

**SECTION 7**

**FLORA AND FAUNA**

**LA FAUNE ET LA FLORE**



# CHAPTER 19: A PARADIGM SHIFT IN THE LEGAL PROTECTION OF BIODIVERSITY IN CAMEROON

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## 1 Introduction

Cameroon's biodiversity is a composite of a wide diversity of plant and animal species and ecosystems including one of the most intact forest ecosystems in the world and of invaluable support to the livelihood of its people. As a complex dynamic system with diverse values and interests that generate ecological, economic and social relationships, this system and its relationships are regulated by policy, legal and regulatory instruments.

The arsenal of new legal and institutional tools that characterise the current framework for the protection of Cameroon's biodiversity is a paradigm shift from two parallel global and national processes. With the introduction of the concept of sustainability in development came the emergence within the last three decades of multilateral and regional environmental agreements of national import in the conservation, sustainable use and sharing of benefits from its biodiversity and ecosystem services. In a parallel process, the upsurge of a national quest for urgent responses to development challenges in the fight against poverty brought shifts from obsolete and fragmentary legal instruments to an array of national policy, legislative and institutional tools with innovative mechanisms and traditional norms to boost the natural resource industries and reduce negative impacts of sectoral activities and development projects.

Notwithstanding the significant progress in developing biodiversity related global and national legal instruments, the loss of valuable plant and animal species, loss of habitat, genetic erosion and ecosystem degradation continue with the unsustainable and inequitable utilisation of biodiversity. Findings from various assessments globally and nationally highlight or confirm this trend. Globally, the Millennium Ecosystem Assessment commissioned by the United Nations, highlighted the unprecedented loss of biodiversity and decline in ecosystem services caused by human activity over

the last 50 years.<sup>1</sup> The decline in biodiversity is also highlighted in the periodic assessments carried out by the Convention of Biological Diversity<sup>2</sup>, continuous decline of biodiversity with significant habitat loss is highlighted in the Global Environment Outlook of the United Nations Environment Programme (UNEP).<sup>3</sup> Although there is an increase in awareness and shared responsibility in addressing the key drivers of biodiversity loss, the extrapolation for a range of indicators for the global biodiversity targets within the Global Biodiversity Outlook,<sup>4</sup> suggests that based on current trends, pressures on biodiversity will continue to increase at least until 2020, thus the status of biodiversity will continue to decline which urgently calls for accelerated collective action.

Various assessments of the state of the nation's biodiversity<sup>5</sup> highlight a corresponding loss and threat from multiple drivers. This trend is expected to hamper current national efforts in promoting the well-being of its people and the national economy. From the current trajectory of Cameroon's development within its 2035 vision for emergence<sup>6</sup> and the productivity options of its rural production sector largely dependent on biodiversity, there is an expected increase in pressure on biodiversity. The negative impact of biodiversity loss for the development processes will equally have a most severe negative impact on vulnerable people and local communities who depend on natural resources for their livelihoods. This regressive trend will further hinder the attainment of internationally and nationally agreed targets to reduce significantly the rate of biodiversity loss by 2020.

In recognising the importance of the current shift to an innovative legal architecture, addressing challenges of legal effectiveness and efficiency within this paradigm is a concern of environmental legal experts and organisations.<sup>7</sup> This chapter has been prepared as a contribution to the current reflection process carried out within the Konrad-Adenauer-Stiftung in 2017. In setting the scene for this, a focused attention has been given to understanding the biodiversity related multilateral instruments of national import in the national legal architecture and the arsenal of nationally developed legal tools, customs and practice as well as governance options within the design of these instruments.

As the outcome of an on-the desk study, this chapter provides in this present section, an introduction with the contextual setting for the work. In the following section, an analysis of the shifts in global processes will be provided, followed by a dis-

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- 1 Millennium Ecosystem Assessment (2005a) and (2005b); Ash et al. (2010).
  - 2 CBD (2010).
  - 3 UNEP (2012).
  - 4 CBD (2014).
  - 5 Republic of Cameroon (2014); MINEPDED (2012).
  - 6 Republic of Cameroon (2009).
  - 7 Onang Egute et al. (2015).

discussion on the emergence of novel national tools that set policy options, legal and regulatory prescriptions that establish mechanisms and define conditions for protecting biodiversity. The chapter then highlights current challenges in ensuring effectiveness and efficiency and, in conclusion, proposes options for an implementation structure likely to strengthen the current dynamics within the paradigm of the new legal structure for biodiversity protection.

## 2 Shifts in internalised global norms

Positive shifts in the internalisation of international norms into the national legal architecture for protecting biodiversity highlight the critical role of legal norms in translating the Recommendations of the Brundtland Commission of 1987<sup>8</sup> on the link between environment and development into binding commitments by states. Cameroon's active engagement in international negotiations, its key role as part of lead negotiators for the UN Africa Region in the negotiations and adoption of major biodiversity related conventions and protocols, generated a national process with the political momentum resulting in national ratification or adherence to the multiple multilateral environmental agreements to which Cameroon is a party. The fundamental role of these norms and practices as part of the national legal framework for the protection of biodiversity is of constitutional prescription<sup>9</sup> in the Preamble which provides:

...affirm our attachment to the fundamental freedoms enshrined in the Universal Declaration of Human Rights, the Charter of the United Nations and The African Charter on Human and Peoples' Rights, and all duly ratified international conventions relating thereto...

- every person shall have a right to a healthy environment. The protection of the environment shall be the duty of every citizen. The State shall ensure the protection and improvement of the environment...

Of overarching importance is the ratification by Cameroon of the 1992 Convention on Biological Diversity (CBD) which provides the framework for global action on biodiversity with the objective to ensure the conservation of biodiversity, the sustainable use of its components and the fair and equitable sharing of benefits arising from the utilisation of genetic resources. The strategic approach of the CBD to safeguard biodiversity and its benefits is defined by the 2011-2020 Strategic Plan and its 20 Aichi targets.<sup>10</sup> This instrument and its strategic orientation have provided the fundamental basis for developing major national policy and legal tools, assessing and

8 World Commission on Environment and Development (1987).

9 Preamble of Law No. 96/08 of 18 January 1996.

10 CBD (2013).

reporting on the application and impacts of the instruments in ensuring the conservation and sustainable use of the nation's rich natural heritage.

