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Fourth National Report to the Conference of Parties of the Convention on Biological Diversity

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All correspondence to:

Director General
National Environment Management Authority
Popo Road, Off Mombasa Road,
P.O. Box 67839 00200
Nairobi, Kenya
Tel: 020 605522; 601945, 608767, 608667,
Cellphone: 0733 600035, 0724 253 398.
Email: dgnema@nema.go.ke
Website:www.nema.go.ke

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Consultants:

Dr. Gedion H. N. Nyamasyo

Prof. J. B. Okeyo Owour

Editorial and Technical Guidance

The following persons provided editorial and technical guidance during the preparation of this report:

Dr. A. Muusya Mwinzi Director General, NEMA

Dr. Charles Nyandiga United Nations Development Program

Mr. Parkinson Ndonye, CBD Desk Officer, NEMA

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ACRONYMS

ABS	Access and Benefit Sharing
ASALs	Arid and Semi-arid Lands
AWF	African Wildlife Foundation
CBD	Convention on Biological Diversity
CBO	Community-based Organization
CDF	Constituency Development Fund
CGAIR	Consultative Group of Agricultural International Research
CIKSAP	Centre for Indigenous Knowledge and Products
CIMMYT	International Maize and Wheat Research Centre
CIP	International Potato Research Centre
CITES	Convention on International Trade in Endangered Species of Wild Fauna
COP	Conference of Parties
CSO	Civil Society Organizations
DVS	Department of Veterinary Services
EAWS	East African Wildlife Society
EIA	Environmental Impact Assessment
EMCA	Environmental Management and Co-ordination Act
ERSW & EC	Economic Recovery Strategy for Wealth and Employment Creation
ESA	Ecologically Sensitive Area
FAN	Forest Action Network
FAO	Food and Agricultural Organisation
FONA	Friends of the Nairobi Arboretum
GEF	Global Environment Facility
GIS	Global Information Systems
GOK	Government of Kenya
GTZ	German Agency for Technical Co-operation
Ha	Hectares
HEP	Hydro-electric Power
IBA	Important Bird Area
ICIPE	International Centre for Insect Physiology and Ecology
IDPs	Internally Displaced Persons
IFAD	International Fund for Agricultural Development
ILRI	International Livestock Research Institute
IPR	Intellectual Property Rights
ITDG	Intermediate Technology Development Group-Kenya
IUCN	World Conservation Union
KARI	Kenya Agricultural Research Institute
KEFRI	Kenya Forestry Research Institute
KMFRI	Kenya Marine and Fisheries Research Institute
KEPHIS	Kenya Plant Health Inspectorate Services
KESREF	Kenya Sugar Research Foundation
KNBS	Kenya National Bureau of Statistics
KWS	Kenya Wildlife Service
LVBC	Lake Victoria Basin Commission

LVEMP	Lake Victoria Environment Management Programme
EEZ	Exclusive Economic Zone
KFSC	Kenya Forestry Seed Centre
ICRAF	International Centre for Research in Agro-forestry
ILDP	Ilkerin Loita Development Project
IITA	International Institute for Tropical Agriculture
ISTA	International Seed Testing Association
M & E	Monitoring and Evaluation
MOU	Memorandum of Understanding
NARS	National Agricultural Research Systems
NBSAP	National Biodiversity Strategy and Action Plan
NCST	National Council for Science & Technology
NEAP	National Environment Action Plan
NEMA	National Environment Management Authority
NES	National Environment Secretariat
NGO	Non-governmental Organisation
NMK	National Museums of Kenya
NPEP	National Poverty Eradication Programme
PCPU	Plant Conservation and Propagation Unit
PEV	Post-election violence
PGRs	Plant Genetic Resources
PRSP	Poverty Reduction Strategy Paper
SBSTTA	Subsidiary Body for Technical and Technological Advice
SGP	Small Grants Programme
SPECK	Society for the Protection of the Environment in Kenya
Sp./Spp.	Species
UNCCD	United Nations Convention to Combat Desertification
UNCED	UN Conference on Environment and Development
UNEP	United Nations Environment Programme
UNESCO	UN Economic, Social and Cultural Organisation
UNFCCC	United Nations Framework Convention on Climate Change
UON	University of Nairobi
USAID	United States Agency for International Development
WRUA	Water Resources Users Associations

TABLE OF CONTENT

EXECUTIVE SUMMARY

1. The NBSAP is a national framework of action for the implementation of the Convention on Biological Diversity to ensure that the present rate of biodiversity loss is reversed, and that present levels of biological resources are maintained at sustainable levels for posterity.
2. The national goals of the NBSAP include:
    (a) To maintain a high quality environment for sustainable livelihoods for all Kenyans
    (b) To guarantee inter- and intra-generational sustainable use of natural resources and services
    (c) To maintain ecological and ecosystem processes
    (d) To preserve and benefit from genetic resources and biological diversity in the nation's ecosystems and to preserve their cultural value
3. The major threats to biodiversity conservation include but are not limited to:
    (a) Inadequate financial and technical resources
    (b) Low level of awareness about the national goals of the NBSAP
    (c) Poor institutional and regulatory co-ordination at national and sub-national level
    (d) Pollution of the major habitats
    (e) Impacts of climate change
    (f) Increased human population pressure
4. The current status of the NBSAP include:
    (a) The NBSAP document has not yet been fully endorsed and effectively mainstreamed into national programmes this creates constraints in its implementation
    (b) Despite the above weakness, almost every sector makes reference to the NBSAP relevant points and where possible, incorporates them into their strategic and action plans
5. The NBSAP for example, has played a key role in the implementation of the Convention especially in guiding Kenya in the participation of the relevant conferences and in the development of the relevant regulations governing the conservation of biodiversity
6. It is the view of Kenya that the Convention is fulfilling its leadership role in international biodiversity issues
7. There is reasonable evidence that Kenyan society, now more than ever before, has engaged in biodiversity conservation with much clearer understanding. However rapid implementation of the CBD and biodiversity conservation are heavily affected by the country's inadequate capacity with respect to its financial, human, scientific, technical and technological needs
8. With respect to the 2010 target, Kenya:-
    (a) Has established a system of protected areas of particular importance to biodiversity and has updated its policies regarding biodiversity conservation, for example, by the enactment of the Wildlife (Management and Conservation) Act, the Environmental Management and Co-ordination (Conservation of Biodiversity) Regulations of 2006, the Forestry Act of 2005, the Water Act of 2002;

(b) As regards fish species diversity, has undertaken under the 1994-1996 development plan to comply with strict management practices in the enforcement of fisheries regulations, especially in relation to the 200 mile economic exclusive zone (EEZ);

(c) Has enacted statutes and regulations and participated in international and regional programmes for the promotion of genetic diversity as well as established national institutions for the same purpose;

(d) Has yet to develop strategies for the promotion of the sustainable use and consumption of biodiversity resources. However, she has taken a leading role in compliance with CITES and this offers hope in the long run for biodiversity conservation;

(e) Faces increasing challenges from the desire for all Kenyans to own a piece of agricultural land in rural areas which has tremendously increased the pressure on such land due to sub-economic subdivisions and encroachment by individuals and communities into protected areas;

(f) In recent reviews, has estimated that there are 34 species, including wetland invasive species that are attacking biodiversity resources. This is regulated under the Noxious Weeds Act. However, it is time that the legislative situation was updated to address the challenges that may be experienced, for example, as regards biotechnology and genetic engineering of biodiversity resources;

(g) Kenya's geographical location astride the equator has served to intensify the effects of climate change on biological resources leading to prolonged droughts affecting plant and animal population dynamics as never before;

(h) Has taken steps to ensure that ecosystems' capacities are maintained in providing goods and services as well as support livelihoods of local populations;

(i) Ministry of Culture and Social Services through the National Museums of Kenya has taken the lead in ensuring the socio-cultural diversity of indigenous communities is maintained, although it has yet to successfully implement a national strategy in this regard;

(j) Thus far, has gazetted Access and Benefit Sharing regulations to ensure the fair and equitable distribution of the benefits of biodiversity resources, including plant genetic resources. After the enactment of the Biosafety Act in 2009, it is still necessary for a comprehensive strategic action plan and policy be crafted in this area to ensure benefits' sharing; and

(k) As a party to the CBD, has improved the financial, human, scientific, technical and technological capacity to implement the Convention, more still needs to be done in the area of technology transfer and material transfer agreements.

CHAPTER ONE: BIODIVERSITY STATUS, TRENDS AND THREATS

1.0 Introduction

Kenya is a party to the Convention on Biological Diversity (CBD) and under Article 6 of the Convention is expected to report regularly to the Conference of Parties on the progress made in the implementation of the Convention. Accordingly, the first, second and third reports were submitted in 1998, 1999 and 2005 respectively. The Fourth National Report will be submitted on 30th March 2009. The guidelines for the preparation of the report are that it shall contain four chapters, the first on biodiversity status, trends and threats, the second on the current status of the NBSAP, the third on sectoral and cross-sectoral integration of biodiversity considerations, and the fourth on progress towards the 2010 biodiversity targets and the implementation of the strategic plan.

1.1 The National Biodiversity Strategy and Action Plan (NBSAP)

The national efforts to implement the Convention are outlined in the National Biodiversity Strategy Action Plan developed in the year 2000. This document is central to all the programmes, projects and activities that Kenya has developed or been involved in respect of biodiversity conservation. It is therefore, necessary to reproduce the goals and objectives of the NBSAP here in order to build on it and maintain consistency in the presentation of this report.

1.1.1 NBSAP Goals

The national goals of Kenya's strategic action plan for biodiversity conservation as stated in the 1st National Report (1998) are:

1. To ensure and maintain a high quality environment that permits a life of dignity and well-being for all;
2. To achieve sustainable utilization of resource ecosystem for the benefit of the present generations, while ensuring their potential to meet the demands of future generations;
3. To maintain ecosystems and ecological processes essential for the functioning of the biosphere; and
4. To preserve genetic resources and biological diversity in the nation's ecosystems and to preserve their cultural value.

From the onset, it was realized that the achievement of these goals will be dependent on how vigorously Kenya pursued the overall objectives of the CBD, which are "*the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies and by appropriate funding*". To meet the stated CBD objectives the country has articulated **specific objectives**.

1.1.2. NBSAP Objectives

1. *To promote the sustainable utilization of biodiversity products.* This is aimed at neutralizing the overexploitation of biodiversity resources by, for example, controlling charcoal burning, overgrazing of pastures and limiting stock herds; adopting appropriate

land use and agricultural practices by, for example, promoting efficient farming techniques and conserving wetlands; creating alternative products and sources of alternative income; and controlling introduction of substitute in forests, food crops and livestock.

2. *To create an enabling environment for biodiversity conservation by improving national capacity and strengthening regulatory mechanisms*. To achieve this, Kenya will strengthen its institutional and technical capacity by improving the technical infrastructure and strengthening the manpower base. Kenya will strengthen the capacity of biodiversity managers through improved resource allocations and training. It has enacted a comprehensive and effective biodiversity conservation policy that addresses, among other things, emerging issues such as human/wildlife conflicts, illegal timber trade and land tenure. It strives to promote political goodwill in the interests of biodiversity conservation and hopes to avail incentives to stakeholders.

3. *To promote awareness in biodiversity conservation*. The country, through relevant organs, continued to inform the public by providing adequate information through improved extension services and networks and tries to assign real economic and other values to biodiversity products.

4. *To promote and enhance the conservation of biodiversity through in-situ and restorative procedures*.

5. *To strengthen research and monitoring activities by improving inventories, databases and documentation*.

6. *To promote environment-friendly activities like ecotourism and preventive activities like environmental impact assessments*.

1.1.3. International agreements and programs:

Kenya has signed and ratified the following international Conventions which relate to the goals of the NBSAP. These include the Convention on International Trade in Endangered Species of Wild Fauna (CITES) and Convention on the Conservation of Migratory Species of Wild Animals; Convention on Wetlands of International Importance especially as waterfowl habitats (the Ramsar Convention); the United Nations Framework Convention on Climate Change (UNFCCC); Vienna Convention on the Protection the Ozone Layer; the United Nations Convention to Combat Desertification (UNCCD) and the United Nations Convention on Biological Diversity (CBD).

1.2 Status of Biodiversity

The status, trends and threats to biodiversity are examined alongside the identified ecosystems, namely marine and coastal, inland waters including wetlands, agricultural and forests ecosystems.

a) Marine and Coastal Biodiversity

The Kenya's Coast has some fragile forest and grassland ecosystems which frequently experience mild to severe drought even as they carry a diverse and rich biological diversity.

There are increasing efforts to include community participation in Coastal forest management but much awareness, education and demonstration of best practices still needs to be done.

The marine waters and mangrove areas along the Kenyan coast are known to have rich biodiversity much of which is still pristine, other than on areas encroached on by human settlements, hotels and the port of Mombasa. The rich biodiversity and associated resources at the Kenya Coast are the key resources that sustain the tourism industry in Kenya. The rich marine and coastal life forms is composed of over 800 species including 169 species of corals, 9 species of mangroves and 300 species of 11 species of sea-grasses, 344 species of mammals, 5 species of reptiles, not to mention the countless numbers of species not yet described or discovered. Marine fisheries are not only an important source of protein for coastal populations but are also form a significant economic activity. The main fishery along the Kenya coast however, is still at artisan level. At the Kenya Coast coral reefs constitute major biodiversity and tourism features. It's now common to see tourists in glass-bottomed boats being ferried to coral gardens for viewing. Coral gardens are popular spots for water-sports tourism especially diving. Considering that trade goes on by boat traders, diving schools also make income from these ventures associated with corals. Ecotourism in the mangrove forests fringed creeks in dhows is gaining popularity as dhow operators attract tourists by offering a variety of packages among which is the panoramic view of mangrove vegetation and its associated fauna, especially of birds. Ecotourism dhows also offer lunches and dinners on board, activities that require a clean environment. The Kenya Marine and Fisheries Research Institute's (KMFRI) research efforts in corals and mangroves has attracted donor funding by many international institutions including the European Union, the Food and Agricultural Organization (FAO), the US Agency for International Development (USAID), the UN Economic, Social and Cultural Organization (UNESCO), the United Nations Environment Programme (UNEP) and the Belgian Government in the framework of the Kenya-Belgium Project in Marine Sciences.

