



International Environmental
Law Research Centre

Biological Diversity Management in Africa: Policy Perspectives

Dr Patricia Kameri-Mbote, Dr Philippe Cullet

IELRC WORKING PAPER
1999 - 2

This paper can be downloaded in PDF format from IELRC's website at
<http://www.ielrc.org/content/w9902.pdf>

Table of Content

I. Introduction	1
II. The International and Regional Legal and Policy Framework for Biodiversity Management	1
A. The Convention on Biological Diversity	2
B. The African Convention on the Conservation of Nature and Natural Resource	2
C. The Ramsar Convention	3
D. The Convention on International Trade in Endangered Species of Wild Fauna and Flora	3
E. The Convention to Combat Desertification	3
F. The Framework Convention on Climate Change	4
G. The United Nations Convention on the Law of the Sea	4
H. The Agreement on Trade-Related Aspects of Intellectual Property Rights	4
III. Legal and Policy Trends in Biological Resource Management	5
A. Law and Policy Making in Africa	5
B. Influence of International Law	6
IV. Legal and Institutional Frameworks for Biodiversity Management: Some Initiatives	7
V. Towards More Effective Laws and Policies for Biodiversity Management	9

I. Introduction

The African continent is today facing severe economic and environmental crises.¹ The most critical environmental problems include deforestation, desertification, soil erosion and the decline in biological diversity. These crises directly impact on food supplies, as demonstrated by the increased frequency and magnitude of famines.² Since most African people live in rural areas, they depend directly on the extraction and exploitation of natural resources such as food, water and fuelwood to satisfy their basic needs.

Individual African countries are parties to a number of international agreements concerning the management of biological resources. There have also been regional initiatives in this area. The challenge for these countries is to move from the realm of the international and regional regimes to the national sphere through effective and concrete legal and institutional frameworks. Effective national regimes will have to incorporate all actors involved in the management of biological resources, from subsistence farmers to national resource management agencies and the private sector.

In this paper, we first lay out the international and regional framework for the management of biodiversity. We then identify the dominant legal and policy trends in biological resource management at the international and national levels and analyse gaps in national level law and policy making. Further, by way of illustration, we give some examples of countries' initiatives towards establishing legal and institutional frameworks for biodiversity management. Finally, we make some suggestions for more sustainable and effective laws and policies for biodiversity management.

II. The International and Regional Legal and Policy Framework for Biodiversity Management

Biodiversity can be defined to mean the variety of genetically distinct populations and species of plants, animals, and micro-organisms with which human beings share the earth, and the variety of ecosystems of which they are functioning parts.³ It comprises the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part. This includes diversity within species, between species and of ecosystems.⁴

Biodiversity contributes directly to meeting the basic food, health and energy needs of a majority of humankind. It is, for instance, estimated that nearly 2.5 billion people rely on wild and traditionally cultivated plant species to meet their daily needs.⁵ The need to foster sustainable biodiversity management is buttressed by the fact that more than 800 million human beings currently suffer from hunger and malnutrition.

In recognition to the importance of biological resources, the international community has, over the last century, put in place elaborate legal mechanisms for their utilisation and conservation. Traditionally, perceptions of biodiversity management have been limited to issues such as habitat and species preservation and management. We argue, however, that sustainable biodiversity management cannot be achieved within this framework. Indeed, instruments like the TRIPS Agreement which deals with intellectual property rights have direct and necessary impacts on biological resource management. The choice of the legal instruments we highlight below is indicative of our attempt to provide a broader analytical framework.

A. The Convention on Biological Diversity

The Biodiversity Convention, to which 49 African states are parties, seeks to promote the conservation of biodiversity, the sustainable use of its components and the fair and equitable sharing of benefits arising from the use of the resources, including appropriate access to genetic resources and transfer of relevant technologies.⁶

The Convention affirms the principle of permanent sovereignty over natural resources.⁷ The ambit of this principle is, however, qualified by the introduction of the notion of common concern of humankind.⁸ This implies a recognition of the global importance of biological diversity and a duty to cooperate in sustainably managing it. The principle also seeks to facilitate and promote global co-operation for the sustainable management of *in situ* biological resources without forcing any given state to participate in this process. Reference to common concern is an acknowledgment that the management of a state's own environment and resources is a matter in respect of which all states have standing.⁹ Consequently, states are responsible for conserving their biological resources in a sustainable manner utilising both *in situ* and *ex situ* conservation measures.¹⁰