The objectives of the CBD further find emphasis in the 2000 Cartagena Protocol on Biosafety which seeks to ensure an adequate level of protection in the safe movement and use of living modified organisms from biotechnology likely to adversely affect biodiversity.

A new and innovative norm introduced with the entry into force of the 2010 Nagoya Protocol recognises the contribution of genetic resources and information from genetic material in promoting research and development in fast growing pharmaceutical, cosmetic, biotech and food industries and the inadequate contribution of its benefits to conservation. By obligating prior informed consent for access and mutually agreed terms in sharing benefits with providers and holders of traditional knowledge (TK) associated with genetic resources, a major transformative shift is expected towards an increase in the contribution of research and development to conservation efforts and the valorisation of traditional knowledge. In recognising national sovereignty and competence in defining conditions for access and benefit sharing, this innovative tool has triggered a recent ambitious process of developing a national legal regime for an ABS system.<sup>11</sup>

An analysis of the focus of other major biodiversity related multilateral agreements introduced by acts of ratification or adhesion confirm the contribution of international legal tools in shaping national responses and intervention actions in the protection of national critical ecosystems,<sup>12</sup> endangered species,<sup>13</sup> crimes on protected species and trade in endangered species,<sup>14</sup> specific uses of genetic resources<sup>15</sup> and major threats to biodiversity.<sup>16</sup> Successful legal outcomes of internalised international norms equally comprise regional level environmental agreements of general application or specific to species or fragile ecosystems and to which Cameroon is a party.

Within these multilateral environmental agreements different types of governance structures within which Cameroon has participated actively have emerged. These have been established as governing bodies, standing or Ad-hoc subsidiary advisory

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11 Galega (2017).

12 Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar) 1971; Convention on the Law of the Sea 1973.

13 Convention on Migratory Species of Wild Animals 1979; Convention on the Protection of World Heritage, Culture and Nature 1972.

14 Convention on International Trade in Endangered Species of Wild Plants and Animals 1973.

15 International Treaty on Plant Genetic Resources for Food and Agriculture 2001.

16 Convention on Oil Pollution Preparedness, Response and Co-operation 2001; Convention on the Control of Transboundary Movements and Disposal of Hazardous Wastes 1989; Convention on Climate Change 1992 and its Kyoto Protocol; Convention to Combat Desertification 1994.

bodies to provide scientific and technical advice, and inter-governmental platforms to inform global decision-making processes on biodiversity.

The existing national compendium of norms of international import and direct application provides core elements in defining biodiversity specific principles, measures and procedures and in shaping multiple levels of governance systems in the protection of biodiversity. The National Biodiversity Strategy and Action Plan version II (NBSAP II) recognises the significance of these international norms in providing the framework for international and regional cooperation in the protection and valorisation of Cameroon's biodiversity as well as regional legal tools in the management of shared trans-boundary ecosystems. This recognition is highlighted with the identification of 21 biodiversity-related international agreements and 21 regional agreements ratified by Cameroon and demonstrates a long-standing national commitment to collectively defined norms.<sup>17</sup>

The emphasis on the need for sustainability in the choices of key development sectors in the recently adopted 2030 Agenda for Development and the Sustainable Development Goals highlights the need for greater attention in ensuring effective compliance with the nation's commitments to the norms of the plethora of ratified biodiversity related international agreements.

### 3 Innovative shifts in national legal tools

National efforts to ensure compliance with commitments to international norms and the national quest for urgent responses to address poverty challenges brought shifts from obsolete and fragmentary legal instruments to an array of national policy, legislative and institutional outcomes. These have defined innovative approaches, mechanisms and traditional norms to boost the natural resource industries and seek to reduce negative impacts of sectoral activities on biodiversity, recognised as a common heritage that should contribute to national development.

#### 3.1 Legal recognition of biodiversity as common national heritage

Major shifts in the legal protection of biodiversity have been defined to comply with the recognition of state ownership and responsibility for biodiversity which constitutes an integral part of the national heritage which should underpin development as established by constitutional recognition in the preamble which reads as follows:

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17 First ratification in 1978 of the Algiers Convention on the Conservation of Nature and Natural Resources in Africa.

Resolved to harness our natural resources in order to ensure the well-being of every citizen...-  
The protection of the environment shall be the duty of every citizen. The State shall ensure the protection and improvement of the environment.<sup>18</sup>

State ownership and responsibility over biological and genetic resources is further established in several statutory provisions, specifically under the Framework Law for Environmental Management.<sup>19</sup> The Forest, Wildlife and Fisheries Laws<sup>20</sup> impose state ownership and responsibility for the protection of the forest, wildlife and fisheries heritage.

It further recognises the *usufruct* rights of indigenous and local communities living in forest riparian communities, a right which is limited to traditional collections with no reference to rights over their traditional knowledge.

The 1994 Forest Code in Section 7 further regulates ownership by stating that

the State, local councils, village communities and private individuals may exercise on their forest and aquacultural establishments all the rights that result from ownership subject to restrictions laid down in the regulations governing land tenure and State lands and by this law.

The Forest Code grants usage rights while stipulating that:

usufruct rights (or customary rights) are those recognized to local populations to exploit all forest, wildlife and fish products, with the exception of protected species, for their personal use. They may be temporarily or permanently suspended when the need arises for reasons of public interest.

A major point of contention with the 1994 Forest Code is its failure to recognise indigenous peoples' rights to the lands, territories, and resources they have traditionally owned, occupied or otherwise used and acquired. This has been a major issue during Cameroon's recent Forest Code reforms.

### 3.2 Policy outcomes for biodiversity protection

The National Environmental Management Plan as revised (NEMP II) in 2012, provides the current policy framework for intervention in environmental matters. In a visionary approach, NEMP II recognises the protection of the environment as an integral part of the process of development and thus envisions the pathway for growth as one with a green economy which reduces carbon emissions, pollution, and prevents biodiversity loss. The long-term objective of NEMP II is to significantly reduce the loss of biodiversity, mitigate the impacts of climate change and desertification, fight against pollution and noise, and to promote sustainable development. Based on this

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18 Preamble of Law No. 96/08.