The nearly 53,000 hectare Kenyan mangrove system, though being rapidly degraded, provides local communities with timber, tannin and other products. They also present an excellent refuge and breeding sites for many coastal fish species where they also form important feeding grounds. Mangroves are however, threatened by degradation caused by over-harvesting of its timber and conversion for salt farming, practices that need to be controlled so as to maintain the rich biodiversity and ecological functions of these ecosystems.

There are good efforts by the Kenya government, through KMFRI, to conduct research on marine and coastal ecosystems to provide the necessary data for implementing conservation efforts of this rich biodiversity. KMFRI has mapped out the commercial fishing grounds in our national sector. The 1979-1981 FAO and KMFRI collaborative research generated data that was used in the compilation of the Kenya Atlas of Coastal Resources (1994-1995). The map shows that the richest fishing grounds are in Northern Kenya, North of Malindi and off the island of Lamu bordering the rich fishing grounds of the Somali Republic. Currently, the Kenyan portion of the Indian Ocean is being exploited by a fleet of mostly foreign-owned fishing vessels. The total amount of marine fishery production in Kenya is about 10,000 tons, mostly from inshore waters rather than offshore production. The Northern Kenya fishing area yields good commercial fish types for export and also supports a prawn fishery and a deep-water lobster fishery which fetch very high export prices. At the moment pilot studies and demonstrations are being conducted on better methods to culture oysters and the Brine shrimp *(Artemia)* at the Kenya coast to enhance economic gains rather than restock the coastal waters

with such species. However, there is little progress in this venture even as collaboration between KMFRI, the University of Brussels, the Coast Development Authority, and some local NGO has been tried.

b) Inland Waters including Wetland Biodiversity.

Inland waters include lakes, rivers, ponds, streams, groundwater, springs, cave waters, floodplains, as well as bogs, marshes and swamps, which are traditionally grouped as inland wetlands. The CBD, and indeed Kenya, has adopted the Ramsar Convention's definition of "wetland" i.e. *"Areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres."* This definition is taken to fit the purposes of this review and includes all possible kinds of inland water bodies or ecosystems, or components thereof, as well as groundwater. "Inland water habitat" also includes land that is influenced directly by aquatic habitat. For example, the vegetation near water bodies (in the riparian zone), even if never submerged, is influenced greatly by proximity to water. Inland waters biodiversity may be taken to include all the species diversity and ecosystems of which they are part that is associated with any non-coastal or inland waters. At the species, genetic and ecosystem levels, inland water biodiversity generally includes all life forms that depend upon inland water habitat for things other than simply drinking (or transpiration in plants). Inland waters are characterized by high endemicity of freshwater species, for example, between different lakes or the upper reaches of sub-catchments of rivers, often even where located physically close to each other. Also, human interventions in the ecosystem tend to deliberately reduce this diversity (e.g., by modifying the form, and therefore function, of river channels and/or hydrology).

In Kenya inland waters occur everywhere and are particularly a part of all landscapes. They are found in all terrestrial ecosystems - including grasslands, mountains, forests, islands, agricultural ecosystems, inland sections of coastal zones and dry and sub-humid lands. They sustain all forms of life, including humans, in surrounding areas. The major inland waters include all major rivers and lakes within the Rift Valley and parts of the regionally shared Lake Victoria (Nyanza Gulf) all of which are rich in biodiversity of all sorts but are fast degrading largely due to human activities. Except for Lakes Victoria and Naivasha many of Kenya's inland waters are generally poor in biodiversity, particularly fish diversity. Lake Victoria has over 250 fish species, a large number of which are endemic. Lake Turkana, the second largest lake in Kenya, has 48 species ten of which are endemic. With the exception of Lake Magadi, which has one endemic species, the alkaline Rift Valley lakes are generally poor in fish resources. Kenya's rivers such as the Tana, Athi, and Uaso Nyiro (North), Malewa and Nzoia largely contain non-endemic fish species. It should be noted that the above figures of biodiversity assessments are nearly two decades old and a re-assessment is urgently required to ascertain the current status.

Plants and animal species associated with inland freshwater wetlands are unique and highly specialized. In fact some wetlands, especially in the extensive semi-arid parts of Kenya provide the last refuge to rare and threatened species. Kenyan wetlands are breeding grounds for fish and birds, and provide a wide variety of products and environmental services to

communities. Although only 20% of Kenya's human population (projected at 29 million in 1997, and 35 million in 2009) lives in these areas, wetlands contribute greatly to Kenya's economy in terms of livestock production and biodiversity (especially wildlife) conservation. The waters of her rivers have been dammed to supply hydroelectric power (HEP).

Recent research results reveal that species diversity, distribution and abundance especially of fish has declined from the previous 400-500 species to just under 10, with only 3 being landed on a commercial basis. According to KMFRI' stock assessment reports, the inland annual fisheries resources production in Kenya is about 200,000 tons. The main inland waters and wetlands containing rich species-diversity are lakes Victoria, Turkana and Naivasha while several others such as Baringo, Nakuru and Elementaita provide touristic biodiversity phenomena. KMFRI's recent findings show that fish stocks of Lake Baringo show a suitable fishery and a very profitable one through a combination of closed and open season fishery as the Lake is in an arid zone. But in both Lake Naivasha and Victoria there is increasing pressure on the fish resources due to over-fishing and increasing pollution loading, hence the continued desire to promote aquaculture in the country. Indeed aquaculture in the inland waters has a long history. But it is necessary to perfect culturing methods and adapting them to various local environmental conditions in the different parts of Kenya. Currently fish production through aquaculture is about 1,100 tons and the popular fish species for propagation to farmers is still the tilapia, even though other species such as *Clarias gariapenis* are being tried.

Inland water resources support a wide range of socio-economic activities, including a rapidly growing fishing and tourist industry as well as conservation of wildlife. Freshwater and saline ecosystems cover about 8% of Kenya surface area and include rivers, lakes and wetlands. These are important areas of biodiversity, food production, hydrological stability, mineral cycling and socio-economic development. The biodiversity values of Kenya's inland waters are largely based on their capacity to support fisheries and wildlife, as well as birds. These series of freshwater and saline lakes and the associated wetlands constitute vital stepping stones along the migratory route of thousands of birds. Fresh water lakes, such as Lake Naivasha, constitute a significant life support system for local communities who extract water and fish from the lakes.

The Lake Victoria basin produces 90% of Kenya s total catch and sustains nearly half of the country's population. The alkaline lakes of the Great Valley such as Lakes Baringo, Nakuru, Bogoria and Magadi are important tourist attractions. In Kenya the fresh water lakes, rivers and wetlands do not attract as much tourism as the ocean waters; except for Nile Perch sport-fishing in Lake Victoria and Trout sport-fishing around Kiganjo, there are no other inland tourist water activities. However, there are many inland waters and wetlands that are still rich in biodiversity that need to be actively conserved and protected. Many of these are found outside the protected areas. KMFRI has made great strides towards understanding the massive fish kills that occur in Lake Victoria and establishing the status of rare and endangered fish species. They have also cultured them and made releases into the Lake with an aim of regaining back the biodiversity of the lake. Since the introduction of the Nile perch, *Lates niloticus*, in Lake Victoria over 50 years ago and due to over-fishing the lake's fishery has undergone dynamic changes in the last 15 years involving lucrative trade for international markets but with little impact on the fisher-folk in terms of economic gains and infrastructure development. The recent invasion of the Kenyan fresh water systems by aquatic weeds such as *Salvinia molesta i*n Lake Naivasha and

Lates nilotica in Lake Victoria has seriously altered the biodiversity of fauna and flora in these lakes and many water bodies a situation that needs to be dealt with on a sustainable basis.

Kenya has more than 77 statutes for the conservation and management of the environment, including biodiversity, which include the Forestry Act (2005); the Wildlife (Conservation and Management) Act (1989); the Government Fisheries Protection Act (Cap 379, 1962); the Fish Industry Act (1983), the Environmental Management and Co-ordination (Conservation of Biodiversity) Regulations (2006), the Water Act (2002), and the Agriculture Act, all of which do not adequately address issues on marine and inland waters. Kenya's current biodiversity policy aims at integrating the various facets of conservation into the national development plan. Existing legislation on environmental management has been reviewed and consolidated into the Environmental Management and Co-ordination Act of 1999. They are not adequately enforced and there are very low levels of awareness among Kenyans, including riparian communities. There are many gaps and overlaps in the institutional framework making enforcement difficult; the high level of poverty in these areas promote the unsustainable use of resources and this is compounded by lack of a comprehensive land-use policy. Further, there are conflicting issues that relate to the various national institutions and agencies upon which the making and enacting of such laws and policies are vested, even as these important ecosystems and biodiversities are being degraded.

c) Arid and Semi-arid Areas (ASAL) Biodiversity

Kenya's ASALs comprise rangeland where the ecosystems include livestock and indigenous biodiversity. Over 20% of Kenyan population lives here. The wildlife in the ASAL areas are an important biological resources since they form the backbone of the tourism industry. Plant communities and species are diverse and range from desert to dryland forest types. The vegetation comprises the dryland forests, woodlands shrubs, wooden grasslands and savanna type of plants. The fauna comprise a unique assemblage of megafauna which include large herbivores and carnivores, birds and many arthropod species. However, these rather fragile ecosystems, with diverse and rich biodiversity, frequently experience drought conditions and have in recent times has been on the decline due to adverse human activities.

It is worth noting that most of the country's national parks and game reserves occur in the ASALs and the ecosystems beautiful scenery makes them preferred tourist destinations. Of the 12 national protected areas, 50% are found in the ASALs. The current trend shows a sharp decline in animal species diversity and population abundance in the ASALs. Monitoring the environmental situation including ASAL vegetation has not progressed well making it difficult to adequately provide accurate information on its status.

d) Agricultural Biodiversity

Plant Genetic Resources - Kenya lies at the intersection of four major zones of plant species and possesses the easternmost fragments of the region, now restricted to the degraded forests of and adjacent Bologe forest. This region is the last remaining patch of one of Kenya's most species-rich biotic communities. The entire area remains under intense pressure from encroachment and unsustainable use. On the other hand, the Zanzibar-Inhambane Mosaic, which lies along the Coast, and once known as the 10 mile wide narrow strip of vegetation, is under intense population pressure and changes in land use. Although, the forest component of

this vegetation is now fragmented, each surviving region shows a high level of endemism and all remaining patches are under threat. Only two Hills currently receive any protection.

Further, the upland dry-evergreen forests of Kenya, known as the Somali-Maasai Region, now only a relic, stands along the eastern edges of the Rift Valley of Kenya and is characterized by the protected areas Ol Doinyo and Nairobi Forest Reserve forms one of the best studied forests in Kenya. The forests grow on the higher reaches of the Rift Escarpment and Central Highlands. They perform important watershed functions, in addition to providing sites for high plant and animal biodiversity. Although some high altitude forests are well protected by their isolated position and protected area status, others are being eroded at a fast rate. There are several prime areas that need increased protection including Mau forest (30% degraded in the last 10 years) and Mt. Kenya (lower slope threatened by encroachment by agriculture and illegal logging).

Currently, the national records of threatened species show that some 392 are endemic. There are also, a further 336 regional species that are endemic, 6 known extinctions and at least 258 species that are threatened and all as such have presidential protection. Also there are 45 known domesticated vegetable species and 200 wild species in Kenya. There are also 110 species of multipurpose (including medicinal) forest species all with modest economic promise. Other wild species and wild relatives of Kenyan vegetation are endowed with a unique heritage of diverse of forages (grasses, legumes, browse plants, etc.), cereals (sorghum and millets), pulses (pigeon peas, tuber crops, yams, sweet potatoes, etc.), oil crops (castor, sesame trees), tropical fruit plants and vegetables (*Amaranthus,* etc). In particular parts of Eastern and North Eastern Kenya are believed to have wild relatives of coffee. There are also in the wild a number of plant species that have not been developed commercially including indigenous vegetables, indigenous plants and oil crops. These species are bound to be drought tolerant given the arid nature of this region.

Kenya is endowed with a rich variety of cultivated crop species either indigenous or introduced which serve to provide food and income for its 35 million people and beyond. There are several cereal crops including the exotics, maize, wheat, barley and sorghum as well as the indigenous millets (pearl and finger). Among the popular exotic but domesticated crop species are the *Brassicas* (kales, cabbage, etc), pyrethrum, tea, pepper, many fodder crops, sugarcane, Irish potatoes, cotton, sisal, several fruit tree species, etc. All these are promoted by the government research and extension systems.

Although, the Government normally encourages use of improved varieties whenever available to ensure sufficiency in food products, many farmers feel that traditional variety is superior to improved variety for one reason or another. They often grow, conserve and use certain traditional variety, either due to palatability, pest resistance, or plant genetic diversity even though they are not well documented. Inter-cropping and growing a mixture of diverse genotypes of a given crop species is common amongst many small scale farmers. However, factors like drought, floods and other natural catastrophes may have an adverse effect on such crops' diversity. Further, adverse effects of the current high human populations heightened by the recent influx of Somali refugees and the 2007 post-election violence (PEV) Internally Displaced Persons (IDPs) are already being felt in Kenya as they contribute to the national genetic erosion by encouraging deforestation and encroaching upon protected areas with high genetic diversity.

