboundary aquatic ecosystems.<sup>247</sup> The addition of these two provisions sees the Kenyan legislation go above and beyond what can be seen in the ZRB States or Ethiopia. The act takes a precautionary approach to the management of fisheries and states than no less standard will be used at a national level than what is set in any international agreement.<sup>248</sup> The necessity to 'conserve and protect all aquatic habitats for present and future generations' is also mentioned in the National Environment Policy (2013).<sup>249</sup> The policy further states that it will promote 'sustainable aquaculture development' and 'protect fish breeding grounds and implement closed seasons regulations where necessary'.<sup>250</sup>

<sup>236</sup> Fisheries Management and Development Act 2016 (No. 156 of 2016) (Kenya)

<sup>237</sup> Fisheries Management and Development Act 2016 (No.156 of 2016), Section 5(2) (Kenya)

<sup>238</sup> Fisheries Management and Development Act 2016 (No.156 of 2016), Section 34 (Kenya)

<sup>239</sup> See Fisheries (Beach Management Units) Regulations 2007 (Kenya)

<sup>240</sup> Fisheries (Beach Management Units) Regulations 2007, Rule 4

<sup>241</sup> Fisheries Management and Development Act 2016 (No. 156 of 2016,) Section 39(2)(a) (Kenya)

<sup>242</sup> Fisheries Management and Development Act 2016 (No. 156 of 2016), Section 40 (Kenya)

<sup>243</sup> Fisheries Management and Development Act 2016 (No. 156 of 2016), Section 35 (Kenya)

<sup>244</sup> See Fisheries Management and Development Act 2016 (No. 156 of 2016), Part X, Section 88 (Kenya)

<sup>245</sup> Fisheries Management and Development Act 2016 (No. 156 of 2016), Part IV (Kenya)

<sup>246</sup> Fisheries Management and Development Act 2016 (No. 156 of 2016), Section 64(1) (Kenya)

<sup>247</sup> Fisheries Management and Development Act 2016 (No. 156 of 2016), Section 73 (Kenya)

<sup>248</sup> Fisheries Management and Development Act 2016 (No. 156 of 2016), Section 5(2)(i) (Kenya)

<sup>249</sup> National Environment Policy (2013), Section 4.12.2 (Kenya)

<sup>250</sup> National Environment Policy (2013), Section 4.12.2 (Kenya)

**Ethiopia:** In Ethiopia, the National Fisheries Development and Utilization Proclamation No. 315 of 2003 provides broad guidelines related to fishery resource conservation, food safety and aquaculture development. The objectives of the proclamation are to conserve fish biodiversity and its environment, control over-exploitation, increase the supply of good and safe fish for food security and to expand aquaculture development.<sup>251</sup> Section 8 of the proclamation details environmental protection and states that the concerned organs of federal or regional governments shall ensure that development programmes and projects 'are drawn up in such a way that they will not have direct or indirect negative impact on the fisheries resource constituted in the basin'.<sup>252</sup> Licenses or permits are required for fishing and certain types of fishing gear, although not explicitly detailed, are banned.<sup>253</sup> Section 9 of the proclamation states that the ministry may negotiate and enter into transboundary agreements on fisheries. Interestingly, in the context of the recent development projects within Ethiopia, Section 8 focuses on environmental protection and details that Federal or Regional Governments must ensure that development programmes and project are drawn up in such a way that they will not have either a direct or impact on the fisheries resource constituted in the basin where the programmes or projects are intended to be implemented. The National Aquaculture Development Strategy (2009) provides a regulatory framework aquaculture. It aims to integrate aquaculture into the agricultural sector, placing emphasis on its development in an environmentally sustainable manner. Aquaculture is also covered within the National Fisheries Development and Utilization Proclamation No. 315 of 2003 which states that aquaculture facilities shall require a permit which shall only be granted where it is verified that there is sufficient land and surface/ground water and that the establishment of such a body 'does not have a negative impact on the surrounding environment or on the fish species inhabiting the water bodies in the basin'.<sup>254</sup> As the proclamation covering Fisheries Management operates on the basis of federal or regional governments putting in place their own plans, only two of which have done so, it is not well implemented. In 2013, co-management approaches were also proposed which included mesh size limitation, closed season during the breeding of certain species, limitations on the number of licenses and progressive reduction of beach seine nets (Janjo, 2014).

## Forests

**Kenya:** Forestry legislation in Kenya has recently been updated, with the enactment of the Forest Conservation and Management Act 2016,<sup>255</sup> which repeals the earlier Forests Act of 2005.<sup>256</sup> The new Act recognizes the decentralization enacted with Kenya's new constitution. While forests were vested in the State in the 2005 Act, the new Act vests them in the Kenya Forest Service.<sup>257</sup> The legislative framework is now newer than the Ministry of Environment, Water and Natural Resources Forest Policy of 2014. The Forest Conservation and Management Act aims to provide for the development and sustainable management, including conservation and rational utilization of all forest resources for the socio-economic development of the country.<sup>258</sup> Different definitions are provided in the legislation to distinguish between 'forest produce' and 'forest resources', while the forest produce list contains items which can be sourced from a forest, including; honey, firewood, flowers, soil and timber, forest resources are defined must more broadly as 'anything of practical, commercial, social, religious, spiritual, recreational, educational, scientific, subsistence or other potential use to humans that exists in the forest environment, including but not limited to flora, fauna and microorganisms' and therefore could animals could be included within its remit.<sup>259</sup> Forests are classified as public, private or community forests.<sup>260</sup> Any public, community, or private forest can be declared as a nature reserve, should it be deemed necessary for the conservation of forestland which is of particular environmental, cultural, scientific or other special significance or for the preservation of biological diversity and threatened or endangered species.<sup>261</sup> All indigenous forests and woodlands are required

<sup>251</sup> National Fisheries Development and Utilization Proclamation 2003 (No. 315 of 2003), Section 3 (Ethiopia)

<sup>252</sup> National Fisheries Development and Utilization Proclamation 2003 (No. 315/2003), Section 8 (Ethiopia)

<sup>253</sup> National Fisheries Development and Utilization Proclamation 2003 (No. 315 of 2003), Section 5 (Ethiopia)

<sup>254</sup> National Fisheries Development and Utilization Proclamation 2003 (No. 315/2003), Section 6 (1) and (2) (Ethiopia)

<sup>255</sup> The Forest Conservation and Management Act 2016 (No. 34 of 2016) (Kenya)

<sup>256</sup> The Forests Act (No. 7 of 2005) (Kenya)

<sup>257</sup> The Forest Conservation and Management Act 2016 (No. 34 of 2016), Section 31 (Kenya)

<sup>258</sup> The Forest Conservation and Management Act 2016 (No. 34 of 2016) (Kenya)

<sup>259</sup> The Forest Conservation and Management Act 2016 (No. 34 of 2016), Section 2 (Kenya)

<sup>260</sup> The Forest Conservation and Management Act 2016 (No. 34 of 2016), Section 30 (Kenya)

<sup>261</sup> The Forest Conservation and Management Act 2016 (No. 34 of 2016), Section 39(3)(a) and (b) (Kenya)

to be managed on a sustainable basis for a variety of purposes which are listed within the Act, including the conservation of water, soil and biodiversity, riparian and shoreline protection, sustainable production of wood and non-wood products and to provide habitat for wildlife.<sup>262</sup> Community participation in forest resource management is encouraged through the Act which allows a member of a forest community, together with other members or persons resident in the same area to register a community forest association which they can then use to participate in the conservation and management of a public forest.<sup>263</sup> The proposals put forward by the associations must contain *inter alia* details of their intended use of forest resources and methods of conserving biodiversity. Once the association has been granted permission to participate in the management or conservation of a forest, a number of obligations are placed upon them such as assisting with firefighting and protecting sacred groves and trees.<sup>264</sup> As a result, the association gains a number of forest user rights including harvesting of timber or fuel wood, grass harvesting and development of community wood and non-wood forest based industries, provided that such activities are not in conflict with the conservation of biodiversity.<sup>265</sup> The Act also allows members of a forest community to collect, subject to conditions which may be prescribed, forest products which that group has been custom to taking, other than for the purpose of sale.<sup>266</sup> No cutting, grazing, removal of forest produce, hunting or fishing is allowed within a nature reserve without the permission of the Director in consultation with conservation agencies.<sup>267</sup> The Cabinet Secretary, on advice of the Kenya Forestry Research Institute, may, by order in the Gazette, declare any tree, species, or family of trees to be protected.<sup>268</sup> It is an offence to fell, cut, damage, remove, trade in or export any protected tree, species or family of trees.<sup>269</sup> The legislation also states that the Director General may, with the approval of the Board, develop management plans for the purpose of sustainable management of cross-border forest resources.<sup>270</sup> Forests which have been mismanaged or neglected can be declared as provisional forests under the Act, the forest will then be managed by the Kenya Forest Service for a period of three years, subject to review and revert to the owner when the board is satisfied that it has been adequately rehabilitated and the owner has given an undertaking to efficiently manage it.<sup>271</sup> Any profits accrued during that time are paid to the owner, less the expenses incurred by the Forestry Service for managing the forest.<sup>272</sup> Any forest area, or woodland, or part thereof which has particular environmental, cultural, scientific or other special significance can be declared to be a nature reserve for the purpose of preserving its biodiversity.<sup>273</sup> Compensation will be given to the owner of such a forest.<sup>274</sup>

**Ethiopia:** The Forest Development, Conservation and Utilization Proclamation No.542/2006 is main piece of legislation covering forestry in Ethiopia. Only three types of forest can be owned in Ethiopia, Private, Regional and State.<sup>275</sup> Forest development by individuals, associations, government, NGO and the private sector is encouraged through the Act which states that areas in productive state forests which could be developed into man-made forest developments should be 'given out'.<sup>276</sup> Forests which are not designated as protected or productive are to be given to the community, associations and investors so that they can conserve and utilize them.<sup>277</sup> 'Major forestlands' are to be designated as state forests<sup>278</sup> to be registered as protected and productive forests, the designation of which is to be done with the participation of local communities.<sup>279</sup> Forests are to be protected from

<sup>262</sup> The Forest Conservation and Management Act 2016 (No. 34 of 2016), Section 42 (Kenya)

<sup>263</sup> The Forest Conservation and Management Act 2016 (No. 34 of 2016), Section 48 (Kenya)

<sup>264</sup> The Forest Conservation and Management Act 2016 (No. 34 of 2016), Section 49 (Kenya)

<sup>265</sup> The Forest Conservation and Management Act 2016 (No. 34 of 2016), Section 49(2) (Kenya)

<sup>266</sup> The Forest Conservation and Management Act 2016 (No. 34 of 2016), Section 52 (Kenya)

<sup>267</sup> The Forest Conservation and Management Act 2016 (No. 34 of 2016), Section 64 (Kenya)

<sup>268</sup> The Forest Conservation and Management Act 2016 (No. 34 of 2016), Section 40(1) (Kenya)

<sup>269</sup> The Forest Conservation and Management Act 2016 (No. 34 of 2016), Section 40(2) (Kenya)

<sup>270</sup> The Forest Conservation and Management Act 2016 (No. 34 of 2016), Section 74 (Kenya)

<sup>271</sup> The Forest Conservation and Management Act 2016 (No. 34 of 2016), Section 35 (Kenya)

<sup>272</sup> The Forest Conservation and Management Act 2016 (No. 34 of 2016), Section 35(3) (Kenya)

<sup>273</sup> The Forest Conservation and Management Act 2016 (No. 34 of 2016), Section 39 (Kenya)

<sup>274</sup> The Forest Conservation and Management Act 2016 (No. 34 of 2016), Section 39(2) (Kenya)

<sup>275</sup> Forest Development, Conservation and Utilization Proclamation No.542/2006, Section 3 (Ethiopia)

<sup>276</sup> Forest Development, Conservation and Utilization Proclamation No.542/2006, Section 4(2) (Ethiopia)

<sup>277</sup> Forest Development, Conservation and Utilization Proclamation No.542/2006, Section 4(3) (Ethiopia)

<sup>278</sup> Forest Development, Conservation and Utilization Proclamation No.542/2006, Section 8(1) (Ethiopia)

<sup>279</sup> Forest Development, Conservation and Utilization Proclamation No.542/2006, Section 7(2) (Ethiopia)

fire, deforestation, unauthorized settlement and similar dangers.<sup>280</sup> Reference is also given to the sustainable utilization and protection of forests to ensure the ecosystem is protected from imbalance and biodiversity is conserved.<sup>281</sup> The use of state forests is not limited within the Act, but rather is anything which is within the remit of the management plan which is established, it is however stated that state forests will be used to generate income from tourism.<sup>282</sup> Overall the legislation appears to focus on the economic use of forest resources and less on conservation or protection. Owners of private forests are expected to 'follow sound forest development methods' to replace trees when harvested and ensure the safety of the environment, conservation of catchments, biodiversity and unique natural trees and wildlife.<sup>283</sup> Protected natural forests and forest land are to be demarcated and conserved for the purpose of environmental protection and conservation of history, culture and biodiversity.<sup>284</sup> Forests may be declared as protected for the purpose of protecting and improving the status of water bodies, sources of rivers and catchments, conserving rare and endangered endemic plant, animal and bird species and controlling flood and protecting soil.<sup>285</sup> The proclamation gives reference to traditional use of forests, stating that fast growing tree species may be used by the local community for fuel and construction and should be planted around a protected forest to indicate the boundary.<sup>286</sup> The local community is also permitted to keep bee hives, produce spices and forage for forest coffee.<sup>287</sup> Prohibitions focus on what cannot be conducted within a state forest, with little regard for what activities may be conducted within a protected forest. The implementation of the proclamation relies on the federal and regional bodies, as overseen by the Ministry.<sup>288</sup> Should the regional state fail to properly conserve the forest, the Ministry can take over and administer the forest.<sup>289</sup>

## Wetlands

**Kenya (6 Ramsar Sites):** The Environmental Management and Coordination (Wetlands, River banks, Lake shores and Seashore Management) Regulations 2009 and the Environment Management and Coordination Act<sup>290</sup> form the basis of wetland regulation in Kenya. The Draft Environmental Management and Coordination (Conservation and Management of Wetlands) Amendment Regulations of 2017 are intended to amend the 2009 regulations. The objective of the Draft Environmental Management and Coordination (Conservation and Management of Wetlands) Amendment Regulations is: to provide for participatory conservation of wetlands and their resources; to promote the wise-use of resources in wetlands; to ensure the protection of the diversity of wetland habitats, flora and fauna; to promote awareness creation, education, research; and to promote the use of indigenous knowledge and partnerships with other relevant institutions in the management of wetland ecosystems.<sup>291</sup> Protection from pollution, invasive species and other forms of degradation is also a priority.<sup>292</sup> The policy also requires an inventory of all wetlands to be produced within three years of the date of the amendment.<sup>293</sup> There are a few key differences between the 2009 regulations and the 2017 amendment (still currently in draft). The application of the regulations is altered in Section 3 to give a more specific definition and details of specific types of pollution to be resolved and the prevention and control of alien species are added to the objectives of Section 4. Importantly for the Omo-Gibe-Turkana river basin, a provision is also added in Section 9 for the protection of riparian reserves. The provision on the protection and management of traditional interests is also new. The

<sup>280</sup> Forest Development, Conservation and Utilization Proclamation No.542/2006, Section 9 (Ethiopia)

<sup>281</sup> Forest Development, Conservation and Utilization Proclamation No.542/2006, Section 9(10) (Ethiopia)

<sup>282</sup> Forest Development, Conservation and Utilization Proclamation No.542/2006, Section 10 (5) (Ethiopia)

<sup>283</sup> Forest Development, Conservation and Utilization Proclamation No.542/2006, Section 7 (Ethiopia)

<sup>284</sup> Forest Development, Conservation and Utilization Proclamation No.542/2006, Section 11 (Ethiopia)

<sup>285</sup> Forest Development, Conservation and Utilization Proclamation No.542/2006, Section 11 (Ethiopia)

<sup>286</sup> Forest Development, Conservation and Utilization Proclamation No.542/2006, Section 11(5) (Ethiopia)

<sup>287</sup> Forest Development, Conservation and Utilization Proclamation No.542/2006, Section 11(6) (Ethiopia)

<sup>288</sup> Forest Development, Conservation and Utilization Proclamation No.542/2006, Section 18 (Ethiopia)

<sup>289</sup> Forest Development, Conservation and Utilization Proclamation No.542/2006, Section 17(2) (Ethiopia)

<sup>290</sup> No. 8 of 1999 (Kenya)

<sup>291</sup> The Draft Environmental Management and Coordination (Conservation and Management of Wetlands) Amendment Regulations of 2017, Section 4 (a)-(d) (Kenya)

<sup>292</sup> The Draft Environmental Management and Coordination (Conservation and Management of Wetlands) Amendment Regulations of 2017, Section 4(f) (Kenya)

<sup>293</sup> The Draft Environmental Management and Coordination (Conservation and Management of Wetlands) Amendment Regulations of 2017, Section 5 (Kenya)

National Wetlands Conservation and Management Policy (2015) sets out a number of policy objectives which the country seeks to achieve with regard to wetlands, such as the establishment of an institutional and legal framework which provides integrated management and wise use of wetlands and the promotion of partnerships and cooperation at county, national, regional and international levels for the management of transboundary wetlands.<sup>294</sup> The Environment Management and Coordination Act (1999), revised 2012, prevents a number of activities which could cause harm to wetlands including the erection of a structure; excavation or drilling work; the introduction of any animals (including alien and indigenous) and pollution.<sup>295</sup> The Act also provides regulation of the protection of environmentally significant areas (Section 54). Although wetlands are not mentioned within the provision, they can fall within the remit of 'preserving specific ecological processes' and the 'preservation of biodiversity'. Protection of biological diversity is also covered within the legislation which states that guidelines should be issued detailing special arrangements for the protection of species ecosystems and habitats threatened with extinction.<sup>296</sup> Under the Draft Environmental Management and Coordination (Conservation and Management of Wetlands) Amendment Regulations of 2017 (Section 7) protected wetlands can be established where that area has either national or international significance due to its biological diversity; ecological and hydrological importance; landscape; natural and cultural heritage or aesthetic value. Importantly, Section 9 covers the protection of riparian reserves and states that all shores of lakes specified in the First Schedule to these regulations shall have a protected zone of 50 meters measured from the highest water mark, which includes Lake Turkana.<sup>297</sup> Although the Omo river is not listed in the schedule of protected rivers within the regulations, a general provision for the protection of all rivers is given in Section 9(6) which states that rivers not specified will have a protected zone of twice the rivers width from the highest water mark of the river. The National Wetlands Conservation and Management Policy (2015) reiterates the need for transboundary management of wetlands in Section 3.2.5 which states that the Government shall 'jointly develop and implement harmonized regional approaches and policies for sustainable management of transboundary wetlands'.