19 Framework Law No. 96/12, Article 2 (1).

20 Law No. 94/01.



new orientation, the NEMP II provides for four key programs with 11 strategic components in response to the current threats and regressive trends in the state of the environment. A specific objective of the program on conservation of terrestrial biodiversity is to integrate biodiversity in national policies and sectoral plans that have a negative impact on biodiversity. Within its design, the NEMP II is being operationalised through several thematic strategies. The adaptive approach of this document to the evolving responses to protecting the environment, provides for periodic revisions and thus ensures and adaptive response in filling gaps and weaknesses in policy orientations for intervention in protection biodiversity. Within the monitoring program for this five year management plan, the document was due revision in 2017.

The Environment Sector Strategy developed in 2013 constituted a major sectoral response to government's dispensation within its structural development and the national policy for growth and development, to adopt a policy, strategy and a budget-programmatic approach in all development sector. This Strategy, developed as a maiden effort of the Ministry of Environment and Protection of Nature (as it then was), is based on a diagnostic analysis that identifies major achievements of the sector and highlights problems and challenges. The recommended response is presented in what constitutes the four program areas of intervention in the sector today with defined priority actions which form the basis of triennial and annual budgeted action plans adopted by Parliament. Within this framework, the diagnostic analysis recognises biodiversity protection as a major focus of several policy and intervention actions that have been undertaken. Under Program 2 of the Environment Sector on the Sustainable Management of Biodiversity, the follow up on the conservation of biodiversity is defined as a key intervention action.

The National Biodiversity Strategy and Action Plan II (NBSAP II) revised in 2012 as a second-generation version of the 2000 NBSAP, recognises the central role biodiversity and genetic resources can play for a sustained economic growth and poverty alleviation. Designed in coherence with the Strategic Plan of the Convention on Biological Diversity and the (global) Aichi Biodiversity targets, this document provides compliant evidence to the nations obligations to the CBD, the Nagoya Protocol and other biodiversity related global instruments. Of specific relevance, the NBSAP recognises as a regressive trend the loss of biodiversity and genetic diversity attributed to multiple causes with negative social, economic and ecological consequences. In proposing a new policy orientation to reverse and halt the trend in loss of biodiversity and its genetic components, the NBSAP II provides a visionary direction set for 2035:

a sustainable relationship with biodiversity is established in its use and sharing of benefits to meet the development needs and well-being of the people, and ecosystem balance is preserved through sector and decentralized mainstreaming with the effective participation of all stakeholders including local communities.

It further defines a mission for 2020:

Take all necessary measures to reduce the rate of national biodiversity loss and ensure long-term sustainability of critical ecosystems in order to guarantee by 2020 the continuous contribution of biodiversity and other ecosystem services to wealth creation including through mainstreaming, capacity building and funding biodiversity that is driven by a strong partnership with the involvement of indigenous and local communities and a focus on gender as a guarantee for future generations.

To realise its vision, the Strategy document defines four national strategic goals to guide all interventions in biodiversity and these are aimed at addressing the causes of biodiversity degradation/loss by reducing the direct and indirect pressures on biodiversity. This goal seeks to provide responses relating to the lack of awareness and knowledge on the values and potentials of biodiversity, the weak import of science to inform decision-making and weaknesses in the policy and legal sphere (Strategic Goal A). It also seeks to maintaining and improving the status of biodiversity by safeguarding ecosystems, habitats, species and genetic diversity through responses that address changes in landscapes and habitat fragmentation, reduction of ecosystem resilience and disruption of its stability and functions (Strategic Goal B). Promoting the sustainable utilisation of biodiversity for wealth creation is an important goal (Strategic Goal C). Aimed at promoting coordination and integration of biodiversity and provides responses through options of coordination, sector and local level planning and development, gender mainstreaming and funding of biodiversity (Strategic Goal D). A set of 20 general plus ten ecosystem-specific national biodiversity targets with key actions have been identified in this document to ensure attainment of the defined goals.

The 1993 National Forestry Action Programme (NFAP) established a major policy shift with innovative natural resource management options. This policy document set the objectives of the forestry and wildlife sector and provided a new orientation for defining legal safeguards for forest biodiversity. In opting for a decentralised forest management and the participation of forest riparian indigenous and local communities in the management of forests, this innovative policy tool is also recognised for setting the steps for the current decentralisation in state management approaches that go beyond the forest sector.

### 3.3 Environmental protection

Law No. 96/12 of 5 August 1996 on Framework Law on Environmental Management (FLEM) is the overarching legal instrument for managing the environment. Of relevance is the incorporation of the precautionary and the polluter pays principles as fundamental principles for environmental management. In establishing within the law the conduct of environmental impact assessments (EIA) for development projects likely to have significant adverse impacts on the environment and defining con-

ditions and procedures for its application.<sup>21</sup> In compliance with the principle of participation, the regulatory tool<sup>22</sup> institutes public participation through consultations and public hearings as the approach of involving communities in decision-making processes within development projects with likely negative impacts on biodiversity. The conservation outcomes of these EIA legal tools have been significant.<sup>23</sup> Decree No. 2001/718/PM, amended in 2006 establishes the Inter-ministerial Environmental Committee as the organ responsible for EIAs.

### 3.4 Innovative legal tools for the protection of forest biodiversity

National legislative and regulatory instruments which characterise the current framework for protecting forest ecosystems and specific forest species and wildlife have been largely shaped by the options adopted in the forest policy. A major instrument is the 1994 Forest, Wildlife and Fisheries Law enacted to facilitate the implementation of the Forest Policy. This instrument, in translating the options of the forest policy into legal realities, defines further innovative mechanisms and approaches, the application of which has enabled Cameroon to effect significant progress in developing regulatory tools and accelerating national efforts in the conservation of biodiversity, protection of important wildlife and plant species under threat of loss, sustainable exploitation of forests and forest resources, involvement of indigenous and local communities in forest management and benefit-sharing schemes.

The forest zoning system of the national forest estate into distinct domains of Permanent Forest Estate (PFE) and Non-Permanent Forest Estate (NPFE), as an establishment of the Forest law has facilitated state allocation in the management of forest ecosystems and resources for different types of uses of biodiversity based on state ownership. As a result, different types of forest rights and relationships have emerged between the state and several legal entities including local councils, communities and private individuals. Under this system, the PFE establishes permanent forest domain under state ownership and local council ownership to be used for forestry purposes including the creation of protected areas and research, while NPFE consists of forests for uses other than forestry and within private forest estates by individuals or corporate entities, forest estates allocated for community forest management and residual local council forest estates.