Conservation of PGR *In-situ* - In Kenya the PGRs, where natural or cultivated, are actively being conserved by the National Museums of Kenya (NMK), the Kenya Agriculture Research Institute (KARI), Kenya Wildlife Services (KWS), the Kenya Forest Research Institute (KEFRI) and the Kenya Forest Service (KFS). There are also several CGAIR centres and NGOs that conserve for their own use many PGRs. However, the key player in *in-situ* conservation of indigenous forest resources are the NMK and KWS although the KFS is the main agency concerned with *in situ* conservation and management of indigenous forests. Other *in-situ* sites in protected areas exist (e.g. those protected under the Kenya Wildlife Service, Forestry Department) where inventories on rare, threatened and endemic PGR are taken even when the plants are under protection. For example, the Plant Conservation and Propagation Unit (PCPU), in collaboration with the KWS and the NMK, conducts this task on a routine basis. Similar work is also being undertaken in wetlands and other departments working under the Centre for Biodiversity. However, conservation of PGRs in Kenya is un-co-ordinated and is largely donor funded with a time frame not long enough to sustain the process. There is also a very strong NGO movement which is involved directly or indirectly in forest conservation. This NGO work has not been well documented.

The NMK is responsible for conservation of crop plants at its herbarium and other sites located in various parts of the country where materials that cannot be conserved as seed (i.e. either recalcitrant seeded and/or do not produce viable seed) are maintained. Due to lack of regular and adequate funding this activity is still far from being complete as a number of species are yet to be addressed. On average, 1500 accessions are donated to users each year. This would be higher if one also considers utilization of active collections held at the research facilities around the country. The main users include several national and international breeders and researchers.

Existing laws and regulations on PGR- At present comprehensive and legal provisions focused on the protection of genetic resources are inadequate and some provisions serve the national purpose. Such include the Seeds and Plant Varieties Act (Cap. 326), the Grass Fires Act (Cap 327) and Suppression of Noxious Weeds Act (Cap. 325), Industrial Property Act (Cap. 509), the Trade Marks Act (Cap. 506) and the Copyright Act (Cap. 130). The government policy as laid out the Sessional Paper No 2 of 1994 on National Food Policy is to increase food production and has tended to promote the use of the improved varieties at the expense of traditional varieties of crops. Policies on both local and foreign PGRs are regulated, monitored and implemented by relevant ministerial legal notices, parliamentary enactments (statutes), bilateral, regional and multilateral organizational agreements and memoranda of co-operation in plant genetic resources or products. These are largely formulated and implemented by relevant Ministries and bodies. The Ministry of Trade has control through the Acts administered by it.

e) Forest Biodiversity

Kenyan forests are largely located in high potential areas. They have high mean annual rainfall, good soil fertility, productivity and are rich in biodiversity. They are also located in parts of the country where over 70% of the national population is concentrated. Kenya's forested areas may be divided into forest reserves and those in the National Parks (mainly confined to the less densely populated dry areas). The later receives higher priority than the former in terms of conservation. This means that there has to be a balance between conservation of these vital biodiversity resources and sustainable use by the local populations.

Forests cover only 2.4 % (1,400,000 ha) of the area of Kenya i.e. 1,240,000 ha is indigenous forests; and 160,000 ha is plantation forests. In total, there are164,000 hectares of gazetted Forest Reserves. This area is ever changing as well as their excisions and increased need for land allocation. Although forests cover a relatively small proportion of the total land area in Kenya, they still contain 50% of the nation's tree species, 40 % of the larger mammals and 30% of birds. Kenya's forests are also significant because they host numerous endemic, rare and threatened species. Over 150 internationally recognized threatened woody species occur in the country and 60 inland forests and 65 coastal forests are known to have threatened plant species.

The Kenyan coastal forests though small are rich in plant diversity and endemism and the hills are reported to be the richest area for plant species in the country. For example, the *Arabuko-Sokoke* Forest and those adjacent contain a large area of mixed forest which accounts for a large portion of the coastal flora. Along the gradient from the coastal area such as in the Taita Taveta Hills and Rivers are important repositories of forest biodiversity and have high level of species endemism, despite being threatened by increasing extreme degradation by human activities.

The Kenya forests are represented by the Mt. Kenya whose vegetation zones and species distribution are distinguished according to the different climatic zones and altitude levels. The more moist eastern and southern slopes from the "a Tea Zone" at the reserve boundary through the famous Camphor forest (1900 -2400m) is now characterized by regeneration of secondary vegetation of *Macaranga kilimandscharica* at the lower and medium altitudes and higher altitudes while the south-western slopes the forest is dominated by *Cassipourea malosana.* The vegetation profile, hence status of biodiversity in the Mt. Kenya Complex changes with zones as described in the Kenya Forest Service documents but to date remains relatively rich is species diversity despite the escalating threat. In the Mt. Kenya Forest Reserve area there are several rare or threatened animal species which are of particular international interest. The bongo, which is very rare in Kenya, occurs mostly in the mixed bamboo and bamboo zones. There are also two known populations of the black rhinoceros in the Mt. Kenya area.

In the Western part of the country are the Kakamega and Nandi Forests both of which are highly threatened but have high biodiversity. Because of the adjoining human populations, they represent an "island a sea of population" and therefore pose considerable conservation challenges.

1.2.1 Review of Institutions Working on Biodiversity in Kenya

In an effort to mainstream the ABS within government activities the NES prepared the NEAP in 1994, followed by the National Biodiversity Strategy and Action Plan (NBSAP) in 2000. At the same time several related activities started and the driving force was aimed at helping to meet the 2010 targets of the CBD. Although at present the national environment management matters cuts across various agencies, NEMA is the one charged with coordination and establishment of appropriate legal and institutional framework for management and conservation of biological diversity. Over the years the Kenya government has evolved various strategies in dealing with its environment and biological diversity. The country has a rich background in its attempt to implement the CBD by 2010, meet MDGs and set the stage for meeting its 2030 vision. Up to date the country has several ministries with the portfolio of

environmental conservation. The Ministries of Environment and Mineral Resources, Forestry, Lands, Finance, Special programs in the Office of the President, Fisheries and Agriculture have direct links with biodiversity conservation but in a rather uncoordinated manner. There are few linkages and even awareness on what each ministry should be doing and how synergy can be achieved. Further Kenya has also numerous research institutions, institutions of higher learning, parastatals and programs that handle different or even the same aspects of environment and even biodiversity related issues. Listed below are some of the national institutions where issues of the Kenya's biodiversity may be found and their roles examined:

i. National Environment Management Authority (NEMA).
ii. Kenya Forestry Research Institute (KEFRI)
iii. Kenya Agricultural Research Institute (KARI)
iv. Kenya National Bureau of Standard (KNBS)
v. Kenya Sugar Research Foundation (KESREF)
vi. Lake Victoria Environment Management Project
vii. Coast Development Authority
viii. Lake Basin Development Authority
ix. Uaso Nyiro (N & S) Development Authorities
x. Tana River Development Authority
xi. Kerio Valley Development Authority
xii. National Universities with teaching and research activities at schools of Environment and Natural Resources Management (University of Nairobi, Kenyatta University, Moi University, Jomo Kenyatta University of Agriculture and Technology and Egerton University)
xiii. National Museums of Kenya
xiv. Kenya Forest Service
xv. Kenya Wildlife Services

In Kenya there are also several CGIAR centres such as ICIPE, ILRI, ICRISAT and IRRI as well as national and international NGOs who are working on biodiversity conservation. Suffice to state here that great efforts are being made in different sectors and by various national and international bodies whose efforts need to be well coordinated to make the country meet the targets of CBD.

1.3 Trends and Threats of Kenya's Biodiversity

Although the biological diversity of Kenya remains highly protected there are many unprotected areas and its status is declining fast due to a number of threats leading to numerous conservation challenges. The major threats to biological diversity in Kenya can be as: the high population pressure, escalating poverty situation, conflicts, poor land use practices, inadequate laws, policies and institutional framework, poor education and inadequate involvement of community participation. Other threats are invasive species, land degradation and pollution occasioned by poor land use practices.

Kenya's population is now approximately 34 million most of who live in the biodiversity rich rural areas. Given that the entire Kenyan population depends on biological resources for livelihood, income, shelter and health and that these resources also provide the

country with the much needed foreign currency as well as the means to service external debts, there are great opportunities and threats for over exploitation. The narrow genetic base of the country's biological resources found only in a few plants and animal species have put the entire ecosystems and their biological diversity in the danger of over exploitation of the few resources thus exposing the entire ecosystems to degradation.

The situation is worsened because the majorities of Kenyans living in the biodiversity-rich rural areas are poor and have large households. Many live below US$ 1.00 per day with no alternative means of livelihoods. Scarce biological resources are a source for human-human and human-wildlife conflicts. For instance, the lack of clear land policy has led to land adjudication right into the fragile ecosystems with rich biodiversity like forest reserves and wetland areas while many well to do Kenyans own land in the fringes of forests and wetlands without allowing for buffer zones. The human-wildlife conflicts are numerous especially when wildlife encroach farms and homesteads that border protected area or even biodiversity rich but unprotected areas.

It is worth noting that even as the land area under rich indigenous biodiversity continue to decline, over 70% of the national biodiversity occur in unprotected areas leading to increased human-wildlife conflicts.

Even as the CBD and the Kenya government recognize the use of ecosystems approach as the best methods for conserving biodiversity, the country has inadequate environmental and biodiversity related laws, policies and instructional frameworks towards this end. For example the forest and wetland management systems are in danger as the government continues to de-gazette and excise parts of these ecosystems for settlement and farming. A case in hand is the Yala Swamp along Lake Victoria - given to the Dominion Farm Company for growing rice and the raging war over the Mau Forest. Further, the rampant development of hotels and other infrastructure along the Kenya Coast threaten the very basis for conserving the resident biodiversity. The National Development Plans and Poverty Eradication policy documents make very little mention of the need to conserve the national biological resource. Worth mentioning here is the current lack of the National Wetland Policy which remains in drafting form since 1972 when Ramsar Convention was launched and Kenya is a signatory and even as Kenya is a strong partner for implementation of the CBD and developed its NBSAP in 1994. Also Kenya has many sectoral laws and policy documents that can be used to support the biodiversity conservation but still need to be harmonized and coordinated for better output.

Capacity building and adequate resource allocation are key to biodiversity conservation in Kenya. Although there are some efforts to involve community participation in biodiversity conservation much still has to be done in terms of mobilization, awareness creation, training, and demonstration of best practices in this area. It is evident that there is limited capacity amongst the community and other key stakeholders to actively participate in biodiversity conservation and progress towards this is not fast enough. Further, although reasonable resources are being availed by the donor communities little trickle to the grass roots to enhance communities' capacity towards biodiversity conservation in Kenya. Even more worrying is that Kenya in its budgetary provision has not been able to provide adequate resources towards this end. At the technical level various national middle and higher learning institutions continue to provide degree and short term training on environmental issues, but their curricula give limited

emphasis to biological diversity conservation. Further, those trained in environmental field hardly find suitable placements in areas that are biodiversity relevant.

Biological diversity conservation threats occasioned by invasive species, land degradation and pollution occasioned by poor land use practices are real and need urgent interventions. Poor agricultural activities contribute significantly to ecological degradation and hence biodiversity loss in Kenya. As mentioned earlier, large trucks of terrestrial and wetland ecosystems have been converted to farmland in Kenya. In the coastal area biodiversity in Kwale District especially Tana, Shimba Hills and Rahamisi are fast degrading due to the new sugarcane projects there. In the expansive Mau Forest the previously settled people there have continued to resist government call for evacuation and resettlement so as to give way for rehabilitation and conservation of the previously rich biodiversity ecosystem. This situation threatens the very existence of the ecologically and economically important Masai Mara Game Reserve, rivers Sondu Miriu and Mara and Lake Victoria water resources and biodiversity. The agriculture-instigated high silt loading and pollution by agrochemicals threatens the rich biodiversity in the fresh water ecosystems of western Kenya. Similar situation occurs in the Nyando River Basin where Nyando is recorded to be the most polluted river in the Lake Basin area. Nyando, Yala and Nzoia river basin are heavily farmed right into the fringes of the lake and also encroaching the once biodiversity rich wetlands which buffer the lake. These situations and many other threaten the fish biodiversity and adversely affect the fish refugia and breeding sites in the lake.

The various land use threats especially farming has caused habitat loss and degradation, for example, the destruction of wetlands, grasslands and indigenous forests for housing estates or low cost housing. It has further led to habitat fragmentation in the once pristine ecosystems resulting into increased number of rare and threatened species therein. The much needed wildlife movement corridors, and a certain amount of interconnectivity for processes to continue, are now jeopardized in such ecosystems. Adverse farming and land use practices near protected areas and in the rangeland is resulting in fast loss of species as in many Kenyan ecosystems many are displaced and/or migrate to new areas. For example, in the changed habitats, plants and animals endemic to a particular habitat will not be able to survive if that habitat is destroyed or altered by development. Further, in Kenya these threats have interfered with the natural ecological processes such as continued river flow, water purification, and erosion control in the affected areas which can lead to an accumulated effect on both habitat and species. Or, this can continue to affect habitats and therefore species into the long-term until they die out.