The Convention also recognises the relevance of private property rights in the management of biological resources. It particularly emphasises the role of intellectual property rights in facilitating the transfer of technologies relevant for biodiversity management to developing countries.¹¹

Beyond states and private individuals, the Convention recognises both the dependence of local communities on biological resources and the roles that these communities play in the conservation and sustainable use of the resources. It further points to the need for equitable sharing of benefits arising from the use of their traditional knowledge, innovations and practices, relevant to the conservation of biodiversity and the sustainable use of its components.¹²

B. The African Convention on the Conservation of Nature and Natural Resource

The African Convention on the Conservation of Nature and Natural Resource obliges member states to adopt measures necessary to ensure the conservation, utilisation and development of natural resources in accordance with scientific principles and with regard to the best interests of the people.¹³ It also seeks to protect the animal and plant species that are threatened with extinction and their habitats.¹⁴ Member states are specifically obligated to establish conservation areas to protect all species and ecosystems that are most representative and those that are peculiar in any respect to their territories.

The Convention also contains provisions for the protection of habitats outside protected areas, conservation education, research and the need to integrate conservation into development plans.¹⁵ With respect to the latter, member states are obliged to ensure that the conservation and management of natural resources are treated as an integral part thereof and to give full consideration to ecological, social and economic factors.¹⁶ Thus, the Convention adopts the goals of conservation and development which are key themes in modern conservation philosophy.¹⁷

Despite the Convention's mention of people's interests, provision for the protection of wildlife outside the protected areas and the obligation of member states to take the necessary legislative measures to reconcile customary rights with the provisions of the Convention,¹⁸ its major provisions emphasise the conservation of resources with little regard for the needs of human beings dependent on those resources for sustenance. The control and management of the protected areas are vested in the state and no mechanisms are put in place for the protection of traditional rights of people to wildlife and its products.

C. The Ramsar Convention

The Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention) ratified by 28 African countries was the first global convention to be exclusively concerned with habitat protection. It seeks generally the establishment of nature reserves on wetlands.¹⁹ It emphasises the need to conserve wetlands and their sustainable utilisation in a way compatible with the maintenance of the natural properties of the ecosystem.²⁰ The Convention does not, however, regulate the taking of species as long as it does not affect the ecological characteristics of the wetland.

The Conference of the contracting parties has been instrumental in strengthening the regime put in place by the Convention. It has thus recently adopted guidelines to encourage active and informed participation by local communities and indigenous people in the management of listed sites.²¹

D. The Convention on International Trade in Endangered Species of Wild Fauna and Flora

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) provides the primary international control structure for trade in wildlife products.²² It focuses on the identification of endangered species and their withdrawal from the world market through a listing process. CITES appendices list the species that are threatened with extinction currently and those for which there is some indication that they face the threat of extinction in the future. The Conference of Parties determines what species should be listed.²³

The greatest degree of protection is accorded to species threatened with extinction (Appendix 1). An appendix I listing thus acts as an effective ban on trade of a species because even if the exporting state wishes to continue trading in the listed species, the importing state is under an obligation to bar all other than scientific imports.²⁴ Degrees of lesser protection are offered to species facing less imminent threats of extinction.

CITES allows member states to make reservations with respect to particular species provided that they notify other members of their intention not to comply with trade restriction on the species.²⁵ The increasing use of reservations exemplifies parties' growing disenchantment with CITES' protective rather than management approach to wildlife conservation.

E. The Convention to Combat Desertification

The Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa, to which 52 African countries are parties, provides a broad framework for coordinating efforts against desertification. It aims at mitigating the effects of drought in countries experiencing serious drought and desertification.²⁶ While it recognises the principle of common but differentiated responsibility, affected parties bear the main responsibility for taking action against desertification.²⁷

Affected parties are specifically meant to give priority and establish strategies and priorities to combat desertification, strengthen relevant existing legislation, and enact new laws and long-term policies where they are not yet in place. At the implementation level, the Convention focuses on the necessity for collaboration not only between affected countries and donor countries but also between governments, local populations and community groups.