**Ethiopia:** No standalone law or policy on wetlands exists in Ethiopia, the topic is instead covered by a number of different law and policy documents concerning the environment. The Environmental Policy of Ethiopia (1997) Section 3.4 states that it is vital 'to recognize that natural ecosystems, particularly wetlands and upstream forests are fundamental in regulating water quality and quantity and to integrate their rehabilitation and protection into the conservation development and management of water resources'. It also states that it aims to promote the protection of the interface between water bodies and land (e.g. lake shores, river banks and wetlands). It also requires all development and management projects to conduct environmental impact assessments including the costs and benefits of protecting watershed forests, wetlands and other key ecosystems. Ethiopia has also yet to ratify the Ramsar convention and as a result is not obligated to provide national reports on wetland conservation measures and status. There is no mention of wetlands within Environmental Impact Assessment Proclamation No. 299 of 2002 or within the Water Resources Management Proclamation No. 197 of 2000.

## Biodiversity

**Kenya:** No specific biodiversity policy or legislation on biodiversity is in place in Kenya. Sessional Paper No.6 on the Environment and Development of 1999 details biodiversity conservation in-situ and ex-situ in line with CBD obligations. The paper attempted to capture almost all CBD obligations and cover all aspects of biodiversity. Section 4.9 of the National Environment Policy (2013) also covers biodiversity, recognizing the contribution that biodiversity makes to a wide variety of genetic services. The Section further states that in order to protect biodiversity the government will develop and implement the National Biodiversity Strategy and Action Plan; regulate the sustainable utilization of biological resources in accordance with international law; develop benefit sharing mechanism and develop and implement a strategy to contain and control invasive alien species. Conservation of

<sup>294</sup> The National Wetlands Conservation and Management Policy (2015), (i) and (vii) (Kenya)

<sup>295</sup> Environment Management and Coordination Act (1999) (revised 2012), Part V, Section 40(1) (Kenya)

<sup>296</sup> Environment Management and Coordination Act (1999) (revised 2012), Section 51 (Kenya)

<sup>297</sup> The Draft Environmental Management and Coordination (Conservation and Management of Wetlands) Amendment Regulations of 2017, Section 9 (1) (Kenya)

biodiversity is also covered within the 2006 Environmental Management and Coordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations which puts provision in place for the conservation of threatened species<sup>298</sup> and requires an inventory of biological diversity in Kenya<sup>299</sup> to be updated annually. More generally the regulations provide a requirement for the monitoring of the status of biological diversity and requires all necessary measures to be taken to prevent and control its depletion (Section 7). Preservation of biodiversity is demonstrated in the Section 34(a)(iv) of The Wildlife Conservation and Management Act No.181 of 2013, relating to variation of a boundary of a national park or marine protected area, which will not be allowed if the change prejudices biodiversity. It also states that the declaration of a national reserve can be granted on the basis that it is 'rich in biodiversity and wildlife resources or contains endangered and threatened species'.<sup>300</sup> Similarly, a marine conservation area can be declared where the area is 'rich in biodiversity or harbours endangered and threatened marine species'.<sup>301</sup> Preservation of biodiversity in relation to forests is detailed in The Forest Conservation and Management Act 2016.<sup>302</sup> For instance, it is stated in Section 42(1)(a) that all indigenous forests and woodlands shall be managed on a sustainable basis for the purposes of the 'conservation of water, soil and biodiversity'. The Environmental Management and Coordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations (2006) provide for the conservation of biodiversity preventing any person engaging in an activity which could have an adverse impact on any ecosystem; lead to the introduction of any exotic species; or lead to the unsustainable use of natural resources without an environmental impact assessment license issued by the authority under the act.<sup>303</sup> The Regulations also state in Section 5(2) (a) and (b) that the relevant authority can issue licenses for the establishment and maintenance of facilities for the recovery and rehabilitation of threatened species and for full recovery and rehabilitation measures of threatened species natural habitats.

The National Environment Policy (2013) section 5.13 covers invasive alien species and details its aims to set up a framework for their management. Arguably, within the Environmental Management and Coordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations (2006) the definition of 'exotic species' seems to cross over with alien species, exotic species is taken to mean 'any species of plant or animal or microorganism (life form) whose natural range does not, or did not in the past, exist in a specific part of, or the whole of Kenya which out-competes all other life forms'.<sup>304</sup> The importance of local communities is emphasized in The Protection of Traditional Knowledge and Cultural Expressions Act (2016) which mentions biodiversity within the meaning of traditional knowledge.<sup>305</sup> Although it has no other direct link to biodiversity or the environment it does exhibit the importance that Kenya affords to the consultation of local communities and the use of indigenous knowledge. Reference to the needs of community groups is also given in the Environmental Management and Coordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations (2006) which states that the application of the regulations do not apply to 'the exchange of genetic resources, their derivative products or the intangible components associated with them carried out by members of any local Kenyan community amongst themselves for their own consumption'.<sup>306</sup> The regulations also have in place a provision for benefit sharing in Part IV which dictates

<sup>298</sup> Environmental Management and Coordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations 2006 (No.160 of 2006), Section 5(1) (Kenya)

<sup>299</sup> Environmental Management and Coordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations 2006 (No.160 of 2006), section 6(1) (Kenya)

<sup>300</sup> The Wildlife Conservation and Management Act 2013 (No.181 of 2013), Section 35(1)(a) (Kenya)

<sup>301</sup> The Wildlife Conservation and Management Act 2013 (No.181 of 2013) Section 36(a) (Kenya)

<sup>302</sup> Forest Conservation and Management Act 2016 (No. 34 of 2016), see Sections 35(2)(ii), 38, 41(2), 42(1) (Kenya)

<sup>303</sup> Environmental Management and Coordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations 2006 (No.160 of 2006), Section 4 (Kenya)

<sup>304</sup> Environmental Management and Coordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations 2006 (No.160 of 2006), section 4(2) (Kenya)

<sup>305</sup> The Protection of Traditional Knowledge and Cultural Expressions Act 2016 (No. 154 of 2016), Section 2 (Kenya)

<sup>306</sup> Environmental Management and Coordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations 2006 (No.160 of 2006), Section 3(a) (Kenya)

that any holders of a permit for access to genetic resources shall facilitate the active involvement of Kenyan citizens and institutions in the execution of activities under the permit.<sup>307</sup>

**Ethiopia:** As is the case in Kenya and all of the ZRB States, there is no specific policy or legislation which specifically focuses on biodiversity in Ethiopia. Instead, biodiversity has been covered across different legislative and policy instruments. The National Biodiversity Strategy and Action Plan (2015-2020) has the vision that ‘by 2050 Ethiopia’s biodiversity and ecosystems are conserved and sustainably utilized by all sectors providing food security and contributing to poverty eradication and improved quality of life of the Ethiopian people’.<sup>308</sup> The focal institute for the implementation and coordination of the plan lies with the Ethiopian Biodiversity Institute. The proclamation which established institute (proclamation No. 381/2004) states that its objective is to ensure the appropriate conservation and utilization of the country’s biodiversity.<sup>309</sup> The proclamation further states that it is the institutes duty to ensure the conservation of the countries biodiversity using ex-situ and in-situ methods.<sup>310</sup> The Environmental Policy Section 3.3 also provides coverage of biodiversity, detailing genetic, species and ecosystem biodiversity and covering both in situ systems of conservation and ex situ. The policy lists goals for biodiversity which include: ensuring the control of the import and export of genetic material; ensuring the conservation of genetic material; promoting the involvement of local communities; provide coverage for protected areas in as wide a range of ecosystems and habitats as possible and link them with corridors of suitable habitats. The Environment Policy (1997) not only states that local communities both inside and outside of protected areas must be included in the planning of such areas, but that park, forest and wildlife conservation and management programmes which conserve biological diversity on behalf of the country should allow for a major part of any economic benefits deriving therefrom to be channeled to local communities affected by such programmes.<sup>311</sup> Community participation is further elaborated within Section in 4.2. Other relevant pieces of law and policy include: The Conservation Strategy of Ethiopia (1997); Proclamation on Environmental Impact Assessment (No.299/2002); Development, Conservation and Utilization of Wildlife (Proclamation No. 54/2007); National Policy on Biodiversity Conservation and Research (1998); Access to Genetic Resources and Community Knowledge, and Community Rights (Proclamation No.482/2006) and Regulation 169 of 2009.

## Wildlife

**Kenya:** Sessional Paper No.5 of 1975 was the first comprehensive policy on wildlife conservation in Kenya, recognizing the importance of wildlife both within and outside of protected areas. The paper had, as its primary goal, optimization of the returns from wildlife.<sup>312</sup> The paper sought to secure further areas of land for wildlife protection from landowners who could accommodate the animals and in return be entitled to their benefits. Wildlife legislation in Kenya was revised in light of the new Constitution of Kenya in 2010 and the new Wildlife Conservation and Management Act (WCMA) was enacted in 2013.<sup>313</sup> The WCMA enacts stricter penalties and upholds and strengthens the ability of the Kenya Wildlife Service to protect and conserve wildlife in Kenya for sustainable use.<sup>314</sup> Community conservancies which allow local communities to take the lead in protecting and conserving wildlife have also been recognized by the Government of Kenya as a highly successful model for protecting Kenya’s natural resources. Under the Act, protected areas can be declared as a national park; marine protected area; wetland or national reserve.<sup>315</sup>

Mining and quarrying is only permitted under the Act in cases where the area does not contain endangered or threatened species; the area is not a critical habitat or ecosystem for wildlife; and the

<sup>307</sup> Environmental Management and Coordination (Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing) Regulations 2006 (No.160 of 2006), Section 20(1) (Kenya)

<sup>308</sup> National Biodiversity Strategy and Action Plan (2015-2020), (Ethiopia)

<sup>309</sup> Institute of Biodiversity Conservation and Research Establishment/Amendment/Proclamation, Proclamation No. 381/2004 (Ethiopia)

<sup>310</sup> Institute of Biodiversity Conservation and Research Establishment/Amendment/Proclamation, Proclamation No. 381/2004, Section 6.4 (Ethiopia)

<sup>311</sup> Environment Policy (1997), Section 3.3 (f) and (j) (Ethiopia)

<sup>312</sup> Republic of Kenya, Statement on the Future of Wildlife Management Policy in Kenya (Sessional Paper No. 3, 1975) (Kenya)

<sup>313</sup> Wildlife (Conservation and Management) Act 2013 (No. 47 of 2013) (Kenya)

<sup>314</sup> Wildlife (Conservation and Management) Act 2013, Section 6 (No. 47 of 2013) (Kenya)

<sup>315</sup> Wildlife (Conservation and Management) Act 2013 (No. 47 of 2013), Section 31 (Kenya)

area is not an important catchment area or source of springs.<sup>316</sup> A list of protected ecosystems and endangered areas is to be published and renewed every 5 years, providing the threats to the area and measures being taken for restoration.<sup>317</sup> Critically endangered species are listed under Schedule 6 of the Act and include Black Rhinoceros, while the White Rhinoceros, Grevy's Zebra, Cheetah, Lion, Leopard and Elephant are included within the endangered list. Recovery plans are required to be developed all species listed under Schedule 7 with priority given to species which are rare, endangered and threatened.<sup>318</sup> Conservation orders and easements can be entered into by a voluntary private arrangement or upon application by the court, where it is necessary for sustainable wildlife management and conservation, including the preservation of flora and fauna, creation or maintenance of wildlife corridors or the preservation of the quality and flow of water in a dam, lake or aquifer.<sup>319</sup> Parties to a voluntary easement may negotiate appropriate compensation for loss or diminished value of land, for this imposed by court order compensation will also be entitled to compensation.<sup>320</sup> Benefit sharing is detailed in Sections 70 - 72 which declares that every person has the right to reasonable access to wildlife resources and should be entitled to enjoy the benefits accruing therefrom, although this must be practiced in a manner which is sustainable. Permits for non-consumptive and consumptive wildlife use can be granted under Section 80, but do not include permits for hunting. Subsistence hunting is also expressly prohibited in Section 97 and can result in both a fine and imprisonment. The penalty for committing an offence in relation to endangered or threatened species can be up to life imprisonment.<sup>321</sup> Strict penalties are also enforced for introduction of invasive species into a conservation area, which can result in up to one year imprisonment.<sup>322</sup>

**Ethiopia:** The main legislation covering wildlife is the Ethiopian Wildlife Development and Conservation Authority Establishment Proclamation No.575 of 2008. The legislation provides the relevant authority the powers and duties to draft policies and laws relating to the development, conservation and utilization of wildlife resources.<sup>323</sup> Power is also granted for, *inter alia*, the issuing of permits of hunting to foreign tourists, the utilization of wildlife products and to ensure that wildlife conservation areas are established in accordance with international standards.<sup>324</sup> Specific regulations enacted under the legislation include the Wildlife Development, Conservation and Utilisation Council of Ministers Regulations (2008)<sup>325</sup> which provide more detailed provisions for wildlife management. The regulations state that wildlife protection areas should be administered by Federal and Regional Governments.<sup>326</sup> A number of activities which are prohibited within the boundaries of such areas are also specified and include hunting or fishing, agricultural activities or undertaking exploration and mining.<sup>327</sup> However, a number of activities are still permitted, provided that they have been approved in writing by the relevant authority.<sup>328</sup> Seasonal utilisation of natural resources such as bee-keeping and honey harvesting, foraging and medicinal plant collection by local communities is included within the list of permitted activities.<sup>329</sup> Local communities are also permitted to administer and develop community conservation areas and utilise the resources therein, this includes participation in eco-tourism activities and using the income for community development.<sup>330</sup> Local communities are also permitted to allow hunting, by legally authorised hunters, subject to an annual quota, the income from which they may also use towards community development.<sup>331</sup> Hunting within conservation areas is prohibited unless conducted under a license, types of license include a Foreign Tourist Hunting License,

<sup>316</sup> Wildlife (Conservation and Management) Act 2013 (No. 47 of 2013), Section 45 (Kenya)

<sup>317</sup> Wildlife (Conservation and Management) Act 2013 (No. 47 of 2013), Section 46 (Kenya)

<sup>318</sup> Wildlife (Conservation and Management) Act 2013 (No. 47 of 2013), Section 49 (Kenya)

<sup>319</sup> Wildlife (Conservation and Management) Act 2013 (No. 47 of 2013), Section 65 (Kenya)

<sup>320</sup> Wildlife (Conservation and Management) Act 2013 (No. 47 of 2013), Section 69 (Kenya)

<sup>321</sup> Wildlife (Conservation and Management) Act 2013 (No. 47 of 2013), Section 92 (Kenya)

<sup>322</sup> Wildlife (Conservation and Management) Act 2013 (No. 47 of 2013), Section 93 (Kenya)

<sup>323</sup> Ethiopian Wildlife Development and Conservation Authority Establishment Proclamation No.575 of 2008, Section 6(1) (Ethiopia)

<sup>324</sup> Ethiopian Wildlife Development and Conservation Authority Establishment Proclamation No.575 of 2008, Section 6(3-7) (Ethiopia)

<sup>325</sup> Wildlife Development, Conservation and Utilisation Council of Ministers Regulations No. 163 of 2008 (Ethiopia)

<sup>326</sup> Wildlife Development, Conservation and Utilisation Council of Ministers Regulations No. 163 of 2008, Section 4 (Ethiopia)

<sup>327</sup> Wildlife Development, Conservation and Utilisation Council of Ministers Regulations No. 163 of 2008, Section 5 (Ethiopia)

<sup>328</sup> Wildlife Development, Conservation and Utilisation Council of Ministers Regulations No. 163 of 2008, Section 5(2) (Ethiopia)

<sup>329</sup> Wildlife Development, Conservation and Utilisation Council of Ministers Regulations No. 163 of 2008, Section 5(2) (Ethiopia)

<sup>330</sup> Wildlife Development, Conservation and Utilisation Council of Ministers Regulations No. 163 of 2008, Section 7 (Ethiopia)

<sup>331</sup> Wildlife Development, Conservation and Utilisation Council of Ministers Regulations No. 163 of 2008, Section 7(3) (Ethiopia)



Resident Hunter License and Game Bird Hunting License, amongst others.<sup>332</sup> The use of assistants for tourists is also permitted.<sup>333</sup> The hunting of some species of animal is expressly prohibited, except for scientific study.<sup>334</sup> The species subject to this protection and include Cheetah, Eland, Giraffe, Elephant, Zebra and Rhinoceros. Certain types of hunting are also prohibited, including hunting during darkness (except for nocturnal species).<sup>335</sup>

## ENVIRONMENTAL POLICY IN THE ZAMBEZI

### Fish and Aquaculture

**Angola:** The Ministry of Fisheries has the responsibility of managing fish resources through the Aquatic Biological Resources Act,<sup>336</sup> General Fishing Regulations<sup>337</sup> of the Fisheries Sector, and the Strategy of Long-term Sustainability of Fisheries and Aquaculture.<sup>338</sup> The strategy identifies capacity building as a priority which includes training of observers and inspectors and strengthening the capacity of the private sector, aiming to preserve biological aquatic resources, ensure aquaculture procedures are safe, and improving landing and processing conditions and increasing the sanitary control and certification of products. Further, the General Fishing Regulations<sup>339</sup> prescribe general rules for fishing activities and establishes guidelines for the preparation, implementation, and evaluation of Fisheries Management Plans. It also provides for conservation measures, obligations, and prohibitions pursuant to the objectives of the Aquatic Biological Resources Act. A total allowable catch is set for different fish on an annual basis (Sjöstedt & Sunderström, 2013) and gear restrictions, closed seasons, licenses and size regulations are all used to manage fisheries. References to a co-management system of fishing management are given, however the extent and quality of the regimes has been criticized. Although members of the community are appointed as monitors, they are not provided with any payment (Sjöstedt & Sunderström, 2013). Local, subsistence fishers are however entitled to catch up to 20kg of fish, per person, per day, without a license (Sowman & Cardoso, 2010). Implementation of the legislation is weak, in many instances cases of malpractice do not get reported due to fishing vessels being co-owned or operated by government officials (Sjöstedt & Sunderström, 2013). There is also no formal catch inspection system in place resulting in illegal quantities of fishing being caught and prohibited gear and fishing methods being used.