Kenyan habitats and biodiversity has suffered set back due to construction of dams and hydro power stations along the main rivers. In recent times the Sondu Miriu forms a perfect example. It is not yet well understood how much biodiversity is affected both down and upstream this barrier, but the fact remains that biodiversity and ecological processes in this and similar ecosystems are threatened, as long as the Kenya government continue to plan and implement hydropower project across its major rivers.

Both terrestrial and aquatic ecosystems have been prone to alien invasive species. The ASAL ecosystem has suffered the invasion by a number of invasive species. But the most spectacular

and recent invasion by water hyacinth in the Lake Victoria has pose a major challenge, altered the lakes biodiversity and made the lakes resources inaccessible. Since the 1990's the lake has been invaded by an exotic prolific and noxious weed, the water hyacinth (*Eicchornia crassipes*) whose management has posed great challenge to both the scientific communities and the regional governments. In the meantime this weed has caused serious ecological changes in the lake and impediments to livelihoods and development initiatives in the region. During the implementation of LVEMP I much attention was placed on the management of the weed using integrated that involved manual, mechanical and biological control. Biological control method proved to be the most successful and cheapest approach to deal with the weed. But there is a major challenge of ecological succession and resurgence of the weed following the end of the LVEMP I and because LVEMP II is yet to start to numerous national and World Bank bureaucracies even as Kenya has declared water hyacinth a national disaster and outlawed its transport and use in any way.

Climate change and lack of alternative energy sources is a major threat to Kenya's biodiversity and pose serious challenge to achieving the 2010 CBD targets. Access to energy is an essential element in sustainable development and growth in Kenya. But only 16% of Kenyans have access to the national power grid many of whom are in the urban centres. Most rural and many urban dwellers depend on primary biomass energy sources for lighting and cooking. While wood fuel contributes to over 68% source of such energy and the predominant one charcoal is used by 13.3% of the population. Much of the fire wood and charcoal are obtained from indigenous woody plants posing a serious threat to local biodiversity. It is worth noting that even in the fragile ASAL areas some 4.5% of the population use biomass for lighting. Although climate change has been considered as occurring mainly in the developed countries, there is evidence of occurrence of its adverse effects in several areas Kenya i.e. increased frequencies of flooding and droughts in many parts of the country. In Kenya there are not yet measures underway to mitigate the effects of climate change and both the biodiversity and communities remain vulnerable. It is necessary for Kenya to develop a national strategy for mitigating climate change if the situation is to be contained.

The current trend in Kenya involves issues such as the continued changing land use and their impacts on biodiversity. There is increasing extensive agricultural exploitation of land that reduces biodiversity in many parts of Kenya. For example, the species-rich, former species-rich grasslands, wetlands and forest areas are exploited intensively in the absence of better farming methods to optimize intensive agriculture. However, in some areas of Kenya especially the protected areas and rangelands appear to maintain or restore the original biodiversity. The government's previously created nature reserves and community based nature sanctuaries are showing good promise of biodiversity conservation in such areas and is stimulation the development of alternative land use methods and alternative means of livelihoods. The latter process need to be enhanced. Another option is to establish alternative land use regimes that create a new biodiversity but are integrated with farming practices. Such land use is therefore also a socio-economically practical alternative to the actual intensive exploitation.

There is also increasing awareness and participation of communities and other key stakeholder in biodiversity conservation processes which will yield significant results if increased resources

are availed and capacity build. There are many national and international organizations that have taken to supporting biodiversity conservation in many parts of Kenyan albeit in an uncoordinated manner. The trend towards creating institutional networks is in progress in Kenya although at a slow pace.

Kenya's major ecosystems namely forests, wetlands, moist grasslands and arid/semi-arid land ecosystems still and will continue to harbor the country's key biodiversity habitats and need to be protected. There are also many of its cultural and spiritual sites that are crucial for biodiversity conservation. The government of Kenya recognizes that future sustained economic growth requires sound and equitable allocation of resources in management. However, the government plan is yet to be realized even as most of these ecosystems especially wetlands and forests continue to be destroyed and evidenced by more frequent reports of floods, landslides, reduced water flows and drying up of rivers and springs.

There is evidence in some ecosystems that at least there was moderate improvement in biodiversity status. According to the recent Nature Kenya reports the Aberdare National Park has recorded marked **improvements**, while Amboseli National Park recorded a small improvement in habitat status. Sites like Maasai Mara continue to record deterioration, and a number of sites such as Mau Forest Complex, Busia Grasslands, Machakos Valleys and Lake Victoria and its wetland areas still recorded significant degradation, just as in 2007. Dispersal and migratory areas for wildlife have been encroached, blocking free wildlife movement into and out of parks such as Nairobi National Park and Maasai Mara National Reserve. Following the recent Post election violence in Kenya issues of increased poverty and degradation of Mau forests have cropped up engaging communities and politicians against each other and causing mass movements and threatening destruction of biological diversity in several areas. This trend still exists and could escalate if political animosities continue to exist especially around the fragile ecosystems.

The trend of marine and inland waters degradation pose a real threat to the inherent rich biodiversity therein. There is increasing concern on the continued effects on biodiversity by the tourism industry where new hotels and access infrastructure encroach fragile marine and coastal areas. Further, there is continued degradation of mangroves, inland waters and wetlands. The situation of lakes Naivasha, Nakuru and Victoria are cases in hand. There is increasing evidence of climate change and other biodiversity degrading trends and Kenya need to develop precise indicators of biodiversity status and dynamics to help monitor such events.

Further, the continue poverty trends will lead to even an increased biodiversity degradation and erosion of valuable biological/genetic resources. Kenya must therefore step up community, technical and institutional capacity to build on the existing ones so as to help deal with the situation. The current trend in capacity building is uncoordinated and not adequately funded and may not cope with the escalating conservation demands.

CHAPTER TWO: THE CURRENT STATUS OF THE NATIONAL BIODIVERSITY STRATEGY AND ACTION PLAN (NBSAP)

2.0 Overview

In decision VI/26 The Conference of the Parties took note of the conclusions of the Seychelles Workshop on the Strategic Plan and the report of the Open-ended Inter-Sessional Meeting on the Strategic Plan, National Reports and Implementation of the Convention on Biological Diversity (19 - 21 November 2001, Montreal, Canada) and adopted a Strategic Plan for the Convention on Biological Diversity. The Conference of the Parties urged Parties, States, intergovernmental organizations and other organizations to review their activities, especially their national biodiversity strategies and action plans in the light of the Strategic Plan for the Convention on Biological Diversity.

In this chapter we provide an overview of the implementation of Kenya national biodiversity strategy and action plan and other programmes and plans (e.g. Forest management plans ...) developed and adopted to implement the Convention in line with the requirements of Article 6(a) of the Convention. The chapter contains a succinct account of existing strategies and actions that Kenya has implemented. It also provides information on the extent to which these actions have been implemented. The effectiveness of the national strategy and the obstacles encountered in implementation are assessed and summarized in this chapter. Strategies to overcome the said obstacles are highlighted. The following information is provided.

2.1 The NBSAP Priority Activities

2.1.1 Summary of global progress on implementation progress

The GEF, UNDP, UNEP and the World Bank continue to take positive steps to increase GEF support for land degradation activities as they relate to the focal areas (see Annex A for details). UNDP has developed five new projects for GEF pipeline entry, and UNEP has developed three new projects for the GEF pipeline. The World Bank has in its own pipeline 28 projects, 15 of which are medium-sized projects. *It is anticipated that Kenya will benefit from these facilities in its efforts to implement the NBSAP and also meet the CBD strategies.*

- The GEF Capacity Development Initiative is helping to raise greater awareness about land degradation. It is aimed at examining the capacity development needs with respect to biodiversity, climate change, and land degradation. The GEF Country Dialogue Workshop is also helping to raise awareness about land degradation. In 1995 and 2000 Kenya has been able to assess its capacity building needs for the conservation of biodiversity and country specific priorities in the conservation of the biodiversity projects.
- The Africa Land and Water Initiative is also providing opportunities to further develop projects that include land degradation prevention and control elements. Led by the Africa

Region of the World Bank, the GEF, UNDP,UNEP, UNCCD Secretariat, Global Mechanism of the UNCCD, IFAD, African Development Bank, and other partners are working together to develop a coordinated action program to address land and water management issues in Africa in an integrated way. The next step is the identification of pilot sites for implementation of the Initiative in collaboration with other organizations in Africa.

- To incorporate local knowledge into integrated land and water management, the GEF Secretariat, in collaboration with international agencies and NGOs, is undertaking a study to compile, synthesize, and disseminate information on good practices in community-based approaches to integrated land and water management.

2.1.1 Summary of national implementation progress

a. Status of the Kenya's NBSAP process

The biodiversity strategy and action plan process for Kenya has achieved considerable progress since it was officially published in the year 2000. The early processes that led to the NBSAP are described in the 1st National Report. Following the publication of NBSAP an implementation schedule was drawn up against which the progress towards its implementation and subsequently that of the CBD can be measured and reported. Further, Kenya's National Environment Action Plan (NEAP) report proposed a number of strategic actions to be taken immediately:

- Formulation of a biodiversity strategy to maintain, use preserve Kenya's remarkable biodiversity;
- Treatment of biodiversity conservation and economic development as integral aspects of the same process of sustainable development;
- Measurement of the value of standing, genetic resources and especially biodiversity in economic terms;
- Establishment of a system of incentives and so that resource are rewarded and resource
- abusers
- Urgent action taken to conserve areas of outstanding biodiversity value of critical importance i.e. sites with unique species of plants, animals and microorganisms.

Implementation of the NBSAP has continued to be done through both national and international actions although in a scattered and uncoordinated manner. For example the Kenya Forestry Master Plan, 1994 (1995-2020) contains various implementation strategies being supported by various donors and have targeted conservation of indigenous forests and their biodiversity. Particular attention has been given to habitats of high biodiversity and endemism and priority areas for conservation include wetlands (especially seasonal wetlands), forests, highland grasslands and natural areas near large urban. Capacity building through education, training and research has been seen as a major component here. In Kenya, this strategy has been extensively applied in the conservation of forests and large mammals, and flowering plants but least to terrestrial micro-organisms. There are few cases where charismatic and beneficial arthropods have also been targeted such as the butterflies of the *Arabuko-Sokoke* and Kakamega forests

Reasonable biodiversity conservation is also in progress in marine and coasted ecosystems as well as in some fresh water. In Marine areas KMFRI, some NGOs and CBOs have concentrated work on coral reefs, bivalves, sea-grasses and fishery. In freshwater ecosystems, the main conservation processes have been in Lakes Turkana, Naivasha and Victoria where many fish species are reported threatened by extinction or are rare due to numerous anthropogenic factors. However, significant achievements are hard to quantify and demonstrate due to lack of appropriate biodiversity indicators.

Some tangible progress has been made by the KWS and NMK particularly in protected areas where the number of some large mammals previously threatened have been on the increase. Efforts by the NMK to spear head in-situ and ex-situ conservation are promising but hindered by lack of resources and sufficient technical staff at the various field stations. In the case of KWS, the major impediments are poachers and lack of resources to intensify scouting in protected areas.

KARI supported by IPGR has established a gene bank at its Muguga station mainly to preserve germplasm of agricultural importance. Further the institute maintains valuable plant materials at its various field stations for breeding and agronomic purposes. However, the capacity of the gene bank is inadequate and funds are not sufficient to meet the intended targets. There is little evidence that apart from paying staff and general maintenance Kenya government has allocated good resources towards this end. Most funding for the gene banking and its subsidiary activities e.g. field collections are provided through short term and unsustainable donor funds.

In the water sector, recently the parent ministry has carried out water management reforms bringing into force the Water Resources Management Authority. This authority has initiated various mechanisms and policies to protect water resources thereby conserving the aquatic biodiversity and that of the riparian habitats. Although the ministry has no biodiversity expertise their action will contribute effectively to the implementation of NBSAP and CBD. The authority has since established different regional and sub-regional authorities some of which are already working in close partnership with the local and international NGOs, local authorities and communities. These sub-regional authorities are spearheading formation of water resource users' associations (WRUAs) to take charge of water resources management at river basin or local water levels. The ministry has already established viable policies and legal framework to manage national and regional water resources in Kenya. Never the less major challenge remains in the conservation strategies of Kenyan wetlands whose national policies do not exist to date even as these areas carry high biodiversity and are under serious threat of degradation in the entire country. KWS is only responsible for wetlands in the protected area, while large wetlands occur outside and continue to be encroached and degraded. If this situation continues it will be difficult to fully implement the NBSAP and contribute positively to the objectives of the CBD.

NGOs and Community participation in implementing NBSAP have achieved considerable ground particularly in specific target areas and species. Protection of areas of special environmental importance has also been the key to some successful stories such as those by Nature Kenya, WWF, and the IUCN. Information from these NGOs is only trickling to the end users making it difficult to copy and upscale some of their best practices. Further, even as these efforts are making good progress to ensure sustainability and better community engagement it is necessary develop in economic terms the value of standing, unexploited natural resources

and ecological functions of the resident biodiversity in target ecosystems and habitats. It is also necessary to recognize and quantify the local economic value of wild plants, and microorganisms in development and land-use planning. In many cases however, technical and financial support to compile inventories of plants and animals, especially those social, spiritual, cultural, aesthetic, economic and scientific values, and including indigenous crop diversity, through ecological and ethno-biological surveys are needed but hard to come by even as their application will enhance implementation of the NBSAB.