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21 Decree No. 2005/0577/PM of 23/02/2005; Order No. 0070/MINEP.

22 Decree No. 2005/0577/PM of 23/02/2005, Article 11.

23 The creation of the Ma'an National Park and the Mbam and Djerem National Park in 2000 as mitigating measures for biodiversity loss along the Chad-Cameroon pipeline.

Community Forestry (CF) introduced as an innovative concept of legal creation also translates the forest policy option of participatory management with local communities. Through the state allocation of portions of permanent forest estate to local community entities, community forest management was ushered into the forest management system as a viable legal mechanism for transferring power to local communities, integrating traditional knowledge and practice systems in the sustainable use of forest biodiversity. The participatory and consultative procedure for the development of simple management plans for CF provide opportunities for traditional knowledge and long-standing traditional practices that have favoured conservation and the use of forest resources to inform management options of specific allocated permanent forest areas. It further provides opportunities for increasing benefits offered by biodiversity and ecosystem services to local livelihoods and economies. The multiple uses of community forests including ecotourism provide opportunities for indigenous and local communities to generate and manage benefits from forest resources under their control.

Significant national progress in conservation efforts through protected area management have largely been influenced by a statutory setting of the target for protected areas. Per definition of the 1994 Forest Law Article 22 (1), the national target is set at 30% of the total area of national territory for the creation of protected areas within the permanent forest domain and representative of all major ecosystems or biomes in proportion to their occurrence. Target 11 of the NBSAP in ensuring coherence of the biodiversity policy with the protected area target of 30% has adopted the following as a national priority by the year 2020:

By 2020, at least 30% of the national territory, taking into consideration “ecosystem representativeness” is under effectively and equitably managed protected areas.

The current trend in protected area in implementation of this law depicts an increase of 76.5% in the creation of protected areas between 2000 (with a baseline of 17 Protected Areas) and 2012 (having a total of 30 Protected Areas). By 2012 there was a wide protected area network of 19 National Parks, 7 Wildlife Reserves, 5 Wildlife Sanctuaries, 3 Botanical Gardens, 47 Cynergetic Zones and 26 Community Managed Cynergetic Zones with a total cover of 16,683,779 ha in protected areas and 9,159,135 ha specifically for wildlife.<sup>24</sup> This represents 19.25% of the national territory and has enabled national progress beyond the global target of the Aichi Targets set at 15% for terrestrial protected areas. Management plans have been developed and adopted to ensure the protection of most of the protected areas.

In obligating the development of management plans for various forest uses, protected areas, community forests, production forests, etc. the Forest Law established a

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24 Law No. 94/01, page 52.

mechanism for ensuring the sustainable use of biodiversity and restoration of degraded forest lands. Specifically, in the forest exploitation sector, the obligation to produce management plans for each Forest Management Unit (FMU) granted to logging companies, seeks to ensure exploitation activities within each FMU is compliant with the priorities of the plan defined within clear procedural conditions.

### 3.5 Wildlife protection regime

Wildlife protection within the forest and wildlife regime is based on a three-level species classification,<sup>25</sup> of A, B, and C. Rare species threatened with extinction and categorised in class A are granted total protection and prohibition from being hunted with the exception of authorised captures for purposes of research or protection. A series of regulatory tools set the conditions for implementation of this wildlife legislation<sup>26</sup> and specify animal species in each class<sup>27</sup> with class A species consisting of species in Annex 1 of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), those of class B consist of species in Annex II of CITES and benefiting from partial protection and requiring hunting authorisations and licences, while those of class C consist of species in Annex III of CITES protected through regulated capture and hunting in cases out of the previous two categories. Other instruments set the list of species with authorised killing<sup>28</sup> and those for sports hunting. Further to this is the hunting permit system introduced by the law which categorises hunting permits in three categories for traditional or subsistence hunting, sporting and commercial hunting. Further to this, the policy option of participatory management involving local communities is translated in the wildlife sector with the introduction of the notion of Community Hunting Ground (CHG) through state allocation of hunting rights in a non-permanent forest domain to a local community.<sup>29</sup> Through this community use rights and incentives, traditional knowledge and traditional practices can again be integrated in the protection of wildlife and provide opportunities for contributing to improve the subsistence living of hunting indigenous and local communities.

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25 Law No. 94/01, Article 78.

26 Decree No. 95/466 of 20 July 1995.

27 Order No. 0648/MINFOF of 18 December 2006.

28 Order No. 0649/MINFOF of 18 December 2006.

29 Decree No. 95/466, Article 2 (19).

### 3.6 Legal regime for benefit sharing from biological and genetic resources

The objectives of the CBD recognise the need for a balance in conservation, sustainable use and benefit sharing of biological resources. In the logic of the interdependence of these goals, conservation can be effective where there is fairness and equity in sharing the benefits generated from the use of biodiversity with local communities. This constitutes a key incentive for conservation as favourable traditions and practices of local knowledge holders can be integrated in national conservation efforts. The CBD in this regard obligates parties to adopt incentive measures and benefit sharing mechanisms for biological and genetic resources. In compliance with this obligation, several benefit sharing mechanisms have been defined.

#### 3.6.1 Benefit sharing from forest royalties

The Forest Law makes provision for revenue generated through annual forest royalties paid by logging companies to be shared with forest riparian communities through which a quota gets to the forest neighbouring communities; quota from hunting fees paid to community hunting areas through local management committees; expected social and economic benefits to indigenous and local communities living in and around protected areas. Benefits are also expected from Local Council Forests and Community Forests.

A major forest and wildlife benefit sharing mechanism established by legal definition<sup>30</sup> at the national level is the model annual forest royalty scheme with a benefit distribution scheme of 50% to the State, 40% to the local Council and 10% to the riparian village community, from total forest revenue. Several regulatory instruments revised over a period of time give effect to this statute by laying down detailed rules and procedures for its implementation<sup>31</sup> and implementation of the wildlife provisions,<sup>32</sup> the measures for collection of royalty and taxes on forestry activities. Decree No. 96/642/PM of 17 September 1996 covers the basis and methods of collection of royalty and taxes on forestry activities, establishing management committees responsible for managing forest royalties,<sup>33</sup> and modalities for monitoring the use of the revenue.<sup>34</sup>

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30 Law No. 94/01.