**Botswana:** Legislation relating to fish and aquaculture in Botswana is dated. The Fish Protection Act<sup>340</sup> is which aims to ‘... provide for the more effectual regulation, control, protection and improvement of fish and fishing in Botswana’ has been in force since 1975.<sup>341</sup> The Act provides the overarching legislative framework of fisheries and is geared towards control rather than development, with high levels of Ministerial control such as the setting of regulations, fishing seasons and gear types. The subsequent regulations, despite the title of Fish Protection Regulations<sup>342</sup>, fail to provide any mechanisms for the protection of fish species. The regulations do, however, provide a framework for the licensing of fisheries, enact limitations on certain types of gear, and details closed seasons, but give no further provision for the biological protection of fish species, aquaculture, or fishery resources. Open season for fishing begins on the 1<sup>st</sup> of March and ends on the 31<sup>st</sup> of December each year, it is an offence to catch a fish outside of this time period.<sup>343</sup> The involvement of local communities is not addressed within the Fish Protection Act. There is no limitation on the number of licenses

<sup>332</sup> Wildlife Development, Conservation and Utilisation Council of Ministers Regulations No. 163 of 2008, Sections 18, 19 and 20 (Ethiopia)

<sup>333</sup> Wildlife Development, Conservation and Utilisation Council of Ministers Regulations No. 163 of 2008, Section 34 (Ethiopia)

<sup>334</sup> Wildlife Development, Conservation and Utilisation Council of Ministers Regulations No. 163 of 2008, Section 24 (Ethiopia)

<sup>335</sup> Wildlife Development, Conservation and Utilisation Council of Ministers Regulations No. 163 of 2008, Section 25 (Ethiopia)

<sup>336</sup> Law No. 6-A/04 on Aquatic Biological Resources (new Fishing Act) (Angola)

<sup>337</sup> General Fishing Regulations Decree No. 41 of 2005 (Angola)

<sup>338</sup> See also Surveillance of Fishing Activities Regulation, Decree No. 43 of 2005 and Granting of Fishing Rights and Licenses Regulations, Decree No. 14 of 2005 (Angola)

<sup>339</sup> General Fishing Regulations Decree No. 41 of 2005 (Angola)

<sup>340</sup> Fish Protection Act 1975 (Act No. 42 of 1975) (Botswana)

<sup>341</sup> Fish Protection Act 1975 (Act No. 42 of 1975), Preamble (Botswana)

<sup>342</sup> Fish Protection Regulations 2008 (S.I. 41 of 2008) (Botswana)

<sup>343</sup> Fish Protection Regulations 2008 (S.I. 41 of 2008), Section 11 (Botswana)

which can be granted. With regards to aquaculture, Botswana does not have a comprehensive development policy nor is aquaculture mentioned within other environmental legislation, likely due to the limited aquaculture production currently in place within Botswana.

**Malawi:** The National Fisheries Policy (2012 – 2017) of Malawi aims to promote both ‘sustainable fisheries’ and ‘aquaculture development’ through a number of policy outcomes.<sup>344</sup> The policy reinforces the Fisheries Conservation and Management Act<sup>345</sup> and updates the National Fisheries and Aquaculture Policy (2001), representing a shift from natural resource conservation and management to promoting the sustainable production of fish for food security and income generation.<sup>346</sup> There are no references specifically to biodiversity or protected fish species within the Fisheries Act, although it is possible for Ministers to declare certain species as endangered and enact provisions for their management.<sup>347</sup> However, the more recent Fisheries Conservation and Management Regulations (2000) declares rainbow trout as a controlled species of fish for the purpose of the regulations.<sup>348</sup> A number of additional conservation measures are listed in Part IX (sections 33-38) including limitations on the types of fishing equipment which can be used, size limits on fish<sup>349</sup> and details of closed fishing seasons.<sup>350</sup> While all fishing vessels are required to be licensed, there is no limitation on the number of licenses which can be granted. However, the quantities of species, fishing gear, fishing methods, area and times of fishing may all be attached or endorsed as conditions on a license.<sup>351</sup> The 2001 National Fisheries and Aquaculture Policy provides operational guidelines for aquaculture development, including the formation of protocols to manage biological diversity of farmed fish, which the new (2012 – 2017) policy develops, aiming to increase fish supply within Malawi by scaling up aquaculture and increasing catches in capture fisheries through improve participatory fisheries management<sup>352</sup> with local communities.<sup>353</sup> Regulation of aquaculture is also contained within the Fisheries Conservation and Management Regulations which states that all aquaculture activities require a license and details provision for the outbreak of disease.<sup>354</sup> Malawi legislates for participatory or co-management in the conservation and management of fisheries.<sup>355</sup> Management is based on the Government and local fishing communities working jointly to manage fishing resources.

**Mozambique:** The Fisheries Law (2013) mandates the general framework for fisheries and covers the adoption of conservation measures, licensing, and the imposition of penalties.<sup>356</sup> Plans and regulations for both fisheries and aquaculture utilise the best available scientific information in order to ensure conservation of aquatic species and habitats and maintain sustainability. Regulations are subsequently drafted with the input of scientists and accepted or rejected by the Ministry.<sup>357</sup> All fishing vehicles in Mozambique must be registered and pay a fee, with the exception of those used for subsistence fishing.<sup>358</sup> Mozambique operates a co-management model for small-scale fisheries through which local fishing communities establish fishing associations in order to manage their resources at local level. However, the operation of the co-management model has resulted in Artisanal fisheries skirting the law and remaining largely unregulated (Sjöstedt & Sunderström, 2013). Aquaculture and fisheries are also mentioned within Chapter III of the main legislation relating to water resources.<sup>359</sup> Despite the existing legislation, fishing often takes place in Mozambique during closed season and within protected areas (Stop Illegal Fishing Programme, 2008). Ultimately, the legal and

<sup>344</sup> Malawi National Fisheries Policy (2012 – 2017) Section 2.2

<sup>345</sup> Fish Conservation and Management Act 1997 (No.25 of 1997) (Malawi)

<sup>346</sup> National Fisheries Policy (2012 – 2017), Foreword

<sup>347</sup> Fisheries Conservation and Management Act 1997 (No. 25 of 1997) Section 9(2)(d) (Malawi)

<sup>348</sup> Fisheries and Conservation Management Regulations 2000, Section 22 (Malawi)

<sup>349</sup> Fisheries and Conservation Management Regulations 2000, Section 36 (Malawi)

<sup>350</sup> Fisheries and Conservation Management Regulations 2000, Section 37 (Malawi)

<sup>351</sup> Fisheries Conservation and Management Act 1997 (No. 25 of 1997), Sections 10, 12 and 20(3) (Malawi)

<sup>352</sup> Local community participation in fishery management is further through the Fisheries Conservation and Management (Local Community Participation) Rules, 2000

<sup>353</sup> Malawi National Fisheries Policy (2012 – 2017), Section 3.1

<sup>354</sup> Fisheries and Conservation Management Regulations (2000), Section 38 and 42 (Malawi)

<sup>355</sup> Fisheries Conservation and Management Act 1997 (No. 25 of 1997), Sections 7 (Malawi)

<sup>356</sup> Fisheries Law 2013 (No. 22 of 2013) (Mozambique)

Presidential Decree No. 17 of 2015 establishing competences of the Ministry of Sea, Inland Waters and Fisheries, Section 5 (Mozambique)

<sup>358</sup> Presidential Decree No. 17 of 2015 establishing competences of the Ministry of Sea, Inland Waters and Fisheries, Sections 30 and 35 (Mozambique)

<sup>359</sup> Act No. 16/91 Regulating Water Resources Belonging to the Public Domain (Mozambique)

policy framework around fisheries and aquaculture could be sufficient if properly enforced, however implementation mechanisms are weak and have resulted in a sector which, particularly at a local level, remains largely unregulated (Sjöstedt & Sunderström, 2013).

**Namibia:** Namibia's legal and policy framework on fisheries and aquaculture focuses on long-term economically and environmentally sustainable fisheries and aquaculture. The Inland Fisheries Resources Act (2003) (IFRA) is the main legal text relating to sector. The purpose of the IFRA is to provide for the conservation and protection of aquatic ecosystems and the sustainable development of inland fisheries resources, as well as the control and regulation of inland fishing.<sup>360</sup> The IFRA prohibits fishing within a game park or nature reserve, or on land which is owned or controlled by statutory institutions.<sup>361</sup> The number of licenses granted can be limited under the IFRA, if the Minister is of the opinion that the sustainable utilization of fish is under threat.<sup>362</sup> Regarding aquatic biodiversity, the IFRA Section 21 states that a person may not catch and retain, injure, or kill an endangered species without the permission of the Minister. Waters may also be declared as area of fishery reserve where it is necessary to preserve the aquatic environment; protect, preserve or rehabilitate the natural environment or fish related ecosystems including wetlands, lakes, lagoons, nursery and spawning areas; to promote the regeneration of fish stocks; or to protect fish resources and their environment from destruction, degradation, pollution and other adverse impacts.<sup>363</sup> The Namibian legislation bans the use of environmentally damaging seine nets and places restrictions on the use gill netting.<sup>364</sup> In 2001, a National Aquaculture Policy 'Towards Responsible Development of Aquaculture' and the subsequent Aquaculture Act (2002) put in place a framework specifically for Aquaculture. The Aquaculture Act prohibits any engagement in aquaculture is without a license.<sup>365</sup> After receiving an application for a licence, the Minister must assess, with the Minister responsible for environment and in accordance legislation or policy dealing with environmental assessments, determine whether the applicant is required to submit an environmental assessment of the proposed aquaculture project.<sup>366</sup> A licence can also be suspended or cancelled where the Minister deems it is necessary to ensure protection and conservation of the environment.<sup>367</sup> Any type of disease or harmful organism must be reported to the Permanent Secretary and suitable steps taken to ensure that no harm is caused.<sup>368</sup> Any aquaculture performed within a conservation area or protected area is subject to the laws of that area.<sup>369</sup>

**Tanzania:** The Tanzanian Government has prioritised the development of the fisheries sector, as demonstrated through the formation of the National Fisheries Policy (2015)<sup>370</sup> which aims to contribute to socio-economic development through the sustainable utilisation of fisheries while conserving the environment.<sup>371</sup> The Policy is legally enacted by The Fisheries Act (2003) which focuses on the development and sustainable use of both fisheries and aquaculture in Tanzania. Development of the Fishing Industry is detailed within Part III of the legislation<sup>372</sup> and provides measures for producing maximum sustainable yield while taking into account relevant economic and environmental factors. The Act states that excessive fishing, over-exploitation and pollution must be avoided while responsible fisheries, the interests of local fishers and the conservation and protection of biodiversity of aquatic habitats, ecosystems and endangered species should be promoted.<sup>373</sup> With regards to aquaculture, the act states that it must be 'ecologically sustainable' and

<sup>360</sup> Inland Fisheries Resources Act No.1 of 2003, Section 33(4)(h)(Namibia)

<sup>361</sup> Inland Fisheries Resources Act No.1 of 2003, Section 18 (Namibia)

<sup>362</sup> Inland Fisheries Resources Act No.1 of 2003 Section 22(3) (Namibia)

<sup>363</sup> Inland Fisheries Resources Act No.1 of 2003 Section 22 (Namibia)

<sup>364</sup> Inland Fisheries Resources Act No.1 of 2003 Section 17 (Namibia)

<sup>365</sup> Aquaculture Act No 18 of 2002, Section 11 (Namibia)

<sup>366</sup> Aquaculture Act No 18 of 2002, Section 12(2) (Namibia)

<sup>367</sup> Aquaculture Act No 18 of 2002, Section 19(d) (Namibia)

<sup>368</sup> Aquaculture Act (No 18 of 2002), Section 25 (Namibia)

<sup>369</sup> Aquaculture Act (No 18 of 2002), Section 30 (Namibia)

<sup>370</sup> National Fisheries Policy (2015), Ministry of Livestock and Fisheries Development, Government of Tanzania

<sup>371</sup> See National Fisheries Sector Policy (2015) Section 2.4.1

<sup>372</sup> Fisheries Act No.22 of 2003, Section 9 (Tanzania)

<sup>373</sup> Fisheries Act No.22 of 2003, Section 9(2) (Tanzania)

the livelihood, culture and traditions of local communities must not be affected by aquaculture development.<sup>374</sup> Further provisions are added regarding licensing requirements and disease control.<sup>375</sup> The protection of transboundary ecosystems are specifically mentioned in Section 16, which promotes dialogue to ensure protection is in place. There is mention throughout the Act of 'responsible fishing' which is given the definition of applying to the 'conservation, management and development of all fisheries and it covers the capture, processing and trade of fish and fishery products, fishing operations, aquaculture, fisheries research and integration of fisheries into coastal area management'.<sup>376</sup> Section 17 focuses on the management and control of the fishing industry and lists a number of restrictions which can be put in place including closed seasons, prohibited species and restricted areas and gear. There is, however, no restriction on the total allowable catch per species. Beach Management Units can be established which grant local authorities - which have jurisdiction within the vicinity of any water body and who derive the whole or part of their livelihood from it – to manage the fishery matter of that specific water body.<sup>377</sup> Specific restrictions in place regarding particular aquatic species and types of fishing gear are made in Section 22 and 23.

**Zambia:** The Fisheries Act (No. of 2011) and subsequent Fisheries Regulations of 2012<sup>378</sup> are the principle legal frameworks for the management of fisheries in Zambia. The legislation provides a precautionary approach to fisheries management<sup>379</sup> as well as detailing principles for the conservation and utilisation including the regulation of aquaculture. Despite the absence of a focused fisheries policy, a National Aquaculture Strategy and Development Plan were formed in 2006 and 2008, respectively. The Fisheries Act states that ministers should take appropriate measures, in consultation with the Environmental Management Agency, for the safeguard against extinction of protected species.<sup>380</sup> The Minister is also able, in consultation with other relevant stakeholders, to declare any area of water to be a fisheries management area for the management and sustainable utilisation of such species of fish as may be specified in the order.<sup>381</sup> Where the fisheries management area is within a Local Forest, National Forest or National Park, the exercise or enjoyment of any fishing right or interest in the area must be consistent with sustainable forest management or wildlife conservation and management, as the case may be.<sup>382</sup> Closed seasons, restrictions on areas, species or methods of fishing can also be prohibited by the Minister.<sup>383</sup> The need to preserve biodiversity is covered within Section 12, while Part III on the Protection of Fish (Sections 15-25), despite relating to fish protection, provide little detail in regard to either the biological preservation of aquatic species or fish stock monitoring. Any person who wishes to engage in aquaculture must conduct an environmental impact assessment in accordance with the provisions of the Environmental Management Act (2011)<sup>384</sup> and must also obtain a license.<sup>385</sup> There is a requirement for the creation of an Aquaculture Development Plan for sustainable development of aquaculture for a duration of three years in Section 51(1). Community participation is not widely covered within the Act except to say that a 'community-based' natural resource management approach in respect of fisheries management will be taken<sup>386</sup> and that one representative from the local fishing community should be included within management committees within each local authority.<sup>387</sup>

**Zimbabwe:** No specific law or policy regarding fisheries or aquaculture exist in Zimbabwe. Instead, the management of fisheries falls under the Parks and Wildlife Act (1975)<sup>388</sup> which places limitations on gear and fishing area, mesh size, regulates the provision of licences. The main goal of fisheries

<sup>374</sup> Fisheries Act No.22 of 2003, Section 11 (Tanzania)

<sup>375</sup> Fisheries Act No.22 of 2003, Section 12 and 15 (Tanzania)

<sup>376</sup> Fisheries Act No.22 of 2003, Section 2 (Tanzania)

<sup>377</sup> Fisheries Act 2003 (No.22 of 2003), Section 18 (Tanzania)

<sup>378</sup> Fisheries Regulations 2012 (S.I. No 24 of 2012) (Zambia)

<sup>379</sup> Fisheries Act 2011 (No.22 of 2011), Section 12(b) (Zambia)

<sup>380</sup> The Fisheries Act 2011 (No.22 of 2011), Section 4.1(f) (Zambia)

<sup>381</sup> The Fisheries Act 2011 (No.22 of 2011), Section 26 (Zambia)

<sup>382</sup> The Fisheries Act 2011 (No.22 of 2011), Section 26 (3) (Zambia)

<sup>383</sup> The Fisheries Act 2011 (No.22 of 2011), Section 14(1)(b) (Zambia)

<sup>384</sup> Environmental Management Act 2011 (No. 13 of 2011) (Zambia)

<sup>385</sup> The Fisheries Act 2011 (No.22 of 2011), Section 45 (Zambia)

<sup>386</sup> The Fisheries Act 2011 (No.22 of 2011), Section 2 (Zambia)

<sup>387</sup> The Fisheries Act 2011 (No.22 of 2011), Section 29(2)(f) (Zambia) Under Section 29(7) the aforementioned management committees can also be dissolved should the Minister deem the fisheries and natural resources to have been mismanaged.

<sup>388</sup> Parks and Wildlife Act 1975 (No.14 of 1975), (Zimbabwe)

management in Zimbabwe is sustainable utilization realised through the institution of various management measures. When fish populations are threatened either by excessive aquatic plant growth or other fish, Ministerial powers allow provision to be made to control or eradicate the threat in such waters.<sup>389</sup> The Minister may also limit fishing within certain areas or for certain species in order to conserve or control fish populations.<sup>390</sup> Fishers are issued licenses, which are renewable annually.<sup>391</sup> The license specifies the dimensions of the nets, their mesh size and the reservoir where they can be used. The use of explosives, chemicals, poisons, intoxicating substances, scoop nets, jigging and fish-driving are prohibited.<sup>392</sup> Commercial fishing using spear guns, basket traps and rod-and-lines with 3 hooks or more is prohibited.<sup>393</sup> Aquaculture production is carried out for both subsistence and commercial purposes in Zimbabwe. Subsistence aquaculture is carried out at household level and is limited to a few pond-based enterprises where it provides a cheap source of protein for domestic consumption. Aquaculture is not mentioned within the Parks and Wildlife Act. A fisheries policy that embodies participatory approaches has not yet been formulated, as such there is limited involvement and participation by communities and stakeholders in fisheries management. It is the sole responsibility of the Parks and Wildlife Management Authority to manage the fishery resources. This causes conflicts of interests among fishers and resource managers.

**Angola:** The National Policy on Forests, Wildlife and Conservation Areas (2010)<sup>394</sup> aims to both promote contribution to sustainable development through the development and rational use of forests and enhance the economic profitability of forests. The Forestry Development Licenses (order No.148/00) (2000) was developed by the Ministry of Agriculture, motivated by the fact that the previous forestry legislation was outdated. The order recognizes the need to regulate forestry activities in Angola, particularly those relating to timber, and considering the need to establish appropriate rules for the achievement of sustainable development. The policy recommends the implementation of its recommendations through the formation of Local Councils of Forest and Wildlife Protection, encouraging community ownership and action from the bottom-up. According to the Order only entities in possession of licenses can undertake forestry activities on Angolan soil. The maximum quantity of forest area that can be developed annually is determined by the *Instituto de Desenvolvimento Florestal* (Forestry Development Institute – IDF).