The Kenya government is in the process of creating conditions and incentives for effective conservation of biodiversity by local communities, by among other things, recognizing and affirming the value of local knowledge and local communities' rights to genetic and benefits from tourism in their areas. This is engraved in the recently enacted intellectual property rights Act. This position will be enhanced when the country embraces and establishes mechanisms for determining sustainable levels of production for economic benefits from biological resources including fish, timber, wildlife, medicinal plants and other goods and services, and placing limits on harvests, including regulatory.

Further, in the NBSAB there are strategies aimed at improving on and supporting projects which provide immediate and sustainable economic activities to the communities concerned to enable them get alternative sources of supply, access to a large market share for wild products harvested sustainably and in so doing develop the role of traditional medicines and ensure their appropriate and sustainable use. Further, promoting use of indigenous species of plants and animals, by applying the knowledge of local communities to select them need to take root in Kenya. For example, at NMK indigenous knowledge is being integrated into conservation and sustainable use of species and genes.

The NBSAP proposed to promote and establishment of botanical gardens in every province and ecological zone, stocked with indigenous plant species, in consultation with institutions which already have botanical gardens or arboreta. Towards this end the NMK has progressed well to improving the Nairobi Arboretum and the associated nature trail and is looking for others in the outreach areas. Such gardens if well planned, established and maintained will provide useful services to local communities mainly in the form of recreation and information, although they also provide training opportunities in conservation.

Expansion of conservation activities is a strategy aimed at emphasizing increased conservation efforts through the establishment and proper maintenance of gene banks, zoos, aquaria and sites for the captive breeding of endangered species especially for wild plants harvested for food, medicines, cosmetics, building materials, ornaments, etc. The strategy also applies in cases where plant or animal species are only represented by small, bottleneck populations. Although, there exist such areas near or within some national parks additional resources will be required to realize this strategy.

Management of introduced species has been a major challenge in Kenya due to its porous borders and waterways. Over the last 15 or so years several invasive alien species have come into Kenya such as the water hyacinth (*Eichornia crassipes*), *Salvinia molesta*, *Prosopis juniflora, Eucalyptus spp.*, and the Greater Grain Borer all of which are detrimental to biodiversity conservation and livelihood of the local communities. Kenya ranks amongst some of the top countries with good quarantine laws and preventive systems. Harmful alien

organisms such as water hyacinth in fresh water bodies, do affect biodiversity through species displacement and disease. The NBSAB proposed strengthening of information and management strategies to with the threat of introduced species, foreign importations that may adversely affect alter our habitats. Kenya has taken all the necessary steps to prevent the introduction and control of such organisms and elimination or reduction their adverse effects to below ecological and economic injury levels. It has established and enforced adequate legislation to control introductions of alien and unwanted genetically modified organisms, improvement of preventive mechanisms such as screening standards and risk assessment procedures.

The strategy set up to **establish a biodiversity information database** as a central repository of data generated by inventories and surveys. However, even at present knowledge of species and genes is still inadequate therefore, detailed knowledge is still lacking hindering progress on large scale distribution to a wider clientele. To alleviate this problem, Kenya developed a Kenya Data Management Plan which was envisaged to be implemented as a series of short projects as a follow on to the BDM project. This report was not able to obtain tangible information of such projects.

Biotechnology and Biosafety- The Ministry of Research, Science and Technology has identified policy strategies and action plans on the development of biotechnology in Kenya, which are: the development of a comprehensive policy on research and development in biotechnology, and the establishment of a National Committee whose membership is drawn from various stakeholders.

b. Contributions of NBSAP Activities to the CBD implementation

Since signing and ratifying the CBD Kenya has taken several tangible steps towards its implementation.

i) **Thematic areas adopted under the Convention**

Kenya has:

- developed its NBSAP and made good efforts in its implementation.
- conducted several assessments related to conservation of biodiversity i.e. assessment of capacity need for conservation of Kenyan biodiversity (1995), Assessment of capacity Building Needs and country specific Priority in the conservation of biodiversity project (2006), etc.
- developed guidelines for integrating traditional knowledge for the conservation of biodiversity which is mainstreamed in the scientific knowledge.
- mobilized resources both from internal and international sources towards implementation of NBSAP and meeting CBD targets. This is demonstrated by various donor funded projects being implemented at sectoral levels and by numerous government departments and NGOs.
- hosted several national and international meetings and taken some bold decisions to realize the CBD goals.
- raised awareness about biodiversity through various fora such as international biodiversity day, international water day, international wetland day and international environmental day celebration at national, regional and local levels.

- developed various policies, laws and institutional framework that relate to conservation of biodiversity i.e. the EMCA, Forest Act and Water Act. Others recently established are the Intellectual Property Rights, management of alien species, etc. Arising form the adoption of the Cartagena Protocol on Biosafety, Kenya established a national biosafety policy and framework. The national biotechnology and wetland management policies are in their final stages of being enacted.
- also engaged in numerous regional arrangements and MOUs that target cross border conservation environmental conservation and increasing the capacity to safe guard shared biological resources such as the Lake Victoria Basin Commission (LVBC) and IGAD. There are also the World Bank Funded LVEMP, EU funded LVFO, etc. Even as some minor conflicts still need to be resolved the progress made so far is good.
- engaged in several ways in building capacity that could support NBSAP implementation and lead to the realization of the 2010 CBD targets. However, numerous capacity gaps still exist since the most recent capacity needs assessment in 2006. Although this capacity needs assessment was specific to in situ and ex situ conservation measures and sustainable use of biological resources, a generalized view can be drawn for other various key areas of biodiversity conservation.

The Agenda 21, among other things, specifically calls for the development of national strategies for the conservation of biological diversity and the sustainable use of biological resources. Sustainable development is an integrated approach to policy and decision making, in which environmental protection and long term economic growth are seen as being both compatible and complementary and mutually dependent. Through a series of processes the Kenya government established several measures aimed at meeting the targets of the CBD. Key among these is the development of NBSAP. The overall objective of the NBSAP is to address the national and international undertakings elaborated but Article 6 of the Convention. It is a national framework of action for the implementation of the Convention to ensure that the present rate of biodiversity loss is reversed, and that present levels of biological resources are maintained at sustainable levels for posterity.

The country has since then, witnessed a remarkable rise in environmental awareness as evidenced by the phenomenal growth of relevant institutional and sectoral activities.. In general Kenya through its various actors has achieved considerable progress towards implementation of its NBSAP. Although it has been rather slow toward achieving the CBD targets set for 2010 considerable ground work has also been done.

i) Cross-cutting issues adopted under the Convention

Institutional Capacity and linkages – According to the NBSAP the institutions involved in biodiversity conservation should have adequate facilities for research, information storage, and retrieval. There is also need to establish networks between government departments, NGO's, the private sector and other stakeholders for enhanced coordination of biodiversity conservation. Based on the set strategies efforts have been made towards building the capacity of some target the law enforcement agencies including provincial administration (chiefs) and parliamentarians. But there is little evidence in build the capacity of other key law enforcement offices such as the police, judiciary and other regulatory agencies). By building the capacity of the latter category it will be possible to speed up enhancement and streamlining implementation

and enforcement of environmental policies and legislation for the protection of biodiversity in Kenya and stem the current culture of corruption and impunity amongst the highly placed citizens. Further there is need to provide scientific equipment and related infrastructure for biodiversity institutions to enable them to effectively c*a*rry out research and strengthen institutional systems *a*nd capacities for collaboration, *a*nd establish linkages and networks. This action will improve coordin*a*tion, generate and exchange of reformation, research and development and the management of resources. It is not clear yet how much this has been achieved in the key research institutions such as KWS, NMK, KARI and national universities, but some support in this direction has been going on.

Gender concerns – Although, the Kenya government does not discriminate on the basis of gender, practices related to gender imbalances especially on land and benefit sharing and utilization of natural resources such as biodiversity do exist. Although Kenya's statutory laws do not prevent women from owning land, women still face numerous challenges in this area partly because males member of the family tend to hold in trust communal property. The NBSAP proposed strategies to overcome this apparent gender disparity on biodiversity management are partly being addressed. Some biodiversity programs have been development and being implemented that cater for gender concerns and focus on mainstreaming women and youths in the activities. For example through CDF, National Youth Fund and Women Development Fund, communities are able to plan and implement such projects that are ecological and biological friendly while providing them with alternative means of income and subsistence. Further, work is going on in various parts of the country to facilitate gender ana**l**ysis, participation, and affirmative action in biodiversity management through gender-sensitive legislation, promote gender awareness and involvement in all biodiversity programmes and projects the extent of which is hard to quantify.

Policy and legislation - The 1997-2001 and subsequent National Development Plans recognize the underlying causes of environmental degradation. They clearly articulate that environmental management tools, including related laws on internationally shared resources, cross-border issues, biodiversity values, EIAs have not been adequately developed for effective environmental management. The current pressing issues of biodiversity conservation are intended to be addressed when Kenya sets biodiversity as one of the pillars of the pending constitution of Kenya. There is some progress being made to enact new legisla**t**ion to specifically address sustainable wildlife management, water resource management, land and equitable sharing of benefits for local communities. The harmonized policy of the Grand Coalition Government pledges the need to create adequate employment opportunities by various ways in a manner sufficient to support the desired rates of economic growth. By achieving this, the strategy will ease the current pressure on various ecosystems/habitats with high biodiversity but high population. Further, the country has been aggressively promoting and strengthening national programmes revolved m population control programmes so as to achieve sustainable population growth rates and minimize adverse effects on biodiversity. There is evidence that Kenya's population growth has declined nearly 4% up from 6%.

ii) Resources dedicated to priority activities.

To be able to implement the NBSAP and contribute to the targets of the CBD Kenya strives to provide sectoral and specific domestic resources to reach the desired 60% contribution. These

resources mainly, for personnel & infrastructure, are made available from the national annual budget from treasury and are provided to different line ministries and relevant parastatals. International resources continue to play significant role in supporting the national effort towards the realization NBSAP and CBD but their main concentration is on the incremental budgetary costs and some support for actions by NGOs. Following the 2007 post election violence (PEV) Kenya has been constrained in its efforts to meet these objectives while at the same time dealing with the adverse impacts of the PEV.

iii) NBSAP incorporation of CBD targets and indicators

The Conference of parties CBD set targets to be met by all parties by 2010. Kenya has worked well towards meeting these targets as summarized elsewhere in this report. Further, the CBD established some 18 or so biodiversity indicators to help in the implementation and monitoring progress. Although Kenya has been implementing its NBSAP at a process towards meeting the CBD targets, there is no evidence that Kenya has adopted or even domesticated the CBD indicators.

iv) Obstacles and Lessons Learnt in implementation.

a) Political/societal issues

- There is inadequate political will and support to implement the NBSAP. Thus ecological degradation continues in many biodiversity rich ecosystems in Kenya take action only where there are clear political gains e.g. in the case of the Mau Forest. But in the biodiversity losses caused by water hyacinth little action seem to be in place. For instance recently, a group of youths were arrested by police when they went to petition for necessary intervention against the weed in Kisumu.
- Limited public participation and stakeholder involvement. Even as some government departments and NGOs have been creating awareness on the need to combat biodiversity loss in many parts of the country, community engagement and participation still remain a major challenge.
- Lack of mainstreaming and integration of biodiversity issues into other sectors, including use of tools such as environmental impact assessments. In Kenya many development programs are in conflict with the desired biodiversity conservation activities. For example the land allocation and adjudication processes has encroached into many biodiversity rich areas in Kenya e.g. ASALs, Wetlands – the Dominion Farm in Yala Swamp, Marine and Coastal areas - hotels near marine parks and the developments in Chale Island.
- Political instability – the Kenya's recent 2007 post election violence (PEV)has created visible biodiversity conservation obstacles- i.e. status of insecurity for IDPs some of whom were experts and worked in the field of biodiversity conservation.
- Lack of precautionary and proactive measures, causing reactive policies- for example the recent government decision to remove people from Mau Forest without providing clear alternatives.

b) Institutional, technical and capacity-related obstacles

- Institutional weaknesses have led to inadequate capacity to act. The various national institutions such as KARI, Kenya Forest Services, Department of Fisheries, KWS, NMK,

etc especially their out rich are not adequately equipped to handle biodiversity conservation activities.

- Lack of human resources – only a few university-trained environmental graduates find their way to biodiversity conservation activities in the respective institutions. The ones deployed to these institutions are also ill prepared since they don have professional biodiversity background and hardly find opportunities to attend related short courses to improve their knowledge and skills.
- Biodiversity interventions in Kenya has not benefited from new and innovative transfer of technology and expertise as various institutions consider it as a side activity of their priority concerns.
- Biodiversity conservation practices lack up to date relevant data from well designed scientific research. A survey of the several local organizations engaged in biodiversity work indicates that research capacity is lacking. Some well trained people are in KARI, NEMA, KEFRI and KMFRI but their institutional tasks may not be related to biodiversity research. Further, there is high mobility amongst professional staff either transferred to irrelevant departments or resigning to join NGOs and international organizations for greener pastures as they are not well rewarded by the NARS.

c) Lack of accessible knowledge/information

- Through NES (formerly in the Ministry of Environment & Natural Resources) Kenya established a National Biodiversity Data Base was established, but information is hardly updated and rarely accessed by field biodiversity workers.
- Although the NBSAP is clear about the need to promote better knowledge and information on consequences of loss of biodiversity and the corresponding goods and services this has not been well understood, demonstrated and documented by many practitioners and stakeholders to educate and create awareness to the communities who are also the beneficiaries and burden bearers. Further, insufficient efforts and resources have so far been targeting public education and awareness at all levels.
- In Kenya biodiversity conservation practitioners have neither integrated nor fully utilized existing scientific and traditional knowledge in their activities.

d) Socio-economic factors, economic policy and financial resources

- The Kenyan government has not provided adequate financial and human resources for implementation of NBSAP and hence CBD strategies, even though the current Coalition Government has provided more biodiversity related ministries and departments (e.g. Ministries of Environment and Mineral Resources, Ministry of Fisheries, Ministry of Livestock, Ministry of Water and Irrigation, Ministry of Agriculture, etc). The available financial and human resources are scanty and fragmented.
- Efforts to conserve national biodiversity and hence realize the goals of NBSAP and CBD in Kenya lack economic incentive measures and benefit-sharing policies and framework. Therefore people are not inspired to participate in activities that conserve biodiversity. Rather they prefer to concentrate of economic activities even as they impact negatively on the indigenous biodiversity.