31 Decree No. 95/531 of 23 August 1995.

32 Decree No. 95/466-PM.

33 Order No. 00122/MINEFI/MINAT 29 April 1998.

34 Joint Order No. 0000076/MINADT/MINFI/MINFOF of 26 June 2012.

### 3.6.2 Benefits sharing from genetic resources

The current dynamics for access and benefits sharing (ABS) in Cameroon depicts an existing political will, a strong partnership with private sector and development partners all committed to capitalising on the current shifts from the international and national processes to develop innovative ABS legal regimes and establish ABS mechanisms which are informed by new international rules and principles on dealing with genetic resources. On-going initiatives within the Ministry of Environment, Nature Protection and Sustainable Development are supported by several projects,<sup>35</sup> which all seek to give effect to the National ABS Strategy which defines as a national priority, the development of a specific national law on access to genetic resources and benefit sharing from its utilisation.

Cameroon's recent accession to the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is preceded by an effective engagement as one of the country leads in the negotiation of the Protocol and Coordinator of the Africa Region for the Intergovernmental Committee that worked towards the entry into force of the Protocol in 2014. This engagement was endorsed in July 2014, with the adoption of the Ratification Bill by Parliament<sup>36</sup> and its promulgation into Law by the Head of State.<sup>37</sup> The deposit of this instrument in November 2016, marked Cameroon's accession to the Protocol as announced at the opening of the Second Meeting of the Parties to the Convention serving as the Meeting of the Parties to the Protocol, in Cancun, Mexico. Based on the 90 days rules after the deposit of the instrument of accession, the Protocol entered into force for Cameroon on 28 February 2017. By acceding to the Protocol, Cameroon has contributed to the achievement of Aichi Biodiversity Target 16 which provides that

by 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.

This political commitment is obligated to full compliance in the adoption of appropriate ABS legislative and institutional tools. An early policy response to this commitment was the 2012 National Strategy on Access to Genetic Resources and the Fair and Equitable Sharing of Benefit arising from its Utilisation, developed upon the heels of the Nagoya Protocol. The prevalence of a wanton ABS legal and

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35 For example the GIZ/COMIFAC Sub-Regional Project on ABS, the GEF/UNEP/COMIFAC Sub-Regional Project on ABS, the JICA/COMIFAC Sub-Regional Project on ABS and the GEF/UNDP Support Project to Cameroon on ABS.

36 Law No. 2014/009 of 18 July 2014.

37 Decree No. 2014/262 of 22 July 2014.

institutional framework as highlighted by several studies, greatly influenced the spirit of this policy tool as defined in its overall objective: “to give orientation for developing a national ABS framework law in accordance with the provisions of the Convention on Biological Diversity (CBD) and the Nagoya Protocol on ABS”. Its specific objectives however widen this scope by addressing several implementation issues that go beyond the development of an ABS framework law per se. Within the strategic objectives set to attain this overall goal, five thematic issues are identified which set the framework for intervention actions in ABS matters. The key areas relate to capacity building and development, the putting in place of a legal and institutional framework, adopting administrative measures, strengthening mechanisms for stakeholder participation and promoting the valorisation of genetic resources and associated traditional knowledge. Of major significance in this document is the orientation for strengthening the existing legal and institutional framework for ABS. Although the strategy document is not a binding instrument, it seeks to ensure compliance with key provisions of the Nagoya Protocol by providing an innovative guidance for establishing legal tools and measures that deal in a comprehensive approach with key ABS issues.

Within the option for a specific legislation, elements to be taken into consideration in the development of an ABS law have been defined. Although the elements in this maiden planning tool provided guidance for an ABS regime, these elements have not been presented in any structured form but are relevant for developing both legal tools that establish rights and obligations and regulatory tools that deal with purely procedural matters.

Complying with the call for a mutually supportive implementation of the Food and Agriculture Organization’s (FAO) Plant Treaty and the Nagoya Protocol, the document thus recognises current efforts<sup>38</sup> that address issues relevant to the interface between the two instruments. It provides guidance for policy and administrative actors and builds capacity for their mutually supportive implementation at the national level. This provides a framework for integrating the guidance on ABS elements by the FAO Commission on Genetic Resources for Food and Agriculture (GRFA)<sup>39</sup> which highlights key issues for consideration in the mutually supportive assist governments considering developing, adapting or implementing ABS measures to take into account the importance of GRFA, their special role for food security and the distinctive features of the different subsectors of GRFA, and complying, as applicable, with international ABS instruments.

In coherence with the policy objective of the ABS Strategy, NEMP II and the Environment Strategy have identified several key ABS legal and regulatory measures to

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38 Bioversity International (2015).

39 FAO (2016).



be developed which include the development of an ABS National legislation, an institutional mapping and establishment of a data bank of national structures with potential to transform and valorise genetic resources, the development of relevant regulations/measure on ABS, and a manual on modalities of certification and the protection of genetic resources.

Multi sectoral legal tools provide ABS relevant provisions for forestry activities,<sup>40</sup> seed<sup>41</sup> and phytosanitary interventions<sup>42</sup> etc. and determine authorities with mandates for granting research permits,<sup>43</sup> authorisation in the field of modern biotechnology<sup>44</sup>, and establish governing structures for seeds and plant varieties.<sup>45</sup>

The adoption by the African Ministerial Conference on the Environment (AMCEN) and subsequent endorsement by the AU Summit in June 2015 of the African Union Guidelines for the Coordinated Implementation of the Nagoya Protocol in Africa<sup>46</sup> constitutes a major regional drive to ensure the effective internalisation of the Nagoya Protocol and development of ABS legal regimes in the continent. The Strategic Guidelines provide a regional policy direction to the AU Member States and set out commonly agreed principles on ABS to be coordinated at the AU level.

On-going international dialogue and negotiations on ABS, intellectual property (IP) and traditional knowledge (TK) issues are important in ensuring that the evolving national frameworks for ABS are adapted to international standards and markets for which ABS products are intended.

Of importance with regard to genetic resources beyond national borders is the ongoing work under the United Nations Convention on the Law of the Sea (UNCLOS) with implications for Cameroon to clearly define its marine borders which equally determine the geographic limits of its marine genetic resources. The meetings of a preparatory working group set up by a resolution of the United Nations General Assembly (UNGA) will provide the elements of a draft text for a legally binding future agreement on the conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction under UNCLOS. A key issue of focus in this negotiation for the future instrument is on marine genetic resources, including benefit-sharing questions. This discussion raises serious concerns on the limits of Cameroon's marine genetic resources. As a coastal state engaged in the sustainable management of its marine environment with ongoing proposals for protected area management and high biodiversity conservation value areas in the marine ecosystem,

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40 Law No. 94/01.