F. The Framework Convention on Climate Change

The Framework Convention on Climate Change seeks to address the problem of global warming at the international level. The Kyoto Protocol to the Convention sets out quantified emission limitation and reduction commitments for OECD countries and countries undergoing the process of economic transition to a market economy (Annex B Parties). Annex B Parties commit themselves to reduce their overall GHG emissions by at least 5% below 1990 levels between 2008 and 2012.²⁸

Several mechanisms have been put in place to facilitate the implementation of the Convention. These include, for instance, the provision of financial resources through the Global Environment Facility and the setting up of so-called flexibility mechanisms in the context of the Kyoto Protocol. The flexibility mechanisms are specifically meant to enhance the cost-effectiveness of measures to mitigate climate change and to attract new sources of funding. Nations with high costs for meeting environmental obligations can thus invest funds in other nations that avail low cost opportunities to fulfil the same objectives.²⁹ Of the three flexibility mechanisms defined, the Clean Development Mechanism is the only one which is directly relevant for African countries. It seeks to facilitate joint emission reduction projects between developed and developing countries. Further, it also emphasises the fact that projects must assist developing countries in realising sustainable development.³⁰

Climate change is intrinsically related to biodiversity management. Indeed, it is expected that changes in mean temperatures will affect the growth and regeneration of trees.³¹ Climate change also has potential to have negative consequences on agriculture.³² At the level of the implementation of the Convention, a number of direct links with biodiversity management can be seen. This is especially the case of forestry projects for carbon storage in the context of the Clean Development Mechanism which have been proposed as a vital component of climate change mitigation strategies.³³

G. The United Nations Convention on the Law of the Sea

The United Nations Convention on the Law of the Sea regulates most issues linked to the use of marine areas. Various provisions are relevant for the management of biological marine resources. These include, for instance, the creation of Exclusive Economic Zones (EEZ) where coastal states obtain a stronger position in the management of their biological resources. The Convention does not stop at granting sovereign rights for the purpose of exploiting, conserving and managing natural resources in the EEZ but also provides for a number of obligations for coastal states. They must, for instance, ensure through proper conservation and management measures that the maintenance of the living resources in the exclusive economic zone is not endangered by over-exploitation.³⁴ States also have a duty to cooperate in the conservation and management of living resources in the areas of the high seas.

H. The Agreement on Trade-Related Aspects of Intellectual Property Rights

The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement), to which 41 African states are parties, is only indirectly concerned with biological resources. However, the intellectual property rights standards that it sets have wide-ranging impacts on biodiversity management. In the case of patents, for instance, it provides generally that patents must be available for inventions, whether products or processes, in all fields of technology. Some general exceptions to patentability are provided.³⁵ States can, for instance, exclude patentability where this is necessary to protect human, animal or plant life or health, or to avoid serious prejudice to the environment. They can also exclude from patentability plants and animals other than micro-organisms.

Among the various areas where TRIPS has an impact, agriculture is among the most significant for a majority of developing countries. The Agreement requires all countries to protect plant varieties either by patents or by an alternative system (*sui generis* system).³⁶ This is of great significance because most countries have tradi-

tionally believed that patent protection should not be offered in this field since the satisfaction of basic food needs should not be subjected to commercial interests. The ratification of TRIPS is forcing all countries in a similar position to provide property rights on plant varieties. This constitutes a change of immense significance in countries where a majority of the working population can be qualified as being engaged in subsistence agriculture.

III. Legal and Policy Trends in Biological Resource Management

A. Law and Policy Making in Africa

Natural resource laws in many African countries during the colonial and immediate post-colonial period were mainly geared towards resource extraction for export. As early as the 1900s however, concern about the erosion of resources, specifically wildlife, had prompted the promulgation of laws and policies to conserve those resources. These early laws however, were mainly reactionary and ad hoc and consequently not very effective in achieving sustainable management of biological resources.

Natural resource conservation laws have become increasingly common in African countries especially with the conclusion of landmark international environmental agreements to which most of these countries subscribe. These national environmental laws are predicated on the doctrine of police power which asserts that by dint of political sovereignty, the state has a duty to ensure that its use does not harm the public welfare. It justifies the limitation of private property holders in the interest of the general public.³⁷ Some countries, such as Kenya, restate this doctrine in their constitutions, as an exception to the guarantee of fundamental rights and freedoms.³⁸

A number of countries have inserted provisions relating to the environment in their national constitutions. Thus, the Ugandan constitution provides, for instance, that Parliament is to provide measures for protecting the environment, managing it sustainably and promote environmental awareness.³⁹ A number of countries have also inserted provisions relating to the environment in their bills of rights. Thus, the South African Constitution provides that everyone has the right to a clean environment and have it protected and to have the environment protected through measures which secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.⁴⁰

Environmental law has developed on a sectoral basis in most countries of the world. Africa has been no exception to this rule but like elsewhere, a number of countries have tried to remedy this situation by adopting framework legislations. Such legislations often incorporate general principles of environmental management, provide the institutional framework for biodiversity management and set up national environmental funds. Countries like Uganda, the Gambia, Guinea and Comoros have adopted framework legislations.