## Forests

**Botswana:** The National Forest Policy of Botswana (2011)<sup>395</sup> aims for the protection, conservation, development and sustainable utilization of forest land and forest resources for social, economic, ecological and environmental benefits for present and future generations. Its policy goals are derived from the Forest Act<sup>396</sup> which continues to serve as the main forestry legislation in Botswana. The Forest Act legislates for the declaration of forest reserves<sup>397</sup> and declares certain trees as protected.<sup>398</sup> No person is permitted to ‘fell, cut, take, work, burn, injure or remove any protected tree unless he is the holder of a licence to do so issued under the provisions of the act’.<sup>399</sup> Sections 12-19 of the Act detail prohibited acts on forest produce, both within a forest reserve (Section 12) and on state land (Section 13). It is not permitted that a person fell, cut, take, work, burn, injure or remove any forest produce<sup>400</sup> or be in possession of an implement required for any such activities<sup>401</sup>. No hut or place to reside is permitted, nor is it allowable to graze livestock or allow livestock to trespass within forest reserves.<sup>402</sup> Fires are also expressly prohibited.<sup>403</sup> The definition of ‘Forest produce’ in

<sup>389</sup> Parks and Wildlife Act 1975 (No.14 of 1975), Section 84 (Zimbabwe)

<sup>390</sup> Parks and Wildlife Act 1975 (No.14 of 1975), Section 96(1) (Zimbabwe)

<sup>391</sup> Parks and Wildlife Act 1975 (No.14 of 1975), Section 85 (Zimbabwe)

<sup>392</sup> Parks and Wildlife Act 1975 (No.14 of 1975), Section 87 (Zimbabwe)

<sup>393</sup> Parks and Wildlife Act 1975 (No.14 of 1975), Section 93 (Zimbabwe)

<sup>394</sup> Resolution No. 1/10 approving the National Policy on Forests, Wildlife and Conservation Areas (2010) (Angola)

<sup>395</sup> Forest Policy 2011, Ministry of Environment, Wildlife and Tourism

<sup>396</sup> Forestry Act 1968 (No. 23 of 1968) (Botswana)

<sup>397</sup> Forestry Act 1968 (No. 23 of 1968) Sections 4-10 (Botswana)

<sup>398</sup> Forestry Act 1968 (No. 23 of 1968) Section 11 (Botswana)

<sup>399</sup> Forestry Act 1968 (No. 23 of 1968) Section 11(2) (Botswana)

<sup>400</sup> Forestry Act 1968 (No. 23 of 1968) Section 12(1)(a) (Botswana)

<sup>401</sup> Forestry Act 1968 (No. 23 of 1968) Section 12(1)(f) (Botswana)

<sup>402</sup> Forestry Act 1968 (No. 23 of 1968) Section 12(1)(b) and (d) (Botswana)

<sup>403</sup> Forestry Act 1968 (No. 23 of 1968) Section 12(c) (Botswana)

Botswana does not give reference to all living things, but rather simply lists trees, bamboo, honey amongst others.<sup>404</sup> Sections 12-19 cover the control of forest produce and prevent the removal of any 'forest produce' from a designated forest reserve.<sup>405</sup> Prohibitions on the import and export of endangered flora are also given within the Act.<sup>406</sup> While authority for the declaration of a forest reserve lies in the hands of the President, a local authority may propose that a forest reserve be established in any area of its land.<sup>407</sup> Trees may be declared as protected by the Minister through publication in the Gazette, however not where the tree lies within a tribal area, unless consent of the land board in accordance with the local authority has been granted or on private land without consent having been given from the owner. Reference to community participation the Forest Policy, placing heavy emphasis on the participatory involvement of local communities in forest management (Participatory Forest Management). The Community Based Forest Management Supplement to the National Forest Policy states that the policy goal for community-based forest management is to empower rural communities to conserve and develop forest resources for the economic and environmental benefit of present and future generations. Prohibitions on the use of forest produce are different on state land, restricting the removal of any tree which is within 10 meters of a river bank<sup>408</sup> and allowing the use of forest produce in certain circumstances including if it is being used by local communities reliant on hunting and gathering of forest produce, while forest produce within forest reserves is protected.<sup>409</sup> Section 17 also grants exemption for inhabitants of towns in close proximity to forest reserves and to *bona fide* travellers on a 'lawful journey' on a 'recognised road' through or in a forest reserve. Licenses can be granted for the use of forest produce on an exclusive basis by the Minister 'as he may think fit'.<sup>410</sup> No provisions are made for the rehabilitation or afforestation for areas which have been subject to deforestation.

**Malawi:** The legal and policy framework for forest management consists of the Forestry Act No. 4 of 1997 and the recent National Forest Policy 2016. While the Forestry Act details provisions for the control of forests through regulation, the Forest Policy seeks to provide a holistic framework for sustainable forest management. The Forestry Act<sup>411</sup> classifies forests as either forest reserves or protected forest areas. The legislation states that forest reserves can be declared on public land following consultation with the minister or on private land following its compulsory acquisition.<sup>412</sup> If the Minister finds that the 'protection of soil and water resources, outstanding flora and fauna requires that any area of land be maintained or established as a forest' the Minister may by order in the Gazette (subject to approval) declare such land to be a protected forest.<sup>413</sup> If a Minister deems land to need immediate protection due to being liable to serious degradation, the Minister may establish the land as a forest reserve or protected forest area and conduct required consultations subsequently.<sup>414</sup> The declaration of an area as a forest reserve or protected forest area can be subsequently revoked, but only subject to a comprehensive environmental impact assessment which must assess the 'ecological consequences'.<sup>415</sup> The Director of Forestry is responsible for the maintenance, restoration and development of forest cover as necessary for 'soil and water conservation, maintenance of biological diversity and supply of forest produce'.<sup>416</sup> The definition of 'forest produce' in addition to the expected inclusion of trees, fruits and earth, also covers 'vertebrates, invertebrates, wild animals, hides, horns, bones, ivory and meat'.<sup>417</sup> Although indigenous wood can be used on a 'sustainable basis', no indigenous endangered tree species can be cut down without the written permission of the Director of Forestry.<sup>418</sup> It is illegal under the Act to cut, take, fell, destroy, uproot,

<sup>404</sup> Forestry Act 1968 (No. 23 of 1968), Section 2 (Botswana)

<sup>405</sup> Forestry Act 1968 (No. 23 of 1968) Section 11(1)(a) and (b) (Botswana)

<sup>406</sup> Forestry Act 1968 (No. 23 of 1968) Section 19A (Botswana)

<sup>407</sup> Forestry Act 1968 (No. 23 of 1968) Section 1 and 2 (Botswana)

<sup>408</sup> Forestry Act 1968 (No. 23 of 1968) Section 13(a) (Botswana)

<sup>409</sup> Forestry Act 1968 (No. 23 of 1968) Section 13(b) (Botswana)

<sup>410</sup> Forestry Act 1968 (No. 23 of 1968), Section 18 (Botswana)

<sup>411</sup> Forestry Act (No.4 of 1997) (amended by Forestry (Amendment) Act No.5 of 2017) (Malawi)

<sup>412</sup> Forestry Act (No.4 of 1997) (amended by Forestry (Amendment) Act No.5 of 2017) Section 22 (Malawi)

<sup>413</sup> Forestry Act (No.4 of 1997) (amended by Forestry (Amendment) Act No.5 of 2017) Section 26 (Malawi)

<sup>414</sup> Forestry Act (No.4 of 1997) (amended by Forestry (Amendment) Act No.5 of 2017) Section 26(2) (Malawi)

<sup>415</sup> Forestry Act (No.4 of 1997) (amended by Forestry (Amendment) Act No.5 of 2017) Section 28 (Malawi)

<sup>416</sup> Forestry Act (No.4 of 1997) (amended by Forestry (Amendment) Act No.5 of 2017) Section 5 (a) (Malawi)

<sup>417</sup> Forestry Act (No.4 of 1997) (amended by Forestry (Amendment) Act No.5 of 2017) Section 2 (Malawi)

<sup>418</sup> Forestry Act (No.4 of 1997) (amended by Forestry (Amendment) Act No.5 of 2017) Section 83 (Malawi)

collect or remove forest produce within protected areas.<sup>419</sup> Nor is it possible to cultivate crops, graze livestock, clear land, extract minerals or erect any building or structures within protected areas.<sup>420</sup> Part V of the Act discusses forests on customary land and again details provisions for participatory forestry management with local communities.<sup>421</sup> Out-with protected areas, residents of customary land may collect forest produce for domestic use.<sup>422</sup> However, as the definition of forest produce extends to wild animals and their respectful components, this provision opens a gap for hunting of wild animals. The Director is responsible for the promotion of participatory forest management with local communities.<sup>423</sup> Section 25 states that the Director of Forestry may enter into agreement with local communities for implementation of forestry management plans to ensure they are mutually acceptable to both parties. While this draws a clear indication that local community participation forms an important part of forest management, the use of the language 'may' does not place an obligation on the Director of Forestry. Fires are permitted within designated areas within forest reserves or protected forest areas.<sup>424</sup> Part VI of the Act details afforestation provisions which states that the Director of Forestry may enter into forest plantation agreements with NGOs or communities wishing to plant trees.<sup>425</sup>

**Mozambique:** The Forest and Wildlife Act No. 10 of 1999 aims to balance the requirements of local communities with social, environmental and economic goals. A subsequent regulation was passed in 2002 through which a number of Ministerial Decrees have been enacted, two of which can be highlighted: 1) the establishment of a 20% revenue share from wildlife and forestry exploration with local communities and 2) the development of a framework for REDD+ implementation.<sup>426</sup> The Forest and Wildlife Act of 1999 and the Regulations of 2002 divide forests into multiple use areas, productive forest and protected areas (Norfolk & Cosijn, 2013). Multiple use areas are those which have competing land uses, it is possible to obtain rights to use and improve the land if an EIA is conducted and the plantation is for conservation purposes. Local communities can also utilize the land for agroforestry, biomass energy systems and timber operations (Macqueen & Falcão, 2017). Productive forests are those which contain high-value timber and are open to long-term operations of more than 50 years and the installation of a processing industry within Mozambique or national citizens, under simple licenses for the development and management of an area up to 10,000ha for the duration of five years (Macqueen & Falcão, 2017). Protected forest areas encompass game reserves, national parks, hunting areas and forest reserves. Under the existing legislation there is no transparent competitive bidding system for the distribution of licenses which has led to opportunities for corruption within the sector and financial incentives for forest harvesting leading to deforestation and environmental degradation (Macqueen & Falcão, 2017).

**Namibia:** The current Forest Act<sup>427</sup> consolidates all laws regarding utilization, conservation and management of forests and forest produce, replacing the Preservation of Trees and Forests Ordinance 37 of 1952 and the Forest Act 72 of 1968. The aim of the Forest Act is to ensure forest resources are managed and developed, including the planting of trees where necessary, to conserve soil and water resources, maintain biological diversity and to use forest produce in a way which is compatible with the forest's primary role as the protector and enhancer of the natural environment.<sup>428</sup> The Act requires the preparation of a management plan for all classified forests (state forest reserves, regional forest reserves, community forests and forest management areas) which are required to detail the forest produce found in that forest, its uses, and the management objectives and processes within the forest.<sup>429</sup> 'Forest Produce' is defined within the act as 'anything which grows or is naturally found in a forest and includes a) any living organism or product of it; and b) any inanimate object of

<sup>419</sup> Forestry Act (No.4 of 1997) (amended by Forestry (Amendment) Act No.5 of 2017) Section 46 (Malawi)

<sup>420</sup> Forestry Act (No.4 of 1997) (amended by Forestry (Amendment) Act No.5 of 2017) Section 46 (Malawi)

<sup>421</sup> Forestry Act (No.4 of 1997) (amended by Forestry (Amendment) Act No.5 of 2017) Section 29 (Malawi)

<sup>422</sup> Forestry Act (No.4 of 1997) (amended by Forestry (Amendment) Act No.5 of 2017) Section 50 (Malawi)

<sup>423</sup> Forestry Act (No.4 of 1997) (amended by Forestry (Amendment) Act No.5 of 2017) Section 5(d),(e), (k) (Malawi)

<sup>424</sup> Forestry Act (No.4 of 1997) (amended by Forestry (Amendment) Act No.5 of 2017) Section 39 (Malawi)

<sup>425</sup> Forestry Act (No.4 of 1997) (amended by Forestry (Amendment) Act No.5 of 2017) Section 36 (Malawi)

<sup>426</sup> Decree No. 70/2013 of 20<sup>th</sup> December 2013 "Regulation of the procedures for approval of projects for reducing emissions from deforestation and degradation"

<sup>427</sup> Forest Act 2001 (No. 12 of 2001) (as amended by the Forest Amendment Act 2005) No. 12 of 2001 (Namibia)

<sup>428</sup> Forest Act 2001 (No. 12 of 2001) (as amended by the Forest Amendment Act 2005), Section 10 (Namibia)

<sup>429</sup> Forest Act 2001 (No. 12 of 2001) (as amended by the Forest Amendment Act 2005), Section 12 (Namibia)

mineral, historical anthropological or cultural value'.<sup>430</sup> The Minister of Lands, Resettlement and Rehabilitation can declare any state land which is not communal to be a state forest where the management of forest resources is of national importance, or to preserve ecosystems and biological diversity.<sup>431</sup> Compensation will be paid to the owner of the land or community where this protection results in long-term diminished use of the land.<sup>432</sup> The Minister also may, with the consent of the chief or traditional authority of the area, enter into a written agreement to manage communal land as a community forest.<sup>433</sup> The establishment of a community forest confers the rights, subject to a management plan, to manage and use forest produce and other resources of the forest.<sup>434</sup> The status of forest reserves can be revoked under Sections 17 and 18 and community forests may be revoked or suspended under Section 19. Section 24 grants the use of a forest reserve or produce for use as household fuel or construction of shelter for local communities and their livestock.<sup>435</sup> However this is to be granted only to a maximum quantity harvest, as determined by the Director.<sup>436</sup> Hunting of wild animals in a classified forest is listed under Section 24(5) as being covered in the Nature Conservation Ordinance, 1975. However, this can be seen in contradiction with the definition of 'forest produce' which can be taken to be inclusive of wild animals. Licenses to harvest, carry out agricultural activities, conduct mining activities and construct roads and building can also be granted.<sup>437</sup> Natural vegetation is protected under Section 22, which gives protection to both vegetation on sand and any living trees, bushes or shrubs within 100 meters of a watercourse.<sup>438</sup> A license to remove such vegetation can be granted, but it must be ensured that the activity will not interfere with the conservation of soil, water or forest resources.<sup>439</sup> Restrictions are placed on both afforestation and deforestation in Section 23 which limits forest produce which can be reduced and planted. However, forest produce is limited to '500 cubic meters' which is, arguably, not an appropriate measurement or limitation on all categories of goods which are contained within the wide definition of 'forest produce'. Areas will be protected where it is necessary to 'protect the soil, water resources, protected plants and other elements of biodiversity'.<sup>440</sup> Forest management areas can also be established under the act but are not subject to the same protection as reserves.<sup>441</sup> Fires within both reserves and protected areas are prohibited, unless within an area which has been set aside for that purpose.

**Tanzania:** The Forest Act No. 14 of 2002 and the National Forest Policy (1998) form the key legal and policy frameworks for forestry in Tanzania. The Forest Act defines 'forest resources' as forest and forest produce, while 'forest produce' covers 'anything which is produced by or from trees or grows in a forest or is naturally found in a forest'.<sup>442</sup> Forests are classified as national forest reserves, local authority forest reserves, village forests and private forests.<sup>443</sup> National forest reserves cover forests for the sustainable production of timber (production forest reserve), forests used for the protection of water sheds, soil conservation and protection of wild plants (protection forest reserve) and forests used principally to protect nature and scenic areas of national or international significance and to maintain and enhance biodiversity (nature forest reserve).<sup>444</sup> An extensive list of acts prohibited within the forest reserve are listed in Section 26. The provisions relating to forest management plans within the Tanzania Forest Act 2002 are extensive. The Act not only provides a definition of different types of forestry management plan which can be drawn up,<sup>445</sup> it also details a number of provisions which the plan may contain, although it places no obligation on their inclusion.<sup>446</sup> The Act states that a forest management plan will be used to define the management objectives which the

<sup>430</sup> Forest Act 2001 (No. 12 of 2001) (as amended by the Forest Amendment Act 2005), Section 1 (Namibia)

<sup>431</sup> Forest Act 2001 (No. 12 of 2001) (as amended by the Forest Amendment Act 2005), Section 13 (Namibia)

<sup>432</sup> Forest Act 2001 (No. 12 of 2001) (as amended by the Forest Amendment Act 2005), Section 21(4) (Namibia)

<sup>433</sup> Forest Act 2001 (No. 12 of 2001) (as amended by the Forest Amendment Act 2005), Section 15 (Namibia)

<sup>434</sup> Forest Act 2001 (No. 12 of 2001) (as amended by the Forest Amendment Act 2005), Section 15 (Namibia)

<sup>435</sup> Forest Act 2001 (No. 12 of 2001) (as amended by the Forest Amendment Act 2005), Section 24(4) (Namibia)

<sup>436</sup> Forest Act 2001 (No. 12 of 2001) (as amended by the Forest Amendment Act 2005), Section 26 (Namibia)

<sup>437</sup> Forest Act 2001 (No. 12 of 2001) (as amended by the Forest Amendment Act 2005), Section 27-30 (Namibia)

<sup>438</sup> Forest Act 2001 (No. 12 of 2001) (as amended by the Forest Amendment Act 2005), Section 22 (Namibia)

<sup>439</sup> Forest Act 2001 (No. 12 of 2001) (as amended by the Forest Amendment Act 2005), Section 22(2) (Namibia)

<sup>440</sup> Forest Act 2001 (No. 12 of 2001) (as amended by the Forest Amendment Act 2005), Section 21(1) (Namibia)

<sup>441</sup> Forest Act 2001 (No. 12 of 2001) (as amended by the Forest Amendment Act 2005), Section 16 (Namibia)

<sup>442</sup> The Forest Act 2002 (No. 14 of 2002) Section 2 (Tanzania)

<sup>443</sup> The Forest Act 2002 (No. 14 of 2002) Section 4

<sup>444</sup> The Forest Act 2002 (No. 14 of 2002) Section 22(2) (Tanzania)

<sup>445</sup> The Forest Act 2002 (No. 14 of 2002) Section 11 (Tanzania)

<sup>446</sup> The Forest Act 2002 (No. 14 of 2002) Section 11(3) (Tanzania)



forest manager will use to achieve the sustainable management of forest resources.<sup>447</sup> Forest management plans must be updated at least once every five years.<sup>448</sup> The President is responsible for appointing a Director of Forestry to advise the Government of all matters relating to the management of forests.<sup>449</sup> The Act also establishes a National Forestry Advisory Committee, at least one member of which has to be a representative of local authorities, and places emphasis on the role of local communities in forest management.<sup>450</sup> In the formation of detailed forest management plans, local communities are required to be consulted through one or more village assembly meetings to explain the plan and take any comments.<sup>451</sup> Reiterating the importance afforded to the role of local communities the 'active participation of the citizen in the sustainable planning, management, use and conservation of forest resources through the development of individual and community rights' is listed as one of the objectives of the act.<sup>452</sup> The functions of managing either a national forest reserve or a local authority forest reserve are able to be undertaken by a variety of bodies listed in Section 27, including local authorities and community groups which can be authorized by the Director upon submission of a forest management proposal.<sup>453</sup> The Forest Act dedicates Part IX to fires specifically and restricts the burning of any kind of vegetation on any land outside of his own house or compound illegal.<sup>454</sup> Under Section 18 of the act, an Environmental Impact Assessment (EIA) is required when a development is proposed in a forest reserve, private forest or sensitive forest area, including its wetlands.<sup>455</sup> Part XI details all permits and licenses and the conditions upon which they can be granted including *inter alia*; erecting buildings; tourism; timber felling; hunting; fishing and allowing animals to graze.<sup>456</sup> Permits will, however, not be granted unless they are consistent with a forest management plan and in compliance with laws pertaining to both the environment and land.<sup>457</sup> One of the key objectives of the Forest Act 2002 is to ensure ecosystem stability through the conservation of forest biodiversity, water catchments and soil fertility.<sup>458</sup> Part VIII covers the conservation of trees, wild plants and wild animals. Section 65 states that the Minister may, following consultation with persons or organizations who appear to him to be knowledgeable on environmental issues, declare any general land, tree, class of tree or group of trees, by order published in the Gazette. Exports of timber are to be stopped where it is deemed that it will resort in a range of environmental problems, including loss of biodiversity, interference with water supplies and general deterioration of the environment.<sup>459</sup> Provisions on protection of wild plants are also described within Section 67 so as to 'preserve and maintain biodiversity and genetic resources within the country'.<sup>460</sup> Where a permit is granted under Section 49 and the activity which is granted results in deforestation it is required that those trees be reforested.<sup>461</sup>

**Zambia:** Forestry regulation in Zambia focuses on The Forests Act No. 4 of 2015. While a National Forest Policy does exist, it is outdated and no longer in line with the legislation which is in place.<sup>462</sup> The Forest Act aims to provide sustainable forest management, participation with local communities and the conservation and use of forests and trees for the sustainable management of forest ecosystems and biological diversity.<sup>463</sup> Major forest produce on both state and customary land is to be preserved for the benefit of local communities in those areas except for trees fells and land cleared by or for the local community for the purpose of agriculture or development or produce which is not

<sup>447</sup> The Forest Act 2002 (No. 14 of 2002) Section 11(2) (Tanzania)

<sup>448</sup> The Forest Act 2002 (No. 14 of 2002) Section 13(7) (Tanzania)

<sup>449</sup> The Forest Act 2002 (No. 14 of 2002) Section 5 (Tanzania)

<sup>450</sup> The Forest Act 2002 (No. 14 of 2002) Section 10 (Tanzania)

<sup>451</sup> The Forest Act 2002 (No. 14 of 2002) Section 13(3) (Tanzania)

<sup>452</sup> The Forest Act 2002 (No. 14 of 2002) Section 3 (b) (Tanzania)

<sup>453</sup> The Forest Act 2002 (No. 14 of 2002) Section 27 (Tanzania)

<sup>454</sup> The Forest Act 2002 (No. 14 of 2002) Section 70 (Tanzania)

<sup>455</sup> The Forest Act 2002 (No. 14 of 2002) Section 18 (Tanzania)

<sup>456</sup> The Forest Act 2002 (No. 14 of 2002), Section 49 (Tanzania)

<sup>457</sup> The Forest Act 2002 (No. 14 of 2002) Section 49(5) (Tanzania)

<sup>458</sup> The Forest Act 2002 (No. 14 of 2002) Section 3(c) (Tanzania)

<sup>459</sup> The Forest Act 2002 (No. 14 of 2002) Section 66 (Tanzania)

<sup>460</sup> The Forest Act 2002 (No. 14 of 2002) Section 67(1) (Tanzania)

<sup>461</sup> The Forest Act 2002 (No. 14 of 2002) Section 52(1) (Tanzania)

<sup>462</sup> The most recent edition of the Forest Policy available online is dated 2009. Secondary sources suggest that later draft editions may be available, however it was not possible to obtain them within the remit of this research See < <http://www.fao.org/forestry/18861-01dab2ad4d624b8b0ffe5560e27823487.pdf>> for 2009 draft.