- The majorities (> 60%) of Kenyans are poor and live in or near the fragile and biodiversity rich rural areas. This high population pressure on the local over-dependence and unsustainable consume biological resources and their crude products impact negatively on the local ecosystems and their biodiversity. Further the local communities' lack of capacities to handle the complex biodiversity conservation issues to enable them to effectively contribute to the implementation of NBSAP and the CBD strategies.

e) Standards and criteria for selecting indicators

This is major challenge that has emerged from the implementation of the NBSAP. Although several international indicators have been identified, Kenya is yet to develop its own derived from the CBD. This will ensure consistency between various agencies and working groups that wish through their projects to contribute positively to the realization of NBSAP and CBD objectives.

f) Collaboration/cooperation

In Kenya there are several actors in the environmental field that also deal in one way or another with biodiversity conservation and contribute to NBSAP. However, there are inadequate collaboration arrangements amongst partners even those that work in the same ecosystem. This situation does not spur synergism at the local, national and international levels since there is lack of horizontal cooperation and ineffective partnerships among stakeholders. Further, many ongoing programs hardly engage the scientific community.

g) Legal/juridical impediments

Although Kenya is in the process of putting in place various sectoral policies and laws that deal environment and biodiversity issues many of them are inadequate, not well harmonized and sometimes conflicting.

h) Natural phenomena and environmental change – the eminent effects of climate change, floods, prolonged droughts, bush fire and other natural disasters pose serious challenge to implementation of NBSAP in many parts of the country.

v) Effectiveness of the NBSAP

Kenya has been implementing its NBSAP at a process towards meeting the CBD targets through various sectors albeit in a rather uncoordinated manner. Further there is little progress that Kenya has made towards the adoption or even domestication of the CBD indicators necessary for measuring successes in biodiversity conservation. This situation has made it difficult to precisely and decisively determine any changes in status and trends in biodiversity as related to implementing NBSAP and CBD.

It may also be observed that since the development of the NBSAP many challenges have cropped up. This situation calls for revisiting and updating the contents of the current NBSAP to make in more adequate in addressing the increasing trend of biodiversity threats.

There is a great potential for improving the current NBSAP, through a wide stakeholders consultations and taking into account the new policy frameworks developed since its

development. It is necessary to assess the current weaknesses and opportunities provided by the NBSAP to provide the necessary information for a new NBSAP draft. Various stakeholder consultations will be conducted to gather more information, identify salient obstacles and get suggestions on the way forward.

CHAPTER THREE: SECTORAL AND CROSS-SECTORAL INTEGRATION OF BIODIVERSITY CONSIDERATIONS

3.1. Introduction

A major constraint facing the conservation of biodiversity and in the implementation of the CBD is the fact that biodiversity issues are found in practically all the sectors of the national economy. All human livelihood activities involve one aspect of biodiversity concern or the other. This presents a major challenge for example, when it comes to developing national biodiversity conservation programmes whose implementation involves two or more sectors. There are budgetary management constraints as well as administrative bottlenecks resulting from sectoral mandates and existing management structures. Likewise, inter-sectoral collaboration demands that major reviews of sector mandates be made in order to re-align specific programmes toward the implementation of the Convention. This is further complicated by the existing weak integration of activities within each sector where for example, different institutions have been mandated to carry out activities addressing the same thematic area but which do so without joint programmes. Indeed the concern in this chapter is to elaborate how biodiversity conservation issues have been mainstreamed into the national sustainable development programmes. This is in recognition of the fact that the country may not achieve the objectives of the Convention and in particular the 2010 targets and the objectives of the CBD strategic plan unless all the main sectors and key actors that have impacts on the conservation and sustainable use of biodiversity are effectively engaged in the process.

3.2. CBD Strategic plan

The strategic plan was adopted by the COP in 2002. There are 4 goals 19 objectives and several indicators. Although these goals and targets generally would apply to all country parties, each party was expected to develop its own within that framework. Kenya has not held a workshop to domesticate the goals and objectives or otherwise to adopt them as they are. In this case therefore the review has been based on the goals and objectives as they were adopted by the COP.

Integration will be considered at three levels as follows:

Level 1: Integration of the CBD with other environmental Conventions especially those of the climate change (UNFCCC), desertification (UNCCD) and wetlands (RAMSAR).

Level 2: The integration of the implementation of the CBD (in this case the NBSAP) with the implementation of other strategies and programmes.

Level 3: Integration of the implementation of the CBD within and between sectors.

Goal 1: The Convention is fulfilling its leadership role in international biodiversity issues.

Kenya as a party to the CBD has regularly participated in the implementation process of the Convention by for example, attendance to all the COPs. In deed she hosted the5th COP in Nairobi in 2000.

Kenya is committed to conservation of biological diversity by virtue of its membership of global regional and sub-regional environmental treaties. She ratified the Convention on Biological Diversity (1992) in 1994. She became a party to the Convention on Wetlands of International importance especially as Waterfowl Habitat (1971) in 1990 and by virtue of this Convention has already named four of its Great Rift Valley lakes, Lake Nakuru, Lake Naivasha, Lake Baringo, Lake Bogoria as Ramsar sites, under the list of wetlands of international importance under article 2(1) of the Convention). In 1979 Kenya became a party to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). This is a treaty of great significance to countries with economies dependent on tourism based on their endowment with big game.

Kenya is also a signatory (1994) to the Lusaka Agreement on Co-operative Enforcement Operations directed at illegal Trade in Wild Fauna and Flora (1994), an African regional scheme for co-operation in the protection of wild animals and plants. And she became (1990) a party to the protection, Management and Development of the Marine and Coastal Environment of the East African region (1985), with its two protocols. One of these protocols is the Protocol Concerning Protected Areas and Wild Fauna and Flora in the Eastern Africa region (1985), the object of which is to ensure that the contracting parties shall take all appropriate measures to maintain essential ecological processes and life support systems, to preserve genetic diversity, and ensure the sustainable utilization of harvested natural resources under their jurisdiction.

Biodiversity policy in Kenya has historically been coordinated by the National Environment Secretariat (NES). NES was established in 1974 by presidential directive and was never provided with statutory legal status, and as a consequence had no direct enforcement powers. Furthermore NES was consistently under-funded and was thus unable to respond to the breadth of its responsibilities, and in particular issues arising from dramatic developments such as the results of the United Nations Conference on Environment and Development (UNCED) in 1992. The principal result of these shortcomings was that NES was not able to adequately coordinate the multiplicity of lead agencies and institutions with mandates involving biodiversity issues. This led to fragmented legislation, policies and implementation mechanisms dominated by the interests of the major lead agencies such as the Kenya Wildlife Services (KWS), the Kenya Agricultural Research Institute (KARI), the Kenya Forestry Research Institute (KEFRI) and the National Museums of Kenya (NMK). Thus, while NES had responsibility for the development of the National Environment Action Plan (NEAP) and, more recently, National Biodiversity Strategy and Action Plan (NBSAP), it lacked the capacity to use these processes to coordinate and achieve significant impact on the activities of the lead agencies.

3.2.1 NATIONAL OBLIGATIONS UNDER THE CBD

Kenya's national obligations derive firstly from the CBD itself (including the decisions of the COP), and secondly from commitments made to implement priority actions as elaborated in major national biodiversity planning documents that require it to institute and implement various measures to achieve the three objectives of the Convention. Broadly considered, there are three categories of obligations (Mugabe, *et al*, 2000):

- The first category is those obligations that deal with national domestication (involving formulation and/or reform of policies, laws and institutions or establishment of programmes at national level) of the provisions of the Convention. These include such

responsibilities as the preparation of national biodiversity strategies and action plans (Article 6 of the Convention), enactment of legislation to regulate access to genetic resources and promote sharing of benefits from the use of those resources (article 15), creation of incentive measures (Article 11) and several others.

- The second category is those obligations on reporting to the Conference of Parties (COP) and secretariat. Such obligations are created by Article 26 (Reports) that requires that each "Contracting Party" shall at intervals to be determined by the COP, present to the COP, report on measures which it has taken for the implementation of the provision of this Convention and their effectiveness in meeting the objectives of this Convention.
- The third category is those obligations that require parties to participate in the further elaboration and enrichment of key policy issues and achievement of consensus of matters that are still unresolved. Such provisions include those deposited in Article 23 (Conference of Parties), Article 19(3) (consideration and development of protocol on biosafety) and 18 (international scientific and technical cooperation).

Participation in the CBD

Kenya has participated in all COPs since the first one held in the Bahamas in 1994. In the year 2000, the country hosted COP V in Nairobi. Some of the significant achievements made towards implementing the Convention include the following:

Establishment of a National Focal point

The National Environment Secretariat (NES) was established in 1974 as the focal point for environmental matters in the country. It later became the focal point for the CBD and the Global Environment Facility (GEF) in 1992. In 2000, NES was transformed by statute into a more comprehensive environmental organization, the National Environment Management Authority (NEMA).

Inter-ministerial Committee on Environment (IMCE)

The IMCE was established by NES as a vehicle for assisting the Ministry of Environment & Natural Resources (MENR) in coordinating environmental matters in the country. The committee assisted, among other things, in coordinating and preparing for Kenya's participation in UNEP Governing Council meetings, the United Nations Conference on Environment and Development (UNCED), and in negotiations for the CBD.

IMCE sub-committee on Biodiversity

The IMCE sub-committee on biodiversity was established in 1994 among key stakeholders to assist the erstwhile Ministry of Environment and Natural Resources in coordinating matters relating to biodiversity. It was charged with advising the ministry on policy, legislative, planning, technical, and research activities in the country. The sub-committee was instrumental in assisting the government in the formulation of national biodiversity policies, coordination and development of the NBSAP, follow-up activities relating to the CBD, research in biodiversity, and general advice on technical and scientific matters. The sub-committee also significantly assisted in preparing the country for many CBD meetings, including SBSTTA and

the COPs. It also played a key role in coordinating and providing guidance to stakeholders on the implementation of the CBD.

The sub-committee has now been enlarged to encompass wider stakeholder participation, including non-governmental organizations (NGOS), inter-governmental organizations, and the private sector.

The NEAP Process

The NEAP process in Kenya was fully consultative involving a majority of the stakeholders. The NEAP report of 1994 provided information on the environment in Kenya and suggested many actions necessary for sustainable development. Many of the NEAP recommendations are now included in the Environmental Management Coordination and Act (EMCA). The NEAP also provided the country with a basis for the translation of Agenda 21 into a programme of action on environment and development.

Establishment of the Centre for Biodiversity at the National Museums of Kenya (NMK)

In 1991, the NMK established a Centre for Biodiversity. The centre houses the largest collection of information on Kenya's biodiversity in the country, including actual specimens. The centre was charged with coordinating the Kenya country study on biodiversity in 1992.

Kenya Country study on biodiversity

This was the first integrated study of biodiversity in Kenya carried out in 1992. It produced the first baseline study of biodiversity in the country, including species inventories, conservation programmes, use of biodiversity, its benefits and costs. The study also assisted the country in arriving at a more accurate and realistic assessment of the total costs, benefits and needs of conservation and utilization of biodiversity. The report was formatted on common guidelines provided by UNEP for use by many countries in the world.

Establishment of Biodiversity Databases

The NES, in its efforts to disseminate biodiversity information to all stakeholders long recognized the need to establish biodiversity databases on topical issues. The first achievement was the establishment of the digital database of the Lake Naivasha region. It contains information on ecology, soils, agriculture, water, fisheries, livestock, wildlife, and other information on this important Ramsar Site. The biodiversity Data Management project report of 1998 carried information on a national institution survey that assessed institutional capacity and data needs for biodiversity information management. A meta-database of institutions with biodiversity data and the datasets they hold has also been established at NEMA.

National Clearing House Mechanism (CHM)

The CHM is located at NEMA, the national focal point. The CHM employs e-mail as its main communication and dissemination tool, and has recently established its own electronic platform by acquiring an internet website. A periodic newsletter, NEMA News, disseminates topical information on the environment in hard copy format.

National Biosafety Guidelines, Regulations & Framework

National biosafety guidelines and regulations have been produced to guide the country on how to develop biotechnology and use it judiciously without causing adverse effects on the environment. The national biosafety framework reports the status of biotechnology in the country as well as capacity needs for risk assessment and management. A committee on biosafety has been established by the National Council for Science & Technology to coordinate the implementation of the regulations, guidelines and framework.

Inter-Agency Committee on Access to Genetic Resources and benefit Sharing

Access to genetic resources and sharing of benefits arising is a complex inter-sectoral issue that impacts many government ministries and departments. Its oversight and coordination has necessitated the establishment of an inter-agency committee that should streamline relevant activities, including bio-prospecting.

First National Report to the CBD Secretariat

The first country report to the CBD Secretariat was submitted in 1998 prior to COP IV in Bratislava. It summarized the main achievements towards the implementation of the CBD at the time. It constituted the first consolidated report in Kenya's biodiversity following ratification of the CBD in 1994. Thereafter, the second and third country reports have been compiled and submitted.