Framework laws also lay out enforcement mechanisms. Many African countries have relied on penal sanctions, mainly fines and imprisonment, to enforce their environmental laws. The Uganda national environmental statutes provide, for instance, that the wasteful use of natural resources renders one liable on conviction to a maximum fine of \$12'000 while the illegal traffic in hazardous wastes attracts a maximum fine of \$24'000.⁴¹ The reliance on penal sanctions has on the whole proved to be an ineffective tool to ensure compliance with the standards put in place. Specific sanctions have failed to deter potential offenders and in some cases, offenders may find it more cost effective to flout the standards than to comply.⁴² In recent years, however, some states have sought to use incentives to induce action towards sustainable management of biological resources. They may take the form of economic measures such as taxes and subsidies.⁴³

Apart from framework legislations, some countries have promulgated environmental standards to be attained in general or in specific resource contexts. In this case, existing institutions are given new principles to operate by or new duties and responsibilities. The Malawi Environmental Management Act exemplifies this approach.⁴⁴ At the institutional level, states have attempted to harmonise environmental policies and laws across sectors by establishing environmental ministries or departments.

B. Influence of International Law

International treaty and customary law has had significant influence on environmental law, policy and institutional developments at the national level in many African countries. This influence extends to such impacts as the incorporation of specific international obligations and general principles of international law by state parties.

Influence of principles of international law

One of the first environmental law principles to develop is the duty of states to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction. This constitutes one of the most widely accepted customary principles of international environmental law. It has, for instance, been incorporated by the Comoros into its framework environmental legislation which provides that the state should refrain from engaging in any activities which would be likely to cause environmental degradation to another state.⁴⁵

The principle of sustainable development is now a central tenet of international environmental law. It has been incorporated by a number of African countries in their framework environmental laws. For instance, the Algerian environmental protection act provides in one of the general principles that national development implies a necessary balance between the necessities of economic growth and those of environmental protection.⁴⁶

A number of other principles have been incorporated in domestic laws. The polluter pays principle has, for instance, been included in the Eritrean Environmental Proclamation which states that '[a]ny polluter shall bear the cost of preventing pollution and of cleaning up and removing the effects and consequences thereof'.⁴⁷ The precautionary principle is, for instance, embodied in the Mozambican environment act which states that environmental management activities should be undertaken so as to avoid significant or irreversible negative environmental impacts, independently of the existence of scientific certainty concerning the occurrence of these impacts.⁴⁸ The precaution and prevention principles are, for instance, embodied in the Cameroon environment act where they constitute some of the fundamental principles upon which rational environmental management is based.⁴⁹

Other principles such as the need for environmental impact assessments, public participation and cooperation at the international level have also been explicitly embodied in domestic laws. The Congo environment act provides, for instance, that any development project must include an environmental impact assessment.⁵⁰ The Ugandan environment act provides that one of the principles of environmental management should be to encourage the maximum participation by people in the development of policies, plans and processes for the management of the environment.⁵¹ The Angolan environment act provides on its part that one of the principles guiding action in the environmental field is that the state undertakes to cooperate with other countries and international organisations to provide concerted solutions to common problems.⁵²

Broader guiding principles have also been incorporated. Thus, Ugandan law accepts the principle of intra- and inter-generational equity and provides that environmental management should be carried out with a view to use and conserve the environment equitably and for the benefit of present and future generations.⁵³ Further a number of countries have domesticated the human right to a clean environment. The Comoros provide, for instance, that every citizen has the fundamental right to live in a clean environment and the right to contribute to its conservation.⁵⁴