<sup>463</sup> The Forests Act 2015 (No. 4 of 2015), Section 8 (Zambia)

requires and would be wasted or destroyed if not harvested.<sup>464</sup> Forest resources are defined as 'vegetation, wood and non-wood produces and forest ecological services, including the maintenance of soil quality, control of erosion, provision of organic materials and modulating climate' while forest produce largely covers derivatives of forest resources such as flowers, logs and moss.<sup>465</sup> National Forests are established for; the security of forest resources of national importance; the conservation of ecosystems and biological diversity; improved forest resource management and sustainable utilization of forest resources; and the management of major water catchments.<sup>466</sup> A person is not permitted even to enter any National Forest without a license or permit, except for residents within or adjacent to the forest.<sup>467</sup> Local forests may be established under the act, the land for which can be compulsorily acquired under the Lands Acquisition Act<sup>468</sup> as considered necessary or desirable in the public interest.<sup>469</sup> Land within a local forest can be used for; conservation and development of forests for security of forest resources; protection of ecosystems; utilization of forest resources at local level or meeting the social, cultural and economic needs of the local community.<sup>470</sup> Section 32 dictates that the Director shall be responsible for the control and management of a local forest, except if allocated to a local community, as determined by the Minister. A number of restrictions on local forests are detailed in Section 23 including the removal of forest products, setting of fires; grazing of animals or collecting of bees. Botanical Reserves can also be established under the act in areas which have an environmental, ecological, cultural, scientific or national significance.<sup>471</sup> Prohibitions on the use of Botanical Reserves are very similar to those for local forests and are detailed in Section 25. An owner or lessee of any land or plantation may apply to the Director to register the area as a private forest. The status of private forest will only be granted where land use will be sustainable, an EIA has been conducted, and the local community has been consulted.<sup>472</sup> A number of additional terms and conditions can also be set for the management of the private forest including afforestation and re-forestation, pollution prevention and conservation of flora and fauna.<sup>473</sup> For community groups which derive their livelihood from the forest and live within its vicinity, community forest management can be authorized, subject to conditions.<sup>474</sup> Stricter conditions are imposed on community management than can be seen in the community management structure of other ZRB states. Section 32 dictates tasks which the community group will be responsible for which include the expected protection, conservation and management of the forest, but also provisions on fire-fighting and enforcement of the law. The rights which can be conferred to community groups is also limited in Section 32(2) which lists produce which can be harvested and activities which can be conducted. The protection of flora is specifically covered in Part V of the Act.<sup>475</sup> A number of licenses and permits can be granted which allow use of forest produce for a variety of purposes.<sup>476</sup> However, any removal of forest produce must be endorsed by a forest officer before being removed.<sup>477</sup>

**Zimbabwe:** The main pieces of legislation covering forests in Zimbabwe are the Forest Act<sup>478</sup>, the Communal Land Forest Produce Act,<sup>479</sup> and the Traditional Leaders Act.<sup>480</sup> The legislative framework culminates in the formation of a traditional approach to natural resource management which hinges on state control. Ownership of natural resources in Zimbabwe remains solely in the hands of the state. Although the ratification of international agreements presents a paradigm shift from a State centric approach towards a more decentralized model, it is yet to be replicated within the national

<sup>464</sup> The Forests Act 2015 (No. 4 of 2015), Section 49 (Zambia)

<sup>465</sup> The Forests Act 2015 (No. 4 of 2015), Section 2 (Zambia)

<sup>466</sup> The Forests Act 2015 (No. 4 of 2015), Section 12 (Zambia)

<sup>467</sup> The Forests Act 2015 (No. 4 of 2015), Section 16 (Zambia)

<sup>468</sup> Lands Acquisition Act 1970 (No. 2 of 1970) (Zambia)

<sup>469</sup> The Forests Act 2015 (No. 4 of 2015), Section 18 (Zambia)

<sup>470</sup> The Forests Act 2015 (No. 4 of 2015), Section 19 (Zambia)

<sup>471</sup> The Forests Act 2015 (No. 4 of 2015), Section 24 (Zambia)

<sup>472</sup> The Forests Act 2015 (No. 4 of 2015), Section 26 (Zambia)

<sup>473</sup> The Forests Act 2015 (No. 4 of 2015), Section 26(4) (Zambia)

<sup>474</sup> The Forests Act 2015 (No. 4 of 2015), Sections 29-40 (Zambia)

<sup>475</sup> The Forests Act 2015 (No. 4 of 2015), Section 47 (Zambia)

<sup>476</sup> The Forests Act 2015 (No. 4 of 2015), Section 53 (Zambia)

<sup>477</sup> The Forests Act 2015 (No. 4 of 2015), Section 58 (Zambia)

<sup>478</sup> Forest Act 1949 (No. 37 of 1949) (as amended) (Zimbabwe)

<sup>479</sup> Communal Land Forest Produce Act 1997 (No. 20 of 1997) (as amended) (Zimbabwe)

<sup>480</sup> Traditional Leaders Act 1998 (No. 25 of 1998, as amended by S.I. 430A/1999, 22/2001) (Zimbabwe)

legal framework. Yet, Zimbabwe also acknowledges community ownership vesting the rights of forest management in the hands of local communities and the Forest Act covers the use of and access to forests and forest products by communities. The Communal Land Forest Produce Act defined forest produce as ‘all vegetation whether dead or alive in a plantation, woodland and forest and any part whether alive or dead of any such vegetation including wood, bark, seed, fruit, gum, resin or sap’. The Act goes on to distinguish between major and minor forest produce, the former of which is subject to stricter control. Forest management functions, duties and responsibility are vested solely in the Forestry Commission through Section 8. Forest management is regarded as the sole duty of the state which opposes the perception given by community management strategies. The minister has overriding authority over the Forestry Commission in terms of its function and direction meaning there is essentially no accountability or oversight function to ensure conformity with international law. Rural district councils do, however, have the ability to formulate by-laws, however these too must be approved by the Minister prior to being enacted.<sup>481</sup> The Minister can therefore effectively veto all by-laws, although in practice it has been demonstrated that the Minister shows little resistance to the creation of environmental conservation by-laws. Local authorities are also obliged to draft environmental action plans under the Environmental Management Act.<sup>482</sup> The Communal Land Forest Produce Act covers forest produce found within communal lands. This Act is consistent with the traditional view of forest governance which places power in the hands of the government and local elites, rather than local communities. Section 4(ii) of the act allows inhabitants of communal land to use forest produce for their own use. This is still restrictive for communities who cannot use the forest resources as any means of economic gain. Although given little consideration within the Forest Act, Section 116(1)(i) and (j) of the Environmental Management Act recognizes the need for government to protect the indigenous property rights of indigenous communities in respect of biological diversity and to support the integration of traditional knowledge on conservation of biological diversity with scientific knowledge. Under the Forest Act it is an offence to ‘cut, injure, destroy, collect, take or remove any tree, timber or other forest produce’.<sup>483</sup> Statutory Instrument 116 of 2012 also governs forests and particularly seeks to control timber and forest produce by seeking to protect the trade in both wood and timber. With the forest regulatory framework communities and community-based forest enterprises are recognized as key stakeholders in the management of forests, however despite having engagement with the management of resources, they do not have any conferred ownership. As a result, depletion of forests has continued in Zimbabwe. The Forest Act currently enforces total exclusion thereby barring local communities from having ownership rights over forests. Section 17 of the Communal Land Forest Produce Act only allows the leasing of forests to private individuals. Sections 5,6 and 7 of the Communal Land Forest Produce Act allow large scale exploitation of the forests when a permit or license is given. This results in people outside of the community who have the financial capability to apply for permits benefitting from forest exploitation. The Communal Land Forest Produce Act Section 14(3) also states that plantations can be established by individuals or groups within a communal area.

## Wetlands

**Angola (11 Ramsar Sites pending ratification):** Angola is one of the wettest countries in Southern Africa and is home to a number of diverse wetlands, some of which (Lago Cameia and Lago Dilolo) are outside of the boundaries of National Parks and are therefore not protected (USAID, 2008). No specific national legislation or policy covering Wetlands exists in Angola. There is however a Resolution Implementing the Convention on Wetlands (2016)<sup>484</sup>, however it is unclear how this is related to the pending ratification of the Ramsar Convention. The National Policy of Forestry, Wildlife and Conservation Areas,<sup>485</sup> mentions the conservation and management of forests and the integrated management of natural resources, with specific emphasis on ecologically sensitive areas which include wetlands and mangroves (Russo, 2010). However, this is not matched with any legal backing or implementation framework.

<sup>481</sup> Communal Land Forest Produce Act 1997 (No. 20 of 1997) (as amended), Section 14(1) (Zimbabwe)

<sup>482</sup> Environmental Management Act 2002 (No. 13 of 2002), Section 95 (Zimbabwe)

<sup>483</sup> Forest Act 1949 (No. 37 of 1949) (as amended) Section 78 (Zimbabwe)

<sup>484</sup> Resolution Implementing the Convention on Wetlands 2016 (No. 27 of 2016) (Angola)

<sup>485</sup> Resolution No. 1 of 2010 (Angola)

**Botswana (1 Ramsar Site):** There are no specific pieces of legislation or policy in Botswana to regulate wetlands.<sup>486</sup> This is surprising given that some of the countries most valued assets and vulnerable habitats reside in wetlands, such as the Okavango Delta. Despite a draft wetlands policy and strategy having been in existence for more than 10 years, it is yet to come to fruition.<sup>487</sup> There is also no mention of wetlands within the Environmental Assessment Act (2011) although they are included within the 'environmentally sensitive' locations which would require an EIA.<sup>488</sup> Wetlands could also fall within legislation which covers national parks as protection is afforded not only to living animals within a national park, but also to any vegetation.<sup>489</sup>

**Malawi (2 Ramsar Sites):** The National Environmental Policy of 1996 deals with the sustainable utilization and management of natural resources, the facilitation of the restoration and maintenance of essential ecosystems and ecological processes, enhanced public awareness on the importance of environmental management, legally enacted through the Environmental Management Act.<sup>490</sup> The Environmental Management Act specifically covers the regulation and use of wetlands and prevents any activities which may have an adverse effect on a wetland.<sup>491</sup> The Act also states that guidelines for identification and sustainable management of wetlands in Malawi will be drafted, although they do not yet appear to have been developed.<sup>492</sup> Traditional uses of wetlands are exempt from the main provisions regarding the protection of wetlands under the Environmental Management Act, although they must be declared by Gazette.<sup>493</sup> However, it is also stated that any wetland which is declared as protected will have human activity excluded or limited. No further detail on whether this is also applicable to areas under traditional use are given.<sup>494</sup>

**Mozambique (2 Ramsar Sites):** No specific legislation or policy dealing specifically with wetlands is in place in Malawi. Wetlands are mentioned by a number of law and policy documents including; the Water Law (1991), National Water Policy (2007); National Water Resources Management Strategy (2007); Water License and Concessions Regulation (2007); the Environmental Law (1997).<sup>495</sup> Wetlands are also mentioned in the Environmental Policy and Regulatory Framework for EIAs which consider wetlands as sensitive zones. However, none of the documents listed provide comprehensive or sector specific regulation of wetlands in Mozambique.

**Namibia (5 Ramsar Sites):** The draft Wetland Policy developed by the Namibian Government in 2004 is yet to come into force. The policy was developed within the framework of the National Water Policy (2000) in order to ensure conformity and reinforcement with national policy instruments. The policy therefore cites key principles which are represented in the water policy. The policy states that wetlands are a national asset and recognizes that they form part of larger systems which have considerable components in other riparian states. As such, the policy iterates the importance of cooperation with neighbors for the 'conservation, management and sustainable utilization of shared wetlands and wetlands of international importance'. Although the policy states that legislation to protect Namibia's wetlands will be developed, this is yet to come to fruition.<sup>496</sup> The policy also states that, in addition to legislation, guidelines and mechanisms for the enforcement of wetland conservation and sustainable wetland management will be developed.<sup>497</sup> The draft Policy also states that the protected

<sup>486</sup> Okavango-Cubango River Basin, Botswana National Action Plan, 2011-2016, 22 < <http://www.okacom.org/site-documents/key-documents/okavango-cubango-river-basin-botswana-national-action-plan-2011-2016>>

<sup>487</sup> The enactment of the National Wetland Policy and Strategy is discussed in a UNDP (2005) Project Document "Building Local Capacity for Conservation and Sustainable Use of Biodiversity in the Okavango Delta" < <https://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=11&cad=rja&uact=8&ved=0ahUKEwio8O7stazYAhXLL8AKHQGEAhM4ChAWCCGwAA&url=http%3A%2F%2Fwww.the-eis.com%2Fdata%2Fliterature%2F12-13-05%25202028%2520BOT%2520Wetlands%2520newest%2520prod%2520Dec05.doc&usg=AOvVaw0X8v5tn-I98nfHXbUvF-6d>> However, it was not possible to obtain a copy during this research.

<sup>488</sup> Environmental Impact Assessment Regulations (2012), Schedule 1 (Botswana)

<sup>489</sup> Wildlife Conservation and National Parks Act 1992 (No. 28 of 1992), Sections 6 (1)(b) and(c) (Botswana)

<sup>490</sup> No. 19 of 2017 (Malawi)

<sup>491</sup> Environmental Management Act 2017 (No. 19 of 2017) Section 48(1) (Malawi)

<sup>492</sup> Environmental Management Act 2017 (No. 19 of 2017) Section 48 (3) (Malawi)

<sup>493</sup> Environmental Management Act 2017 (No. 19 of 2017) Section 48(1) and (4) (Malawi)

<sup>494</sup> Environmental Management Act 2017 (No. 19 of 2017) Section 48(4) (Malawi)

<sup>495</sup> See Mozambique National Report on the Implementation of the Ramsar Convention on Wetlands, COP12 (2015) [https://www.ramsar.org/sites/default/files/documents/2014/national-reports/COP12/cop12\\_nr\\_mozambique.pdf](https://www.ramsar.org/sites/default/files/documents/2014/national-reports/COP12/cop12_nr_mozambique.pdf)

<sup>496</sup> Draft National Wetland Policy (2004) Section 4.3.1 (Namibia)

<sup>497</sup> Draft National Wetland Policy (2004) Section 4.3.4 (Namibia)

areas network in Namibia will be expanded to include vulnerable wetlands and Trans-frontier protected areas will be established.<sup>498</sup> Wetlands which are identified as Ramsar sites or potential sites shall be afforded the highest possible protection by the State.<sup>499</sup> However, it is further stated that there are wetland habitats which are 'essential to the survival of endemic and rare amphibians, birds and mammals which should be identified and protected'.<sup>500</sup> No further clarification is added on what distinguishes Ramsar sites and those which are essential wetland habitats, or if they are the same protected areas of wetland. Section 4.3.7 of the policy states that all riparian zones shall be protected in accordance with the Forestry Act No.12 of 2001 however, while protected areas and protection over natural vegetation are regulated within the Forestry Act,<sup>501</sup> there is no specific mention of wetlands. Community participation principles are detailed in Section 4.4 of the draft Wetland Policy which states that the management of wetlands and wetland resources shall make provision for community involvement at all levels and shall ensure the right to consultation between all relevant stakeholders. Decentralization of wetland management is also covered, stating that 'institutions shall be structured so as to devolve decision-making regarding wetland use to the lowest appropriate administrative level'.<sup>502</sup> Programmes which rehabilitate, reforest and improve degraded land and wetlands are encouraged through Section 4.2.11 of the Policy. There are no specific provisions regarding the protection of particular species, however, protection of indigenous species is covered within the Parks and Wildlife Management Act.<sup>503</sup> Wetlands are also not mentioned within the more general environmental framework, the Environmental Management Act No. 7 of 2007.