41 Law No. 2001/014 of 23 July 2001.

42 Law No. 2003/003 of 21 April 2003.

43 Order No. 00002/MINRESI/B00/C00 of 18 May 2006.

44 Law No. 2003/006 of 21 April 2003.

45 Law No. 2001/014, Article 25.

46 African Union Commission (2015).

there is need to appropriate the outcome of these negotiations with the urgent delimitation of Cameroons continental plateau with the exclusive economic zone. Given the national option of a coherent approach in dealing with ABS, marine genetic resources need to be taken into consideration in ABS regimes to be developed.

### 3.7 The role of customs and traditions

The current system recognises the contribution of knowledge and practices of local communities as an important contribution to the protection of biodiversity and ecosystem services. The integration of customs and traditions in the legal architecture of national norms is guaranteed by statute and common law where the custom or practice is not contrary to the law or repugnant to natural justice. An innovative introduction of this national option into natural resource policy development is contained in the 1994 Forest Policy,<sup>47</sup> the NEMP II and the NBSAP II of 2012. In opting for an inclusive and decentralised management approach for the environment, biodiversity and specifically forest, wildlife, fisheries resources, these policy tools recognise the role of traditional knowledge and practices of indigenous and local communities in the protection and management of biodiversity.

Several TK related mechanisms have thus been established to translate these orientations into realities. A major legislation is the Forest Law which recognises, the usage rights of local communities by stipulating that:

usufruct rights (or customary rights) are those recognized to local populations to exploit all forest, wildlife and fish products, with the exception of protected species, for their personal use. They may be temporarily or permanently suspended when the need arises for reasons of public interest.

The right to use natural resources under this instrument does not confer ownership rights over the resources or the lands or territories, an exclusion considered to be a major hurdle to the effective exercise of traditional knowledge. Also of importance, the establishment of community forest or wildlife management systems and the sharing of forest royalties with communities provide opportunities to integrate and compensate traditional knowledge systems in biodiversity protection.

Although these selected provisions establish community systems where traditional knowledge is accessed as a finding of assessments within the NBSAP II,

traditional knowledge (TK) is not fully valued and preserved rather TK is accessed and exploited for purposes of research and development and used, especially with respect to genetic resources, without the prior informed consent of the knowledge holders.

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47 Law No. 1994/01.

Studies carried out<sup>48</sup>, also highlight a wanton legal framework to explicitly recognise or protect the traditional knowledge of indigenous and local communities and specifically traditional knowledge associated to genetic resources. Under IP regimes, studies<sup>49</sup> on Cameroon's genetic resource and traditional knowledge in patent systems confirm that current patent processes and documents are unclear on the precise origin or source of genetic resources and associated TK and very limited information is available on the terms and conditions of acquisition of genetic resources and the associated TK.

For IP protection measures for plant varieties, the law recognises the key role of the Bangui Agreement of 1977 on the establishment of the African Intellectual Property Organization (OAPI), revised in 1999 is highlighted<sup>50</sup> as the institutional structure for administering the IP system in the Central Africa region. Although OAPI plays the role of national industrial property service for member countries such as Cameroon within the meaning of Article 2.2 of the Bangui Agreement and of a central patent documentation and information agency of invention, great concerns prevail on the extent to which these organisations and IP tools can effectively provide protection for TK generally and TK specifically associated to genetic resources.

Current efforts at developing legal tools for the protection of TK to ensure an effective integration of tradition and customs for conservation benefits, call for understanding the links between a national ABS legal regime and IPR<sup>51</sup> and on-going discussions within WTO and WIPO. Strengthening national efforts and developing legal tools to facilitate indigenous and local communities' organisation, representation and participation is also considered a critical step for a very inclusive policy development and engagement of indigenous and local communities in several development sectors that depend on biodiversity and the benefits offered by traditional knowledge and practices.

### 3.8 Biosafety and biosecurity

Justified by the increase in trade within the region and threats presented by the trans-boundary movement of genetically modified organisms (GMOs) to increase agricultural production, for pharmaceutical and cosmetic industries, and research purposes, the 2003 Biosafety Legislation and its implementation Decree, seek to ensure safety

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48 Nnah Ndobe & Djeukam (2011).

49 Oldham et al. (2013).

50 Nchoutpouen (2011).

51 Mahop (2010) and (2011).

to humans, animals and the environment through monitoring and control mechanisms for GMOs through modern biotechnology.

The introduction of invasive alien species including living modified organisms in the national territory and the acceptance that these biological invaders are likely to pose threats to biodiversity, food security, human, plant and animal health, and economic development, generated a national consciousness and commitment to develop a cooperative and comprehensive policy response and management strategy. Within the current national biosecurity project,<sup>52</sup> several management and strategic planning tools have been developed for an invasive alien species program, the identification of pathways and risk assessments of invasive alien species, contingency and emergency response plans, training programs, all towards developing a national monitoring and control system for living modified organisms and invasive alien species. A draft National Biosecurity Law is currently being discussed.<sup>53</sup>

### 3.9 Legal tools for transparency on biodiversity products for trade

In response to the provisions for transparency in the forest sector, a major initiative has been undertaken to promote transparency relevant for forest markets. As a member of the Economic Community of Central African States (CEMAC), Cameroon is part of the sub regional processes with common trade rules.

Cameroon signed a voluntary partnership agreement (VPA) with the European Union in 2010. VPAs aim to ensure timber exported to the European Union has been produced according to Cameroonian laws and regulations. The VPA of 2010 introduces a new legal tool for increased transparency in the forest exploitation industry and specifically seeks to ensure timber exported to the European Union is produced in accordance with the forest laws and regulations and relevant national legal instruments.

Cameroon is currently in the systems development phase, meaning it is developing its legality assurance systems including a rigorous tracking system. The Cameroonian definition of legality used by the VPA was developed with strong stakeholder input. For Cameroonian timber to be legal, it must abide by all legislation applicable to Cameroon's forest sector (including forestry, environment, human rights, labour and trade) and ratified international agreements. The 'legality grid' however, a matrix which defines each legislative reference and the means of verifying that it has been implemented, is complicated. The implementation of the VPA should address further shortcomings identified during the development of the legality grid (e.g. in-

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52 UNEP (2010).