Influence of conventions

International treaties have influenced the development of domestic environmental laws and policies in African countries for a long time. Wildlife laws in Africa have, for instance, been influenced largely by international and regional laws on wildlife conservation and management. Indeed, the provisions of the African Convention have provided the framework for many wildlife laws in Africa. This Convention incorporates the substantive principles of the 1933 Convention relative to the preservation of fauna and flora in their natural state and the 1900 *Convention destinée à assurer la conservation des diverses espèces animales vivant à l'état sauvage en Afrique qui sont utiles à l'homme ou inoffensives*, both of which were signed by colonial powers.⁵⁵ These instruments have provided the basis for the setting aside of land for wildlife conservation which has become the hallmark of wildlife policies in Africa. Another international instrument that has significantly influenced wildlife laws and policies in Africa is CITES which has been ratified by 47 African states. Many countries have, ingrained in their wildlife legislation proscription of trade in endangered species of flora and fauna. The Kenya Wildlife (Conservation and Management) Act, for instance adopted the provisions of CITES by banning all game animal hunting and revoking all licences to trade in wildlife products in 1977.⁵⁶

More recently, concerns with biodiversity management have assumed prominence at international and regional levels. In this context, African countries, in conforming to Article 6 of the Biodiversity Convention, have embarked on the preparation of national strategies, plans and programmes for the management of biodiversity. This process has, in most cases, entailed the integration of the conservation and sustainable use of biological diversity into relevant cross-sectoral plans, programmes and policies. In Ethiopia, for instance, a national conservation strategy has been adopted. The strategy sets the main objective for biodiversity conservation to be the preservation, development, management and sustainable use of the wild and domesticated floral and faunal species and genetic diversity.⁵⁷

The conventions we have looked at here are examples and do not constitute an exhaustive list. There are a number of other international conventions which have had direct influence on the development of national laws and policies relating to biodiversity management.

IV. Legal and Institutional Frameworks for Biodiversity Management: Some Initiatives

Wildlife management and trade

Most of the African countries have policies, laws and administrative measures to promote conservation of biological diversity. These measures contain provisions to regulate trade in biological resources, with emphasis on wildlife, fisheries and forests. They are not obtained in any one policy regime or body of legislation. They are found in sectoral policies and legislation in such specific instruments as national wildlife Act, national wildlife policy, fisheries' act and forest legislation. Existing wildlife and forestry laws contain provisions on ownership of and access to the resources.

For example, Kenya has the Wildlife Conservation and Management Act (amended in 1989) to control illegal access to and exploitation of wildlife resources. Individuals and/or institutions have no right to extract wildlife or parts thereof protected by law without authority of the national agency in charge of wildlife. The Act requires that any person and/or institution seeking access to wildlife or parts thereof shall obtain prior consent of the relevant authorities; currently the Minister of Natural Resources and the Kenya Wildlife Service (KWS). The Act does not however contain provisions requiring the sharing of benefits arising from access to and utilization of wildlife resources. It is also silent on participation of local people in determining access to wildlife, particularly that found on private lands.

The Zimbabwe Parks and Wild Life Act of 1975, deals with protected indigenous plants. A permit is required

to enable any individual or individuals to collect a protected indigenous plant and/or parts thereof for, *inter alia*, export, cultivation and propagation, and for scientific purposes. The Parks and Wild Life Amendment Act of 1985 enables the Minister to prohibit persons from collecting any indigenous plants whether on alienated or unalienated land, within the area specified in the notice. Such restrictions on private land can be brought about in the interests of preservation, conservation, propagation or control of indigenous plants in Zimbabwe. This is a typical piece of legislation in which the state uses, or could use, its administrative machinery to control access to genetic resources.

The Zimbabwe legislation contains provisions that conform, albeit with a number of limitations, to the requirements of Article 15. A permit issued under the legislation is only done after an applicant has provided information on the uses to which the resources will be put. However, there are a number of important provisions that are not contained in the law. For example, the Zimbabwe Act of 1985 does not contain provisions which require foreign collectors of wildlife resources to share benefits (with the state and local people) arising from the use of the resources. There is also no provision that requires that Zimbabwe's nationals, particularly scientists, participate in scientific research on the use of material by foreign institutions. The legislation could be upgraded by integrating these provisions.

The Kenyan and Zimbabwean examples illustrate the divergent positions that have been taken within the CITES regime with regard to the domestic management of wildlife. With regard to the African elephant, Zimbabwe supports wildlife management strategies and has put in place community-based programmes encouraging such management while Kenya supports preservationist strategies.⁵⁸ Thus, Zimbabwe has communal wildlife management projects whereby local communities participate in management activities and derive benefits therefrom. Kenya in contradistinction maintains state control of wildlife management activities with minimal community involvement and consequently, local communities are opposed to wildlife presence on their land.