**Tanzania (4 Ramsar Sites):** No specific legislation on wetlands exists in Tanzania, however, Guidelines for Sustainable Management of Wetlands (2014) have been established. The guidelines have been produced to fulfill Section 56(5) of the Environmental Management Act<sup>504</sup> which states that 'The Minister, in consultation with other sector ministries may make regulations and guidelines on the sustainable management of wetlands protected under this Act'. The guidelines state the need for effective wetland legislation which 'takes into account the diverse nature of wetlands'.<sup>505</sup> In order to do this, the guidelines establish a framework for the management of wetlands including an integrated management plan; wetland resource use permits; rehabilitation of wetlands and awareness raising strategies. The main weakness regarding environmental protection and conservation in Tanzania is stated in the guidelines as the lack of legal enforcement: 'Putting in place policies which are not enforced have resulted in environmental and wetland degradation'.<sup>506</sup> Wetlands are also included under the provisions of the Environmental Management Act, 12 mentions are made throughout the act, allowing regulations to be made on the sustainable management of wetlands.<sup>507</sup> Declaration of protected wetlands is also permitted under Section 56 of the Environmental Management Act. The Guidelines for Sustainable Management of Wetlands develop a range of criteria for designating areas as protected wetlands (Sections 5.1.5 and 5.1.6) including the protection of particular wetland types or wetland species which are unique or endemic to a particular locality, drawing the main criterion from the Ramsar Convention Article 2.2.<sup>508</sup> It is emphasised that key stakeholders and their needs will be identified and involved as part of the wetland management planning process.<sup>509</sup> The Guidelines also give specific reference to the protection of transboundary wetlands and migratory species.<sup>510</sup> There is no specific mention of the exact species which should be protected. Wetlands are also given protection through the Wildlife Conservation Act<sup>511</sup> which, similarly to the Environmental Management Act, states that the Minister may make regulations and guidelines for the sustainable

<sup>498</sup> Draft National Wetland Policy (2004) Section 4.4.2 (Namibia)

<sup>499</sup> Draft National Wetland Policy (2004) 4.2.15 (Namibia)

<sup>500</sup> Draft National Wetland Policy (2004) 4.2.17 (Namibia)

<sup>501</sup> See Forestry Act 2001 (No. 12 of 2001), Sections 21 and 22 (Namibia)

<sup>502</sup> Draft National Wetland Policy (2004) 4.4.3 (Namibia)

<sup>503</sup> Nature Conservation Ordinance No. 4 of 1975 (Namibia)

<sup>504</sup> Environmental Management Act 2004 (No. 20 of 2004) (Tanzania)

<sup>505</sup> Guidelines for Sustainable Management of Wetlands (2004), Government of Tanzania, viii

<sup>506</sup> Guidelines for Sustainable Management of Wetlands (2004), Government of Tanzania, Section 3.4.3

<sup>507</sup> Environmental Management Act 2004 (No. 20 of 2004), Section 55(4) (Tanzania)

<sup>508</sup> Ramsar Convention, Article 2.2

<sup>509</sup> Guidelines for Sustainable Management of Wetlands (2004), Government of Tanzania Section 5.2.2

<sup>510</sup> Guidelines for Sustainable Management of Wetlands (2004), Government of Tanzania, xi

<sup>511</sup> Wildlife Conservation Act 2009 (No. 5 of 2009) (Tanzania)

management of wetlands reserves and wetlands areas.<sup>512</sup> The protection and conservation of wetlands are also listed as one of the objectives of the Act, identified for their high levels of biodiversity and role as wildlife habitats. The legislation protects the vegetation within a wetland reserve by prohibiting the grazing of livestock and the hunting, capture or killing of any animals, including fish.<sup>513</sup>

**Zambia (8 Ramsar Sites):** A Draft Wetlands Policy for Zambia was developed in 2001, but to date has not been formally approved. The Wetland Strategy and Action Plan acknowledges both the socio-economic value and ecological importance that wetland ecosystems provide (McCartney et. al, 2011). The importance of wetlands is however recognized in the National Policy on Environment (2009) which acknowledges the need to safeguard the ecological, economic and social value of wetlands. The policy also defines property rights to land as extending to natural resources including wetlands.<sup>514</sup> The Environmental Management Act<sup>515</sup> gives specific reference to wetland regulation declaration and protection in Sections 24 and 25. Section 34 also declares wetlands as environmentally sensitive for the purposes of the act which should therefore have an environmental protection plan established.<sup>516</sup> Section 25 states that the Minister may, in consultation with local communities, declare any wetland to be an ecologically sensitive area and may impose limitations on the development around it. Although further guidance on what would make a particular wetland an 'ecologically sensitive' wetland is not given. The protection of wetlands is also mentioned within the Zambia Wildlife Act<sup>517</sup> which declares the implementation of the Ramsar convention as one of its objectives, however there is no further mention of wetlands within the act.

**Zimbabwe (7 Ramsar Sites):** There are no existing wetland policies in Zimbabwe, which has led to the degradation of wetland areas and a continuous discord of wetland management across Zimbabwe (Marambanyika & Beckendahl, 2016). However, minor provision for wetland protection through environmental legislation is in place. The Environmental Management Act<sup>518</sup> provides authority for the protection of natural systems including wetlands from degradation.<sup>519</sup> Like the legislation in place in Zambia, the act states that wetland can be declared as ecologically sensitive and therefore have restrictions imposed on it but does not detail what would be required to be ecologically sensitive. Existing legislation is not strongly enforced as mining, cultivation and building works continue within restricted areas (Davis and Hirji, 2014).

## Biodiversity

**Angola:** Protected areas cover 6.6% of Angolan territory, however the majority of the protected areas were established between the 1930s and 1990s and as such are in need of revision to ensure that they still correspond to current priorities.<sup>520</sup> The weakness of governance within these protected areas has resulted in some areas being abandoned.<sup>521</sup> There is no national law or policy in Angola which directly relates to biodiversity. Despite the lack of legislation or policy regarding biodiversity, Angola does have a National Biodiversity Strategy and Action Plan (Resolution No.42/06 of July 2006) (NBSAP), as required under the Convention on Biological Diversity, which guarantees the conservation and sustainable use of biological diversity components that enable the fair and equitable sharing of the benefits of the use of biological resources. However, the NBSAP has no legal authority and does not impose any binding provisions. As such, any legal protection for biodiversity must be derived from other sources. Section 39 of the Environmental Framework Law<sup>522</sup> places an obligation on the state to: take requisite measures to protect the environment and species of flora and fauna throughout national territory; maintain the ecological balance; ensure the correct location of economic activities and the rational development and use of all natural resources within the con-

<sup>512</sup> Wildlife Conservation Act 2009 (No. 5 of 2009) Section 16(3) (Tanzania)

<sup>513</sup> Wildlife Conservation Act 2009 (No. 5 of 2009) Section 18(2) and 19(1) (Tanzania)

<sup>514</sup> See National Policy on Environment (2009) Section 7.1.13 (Zambia)

<sup>515</sup> Environmental Management Act 2011 (No. 12 of 2011) (Zambia)

<sup>516</sup> Environmental Management Act 2011 (No. 12 of 2011), Section 24(7) (Zambia)

<sup>517</sup> Zambia Wildlife Act 2015 (No. 14 of 2015) (Zambia)

<sup>518</sup> The Environmental Management Act 2002 (No. 13 of 2002) (Zimbabwe)

<sup>519</sup> The Environmental Management Act 2002 (No. 13 of 2002) Section 113 (Zimbabwe)

<sup>520</sup> National Biodiversity Strategy and Action Plan, Ministry of Urban Affairs and Environment, Republic of Angola (2007-2012)

<sup>521</sup> National Biodiversity Strategy and Action Plan, Ministry of Urban Affairs and Environment, Republic of Angola (2007-2012)

<sup>522</sup> Environmental Framework Law 1998 (No. 9 of 1998) (Angola)

text of sustainable development; respect the rights of future generations; and ensure the preservation of species. Biodiversity is also covered in the Biological and Aquatic Resources Act (2004) however emphasis is on marine biodiversity, which is not relevant for the purposes of this research.

**Botswana:** No specific national law focusing on biodiversity exists, biodiversity is however covered within number of pieces of environmental legislation. The National Biodiversity Strategy and Action Plan (NBSAP) (2016)<sup>523</sup> of Botswana envisions that 'By 2025, ecosystem, species and genetic diversity is valued, protected, and used sustainably and equitably, through the involvement of all sectors of society and the provision of sufficient resources for its sound management'. Other relevant policies include the National Conservation Strategy (1990); the Botswana Threatened Species Management Action Policy, Implementation Strategy and Action Plan (2007); Wildlife Policy (1986, updated and amended version still in draft form) and the Community Based Natural Resources Management Policy (2007). Applicable legislation includes the Forest Act 1968<sup>524</sup> and the Wildlife Conservation and National Parks Act.<sup>525</sup> Biodiversity or biological diversity is not governed directly by either of the acts, although each of them offers protection in a different sense. The Wildlife Conservation and National Parks Act puts in place measures for the safeguarding of biological diversity through restrictions on hunting and the prohibition of certain acts within national parks, game reserves, sanctuaries and private game reserves (Sections 6-14). The act also prohibits the 'killing or capturing of any animal, or the destruction of any species of vegetation in the interest of the conservation of fauna and flora'.<sup>526</sup> The Forest Act provides protection for certain species of both animals and plants, with particular emphasis on restrictions of trading species which are threatened with extinction.<sup>527</sup> However, the importance of biological diversity as a standalone issue is not recognized in any policy or legislation outside of the NBSAP.

**Malawi:** Malawi has 87 forest reserves, five national parks, four wildlife reserves and three nature sanctuaries.<sup>528</sup> The need to 'conserve and enhance' the biodiversity of Malawi is entrenched in Malawi's Constitution of 1994.<sup>529</sup> Yet, biodiversity is not managed by a single legal framework, but covered within a number of umbrella policies which attempt to address the problems and challenges of sustainable biodiversity management. The National Biodiversity Strategy and Action Plan II (NBSAP II) (2015-2025) acts as the main policy framework for sustainable management of biodiversity in Malawi. The main goal of the NBSAP II is to enhance the management of biodiversity for economic growth and well-being of present and future generations. The NBSAP II gives reference to the challenges of biodiversity, including the lack of framework legislation on biodiversity and weak enforcement of the legal mechanisms which are in place. The National Environment Policy of 2004<sup>530</sup> recognizes the value of biodiversity for purposes such as tourism, agriculture and socio-economic developments.<sup>531</sup> It also supports the development of indigenous knowledge systems and recognizes local communities as custodians of biodiversity.<sup>532</sup> The policy identifies biodiversity conservation programmes, ecotourism and establishment of biodiversity networks as strategies to build on current policies.<sup>533</sup> The National Environment Policy<sup>534</sup> Section 4.12 provides for the establishment of environmental protection areas and the conservation of biological diversity. Part X of the policy covers biological and genetic resources of Malawi, although it does not have any subsequent regulations to enforce those provisions. The policy also requires the maintenance of an inventory of biological diversity in Malawi, which must include components which are threatened with extinction and the pressures which they are facing. It also requires measures to be taken for preventing, removing or miti-

<sup>523</sup> National Biodiversity Strategy and Action Plan (2016) Department of Environmental Affairs, Gaborone

<sup>524</sup> Forest Act 1969 (No. 23 of 1968) (as amended by Act No.8 of 2005) (Botswana)

<sup>525</sup> Wildlife Conservation and National Parks Act 1992 (No. 28 of 1992) (as amended) (Botswana)

<sup>526</sup> Wildlife Conservation and National Parks Act 1992 (No. 28 of 1992), Section 6(k) (Botswana)

<sup>527</sup> Forest Act 1968 (No. 23 of 1968), Section 2 (Botswana)

<sup>528</sup> The National Biodiversity Strategy and Action Plan II (NBSAP II) (2015-2025), Ministry of Natural Resource, Energy and Mining, Section 1.3.1.1 (Malawi)

<sup>529</sup> Constitution of Malawi 1994, Article 13(d)

<sup>530</sup> National Environment Policy of 2004, Ministry of Natural Resources and Environmental Affairs (Malawi)

<sup>531</sup> National Environment Policy of 2004, Ministry of Natural Resources and Environmental Affairs (Malawi), Section 4.12 (b)

<sup>532</sup> National Environment Policy of 2004, Ministry of Natural Resources and Environmental Affairs (Malawi), Section 4.12 (c) and (d)

<sup>533</sup> National Environment Policy of 2004, Ministry of Natural Resources and Environmental Affairs (Malawi), Section 4.12.1 – 4.12.10

<sup>534</sup> National Environment Policy of 2004, Ministry of Natural Resources and Environmental Affairs (Malawi),



gating those threats to devise measures for the better protection and conservation of rare and endemic species of wild fauna and flora.<sup>535</sup> Some legally enforceable protection for biodiversity is established through the National Parks and Wildlife Reserves Act<sup>536</sup> within which protected areas are declared 'to preserve populations of rare, endemic and endangered species of wild plants and animals'.<sup>537</sup> Under the act it is an offence to 'hunt, take, kill, injure or disturb any wild plant or animal'.<sup>538</sup> However, a number of licenses can be granted under specific conditions such as the taking of protected species for scientific, education or use in botanical gardens.<sup>539</sup> The recently updated Malawi Environment Management Act 2017 also provides coverage for biodiversity, stating that measures and guidelines in relation to the 'selection and management of protected areas to promote conservation' must be made.<sup>540</sup> The Act also states that there will be a 'selection and management of buffer zones near protected areas'<sup>541</sup> and that the authority will issue guidelines on the 'protection of species, ecosystems and habitats threatened with extinction'.<sup>542</sup> Environmental protection orders can also be issued under Section 72 where it is necessary for the protection and management of the environment and the conservation and sustainable utilisation of natural resources.<sup>543</sup> Where the protection order is made against the actions of a person, they will be obligated to pay compensation to any person whose land has been degraded by their conduct.<sup>544</sup> Environmental easements can also be issued under the act, through Section 74, under certain conditions including the preservation of fauna and flora and the preservation of the quality and flow of water in a dam, lake, river or aquifer.<sup>545</sup> The Environment Management Act 2017 also prohibits the introduction of alien plant or animal species.<sup>546</sup> Indeed, Section 71 specifically covers the control of alien and invasive species to prevent the unauthorised introduction and spread of alien and invasive species to the ecosystem. In instances where a person is authorised to carry out activities which involve alien or invasive species, they shall take all required steps to prevent or minimise harm to biodiversity.<sup>547</sup> If an alien species manages to establish itself as a result of the actions of one person, the person is liable for all costs incurred in the control and eradication of that species.<sup>548</sup> Reference use of traditional knowledge is given in the Environment Management Act 2017 Section 69(f) which states that traditional knowledge should be utilised in the conservation and sustainable use of biological diversity.

**Mozambique:** Mozambique currently has no single legal or regulatory framework for biodiversity. The National Strategy and Action Plan of Biological Diversity of Mozambique (2015-2035) has as its vision that 'In 2035, the ecological, socio- economic and cultural value of biodiversity in Mozambique will contribute directly to improve the quality of life of Mozambicans, derived from its integrated management, conservation and fair and equitable use'.<sup>549</sup> The Environmental Law No.20 of 1997 is the main instrument for all environment activities in Mozambique. Section 4 discusses the general principles of environmental management, stating that it should be based on rational use and management, enhancement of local knowledge, awareness, integrated vision of the environment, participation wide, equal access, accountability and national and international cooperation.<sup>550</sup> Of specific relevance to biodiversity is Section 12 which states that '...all activities against the conservation, reproduction, quality and quantity of biological resources, especially those threatened with extinction' are prohibited. It further details that the Government shall ensure that the following actions are taken; appropriate maintenance and regeneration of species (b) rehabilitation of degraded habitats and creation of new habitats; and special protection of plant species threatened with extinction or of the

<sup>535</sup> Environment Management Act 2017 (No. 19 of 2017) Section 68 (Malawi)

<sup>536</sup> National Parks and Wildlife Reserves Act 1992 (No.11 of 1992) (as amended by National Parks and Wildlife (Amendment) Act 2017 (No.11 of 2017) (Malawi)

<sup>537</sup> National Parks and Wildlife Reserves Act, Section 27(c) (Malawi)

<sup>538</sup> National Parks and Wildlife Reserves Act, Section 35(a) (Malawi)

<sup>539</sup> National Parks and Wildlife Reserves Act, Section 48 (Malawi)

<sup>540</sup> Environment Management Act No. 19 of 2017, Section 69(b) (Malawi)

<sup>541</sup> Environment Management Act No. 19 of 2017, Section 69(c) (Malawi)

<sup>542</sup> Environment Management Act No. 19 of 2017, Section 69(d) (Malawi)

<sup>543</sup> Environment Management Act No. 19 of 2017, Section 72(1) (Malawi)

<sup>544</sup> Environment Management Act No. 19 of 2017, Section 72(3)(d) (Malawi)

<sup>545</sup> Environment Management Act No. 19 of 2017, Section 74(4)(a) and (b) (Malawi)

<sup>546</sup> Environment Management Act No. 19 of 2017, Section 69(e) (Malawi)

<sup>547</sup> Environment Management Act 2017 (No. 19 of 2017), Section 71(6) (Malawi)

<sup>548</sup> Environment Management Act 2017 (No. 19 of 2017), Section 71(10) (Malawi)

<sup>549</sup> The National Strategy and Action Plan of Biological Diversity of Mozambique (2015-2035), Section 5

<sup>550</sup> Taken from The National Strategy and Action Plan of Biological Diversity of Mozambique (2015-2035), section 2.2(b)



botanical specimen that require special protection due to their genetic potential, size, age, rarity, scientific and cultural value.<sup>551</sup> It is the first piece of legislation to provide no net loss of biodiversity in Section 11(2) indicating that public and private entities that are engaged in natural resources in conservation areas or their buffer zones should compensate for any negative impacts. Protection zones are defined in the Conservation Law No.16 of 2014<sup>552</sup> and include wildlife reserves, community conservancy areas, monuments, official hunting areas, privately owned game farms and biosphere-type reserves, amongst others. The legislation also details 10 categories of protected areas, 3 of which are defined as protected areas and 7 utilized for sustainable use. The division into different categories is aimed at providing a more robust and flexible response to conservation of biodiversity and the involvement of local communities in their management. Management plans for protected areas are detailed under Section 43(2). Section 49 introduces fees for access and use of natural resources, compensation for conservation efforts and ecological services.