53 MINEPDED (2017).

coherencies between laws, the need to define social criteria etc.) but strong civil society input and vigilance will be required.

## 4 Institutional tools

The significant changes in the institutional landscape for the protection of biodiversity constitutes an important outcome of the transformative shift to new policies and national norms and highlights major reforms of key government departments and non-government organisations within the last three decades.

### 4.1 Institutional reforms of biodiversity focal institution

The NBSAP recognises that the heightened awareness on the link of the environment to sustainable development during the Rio Summit of 1992 led to the creation of the ex-Ministry of Environment and Forest (MINEF). In an evolving trend, this focal institution for biodiversity has experienced profound changes in its structural set up and mandate to enable it to provide the required coordination and appropriate institutional response to the increasing threats on the environment. The split in 2004 by a regulatory instrument of the MINEF led to the creation of two separate entities: The Ministry of Environment and Protection of Nature (MINEP) charged with the coordination of the development and follow up of environmental policy and the Ministry of Forest and Wildlife charged with the development and implementation of the forest and wildlife policies. Further to this, the recent creation in 2012 of the Ministry of the Environment, Nature Protection and Sustainable Development (MINEPDED)<sup>54</sup> constitutes a major institutional reform which expands the mandate of the former MINEP to include matters of sustainable development and establishes this focal institution for biodiversity protection as a key stakeholder in the nation's economic development process.

The main tasks of MINEPDED are defined in the new instrument to include the development and implementation of Government policy on the environment and the protection of nature within the perspective of a sustainable development, and the definition of conditions and principles for the rational and sustainable management of natural resources. This provides a stronger mandate for MINEPDED to coordinate the development of policies, laws and regulatory measures in a manner that ensures an effective contribution to the nation's economic growth. The new institution is fur-

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54 Decree No. 2012/431 of 1 October 2012.

ther mandated to define environmental management measures, working in collaboration with relevant ministries and specialised bodies and thus provides a platform for addressing the multi-sectoral and multi-stakeholder nature of dealing with biodiversity issues. From an international perspective, MINEPDED is charged with coordinating and monitoring the interventions of regional or international cooperation agencies that work on the environment, negotiating international conventions and agreements relating to the protection of the environment, and follow up of their implementation. This provides a mandate for the National Focal Institution as the technical administration to represent and negotiate biodiversity agreements at international and regional levels in collaboration with the Ministry of Foreign Affairs.

#### 4.2 Institutional reforms within biodiversity dependent sectors (rural development sectors)

In the rural development sector which depends largely on biodiversity are the subsectors for Forest, Agriculture and Fisheries. Institutional reforms within these subsectors have equally been profound, defined by legal and regulatory tools that create key structures and organs with specialised mandates for biodiversity protection and management. The Ministry of Forestry and Wildlife (MINFOF) established in 2004 as a split off the ex-MINEF and revised in 2011<sup>55</sup> is responsible for the development, implementation and evaluation of the Government's policy for the sustainable management of forests and wildlife. Its mandate includes the management of protected areas with a supervisory authority over Botanical Gardens. It is the national focal institution for CITES and the Convention on the Conservation of Migratory Species of Wild Animals (CMS). Order No. 067/PM of 27 June 2006 provides the organisational set-up and operational procedure of the Inter-Ministerial Coordination and Monitoring Committee for the implementation of the CITES.<sup>56</sup>

Institutional reforms in the agricultural sector have equally been profound with the adoption of an innovative and ambitious policy of increasing agricultural productivity and mechanising agriculture in the rural sector as well as the expansion of the mandate of the Ministry responsible for the national policy for agriculture to include rural development. The Ministry of Agriculture and Rural Development (MINADER)<sup>57</sup> thus coordinates the development of policies, legal and regulatory tools for agricultural biodiversity and its utilisation for developing rural economies. This includes as-

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55 Decree No. 2005/099 of 6 April 2005 and modified by Decree No. 2005/495 of 31 December 2005.

56 Decision No. 104/D/MINFOF/SG/DF/SDAFF/SN of 2 March 2006.

57 Decree No. 2011/408.

sessing and reporting on the effectiveness of the policies on agricultural biodiversity as highlighted in major agricultural biodiversity reports for the FAO,<sup>58</sup> phyto-sanitary protection of plants and plant genetic resources for food and agriculture for which MINADER is focal Institution. The policy and law development process in this sector is of critical importance to ensuring biodiversity mainstreaming and a balance in the implementation of the new policy and the protection of biodiversity that supports production activities in the sector.

Fisheries and livestock resources are the responsibility of the Ministry of Livestock, Fisheries and Animal Industries (MINEPIA)<sup>59</sup> and within this specific mandate, MINEPIA ensures the development, implementation and assessment of national policy and legal tools for the protection of aquatic and marine biodiversity.

#### 4.3 Support role of biodiversity relevant institutions

Of increasing relevance to strengthening the science policy link on biodiversity and ecosystem services is the Ministry of Scientific Research and Innovation (MINRESI)<sup>60</sup> responsible for the development and implementation of Government's policy on scientific research and innovation and thus coordinating and authorising scientific research activities with further oversight over several national research institutions i.e. the Agricultural Research Institute for Development, the Institute of Medical Research and Studies of Medicinal Plants, the Biotechnology Centre and the National Herbarium, which have generated invaluable scientific data relevant in justifying biodiversity mainstreaming and informing on-going reforms of policies, legislations and regulations in biodiversity-relevant sectors.

Education and awareness on the values of biodiversity and the role of legal and regulatory tools in ensuring protection from threats and loss fall within the statutory mandates of several institutions which also include the Ministry of Higher Education (MINESUP).<sup>61</sup> Through its supervisory authority over Universities, MINESUP ensures legal training on the environment and constitutes a key national user of genetic resources for educational purposes with material transfers under exchange and collaboration programs with foreign research institutions.

Institutional reforms in other relevant sectors include the creation of the Ministry of Women's Empowerment and the Family (MINPROFF)<sup>62</sup> with the mandate for de-

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58 Republic of Cameroon (2015).