Economic instruments in forest management

Most African countries have formulated and instituted forest legislation that aims at regulating the exploitation of forests and forest resources. The content these laws vary from country to country. Most of them embody provisions controlling illegal access to public forests. The Forest Act of Uganda, for instance, bars individuals from entering forest reserves for purposes of extracting any forest resource or undertaking activities that may cause damage to the forest ecosystem.

Other countries have also used other mechanisms, such as trade to manage their forest resources. Cameroon has, for instance, used forest legislation to regulate trade in and export of *Prunus africana* since the mid-1970s. The legislation requires that any exploitation of the forest resources, particularly for commercial purposes, be licensed by the Forest Administration. In invoking this legal basis, the Administration has been regulating exploitation and export of the *P. africana* through quota permitting systems.

More recently, forestry projects have been used in the context of the climate change convention. More specifically, they constitute one of the main categories of Activities Implemented Jointly carried out. Various kinds of forestry projects have been promoted. Some seek to enhance forests' carbon conservation potential through improving growth rates of existing forests or protecting existing forests.⁵⁹ This includes the setting up of protected forest areas. The aim of setting up such areas is to prevent the release of carbon fixed in vegetation and to ensure that forests are not converted to other land uses such as agriculture, pasture, uncontrolled logging and urbanisation which store less carbon than forests. Other projects focus on the enhancement of the potential of forests to store carbon by reducing the rate of deforestation, rehabilitating degraded forests and expanding forested areas through plantations. Finally, some projects seek to increase the efficiency of fuelwood use through improved stoves or diminishing wood wastes generated from logging or construction operations which are left to decay. In the context of the Kyoto protocol, forestry projects will probably be central to the Clean Development Mechanism.

V. Towards More Effective Laws and Policies for Biodiversity Management

The international legal system for the management of biological diversity comprises a number of instruments in different fields. Some of them are exclusively concerned with biological resources, some deal primarily with other environmental issues while some are agreements in other areas of international law which have a direct impact on biodiversity management. All of them constitute the relevant framework to build and assess biodiversity management policies in Africa.

International law has had a dramatic influence on the development of environmental laws and policies in most African countries. The concerns expressed in these laws do not necessarily reflect the most pressing needs and challenges in the countries concerned. Thus, while the domestication of international conventions through domestic laws and the incorporation of principles from international law is an important step towards the effective management of biodiversity, it only constitutes the first link of a long chain of causation. Some of the prerequisite elements include the establishment of institutional capacities to ensure the effective implementation of conventions. The latter depends on a variety of factors informed by firstly, an integrated approach to biodiversity management incorporating long-term cross-sectoral approaches and harmonised policies and legislation.

In the process of formulating biodiversity policies and laws, needs assessment and priority setting should be carried out at the outset in specific countries so as to ensure the congruence of laws and policies with the situation on the ground. It is indeed remarkable that most African countries have started formulating national biodiversity strategies and plans as required under Article 6 of the Convention on Biological Diversity before promoting and encouraging understanding of the importance of and measures required for biodiversity management.