**Namibia:** No law dealing specifically with the topic of biodiversity currently exists in Namibia. Although a draft bill on access to biological resources and associated traditional knowledge aimed at the protection of biodiversity and traditional knowledge was drafted in 2000, it yet to come in to force. The Namibian Biodiversity Strategy and Action Plan (2013 – 2022) aims to protect ecosystems, biological diversity and ecological processes through conservation and sustainable use. The plan reinforces Article 95(1) of the Constitution which obligates the state to actively promote and maintain the welfare of the people by adopting policies which include the ‘maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefits of all Namibians both present and future’. Article 91(c) also requires complaints over the utilization of living natural resources, irrational exploitation of non-renewable resources, the degradation and destruction of ecosystems to be investigated. This is reinforced by the Environmental Management Act,<sup>553</sup> which states that ‘Namibia’s cultural and natural heritage including, its biological diversity, must be protected and respected for the benefit of present and future generations’.<sup>554</sup> The Nature Conservation Amendment Act (1996)<sup>555</sup> declares certain habitats as protected. A Protected Areas and Wildlife Management Bill which seeks to protect all indigenous species and control the exploitation of all plants and wildlife, has been proposed in Namibia, but is yet to receive parliamentary approval. Protected zones are also established through the Marine Resources Act which seeks to ensure conservation of the marine ecosystem.<sup>556</sup> Conservation of biodiversity is also covered within the Forest Act<sup>557</sup> which aims to maintain biological diversity in a way which is compatible with the forest’s primary role as the protector and enhancer of the natural environment. The Water Resources Management Act similarly contains provisions which relate to management, protection, development, use and conservation of water resources as a means to protect biodiversity.<sup>558</sup> Section 3(c) lists as one of the fundamental principles of the act that the ‘...harmonization of the human water needs with the water requirements of environmental ecosystems and the species that depend on them while recognizing that water resource quality for those ecosystems must be maintained’. In recognition of the rights and knowledge of local communities, a draft bill on Access and Benefit Sharing was finalized in 2012 to regulate access to genetic resources and associated traditional knowledge, however it is yet to be tabled in parliament. The Nature Conservation Amendment Act creates conservancies in communal areas allowing rural communities to form a conservancy and acquire the use-right over wildlife. Conservancies are areas of land which are managed jointly by landholders for resource conservation. Also of importance to the preservation of biodiversity is the Controlled Wildlife Products and Trade Act 2008<sup>559</sup> controlling the trade in endangered species.<sup>560</sup>

<sup>551</sup> Environmental Law 1997 (No.20 of 1997), Section 12 (1) and (2) (Mozambique)

<sup>552</sup> Conservation Law 2014 (No.16 of 2014), Sections 13-25 (Mozambique)

<sup>553</sup> Environmental Management Act 2007 (No.7 of 2007) (Namibia)

<sup>554</sup> Environmental Management Act 2007 (No.7 of 2007), Section 3(2)(h) (Namibia)

<sup>555</sup> The Nature Conservation Amendment Act 1996 (No. 5 of 1996) (Namibia)

<sup>556</sup> Marine Resources Act 2000 (Act No. 27 of 2000) (Namibia)

<sup>557</sup> Forest Act 2001 (No. 12 of 2001) (as amended by the Forest Amendment Act 2005) (Namibia)

<sup>558</sup> Water Resources Management Act 2013 (No.11 of 2013) (Namibia)

<sup>559</sup> Controlled Wildlife Products and Trade Act 2008 (No. 9 of 2008) (Namibia)

<sup>560</sup> Implements the Convention on International Trade in Endangered Species of Wild Fauna and Flora reprinted in 12 I.L.M. 1085 (1973)(CITES) into national law.

**Tanzania:** There is no specific legislation or policy within Tanzania which is focused on biodiversity. The National Biodiversity Strategy and Action Plan (2015-2020) aims to ensure that 'By 2025 biodiversity and ecosystem are well protected, restored and used sustainably'.<sup>561</sup> The Environment Management Act No. 20 of 2004 provides a basic framework for the sustainable management of the environment.<sup>562</sup> The National Parks Act can also be related to biodiversity as it provides protection to National Parks and therefore provides regulation of the biodiversity contained therein.<sup>563</sup> Similarly, the National Wildlife Conservation Act No.5 of 2009 acts to conserve wildlife and ensure protection, management and sustainable utilization of wildlife resources.<sup>564</sup> The Act also states that protected areas are formed for the 'maintenance of biological diversity'.<sup>565</sup> Recognizing the advantages of community participation in managing natural resources, Section 18 of The Wildlife Conservation (Wildlife Management Areas) Regulations (2012) states that the protection of biodiversity resources of the Wildlife Management Areas is one of the functions of an authorized community association.<sup>566</sup> Biodiversity is also mentioned within the National Water Policy (2002) giving reference to the fact that 'in-stream flows or environmental flows and levels are necessary for riparian biodiversity wetland systems'.<sup>567</sup> Biodiversity conservation is again mentioned as a challenge to the management of trans-boundary water resources in Section 2.12.

**Zambia:** Zambia does not have a specific policy relating to biodiversity but does have a National Biodiversity Strategy and Action Plan, which is now on its section edition (2015-2025). The vision of the NBSAP is that 'By 2025, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy environment and delivering benefits essential for all Zambians and the Zambian economy'.<sup>568</sup> Protected areas within Zambia are composed of 480 Forest Reserves, 20 National Parks and 36 Game Management Areas, and 8 Ramsar Sites the management of which are provided under different legislative acts.<sup>569</sup> Section 24 of the Environmental Management Act No.13 of 2011 gives reference to biodiversity when describing when an area can be determined to be an Environmentally Protected Area, Section 24(4)(d) states that 'any special feature, cultural feature or biological diversity in the area' can be assessed in the declaration of an Environmentally Protected Area.<sup>570</sup> Section 24 states that in declaring an area an Environmentally Protected Area, the Minister shall have regard to the flora and fauna of the area and the interests of local communities.<sup>571</sup> Further acknowledgement of the role of local communities can be seen in Section 27(1)(e) of the Environmental Management Act No.13 of 2011 which states that guidelines can be made 'to respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities'. Section 27 also states that regulations can be made for the establishment of protected areas to conserve biological diversity, the protection of ecosystems, natural habitats and the promotion of environmentally sound and sustainable development in areas adjacent to protected areas with a view to furthering protection of the areas.<sup>572</sup> The Act gives regard not only to the protection of habitats, but also states that regulations can be made for 'the rehabilitation and restoration of degraded ecosystem and promotion of the recovery of threatened species'.<sup>573</sup> Under Section 27(1)(e) of the Environmental Management Act No.13 of 2011 it is stated that regulations can be made for 'the prevention of the introduction of, control or eradication of invasive alien species which threaten ecosystems, habitats or species'.<sup>574</sup> The sustainability, conservation and preservation of biodiversity is also covered within the The Zambia Wildlife Act No. 14 of 2015 where it is listed as one

<sup>561</sup> The National Biodiversity Strategy and Action Plan (2015-2020), Government of Tanzania, xii

<sup>562</sup> There is only one single mention of biodiversity within the act, see Section 230(2)(n) where biodiversity is contained within a list of regulations which can be made.

<sup>563</sup> National Parks Act 2003 (No. 11 of 2003) (Tanzania)

<sup>564</sup> Protection and conservation of areas with great biological diversity listed as one of the objectives, see National Wildlife Conservation Act No.5 of 2009, Section 5(1)(a) (Tanzania)

<sup>565</sup> National Wildlife Conservation Act No.5 of 2009, Section 1 (Tanzania)

<sup>566</sup> The Wildlife Conservation (Wildlife Management Areas) Regulations (2012), Section 18(m) (Tanzania)

<sup>567</sup> National Water Policy (2002), Section 2.8 (Tanzania)

<sup>568</sup> National Biodiversity Strategy and Action Plan, which is now on its section edition (2015-2025), v (Zambia)

<sup>569</sup> National Biodiversity Strategy and Action Plan, which is now on its section edition (2015-2025), 9 (Zambia)

<sup>570</sup> Environmental Management Act 2011 (No.13 of 2011) (Zambia)

<sup>571</sup> Environmental Management Act 2011 (No.13 of 2011) Section 24(4)(d) and (e) (Zambia)

<sup>572</sup> Environmental Management Act 2011 (No.13 of 2011) Section 27 (Zambia)

<sup>573</sup> Environmental Management Act 2011 (No.13 of 2011) Section 27(1)(f) (Zambia)

<sup>574</sup> An example of such regulations is the Zambia Wildlife (International Trade in Endangered Species of Wild Fauna and Flora) Regulations 2007. The regulations focus on the protection of endangered species of wild flora and fauna, enacting the provisions in the

of the functions of the National Parks and Wildlife Department.<sup>575</sup> The Act also states that the president may declare a National Park, upon consultation with the Minister and local community in the area, where the 'conservation or protection and enhancement of wildlife, eco-systems, biological diversity and natural beauty so demands'.<sup>576</sup> The National Water Policy refers to biodiversity, but only in relation to the sustainable use of the natural resources of Lake Tanganyika (Section 6.2) which does not give due regard to the importance of all watercourses, particularly the Zambezi, in the protection of biodiversity.<sup>577</sup> The Environmental Management Act also covers benefit sharing, stating that the Minister shall 'strive to attain the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of biological resources' (Sections 26-28). Offences relating to biodiversity are listed under Section 120 and include the trade in any component of biological resources, unlawful possession of biological resources and unlawfully disturbing the habitat of a biological resource.

**Zimbabwe:** There is no legislation specifically in relating to biodiversity in Zimbabwe. As with the other ZRB States, due to its obligations under the CBD, Zimbabwe does have in place a National Biodiversity Strategy and Action Plan (2014) and submits National reports to the Convention on Biodiversity. The mission of the National Biodiversity Strategy is 'to utilize traditional knowledge, research, technology, innovations and best practices to protect the environment, conserve and sustainably use biodiversity and ecosystems to benefit present and future generations'.<sup>578</sup> The conservation of and access to biological diversity is most comprehensively covered (as it specifically relates to biodiversity) in the Environmental Management Act 2002.<sup>579</sup> The Minister is authorized to take measures for the conservation of biodiversity including the preparation and maintenance of an inventory of biological diversity and means of preventing, removing or mitigating such affects.<sup>580</sup> Measures can also be devised for the better protection and conservation of wild fauna and flora.<sup>581</sup> Indigenous property rights of local communities and the importance of traditional knowledge are also stressed.<sup>582</sup> The Act further provides for the establishment of buffer zones near environmental protection areas<sup>583</sup> and regulates the control of invasive alien species.<sup>584</sup>

## Wildlife

**Angola:** There are two main pieces of legislation regulating wild animals in Angola: Decree No.40.040 Ruling on the Protection of Land, Flora and Fauna which provides protection to wild animals through a number of restrictions imposed and Decree 2:873 of 1957, a hunting regulation which details the requirements of a number of different hunting licenses. Both pieces of legislation date back to the colonial period. Although subsequent regulations and other environmental policies have since been enacted which provide coverage to wildlife, legislation remains fragmented and uncomprehensive. Decree 40.040 aims to provide protection to land, flora and fauna through a requirement for hunting licenses. The decree details a number of species which fall under its remit and fines for illegal hunting are legislated for in a number of additional statutes. The species listed within the Annex I cannot be hunted without a license and Annex II lists those which can be hunted. This list of species contains not only those animals which are indigenous to Angola, but to all Portuguese colonies to which it applied at the time of enactment (DLA Piper, 2015). Decree 43/77, enacted in 1977 added forestry and national park regulations to Decree No.40:040 and revoked some parts of the existing legislation (DLA Piper, 2015) although research has not demonstrated which sections

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CITES convention. The regulations focus on the trade in species as listed in the first schedule of the act, prohibiting their possession, export, re-export, import or movement in any way other than as regulated by the Zambia Wildlife (International Trade in Endangered Species of Wild Fauna and Flora) Regulations 2007, Section 3(1).

<sup>575</sup> The Zambia Wildlife Act 2015 (No. 14 of 2015), Section 5(2)(c) (Zambia)

<sup>576</sup> The Zambia Wildlife Act 2015 (No. 14 of 2015), Section 11 (Zambia)

<sup>577</sup> National Water Policy 2010, Government of Zambia

<sup>578</sup> National Biodiversity Strategy and Action Plan (2014), Section 5.1

<sup>579</sup> Environmental Management Act 2002 (No. 13 of 2002) (Zimbabwe)

<sup>580</sup> Environmental Management Act 2002 (No. 13 of 2002), Section 116 (1) (c) and (d) (Zimbabwe)

<sup>581</sup> Environmental Management Act 2002 (No. 13 of 2002) Section 116(1)(e) (Zimbabwe)

<sup>582</sup> Environmental Management Act 2002 (No. 13 of 2002) Section 116(1)(i) and (j) (Zimbabwe)

<sup>583</sup> Environmental Management Act 2002 (No. 13 of 2002), Section 116 (2)(c) (Zimbabwe)

<sup>584</sup> Environmental Management Act 2002 (No. 13 of 2002), Section 118 – 127 (Zimbabwe)

have been revoked. Decree 2:873 of 1957 is specifically a hunting regulation and defines hunting areas, game reserves and protected zones. Types of licenses are specified and differ between Angolan citizens and non-citizens. Some types of licenses allow elephant hunting, provided that the ivory is over 5kg (TRAFFIC, 2006).<sup>585</sup> Authorities must be informed within 30 days of the killing of an elephant, rhinoceros or hippopotamus who subsequently confirm that the killing was legal and conducted with the relevant hunting license. A permit will then be issued if the hunter wishes to keep the trophy (TRAFFIC, 2006). Ivory sales are, however, not allowed unless properly permitted. A further resolution No. 1/10 of 14 January 2010 details general guidelines for wildlife protection, however the guidelines are unclear and detail only intentions but no specific means of implementation.

**Botswana:** The principle legislation covering wildlife is The Wildlife Conservation and National Parks Act (1992) under which numerous regulations have been adopted. Some of the regulations are general, concerning hunting and licensing conditions, others are more specific providing protection for a particular species or regulating protected areas. The Act expressly grants ownership of wild animals to the owner of the land on which the animals are kept or confined using a game-proof fence.<sup>586</sup> The President has the power to declare any area of state land as a national park, under Section 5. The responsibility of controlling, managing and maintaining national parks falls to the Minister, who is also able to make regulations, control entry to national parks for tourism and research and let sites for the erection of shops, hotels, restaurants or other tourism purposes.<sup>587</sup> The Wildlife Conservation Policy of 1986 covers the utilization of wildlife outside of protected areas. Hunting is allowed outside of protected areas as long as the harvesting of wildlife resources is sustainable, however under the Wildlife Conservation and National Parks Act, hunting without license is only permitted by citizens of Botswana for non-designated animals, outside of protected areas, for consumption by himself or his dependents.<sup>588</sup> The hunting and killing of elephants is strictly regulated under the 1992 Act, while the hunting of a rhinoceros is banned.<sup>589</sup> Certain species are declared as protected game and cannot be hunted except with a permit issued by the director.<sup>590</sup> The Act also designates certain species as partially protected which may not be hunted unless a permit has been issued.<sup>591</sup> Elephants are listed within the act as partially protected animal which can be hunted under a license.<sup>592</sup> Commercial hunting in national parks, game reserves and sanctuaries is prohibited, however can be granted for scientific purposes, the protection of life or property, or in the interests of the conservation, management, control or utilization of wildlife. Commercial hunting is allowed in wildlife management areas which are not within national parks and in private game reserves by the owner or with the owner's permission.<sup>593</sup> Landholders privileges are therefore given to owners of private land or occupiers of leased land, provided that they are Botswana citizens or companies registered in Botswana of which the majority of shareholders are citizens (Sections 20-22). If a person has landholder privileges, any animal other than those protected or partially protected may be hunted without a license or permit. The landholder/occupier may charge fees from the person hunting, with permission of the director. An owner or leaseholder of land may also apply for permission to establish a game farm or game ranch (Sections 24 and 25) subject to conditions given by the Director and regulations made by the Minister. A rancher is then entitled to farm, ranch, hunt or capture animals on their land for commercial purposes.<sup>594</sup> However, a temporary hunting ban was introduced in 2014 which stopped any quotas, licenses or permits being granted for the hunting of part 1 and 2 schedule game animals in the

<sup>585</sup> See 'Hunters issued these permits were not allowed to shoot elephants with ivory that weighed less than five kilograms, but it remains ambiguous whether this specification related to each tusk independently or the combined weight of both tusks.' (TRAFFIC, 2006) Pg. 9

<sup>586</sup> The Wildlife Conservation and National Parks 1992 (No. 28 of 1992), Section 207 (Botswana)

<sup>587</sup> The Wildlife Conservation and National Parks 1992 (No. 28 of 1992), Section 6(1) (Botswana)

<sup>588</sup> The Wildlife Conservation and National Parks 1992 (No. 28 of 1992), Section 19 (Botswana)

<sup>589</sup> The Wildlife Conservation and National Parks 1992 (No. 28 of 1992), Section 67 (Botswana)

<sup>590</sup> The Wildlife Conservation and National Parks 1992 (No. 28 of 1992), Schedule 7, Section 18 (Botswana)

<sup>591</sup> The Wildlife Conservation and National Parks 1992 (No. 28 of 1992), Section 18 (Botswana)

<sup>592</sup> The Wildlife Conservation and National Parks 1992 (No. 28 of 1992), Section 18 (Botswana)

<sup>593</sup> The Wildlife Conservation and National Parks 1992 (No. 28 of 1992), Section 39(2) (Botswana)

<sup>594</sup> The Wildlife Conservation and National Parks 1992 (No. 28 of 1992), Section 24 (Botswana)

Act and is still in place.<sup>595</sup> Prior to the introduction of the complete hunting ban, orders had already been put in place to prohibit killing of lions<sup>596</sup> and cheetahs.<sup>597</sup>

**Malawi:** The National Parks and Wildlife Act (2004) sets out the institutional arrangements for wildlife protection in Malawi including declaration of national parks, wildlife reserves, hunting, trade in wildlife and EIAs.<sup>598</sup> Possession, sale and purchase of specimens of protected species constitutes an offence, unless the specimen has been lawfully taken and a certificate of ownership has been obtained.<sup>599</sup> Trade in live animals requires a live animal dealer's permit, which may be issued under the National Parks and Wildlife (Control of Trade in Live Animals) Regulations (1994). Although hunting in protected areas is generally banned, Section 35 of the National Parks and Wildlife Act (2004) makes it allowable under certain conditions, which are largely up to the discretion of the administration. Where a person is granted permission to 'harvest' a wildlife resource, the Chief Wildlife Officer may issue authority to any person for this purpose and must ensure that the annual harvest does not exceed sustainable yield level, unless otherwise determined by the minister for management purposes (Section 39).

**Mozambique:** The new Conservation Law No.16 of 2014 is aimed at implementing stricter legislation on the protection, conservation and sustainable use of wildlife in Mozambique. It provides coverage for the management of conservation areas, protected zones, recovery and restoration of biological diversity, endangered species resettlement and addition inspection and sanctions regimes (DLA Piper, 2015). However, there are a number of demonstrable gaps in the legislation, namely the penalties imposed do not apply to illegal trafficking in wildlife or wildlife products and the legislation does not detail which animals are 'protected' (DLA Piper, 2015). The enactment of the legislation does however demonstrate the willingness of the country to put in place more sufficient legislation. The Forest and Wildlife Law<sup>600</sup> establishes the principles and basic norms on the protection, conservation and sustainable use of forest and wildlife resources and is implemented by the Forests and Wildlife Regulations 2000.<sup>601</sup> The legislation states that those who have provoked a decline in wild animals have an obligation to repopulate (Section. 29). It also states that wildlife ranching may be exercised in duly identified areas, in observance of a management plan.<sup>602</sup> Wildlife ranching operators should also prepare an inventory of existing wildlife resources, and install safety facilities for dangerous animals, as determined by the Hunting Regulations, Section 84. The Forest and Wildlife Law places a responsibility on all citizens, and in particular the local management councils and license holders, to collaborate in monitoring for the protection of wildlife and notify the nearest authority of any violation of wildlife law.<sup>603</sup> The wildlife regulation allocates 50% of the fines for violations of forest and wildlife law to the law enforcement officers and community agents that contributed to the detection of the violation, and to the local communities or individual citizens that denounced the violation.<sup>604</sup> Wildlife law enforcement officers benefit from a subsidy for risk corresponding to 20% of the basic salary.<sup>605</sup> This therefore creates an incentive for local communities to participate in the conservation of wildlife species.