Sessional paper No. 6 of 1999 on Environment and Development

The overall goal of the sessional paper is to integrate environmental concerns into the national planning and management processes and provide guidelines for environmentally sustainable development. The specific goals are (a) to promote maintenance of ecosystems and ecological processes essential for the functioning of the biosphere and to (b) promote the protection of biodiversity including genetic resources.

Policies, legal instruments, strategies and action plans

A wide range of policies, legislations, strategies and action plans have been formulated in Kenya to deal with the issues of biodiversity conservation and its sustainable use. Some of the key documents are considered below.

The multilateral environmental agreements, including the CBD, UNFCCC, UNCCD and POPs Convention, are frameworks built on the principles of sustainable development and the strategies proposed by the Agenda 21. Actions at local or national level are expected to have global benefits to the major environmental concerns such as reducing or halting biodiversity loss, stabilize climate or mitigate the changes, eliminate persistent organic pollutants, arrest or control desertification and reduce pollution. Kenya has translated these global and regional obligations into national policies and processes in the National Environmental Actions Plan (NEAP) of 1994 which led to the development of the Environmental Management Authority and Coordination Act (EMCA) of 1999 and subsequently establishment of (NEMA) 2000. Since its establishment NEMA has provided leadership in various aspects of the management of the environment.

Kenya is a party to many international agreements some of whose implementation is a national challenge and that is why it is necessary to prioritize capacity building needs. Likewise there are regional agreements (e.g. the E.A. Community Treaty) whose goals are supportive of the CBD.

Kenya has endeavoured to fulfill the obligations under the international and regional agreements. For a country to effectively implement the provisions of environmental agreements some basic infrastructure that should be in place including:

(a) A national framework for the implementation process. This would include a clear policy framework, and institutional arrangements geared towards that end.
(b) Clear institutional mandates and arrangements structured to ensure a comprehensive undertaking to realize specific goals.
(c) Adequate trained and skilled manpower to carry out specific tasks within the agreed decisions.
(d) Financial and other resources provided in a sustainable manner to guarantee quality outputs as well as continuity.

The above framework is broadly referred to as capacity and is indeed the subject of the CBD goal 2.

Goal 2: Parties have improved financial, human, scientific technical and technology capacity to implement the Convention.

The country has reasonable capacity for the implementation of general measures for in-situ and ex-situ conservation and sustainable use of biological diversity.

The goals of *in-situ* conservation in Kenya are achieved through the establishment of protected areas while those of e*x-situ* are achieved through establishment of gene banks, botanic gardens, aquaria among other practices. The country has a strong policy on protected area conservation and has established several parks and forest reserves. It is presumed that all biodiversity within these protected areas is by extension protected as well. Some of the parks have management guidelines. Reasonable fees are paid at the gates and this enhances the sustainability of the parks. The park managers are adequately trained for the purpose and this has helped to minimize human-wildlife conflict.

For both in-situ and ex-situ, there are policies and legislations developed and enacted long before the CBD came into existence. Institutional management systems based on these legal frameworks are in place and in some cases strategic management plans are available. Likewise there is a fairly good level of training on personnel for *in-situ* and *ex-situ* conservation in most of the institutions.However the national ICT capacity is inadequate.

The national capacity for the conservation and sustainable use of biological diversity important to agriculture and especially for establishing legal regimes to regulate access to genetic resources is limited.

The need to undertake an assessment of the capacity for the conservation and sustainable utilization of biological diversity important to agriculture is in line with the CBD and its programme of work on agricultural biodiversity and the relevant provisions of EMCA and the

International Treaty on Plant Genetic Resources for Food and Agriculture. Agriculture offers a unique opportunity for the CBD to link concerns regarding biological diversity conservation and sharing of benefits arising from the use of genetic resources with the mainstream economy, taking into account the need for a balanced development of the objectives of the Convention. In this regard, concerted efforts are needed in identifying and promoting sustainable agricultural practices, integrated landscape management of agricultural and natural areas, as well as appropriate farming systems that will reduce possible negative impacts of agricultural practices on biological diversity and enhance the ecological functions provided by biological diversity to agriculture.

Capacity includes all instruments used to increase a country's ability to carry out certain activities, whether equipment, information, knowledge or training. Likewise capacity building which includes technology transfer is important when it comes to natural resources management and particularly biodiversity management. Such capacity must be consistent with national priorities and needs which are identified in the national biodiversity strategy and action plan. When it comes to ABS matters, the COP has given guidance through a set of questions adopted by sixth meeting of COP 2002 on assessment on transfer of technology and technical cooperation.

NEMA is mandated by EMCA to issue guidelines and to prescribe measures for the sustainable management and utilization of the Genetic Resources in the country. As a result, NEMA has initiated the process for establishing ABS legislation which are detailed enough to cover aspects of ABS.

Some institutions such KWS and NMK, operate under the CITES provisions, which also covers ABS related issues. For NMK, the institution has got measures to ensure compliance with Mutually Agreed terms (MATs). It has also got institutional IPR policies which are affiliation policies for publication and patenting. The National Gene Bank operates within the Seeds and plant varieties Act and thus in some way addresses the ABS issues

There have been a lot of efforts towards establishing the in-situ facilities particularly the protected area system and forest reserves. The protected area network covering both terrestrial and marine parks covers an area of 8% of Kenya. The ex-situ facilities on the other hand comprises of gene banks, botanical gardens, arboreta and private game parks.

Several legislations focusing on forestry, wildlife, fisheries, IPR have been formulated and although they are not well coordinated they have some basic ABS provisions especially as it pertains to conservation. The environmental management coordination regulations, has been formulated in a concise manner. In terms of safety in biotechnology, Kenya has developed guidelines and regulations to ensure safe development, application and use of biotechnology. A biosafety law is already in place.

At the national level, several libraries have been established within the national library services system and at various universities and research institutions. The NMK has a herbarium which contains checklists of plants and animals in East Africa. The national gene bank holds some of the important information pertaining to crop and wild plant accessions.

NEMA has established a clearing house mechanism which offers information pertaining to the CBD while the NCST has established a Biosafety clearing house mechanism in line with the objectives of the Cartagena Protocol on Biosafety.

In the past two decades, Kenya has witnessed increased interest and research based on indigenous knowledge particularly in traditional medicine and a rise in the number of institutions, incorporating IK in their programmes and/or engaging in IK activities. The importance of IK in Kenya is clearly defined in the NEAP 1994, the NBSAP 2000, and the EMCA 1999.

Likewise the Convention has reaffirmed the commitment by countries to respect, preserve and maintain knowledge innovations and practices of local communities embodying traditional lifestyle relevant for conservation and sustainable use of biological diversity and promote their wider application with approval and involvement of the holders of such knowledge innovations and practices and encourage equitable sharing of benefits arising from their utilization.

The country has a sizeable number of community based organizations which deal with different issues such as water provision and health issues. Some of the CBOs are the women groups at the country side. In other cases NGOs have been formed to spearhead different types of activities and indeed most people acknowledge that the local communities have information pertaining to the use of the genetic resources within their areas.

The CBD established a new international legal framework governing access to genetic resources and the sharing of benefits derived from their utilization. Pursuant to the CBD, many countries, Kenya included, are considering establishing national legal regimes to regulate access to genetic resources and the requisite institutional arrangements to enforce it. Experience on how to go about this, however, is limited.

National obligations in agricultural biodiversity are clearly articulated in the CBD programme of work and global plan of action for the conservation and sustainable utilization of plant genetic resources for food and agriculture. It is expected that these requirements are adequately covered in recent government planning documents that focus on the agricultural sector, including the Kenya agricultural research institute's strategic plan and the joint strategy for the revitalization of agriculture (SRA) by the ministry of agriculture and rural development (MOARD) and livestock and fisheries (ML & F). The fate of agriculture biodiversity in Kenya is intimately tied to that of the agricultural sector as a whole, whose challenges are systemic in nature.

Agriculture is the basis of livelihood for majority of Kenyans and as such the country has an elaborate policy on the sector. Researchers in the country rely on existing genetic resources to upgrade crops and livestock. Institutions with clear mandates guide the sector while well trained individuals are deployed for certain specific duties. There is an extension service to bridge between researchers and farmers. Training institutions including universities run courses in agriculture. It should be noted here that the concept of sustainable use is new and may not be found commonly in the literature of these institutions.

The national capacity for the use of incentive measures for the conservation of biodiversity is very weak.

Markets, when left alone, fail to adequately reflect the value of biodiversity, that is, their essential role in the supply of the myriad goods and services important for human well-being. Unless it makes tangible economic sense of them, communities are unlikely to be willing, and indeed are frequently unable, to conserve biodiversity in the course of their production and consumption activities. Working through the price system, incentive measures improve decision-making on biological resources by reducing the differences between the value of biodiversity to individuals and to society as a whole.

Incentives can be defined as specific inducements designed and implemented to influence or motivate people to act in a certain way. In the context of biodiversity conservation, economic incentives are concerned with making it more worthwhile in financial and livelihood terms for communities to maintain, rather than to degrade, biodiversity resources in the course of their economic activity. They aim to set in place economic inducements, or positive incentives, for biodiversity conservation, to discourage biodiversity degradation through the use of penalties and disincentives, and to overcome the broader economic forces, or perverse incentives, which underlie biodiversity degradation. In Article 11 of CBD, the international community acknowledged the importance of incentive measures in achieving the conservation and sustainable use of biological diversity.

Incentive measures for the conservation and sustainable use of biodiversity have been applied in Kenya through projects and programmes though at a limited extent and with varying success.

Although the current provision addressing environmental impact assessments that are contained within the environment management and coordination act do not specifically mention biodiversity as a consideration, the act contains prohibitive measures, namely environmental restoration orders and environmental easements.

Several publication have identified the lack of adequate capacity and experience with incentive measures as one of the major obstacles of their enhanced use, especially so in the area of biodiversity conservation. Capacity building is recognized as a central element in the implementation of biodiversity-related Conventions and specific in the successful design and implementation of incentive measures for the conservation of biodiversity.

All the national institutions have their own mandate and administrative agenda and retain legal control of all matters of GR management within their jurisdiction. Universities are training scientists in various disciples. For example, Nairobi University offers degrees in Botany, Zoology, Biochemistry and Chemistry. Kenyatta University offers degrees in Environmental Sciences, Botany, Zoology and Chemistry. The Jomo Kenyatta University of Agriculture and Technology offers courses on Biotechnology and degrees in Agricultural Sciences. Likewise some universities offer degrees on courses which are of importance when it comes to bio-prospecting.

Research institutes in the country have a reasonable number of researchers who are mainly scientists to drive the research agenda within their mandates. In particular the KARI, the KEMRI and the KMFRI have established reasonable facilities for research at the field centre as well as at the HQs.

With the available capacity, the application of biotechnology in Kenya has largely been in agriculture and also in animal health. A lot of biotechnology being developed is mainly the tissue culture of crops such as bananas, citrus, Irish and sweet potato. Some transformation work at confined facilities is taking place at KARI for the production of animal vaccines. Other public institutions such as the NMK have established a reasonable capacity particularly in taxonomic work and surveys.

There are a sizeable number of policy makers and scientists in government institutions. The National Council for Science and Technology, the NMK, the Forest Department, the Department of Resource Surveys and Remote Sensing, the National Environment and Management Authority, Kenya Bureau of Standards, Department of Veterinary Services (DVS), the Kenya wildlife Services are but some of the organizations where scientists and policy makers are engaged in one way or other on matters of ABS.

In terms of enforcement custom officials monitor the border entry points while the KEPHIS staff is stationed at these entry points. At NEMA the capacity for ABS comprises of one scientist and four lawyers. The scientist currently has a multiplicity of other activities to handle and considering that this is an added responsibility the capacity definitely needs beefing up.

Research programs for both basic and applied research have been the core business of research institutions in the country. Several other government institutions such as the NMK, DRSRS, Institute of Primate Research and the KWS undertake targeted research in line with their mandates. The universities also play an important role in teaching and carrying out research. The main source of funds for research is from the Kenya government which allocates budgets on an annual basis. Some of the funds are allocated directly whiles others are provided as research grants provided by bodies such as the National Council of Science and Technology and the Directorate of Research management and Development. However the institutes do attract funding from other bodies including multilateral bodies, development partners and the United Nations bodies. A few industries are now collaborating with KARI in the area of biotechnology using the genetically modified organisms.

The national capacity for the preservation and maintenance of biological diversity related knowledge of indigenous diversity and local communities with tradition lifestyles.

The Kenyan communities have always had a cultural background governing the use of the genetic plant and animal resources. All the 62 different ethnic groups have a rich indigenous knowledge base with deep knowledge of medicinal plants, food resources and domestic animals, unique to each community. The cultural diversity offers potential information that can be exploited to contribute positively to national development and future prosperity. The problem statement for this work is that the loss of the world's fundamental living resources - its genes, species, habitats and ecosystems - is proceeding at an unprecedented and alarming rate. This loss is most immediately and keenly felt by those communities whose livelihood depends directly upon their surrounding environment.

Indigenous communities' life style and knowledge linkages are apparent at various levels in the Conventions/agreements/instruments. Some of these include: the UN Framework Convention on Climate Change (UNFCCC); UN Convention to Combat Desertification (UNCCD); Trade-Related Aspects of Intellectual Property Rights (TRIPS); and the Convention on Trade in Endangered Species of Wild Flora and Fauna (CITES).