Endnotes

- ¹ In economic terms, Africa share of world trade has, for instance declined from 3,8% in 1970 to 1% in 1989. See United Nations Development Programme, *Human Development Report 1992* (New York, Oxford University Press, 1992).
- ² See, e.g., René Dumont, *Pour l'Afrique, j'accuse - Le journal d'un agronome au Sahel en voie de destruction* (Paris, Plon, revised ed. 1993).
- ³ See Paul R. Ehrlich & Anne H. Ehrlich, 'The Value of Biodiversity', 21 *Ambio* 219 (1992). See also, United Nations, *Glossary of Environment Statistics* (UN Doc. ST/ESA/STAT/SER.F/67, 1997).
- ⁴ Article 2 of the Convention on Biological Diversity, Rio de Janeiro, 5 June 1992, reprinted in 31 *ILM* 818 (1992) [hereafter Biodiversity Convention].
- ⁵ M.S. Swaminathan, 'Preface', in *Agrobiodiversity and Farmers' Rights* at v (M.S. Swaminathan ed., Delhi: Konark Publishers, 1996).
- ⁶ Article 1 of the Convention on Biological Diversity, Rio de Janeiro, 5 June 1992, reprinted in 31 *ILM* 818 (1992) [hereafter Biodiversity Convention].
- ⁷ Art. 3 of the Biodiversity Convention, *supra* note 6.
- ⁸ See, e.g., Preamble of the Biodiversity Convention, *supra* note 6.
- ⁹ See, e.g., Alan E. Boyle, 'The Convention on Biological Diversity', in *The Environment After Rio - International Law and Economics* 111 (Luigi Campiglio et al. eds., London: Graham & Trotman, 1993).
- ¹⁰ Articles 8 & 9 of the Biodiversity Convention, *supra* note 6.
- ¹¹ Art. 16 of the Biodiversity Convention, *supra* note 6.
- ¹² Preamble § 12 and Article 8 (j) of the Biodiversity Convention, *supra* note 6.
- ¹³ Article II of the African Convention on the Conservation of Nature and Natural Resource, Algiers, 15 Sept. 1968, 1001 UNTS 3 [hereinafter African Convention].
- ¹⁴ Article VIII (1) of the African Convention, *supra* note 13.
- ¹⁵ Articles VI (1) (b) - (e), XII, XIII and XIV of the African Convention, *supra* note 13.
- ¹⁶ Article XIV (2) of the African Convention, *supra* note 13.
- ¹⁷ See generally IUCN/UNEP/WWF, *Caring for the Earth - A Strategy for Sustainable Living* (Gland, Switzerland, 1991).
- ¹⁸ Article II and XI of the African Convention, *supra* note 13.
- ¹⁹ Convention on Wetlands of International Importance Especially as Waterfowl Habitat, Ramsar, 2 Feb. 1971, reprinted in 11 *ILM* 963 (1972) [Hereafter Ramsar Convention].
- ²⁰ Article 3 of the Ramsar Convention, *supra* note 19 and Recommendation C.3.3. on Wise Use of Wetlands, 3rd Conference of the Contracting Parties, Regina, 1987.
- ²¹ See Resolution VII.8, 'Guidelines for establishing and strengthening local communities' and indigenous people's participation in the management of wetlands', 7th Meeting of the Conference of the Contracting Parties, San José, 1999.
- ²² Convention on International Trade in Endangered Species of Wild Fauna and Flora reprinted in 12 *ILM* 1085 (1973) [hereinafter CITES].
- ²³ See Article II of CITES, *supra* note 22.
- ²⁴ See Timothy M. Swanson, *The Role of Wildlife Utilization and other Policies for Diversity Conservation*, in *ECONOMICS FOR THE WILDS* 65 (T. M. Swanson & E. M. Barbier, eds., 1992). See