The Conservation Law of 2014 did not repeal the Forestry and Wildlife Law and as a result it is not clear whether both frameworks will continue to be in operation. The Forest and Wildlife Law classifies

<sup>595</sup> Wildlife Conservation and National Parks (Prohibition of Hunting, Capturing or Removal of Animals) Order 2015 (S.I. 2 of 2015) (Botswana)

<sup>596</sup> Wildlife Conservation and National Parks (Lions)(Killing Restriction) Order (S.I. 27 of 2005) (Botswana)

<sup>597</sup> Wildlife Conservation and National Parks (Cheetahs) (Killing Suspension) Order (S.I. 26 of 2005) (Botswana)

<sup>598</sup> National Parks and Wildlife Reserves Act 1992 (No.11 of 1992) (as amended by National Parks and Wildlife (Amendment) Act 2017 (No.11 of 2017) (Malawi)

<sup>599</sup> National Parks and Wildlife Reserves Act 1992 (No.11 of 1992) (as amended by National Parks and Wildlife (Amendment) Act 2017 (No.11 of 2017), Sections 86 and 88 (Malawi)

<sup>600</sup> The Forest and Wildlife Law 1999 (No.10 of 1999) (Mozambique)

<sup>601</sup> Forests and Wildlife Regulations 2000 (Decree No.12 of 2000) (Mozambique) There is also a Policy and Development Strategy for Forests and Wildlife (1997) which promotes community participation in natural resource management, aiming to decentralize the authority of natural resource management and recognize the rights of local communities in conserving both forests and wildlife resources.

<sup>602</sup> The Forest and Wildlife Law 1999 (No.10 of 1999), Section 20 (Mozambique)

<sup>603</sup> The Forest and Wildlife Law 1999 (No.10 of 1999), Section 37 (Mozambique)

<sup>604</sup> The Forest and Wildlife Law 1999 (No.10 of 1999), Section 112 (Mozambique)

<sup>605</sup> The Forest and Wildlife Law 1999 (No.10 of 1999), Section 113 (Mozambique)

Protected Areas as national parks<sup>606</sup>, national reserves<sup>607</sup> and areas of historic-cultural use or value. The Wildlife Decree No 12 of 2002 prohibits the hunting of 'protected species' which it lists in Annex II along with the relevant fine for each species. The Conservation Law enacted stricter penalties for wildlife crime and particularly the poaching of protects and endangered species.<sup>608</sup> The law does however have in place provision for discretion in imposing such sentences, although it is not possible to state at this stage to what extent that may be utilized.<sup>609</sup> Buffer zones in which multiple uses may be allowed may be established around PAs by the Council of Ministers.<sup>610</sup> In national parks – which may be created for the protection, reproduction, conservation and management of wildlife – and in national reserves – which may be created for the complete protection of certain rare, endemic, threatened wildlife species – hunting is prohibited.<sup>611</sup> The Forestry and Wildlife Law puts in place three types of permissible hunting; hunting under a simple license, sport hunting and commercial hunting. Similarly, the Conservation Law, Sections 28 to 35 put in place provision for three modes of hunting, the biggest change from the Forestry and Wildlife Law is that the simple license has the additional detail of 'sustainable hunting on the basis of a simple license by local communities in accordance with customary norms and practices'.<sup>612</sup> The Forest and Wildlife Law also recognizes the participation of local communities, stating that communities should be involved in the creation of protected areas.<sup>613</sup> Section 24 also states that wildlife in areas of historic-cultural use and value may be used in accordance with the cultural practices of the concerned communities. These include areas in which wildlife is used for religious practices.<sup>614</sup>

**Namibia:** There are few pieces of legislation which cover wildlife protection in Namibia. The Environmental Management Act<sup>615</sup> provides an overall framework for the management of natural resources, while the Nature Conservation Ordinance (1975)<sup>616</sup> outlines hunting regulations and the Nature Conservation Amendment Act (1996)<sup>617</sup> introduced laws and regulations for community led conservancies. Under the Nature Conservation Ordinance, the Minister is responsible for the control, management and maintenance of game parks and nature reserves.<sup>618</sup> A number of activities are prohibited within game parks and nature reserves, including removal or disturbance of any animals.<sup>619</sup> Permission to enter game parks and hunting within such areas is allowed under certain conditions, for hunting this is limited to the written permission of the Minister.<sup>620</sup> Private game parks and nature reserves can be established,<sup>621</sup> the owner of such an area is permitted to hunt animals, except specially protected and protected game.<sup>622</sup> Restrictions may be put in place, by the Minister, on the species or sex of game which may be hunted,<sup>623</sup> while the hunting of specially protected game is expressly prohibited, except in instances where the person is the holder of a permit granted by the Minister.<sup>624</sup> Similar restrictions are in place for the hunting of protected game, however penalties for

<sup>606</sup> National parks are defined as 'zones of total protection for the propagation, protection, conservation and management of vegetation and wildlife, and for the protection of local landscape and geological formations of particular scientific, cultural and aesthetic value representative of the national heritage for public recreation.' The Forest and Wildlife Law 1999 (No.10 of 1999, Section 11 (Mozambique))

<sup>607</sup> National reserves are defined as 'zones of total protection for protecting rare, endemic and/or endangered species of flora and fauna and fragile ecosystems (e.g. wetlands, dunes, mangroves and coral reefs)' The Forest and Wildlife Law 1999 (No.10 of 1999, Section 12 (Mozambique))

<sup>608</sup> Wildlife Conservation Law, 2014 (No.16 of 2014), Section 62 (Mozambique)

<sup>609</sup> Wildlife Conservation Law, 2014 (No.16 of 2014), Section 53(2) (Mozambique)

<sup>610</sup> The Forest and Wildlife Law 1999 (No.10 of 1999, Section 10 (Mozambique))

<sup>611</sup> The Forest and Wildlife Law 1999 (No.10 of 1999, Section 11-12 (Mozambique))

<sup>612</sup> Wildlife Conservation Law, 2014 (No.16 of 2014), Section 29 (Mozambique)

<sup>613</sup> The Forest and Wildlife Law 1999 (No.10 of 1999, Section 13 (Mozambique))

<sup>614</sup> Forests and Wildlife Regulations 2000, Section 7

<sup>615</sup> Environmental Management Act 2007 (No. 7 of 2007) (Namibia)

<sup>616</sup> Nature Conservation Ordinance 1975 (No. 4 of 1975) (Namibia)

<sup>617</sup> Nature Conservation Amendment Act 1996 (No. 5 of 1996)

<sup>618</sup> Nature Conservation Ordinance 1975 (No. 4 of 1975), Section 17 (Namibia)

<sup>619</sup> Nature Conservation Ordinance 1975 (No. 4 of 1975), Section 18 (Namibia)

<sup>620</sup> Nature Conservation Ordinance 1975 (No. 4 of 1975), Section 20 (Namibia)

<sup>621</sup> Nature Conservation Ordinance 1975 (No. 4 of 1975), Section 22 (Namibia)

<sup>622</sup> Nature Conservation Ordinance 1975 (No. 4 of 1975), Section 23 (Namibia)

<sup>623</sup> Nature Conservation Ordinance 1975 (No. 4 of 1975), Section 25 (Namibia)

<sup>624</sup> Nature Conservation Ordinance 1975 (No. 4 of 1975), Section 26 (Namibia)

offending are less severe than those for specially protected game.<sup>625</sup> Specially protected game include Giraffe, Rhinoceros, Hippopotamus, Mountain Zebra and Elephant.<sup>626</sup> Cheetah, Leopard, Eland and Lion are included within the list of protected game.<sup>627</sup> A draft Parks and Wildlife Management Bill has been in preparation since the 1990s, which aims to protect all indigenous species and control the exploitation of all plants and wildlife. The preamble of the bill states that it will give effect to Article 95 of the Namibian Constitution and establish a legal framework which provides for and promotes the maintenance of ecosystems, essential ecological processes and biological diversity of Namibia. If the proposed act does come into force it will repeal the existing Nature Conservation Ordinance 1975 which currently regulates wildlife. The Forest Act (2001) used to govern community-based forest management could arguably also involve the management of wild animals as 'living organisms' found in forests are considered part of 'forest produce'.<sup>628</sup>

**Tanzania:** The main legal and policy frameworks regulating wildlife in Tanzania is the Wildlife Policy (2007), The Wildlife Conservation Act<sup>629</sup> and the Wildlife Conservation (Wildlife Management Areas) Regulations (2012). The Wildlife Policy of 2007 recognizes the role of local communities for the first time and urges Government to create a legal, institutional and regulatory way for rural communities to benefit from the use of wildlife resources. All animals in Tanzania are public property and vested in the President as a trustee for the people of Tanzania.<sup>630</sup> General Management Plans are to be prepared in relating to any wildlife protected area.<sup>631</sup> Any 'significant physical development' in a wildlife protected area and wildlife management area, buffer zone, migratory route or dispersal area must have an EIA of the proposed development prepared and submitted to the Minister. Section 18(1) of the Wildlife Conservation Act also gives protection to other vegetation such as grass, bush, tree or seeding. A person cannot hunt any animal or fish within a game reserve, game controlled area or wetland reserve without the written permission of the Director.<sup>632</sup> Other restrictions within game reserves, wetlands or game controlled areas include trapping or wounding of any animal and crop cultivation.<sup>633</sup> Species Management areas are protected under Section 23 which states that a Species Management Area shall be established for the purpose of protecting an animal or class of animals or their habitat. Section 24 declares it an offence to kill, wound or injure protected species in any way. A person shall not hunt or kill the young of any animal or any female animal which is apparently pregnant or accompanied by its young.<sup>634</sup> Section 22(a) states that the Minister may, in consultation with relevant local authorities, designate wildlife corridors, dispersal areas, buffer zones and migratory routes. Hunting blocks are established in Section 38 and a professional hunters license can be issued under Section 48, subject to conditions. Special licenses can be granted for the hunt, capture or photograph of animals specified in the license for scientific research; display in a museum; education activity; cultural activity or supply of food in the case of an emergency,<sup>635</sup> provided it does not violate any international instrument for the conservation and management of wildlife or natural resources that the Government has ratified. A special license cannot be used for commercial purposes or for personal gain. Restrictions are also placed on the methods of hunting in Section 65, including preventing hunting during the hours of darkness.<sup>636</sup> Restrictions are also placed on the movement and disposal of animal carcass in Section 65(2). Any hunting trophies must be produced within 30 days with the license used to obtain it for registration and certificate of ownership.<sup>637</sup> Trophies cannot be sold without a trophy dealer certificate and the import and export of trophies is regulated under CITES.<sup>638</sup> The Wildlife Conservation Act also established Wildlife Management Areas outside of core protected areas which are used by local communities and within village land,

<sup>625</sup> Nature Conservation Ordinance 1975 (No. 4 of 1975), Section 27 (Namibia)

<sup>626</sup> Nature Conservation Ordinance 1975 (No. 4 of 1975), Schedule 3 (Namibia)

<sup>627</sup> Nature Conservation Ordinance 1975 (No. 4 of 1975), Schedule 4 (Namibia)

<sup>628</sup> Forest Act 2001 (No. 12 of 2001) (as amended by the Forest Amendment Act 2005)

<sup>629</sup> Wildlife Conservation Act 2009 (No. 5 of 2009) (Tanzania)

<sup>630</sup> Wildlife Conservation Act 2009 (No. 5 of 2009), Section 4(1) (Tanzania)

<sup>631</sup> Wildlife Conservation Act 2009 (No. 5 of 2009), Section 34 (Tanzania)

<sup>632</sup> Wildlife Conservation Act 2009 (No. 5 of 2009), Section 19(1) (Tanzania)

<sup>633</sup> Wildlife Conservation Act 2009 (No. 5 of 2009) Section 20(1) (Tanzania)

<sup>634</sup> Wildlife Conservation Act 2009 (No. 5 of 2009), Section 56(1) (Tanzania)

<sup>635</sup> Wildlife Conservation Act 2009 (No. 5 of 2009), Section 58(1) (Tanzania)

<sup>636</sup> Wildlife Conservation Act 2009 (No. 5 of 2009), Section 65(c)(iv) (Tanzania)

<sup>637</sup> Wildlife Conservation Act 2009 (No. 5 of 2009), Section 78(1) (Tanzania)

<sup>638</sup> Wildlife Conservation Act 2009 (No. 5 of 2009), Section 80 (Tanzania)

recognizing the need to give consideration to local communities living adjacent to protected areas, suffering the cost of wildlife conservation, without gaining any benefit.<sup>639</sup> Under Section 45 the Director may grant a traditional community a license to hunt a specified number of animals as may be specified in the license. Mining within a game reserve, wetlands reserve or game controlled area is permitted if for oil, gas or uranium providing that an EIA has been conducted in accordance with the Environment Management Act, protection cost has been paid by the investor, concession free has been paid in accordance with regulations set by the Minister and that the Government is the initiator of the project.<sup>640</sup> The Minister also has the ability to declare a closed season under Section 27.

**Zambia:** The *Zambian Wildlife Act*<sup>641</sup> is the principle legislation for wildlife conservation and was enacted due to the elevated threat of illegal wildlife poaching and trafficking within Zambia. The Act vests all wild animals in the President, on behalf of the Republic, with the exception of animals which are lawfully captured or killed by a person and the ownership of the animal is subsequently transferred.<sup>642</sup> The Act establishes National Parks, Community Partnership Parks, Bird and Wildlife Sanctuaries and Game Management Areas.<sup>643</sup> Community Partnership Parks can be established on application of a local community, person or institution for an area which has an environmental, ecological or scientific value.<sup>644</sup> The partnership agreement allows the parties to the partnership to administer the traditional user rights of the local community, in accordance with sustainable wildlife management and conservation and generally conserve, protect and manage the park.<sup>645</sup> It is an offence to hunt or disturb a wild animal or fish in a National Park or Community Partnership Park, without the appropriate hunting license, capture permit or fishing permit.<sup>646</sup> Areas can be declared as Game Management Areas under Section 28 within which hunting is also prohibited without the appropriate license. The provision declaring the prohibition of hunting in Game Management Areas excludes Elephants and Rhinoceros from its remit.<sup>647</sup> Hunting of Elephants and Rhinoceros is expressly prohibited and can have a penalty of between 5 and 10 years imprisonment for a first time offence and between 10 and 25 for a subsequent offence.<sup>648</sup> Game animals are specified as protected where it is necessary to preserve a viable population of the species; where it becomes rare, threatened or endangered; for its role in the maintenance and assessment of the health of an eco-system; for its economic significance; or to preserve populations of endemic species.<sup>649</sup> No list of those species which are 'protected' within the remit of the Act is provided. A number of licenses can be granted under Section 39, including a hunting license which can also permit a Zambian to be employed in assisting the licensee for hunting purposes.<sup>650</sup> The hunting of young game animals, protected animals, female game or protected animals accompanied by her young is expressly prohibited.<sup>651</sup> Hunting on private land is permitted with the owner's permission.<sup>652</sup> The use of certain methods for hunting and hunting during hours of darkness is also prohibited.<sup>653</sup>

**Zimbabwe:** The main legislative framework for wildlife management is the *Parks and Wildlife Act*<sup>654</sup> which establishes six categories of protected area; national parks; safari areas; recreational parks; sanctuaries; botanical reserves and botanical gardens.<sup>655</sup> The Act delegates all resource rights and responsibility for wildlife management to legally authorized land occupants. In 1989 Zimbabwe also put in place a benefit sharing programme called CAMPFIRE which focused on communal areas

<sup>639</sup> Wildlife Conservation Act 2009 (No. 5 of 2009), Section 31(1) (Tanzania). For further details of Wildlife Management Areas see The Wildlife Conservation (Wildlife Management Areas) Regulations 2012

<sup>640</sup> Wildlife Conservation Act 2009 (No. 5 of 2009), Section 20(4) (Tanzania)

<sup>641</sup> Zambia Wildlife Act 2015 (No. 14 of 2015) (Zambia)

<sup>642</sup> Zambia Wildlife Act 2015 (No. 14 of 2015), Section 3 (Zambia)

<sup>643</sup> Zambia Wildlife Act 2015 (No. 14 of 2015), Section 11 (Zambia)

<sup>644</sup> Zambia Wildlife Act 2015 (No. 14 of 2015), Section 12 (Zambia)

<sup>645</sup> Zambia Wildlife Act 2015 (No. 14 of 2015), Section 12 (Zambia)

<sup>646</sup> Zambia Wildlife Act 2015 (No. 14 of 2015), Section 19 (Zambia)

<sup>647</sup> Zambia Wildlife Act 2015 (No. 14 of 2015), Section 31 (Zambia)

<sup>648</sup> Zambia Wildlife Act 2015 (No. 14 of 2015), Section 36(2), Section 127 (Zambia)

<sup>649</sup> Zambia Wildlife Act 2015 (No. 14 of 2015), Section 36(2) (Zambia)

<sup>650</sup> Zambia Wildlife Act 2015 (No. 14 of 2015), Section 40 (3) (Zambia)

<sup>651</sup> Zambia Wildlife Act 2015 (No. 14 of 2015), Section 65 (Zambia)

<sup>652</sup> Zambia Wildlife Act 2015 (No. 14 of 2015), Section 64 (Zambia)

<sup>653</sup> Zambia Wildlife Act 2015 (No. 14 of 2015), Section 71, 72 and 73 (Zambia)

<sup>654</sup> Parks and Wildlife Act 1975 (No 14 of 1975) (Zimbabwe)

<sup>655</sup> Parks and Wildlife Act 1975 (No 14 of 1975) Parts III-VIII (as amended, 2001) (Zimbabwe)



adjacent to protected areas. National Parks and Sanctuaries can be declared by presidential notice<sup>656</sup> and while hunting within sanctuaries is prohibited but can be allowed under certain conditions as detailed in Section 33. Safari areas are, expectedly, aimed towards tourism and can be created for the 'camping, hunting and viewing of animals'.<sup>657</sup> Hunting in these areas requires a permit which can be issued either for the management and control of animal populations, for conservation purposes, or to guests of the state.<sup>658</sup> Animals which are granted special protection are listed in a schedule appended to the act, the hunting of such animals can be authorized for scientific purposes, for management and control or in the interest of conservation.<sup>659</sup> Specially protected animals include Rhinoceros and Cheetah,<sup>660</sup> while Buffalo, Elephant, Hippopotamus and Leopard are listed as Dangerous Animals under Schedule 9 (Section 121). However, a large degree of discretion remains up to the court and lesser penalties can be given should the potential offender be able to convince the court there were 'special circumstances'.

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<sup>656</sup> Parks and Wildlife Act 1975 (No 14 of 1975), Section 22(1),(4) and 31 (Zimbabwe)

<sup>657</sup> Parks and Wildlife Act 1975 (No 14 of 1975), Section 35-36 (Zimbabwe)

<sup>658</sup> Parks and Wildlife Act 1975 (No 14 of 1975), Section 39 (Zimbabwe)

<sup>659</sup> Parks and Wildlife Act 1975 (No 14 of 1975), Section 43 and 36 (Zimbabwe)

<sup>660</sup> Parks and Wildlife Act 1975 (No 14 of 1975), Schedule 6 (Zimbabwe)