59 Decree No. 2011/408.

60 Decree No. 2012/383 of 14 September 2012.

61 Decree No. 2012/433 of 1 October 2012.

62 Decree No. 2005/088.

veloping policies tools for the promotion of gender mainstreaming, and reforms in the Ministry of Social Affairs (MINAS) is responsible for the development and implementation of Government's policy on social protection of vulnerable groups<sup>63</sup> to include guarantees for respect of the rights of indigenous and local communities through several sectoral interventions.

#### 4.4 Coordination options

MINEPDED in exercise of its mandate as the national focal institution for biodiversity has carried out major institutional changes in the designation of national focal points for various ratified conventions and these include the national focal points for the CBD, the Cartagena Protocol on Biosafety, the Nagoya Protocol, the United Nations Framework Convention on Climate Change (UNFCCC), the United Nations Convention to Combat Desertification (UNCCD), the Ramsar Convention, the Clearing House Mechanism for Biodiversity, the ABS Clearing House, and several regional level agreements.

The conservation and sustainable use of biodiversity is relevant to a wide range of different sectors and provides varied services while other sectors including transport, energy or mining have a potential impact on biodiversity. Regulatory tools in defining coordination mechanism have widely adopted multi stakeholder approaches resulting in the putting in place of key biodiversity organs in the key biodiversity and natural resource management sectors. In the Environment Ministry, these include the National Advisory or Inter-Ministerial Committees for Biodiversity, the Environment Fund, ABS, Biosafety, EIA etc., all tasked with advising the Minister of Environment on specified decision-making processes. Within the MINFOF various relevant inter-ministerial structures have been set up for plant, wildlife species and forest ecosystem activities. Notwithstanding these institutional changes, the regulatory status of most advisory committees of relevance to biodiversity have been based on project driven processes and thus require statutory recognition.

#### 4.5 Other major stakeholders

The liberation of associations in 1999<sup>64</sup> led to changes in the management of state affairs with the explosion of registered associations and NGOs advocating for inclusion in decision-making processes of major development sectors. This approach, aligned

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63 Decree No. 2011/408 of 9 December 2011.

64 Law No. 99/014 of 22 December 1999.



with the natural resource policy option of participatory management, significantly contributing in ushering in a major shift towards non-state actor consultations and contributions in the development of national biodiversity legal and regulatory instruments and recognising their role in creating awareness and disseminating policy and legal tools in local communities. Major stakeholders today include a wide range of CSOs and NGOs, other private sector investors and industries, associations of local community groups, etc.

### 4.6 Implementation challenges

Dynamics within the current legal paradigm for protection biodiversity, highlight coherence, implementation and governance as constituting the major challenges today in ensuring compliant behaviours that favour biodiversity. Notwithstanding the significant shifts in developing legal tools, obsolete legal tenure regimes<sup>65</sup> and incoherence in sectoral policies and regulatory responses required to integrate biodiversity prevail.

With a focus on key governance determinants of participation or inclusiveness, institutional capacity, access principles of information and justice, effectiveness in implementation has been greatly hampered. Specific weaknesses in coordination and in promoting inclusive approaches of all stakeholders including indigenous and local communities have largely negated national efforts towards achieving satisfactory social and economic outcomes as benefits from biodiversity.

Implementation challenges have equally been linked to the current state of knowledge on the policy and legal options within existing legal frameworks. Accessing legal information or legal instruments constitute major challenges for major users and the general public in the absence of a well-established legal information system.

## 5 Improving legal effectiveness

Options for improving legal effectiveness call for a range of policy, practice, enforcement and funding measures to strengthen the current legal protection framework for biodiversity.

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65 Ordinance No. 74/1 of 6 July 1974; Ordinance No. 74/2 of 6 July 1974.

## 5.1 Policy options

Recommended policy options to address the current challenges will need to focus on sector and local level mainstreaming to ensure coherence in existing policies and laws in rural development sectors and most importantly the conflicts with the mining sector. Mainstreaming biodiversity strategic options within sector policies as defined within the NBSAP II and aligned with the CBD Strategic Plan and Aichi Target constitutes a major national priority. Effecting this requires regular assessment of legal tools in informing the law development process. Assessments will improve the current state of knowledge on the policy and legal options within these specific sectors and highlight areas of regulatory gaps and conflicts. Of specific importance is the need for a transformative shift from the fragmented and obsolete land tenure system to an innovative land reform legal structure.

## 5.2 Practical options

Adopting a wide range of practical options include support measures of building capacities for developing coherent sectoral legal frameworks that mainstream biodiversity. Legal awareness with greater attention on the legal information system and improving access to legal information through dissemination and training on biodiversity law are of great importance. Furthermore, is the need to strengthen cross-sectoral and multi-stakeholder dialogues with informed biodiversity policy options.

## 5.3 Enforcement options

With regard to enforcement, options in addressing the weak state of law enforcement of both national and international environmental crimes that pose serious threats to biodiversity are critical to giving effectiveness to biodiversity laws and regulatory instruments.

## 5.4 Funding options

Although increasing biodiversity financing is a major preoccupation at global and national level, investing in the process of developing a viable legal framework for biodiversity protection, provides great opportunities for strengthening national efforts in protecting the natural capital offered by biodiversity for Cameroon's development.

## 6 Conclusion

The outcome of global and national law development processes within the last decade to protect the environment for human well-being is a legal paradigm shift for the protection of Cameroon's rich biodiversity. With the introduction of the concept of sustainability in development came the emergence of multilateral and regional environmental agreements of national import in the conservation, sustainable use and sharing of benefits from biodiversity and ecosystem services. In a parallel process, the national quest for urgent responses to poverty challenges brought shifts from obsolete and fragmentary legal instruments to an array of national policy, legislative and institutional tools with innovative mechanisms and norms to boost the natural resource industries and to reduce negative impacts of sectoral activities and development projects on biodiversity. Current dynamics within this paradigm highlight implementation challenges in ensuring coherence in sectoral policies and regulatory responses required to integrate biodiversity and governance and coordination challenges in promoting inclusive approaches of all stakeholders with the effective participation of indigenous and local communities.

Ensuring legal effectiveness and efficiency in the implementation of biodiversity protection instruments today constitutes a major challenge. Building capacities for developing coherent frameworks, mainstreaming biodiversity, strengthening law enforcement and strengthening cross-sectoral and multi-stakeholder dialogues with informed policy options are critical options to improve the legal effectiveness of global and national tools in contributing to the achievement of the overarching goal of human living in harmony with biodiversity.

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