- also, Michael J. Glennon, *Has International Law Failed the African Elephant?* 84 AM. J. INTL. L. 1, 11 (1990).
- 25 See Article XXIII, CITES *supra* note 22.
- 26 Article 2 of the Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa, Paris, 17 June 1994, *reprinted in* 33 ILM 1328 (1994).
- 27 See, e.g., Stéphane Doumbé-Billé, 'La convention de Paris de 1994 sur la désertification', in *Stratégies énergétiques Biosphère & Société - Le droit international face à l'éthique et à la politique de l'environnement* 143-150 (Geneva : Georg, 1996).
- 28 Art. 2 of the Kyoto Protocol to the United Nations Framework Convention on Climate Change, Adopted at Kyoto, 10 Dec. 1997, UN Doc. FCCC/CP/1997/L.7/Add.1 (preliminary version of 10 Dec. 1997). Annex B of the Protocol stipulates the exact percentage reduction for each country.
- 29 See, e.g., Thomas Heller, *Joint Implementation and the Path to a Climate Change Regime* (Jean Monnet Chair Paper, The Robert Schuman Centre at the European University Institute, 1995).
- 30 Art. 12 of the Kyoto Protocol, *supra* note 28.
- 31 Miko U.F. Kirschbaum et al, 'Climate Change Impacts on Forests', in Robert T. Watson et al. eds, *Climate Change 1995 - Impacts, Adaptations and Mitigation of Climate Change: Scientific-Technical Analyses* (Cambridge: Cambridge UP, 1996).
- 32 John Reilly et al., 'Agriculture in a Changing Climate: Impacts and Adaptation', in Robert T. Watson et al. eds, *Climate Change 1995 - Impacts, Adaptations and Mitigation of Climate Change: Scientific-Technical Analyses* 427 (Cambridge: Cambridge UP, 1996).
- 33 See, e.g., Olga N. Krankina et. al, 'Carbon Storage and Sequestration in the Russian Forest Sector', *Ambio* 25, 1996, p. 284.
- 34 Article 61 of the United Nations Convention on the Law of the Sea, Montego Bay, 10 Dec. 1982, *reprinted in* 21 ILM 1261 (1982).
- 35 See Article 27.2 of the Agreement on Trade-Related Aspects of Intellectual Property Rights, Marrakesh, 15 Apr. 1994, *reprinted in* 33 *Int'l Legal Mat.* 1125 (1994) [hereafter TRIPS Agreement].
- 36 See Article 27.3 of the TRIPS Agreement, *supra* note 35.
- 37 H. W. O. Okoth-Ogendo, 'Juridical framework of Environmental Governance', in H. W. O. Okoth-Ogendo & Godber Tumushabe, eds., *Governing the Environment: Political Change and Natural Resources Management in Eastern and Southern Africa* 41 (1999).
- 38 Section 75 of the Constitution of Kenya.
- 39 Article 245 of the Constitution of Uganda.
- 40 Article 24 of the Constitution of the Republic of South Africa, 8 May 1996, as amended 11 Oct. 1996.
- 41 Art. 99& 100 of the Ugandan National Environmental Statutes, 17 May 1995.
- 42 Cf. The Loi No. 005/97/ADP portant code de l'environnement au Burkina Faso, 30 Jan. 1997 which provides a relatively much higher fine of about \$900'000 for illegal handling of hazardous waste.
- 43 See, e.g., Article 38 of the Eritrean Environment Proclamation of 1996.
- 44 Malawi Act No. 23, 5 Aug. 1996.
- 45 Article 5 of the Comores Loi-cadre No94-018 relative à l'environnement of 22 June 1994.
- 46 Article 4 of the Algerian Loi No. 83-03 relative à la protection de l'environnement of 5 Feb.

- 1983.
- 47 Article 14 of the Environment Proclamation of 1996.
- 48 Article 4.3 of the Mozambican Lei No. 97 of 1997.
- 49 Article 9 of the Cameroon Law No. 96/12 Relating to Environmental Management, 5 Aug. 1996.
- 50 Article 2 of the Congo Loi No. 003/91\ sur la protection de l'environnement, 23 Apr. 1991.
- 51 Article 3.2.b of the Ugandan National Environmental Statutes, 17 May 1995.
- 52 Article 4.f of the Angolan Lei No. 5/98, 18 June 1998.
- 53 Article 3.2.c of the Ugandan National Environmental Statutes, 17 May 1995.
- 54 Article 4 of the Comores Loi-cadre No94-018 relative à l'environnement of 22 June 1994.
- 55 See Convention Relative to the Preservation of Fauna and Flora in their Natural State, London, 8 Nov. 1933, 172 *LNTS* 241 and Convention destinée à assurer la conservation des diverses espèces animales vivant à l'état sauvage en Afrique qui sont utiles à l'homme ou inoffensive, London, 19 May 1900, in *Felix Stoerk, Nouveau Recueil de traités et autres actes relatifs aux rapports de droit international - Continuation du grand recueil de G. Fr. de Martens* 430 (2nd series, Vol. XXX, 1904).
- 56 See (Conservation and Management) (Prohibition on Hunting of Game Animals) Regulations, 30 Kenya Gazette Supplement (May 20, 1977) and the Wildlife (Conservation and Management) (Revocation of Dealer's Licences) Act No. 5 of 1978, 35 Kenya Gazette Supplement (June 23, 1978).
- 57 See Shibru Tedla & Martha Gebre, 'Biodiversity Management in Ethiopia', in *Managing Biodiversity - National Systems of Conservation and Innovation in Africa* 65 (Nairobi: ACTS, 1998).
- 58 See, e.g., Marshall Murphree, The lesson from Mahenye: Rural Poverty, Democracy and Wildlife Conservation, The Wildlife and Development Series, http://www.wildnetafrica.com/bushcraft/articles/document_campfire1.html (last visited 04/01/98).
- 59 Pedro Moura Costa, 'Tropical Forestry Practices for Carbon Sequestration: A Review and Case Study from Southeast Asia', *Ambio* 25, 1996, p. 279.