Kenya does not have a national law covering traditional knowledge, but has put in place various legislations policies and action plans to lay the framework for implementation of programs that touch on indigenous knowledge and biodiversity. Through these, explicit references are made to IK and the government involves indigenous and local communities in decision making and policy planning.

Some other legislations, policies and action plans include: NEAP, NBSAP, and NAP. A framework for Combating Desertification in Kenya, the National Poverty Eradication Plan (NPEP), Poverty Reduction Strategy Paper (PRSP) and Economic Recovery Strategy for Wealth and Employment Creation (ERSW & EC).

- In addition several institutions exist that include aspects of IK in their institutional set-up Ministries and institutions such as KEPHIS, MOA, MOL&FD, MOENR, KEFRI, NCST, NEMA, Public Universities, NMK, and KARI among others already have departments on conservation/preservation of natural resources and sustainable utilization of natural resources and biological diversity.
- The National Gene Bank of Kenya based at KARI incorporates the Plant Quarantine Station, an important centre for ex-situ seed conservation.
- The Kenya Forestry Seed Centre and the Plants for Life Research Programme is based at KEFRI, and has plant genetic materials for establishing indigenous forests.
- The National Museums of Kenya is the home to many groups interested in IK, including KENRIK, the centre for Biodiversity, the Data Project, and the East African Herbarium, among others.
- The Central Artificial Insemination Station (CAIS) and the Livestock Recording Centre (LRS) store animal genetic resources and are based at the MOLFD.
- Community based Biodiversity and Learning Centres at various locations.
- Research Institutions on IK.
- NGOs and CBOs who work with communities on indigenous knowledge for biodiversity conservation. These activities include promotion of use of indigenous vegetable, eco-tourism, medicinal plants, information and networking, capacity building and re-introduction of IK among others. These institutions include among others CIKSAP, INN, Programme Action, formally ITDG and CLOUT.
- Civil society and private sector organizations including doctors specialized in alternative medicines.
- Commercial institutions which process IK products for sale for example, ICIPE, Saroneem Biopesticides Limited and private herbalists and wild game ranches.
- Personnel already available that can adequately carry out activities related to research and development in IK, and interaction with community groups.
- Knowledgeable personnel areavailable within the various ministries, NGOs, CSOs, and the rural communities.
- Indigenous medicine doctors (Naturopathic Medicine)
- Kenya is a member of CBD Article 8(J) Technical Advisory committee, and represents Africa in that committee.

Goal 3: National biodiversity strategies and action plans and the integration of biodiversity concerns into relevant sectors serve as an effective framework for the implementation of the objectives of the Convention.

A brief description of the NBSAP

In response to the United Nations General Assembly Resolution No. 2393 (XXIII) of 1971, Kenya joined the word community in the search for a global approach to the protection of the environment by participating in the first United Nations Conference on the Human Environment (UNCHE) in Stockholm, Sweden, in June 1972. This conference led to the birth of the United Nations Environment Programme (UNEP), now headquartered in Nairobi.

Globally, the value of biodiversity as a key component of the environment was recognized during the build up to the United Nation Conference on Environment and Development (UNCED), also known as the Earth Summit, in Rio de Janeiro in 1992. During that occasion, Kenya endorsed and adopted agenda 21, and also signed the Convention on biological Diversity (CBD). It ratified the CBD in 1994. The Rio Earth summit was a global meeting mandated to devise integrated strategies that would halt and reverse the negative impact of human behaviour on the physical environment and promote environmentally sustainable economic development in all countries.

Agenda 21, among other things, specifically calls for the development of national strategies for the conservation of biological diversity and the sustainable use of biological resources. In fact, biodiversity-related activities feature throughout the 40 chapters of the agenda. Sustainable development is an integrated approach to policy and decision making, in which environmental protection and long term economic growth are seen not only as compatible, but also complementary and mutually dependent.

National Biodiversity Strategy & Action Plan (NBSAP)

The NBSAP process involved a wide cross section of biodiversity stakeholders in the country. Its consultative phase involved meetings in all regions of the country. Its main objective was to set out national priorities, strategies and action plans for biodiversity conservation in the country. The report was completed in 2000, and its widely disseminated in the country. The NBSAP is a policy paper which spells out the way forwards for the conservation and sustainable utilization of biodiversity in the country. The overall objective of the NBSAP is to address the national and international undertakings elaborated by Article 6 of the Convention. It is a national framework of action for the implementation of the Convention to ensure that the present rate of biodiversity loss is reversed, and that present levels of biological resources are maintained at sustainable levels for posterity. One of the key guiding principles is the recognition that although biodiversity is best conserved in-situ, there is need to increase the capacity for ex-situ conservation.

Similarly one of the specific objectives of NBSAP is to strengthen institutional and community capacity for sustainable conservation of biodiversity, including the safe utilization of biotechnology. The national strategy identifies goals and objectives and analyses the gaps between current reality and the aspirations espoused in the goals and objectives. It presents issues and strategies that need to be undertaken in order to mitigate against current threats to biodiversity. However, most of the NBSAP is now mainly outdated, while most of its action

plans was never implemented. Both NEAP and NBSAP are supposed to be updated on a regular basis. Despite this shortcoming the NBSAP is an effective framework for the implementation of the objectives of the Convention.

To-date the NBSAP has not been fully adopted by the government. Consequently its implementation lacks full political and financial backing. But despite this shortcoming the objectives of the NBSAP are slowly being achieved. For example:

(a) Kenya has regularly participated in the COP, SBSTTA and other related international meetings, where its country position on a number of issues has been articulated.

(b) Decisions of the COP have been implemented as far as possible by stepping them down to the relevant sectors. What is missing here is a comprehensive assessment of the mainstreaming process and successes.

(c) In Kenya several regulations aimed at conserving biodiversity have been established. So far regulations developed include those on the ecologically fragile ecosystems, the Environmental Impact Assessments and Audit, use of economic instruments for environmental conservation and management, waste management, access to genetic resources, benefits sharing and environmental standards regulations. Most of these regulations have already been gazetted.

(d) Several sectors have developed policies and management plans which include strategies to conserve biodiversity. There are for example, plans for forestry, wetlands water, marine and coastal area, tourism, wildlife.

(e) The national development plans prepared after 1992 have taken on board biodiversity conservation issues. For example the 1997-2001 National Development Plans have identified the underlying causes of environmental degradation and recognized the importance of environmental management tools including laws, environmental economics, and cross-border issues. Indeed the 2002-2008 National Development Plan adequately addressed biodiversity issues. Acknowledging the lack of a comprehensive policy on biotechnology the plan has been instrumental in the enactment of the Biosafety Act (2009).

(f) National biodiversity data management is being done at sector levels in a rather uncoordinated manner. These efforts are commendable but would need to be stepped up if the data is to be effectively mainstreamed in decision making processes.

(g) *In-situ* conservation activities in line with the NBSAP vision are being undertaken country-wide. There are several national parks and reserves and most of them have draft management plans.

(h) Ex-situ conservation activities also have been stepped up. There is a gene bank, several herbaria, botanic gardens, aquaria and other related initiatives all aimed at conservation of biodiversity. Some of these are government managed while several are run by the private sector. There is dire need to harmonize these initiatives and incorporate them in the national development plans in order to guarantee their continuous existence.

(i) The NBSAP lays emphasis on participatory approaches where rural communities are integrated in all the processes of biodiversity conservation. In Kenya there are over 10,000 civil society organizations majority of them involved in one aspect or the other of environment protection and sustainable utilization of biodiversity. With this CSO force all what is needed is a framework to catalyze their actions for the goals of the NBSAP to be realized.

(j) With respect to education and public awareness, Kenya has already developed a strategic plan on how to mainstream biodiversity conservation issues into the education in both the formal and informal sector.

Goal 4: There is a better understanding of the importance of biodiversity and of the Convention and this has led to a broader engagement across society in implementation

There is no doubt that biodiversity awareness in the country is higher today than it was in the 1990. However, it is rather difficult at this moment, to assess how much the NBSAP has catalyzed understanding of the importance of biodiversity and the Convention in general. As mentioned earlier the thousands of CSOs involved in biodiversity conservation are contributing immensely to the implementation of the Convention. One indicator attesting to this is the overwhelming response by CSOs to the UNDP/GEF/SGP advertisements. Indeed the GEF/SGP projects are spread throughout the country and this has contributed to the raising of biodiversity awareness.

Constraints in the implementation of the NBSAP and way forward

Kenya's assessments report on implementation of agenda 21 to the **R10 + 10** meeting in Johannesburg, South Africa (World Summit on Sustainable Development) indicated that some progress has been made. However, there are challenges and constraints that continue to hinder smooth implementation. The key challenges were highlighted as follows:

- Slow flow of funds from the developed countries.
- Issues of transparency/accountability, governance, and democratic principles were a stumbling block as Kenya like many other developing countries fell short of fulfilling them.
- Technology transfer has been slow; this is because it requires big investment, which has not been forthcoming. Most technologies are also patented or have intellectual property rights, which are costly to pay for.
- Access to benefit sharing has not been realized because there is little willingness for the developed countries to trade equitably with developing countries; the tendency has been trade in their favor. Transparency lacks in this area, because developing countries are forced to sell their goods at dictated prices, which are not a true reflection of their real value.
- For a long time there were no regulations on bio prospecting, which meant unregulated exploitation of biological resources for exports was carried out. In actual fact, a lot of our materials are already in foreign hands and are being used mostly for the benefit of those that have it in their custody. Unfortunately, illegal collection is still going on.
- Inadequate resources in terms of both human and financial and technology are a hindrance to the effective implementation of the CBD.
- Failure of government to provide adequate economic returns to communities living in dispersal area of protected areas and the alienation of local communities from wildlife conservation is likely to be counterproductive.
- The sensitive nature of land issues in Kenya has slowed down the urgent development of comprehensive national land use policy.
- The planning system is yet to adopt the eco-system approach.
- Poorly defined objectives, programs as well as monitoring and evaluation systems.

- Kenya is witnessing a slow economic recovery as a result of post election violence and development that is a draw back to the implementation of the CBD.
- Lack of transparent, equitable and efficient sharing of Kenya's biodiversity is encouraging habitat destruction.
- There is poor appreciation of all the values of biodiversity.
- Infrastructure in Kenya is inadequate for enhancing utilization and management of biodiversity.
- Limited access to biodiversity data and information is still a serious weakness.
- A high level of illiteracy is an impending factor in optimal resource utilization.
- Climate change and desertification.
- Insecurity in some parts of Kenya rich in biodiversity is hindering the sustainable exploitation.
- There is insufficient effort towards ensuring sustainable development in areas adjacent to protected areas.
- There is still illegal prospecting going on for the rare biodiversity products.

WAY FORWARD

There is urgent need for improved coordination among national and international institutions, adoption of policy measures that protect the environment. There is need to strengthen existing institutions responsible for biodiversity conservation and to harmonize and integrate their activities.

Kenya needs to protect more sacred places and areas of cultural importance as communal land, village parks and as national monuments.

There is also need to incorporate scientific understanding of the nature of links among environmental issues and their relationship to meeting human needs as well as to identify strategies that capture as many benefits as possible. Political will and public commitment is needed to seriously address environmental issues.

It is important to transform communities to be pro-conservation by increasing their awareness creation, empowerment. Their involvement in decision-making is essential.

The developed nations should honour their commitment to generate international funds to help developing countries implement their commitments to achieve sustainable development. Although there has been some level of funding, it has been grossly inadequate. Implementation can only be done according to the different conditions, capabilities and priorities of a given country therefore given the conditions of many developing countries, not much can be expected without assistance.

CHAPTER FOUR: CONCLUSION

4.1 Introduction

There are 11 goals, 21 targets and several indicators given on the provisional framework to assess progress in biodiversity conservation by the year 2010. The goals only are reproduced here so as to give the reviewer and other readers of this report a baseline form which to assess the concerns raised. For each goal, an effort is made to review progress towards its achievement.

4.2 Progress towards the 2010 Target

- There is no evidence that the 2010 biodiversity target campaign was ever launched. This then means that there is no implementation structure on the ground. Consequently there is no work plan.
- The 2010 biodiversity target therefore may only be assessed by examining what different sectors have achieved in line with the goals.

Goal 1: Promote the conservation of the biological diversity of ecosystems, habitats and biomes.

Kenya has established a system of protected areas of particular importance to biodiversity.

National parks as a mode of wildlife conservation gained official acceptance in Kenya early in the 20th century. In 1907, the Game Department was set up in particular as an agency for regulating hunting. However, it is the adoption in 1933 by the colonial powers in Africa of the London Convention concerning the conservation of fauna and flora in their natural state that led to the creation of the first and most prestigious national parks in Africa, including the Nairobi National Park and the Tsavo National Park in Kenya. The national park system was instituted by the national parks ordinance on 1945. During the colonial days as well as in the early years of the post-independence period, official interest in wildlife conservation was motivated by the rewards of the sport hunting tourism based economy, rather than by the object of the sustainable management of biodiversity.

The post independence government inherited four national parks and six game reserves. Subsequently the numbers of these parks and reserves have greatly increased. There are currently 46 protected areas that cover the key ecosystems in Kenya all covering approximately 8% of the national land area. This includes a total of 27 National Parks, 34 National Reserves and 4 Wildlife Sanctuaries. The country has 23 terrestrial, 4 marine National pars, 26 terrestrial National Reserves, 6 Marine National Reserves and 4 National Sanctuaries that have been gazetted through a parliamentary process. In addition, there are quite a number of game reserves that are under the management of local authorities (County Councils). Similarly, there exists a host of privately or/and communally wildlife conservancies. Currently there are 17 community sanctuaries and private conservancies covering a total area of 300,000 ha and 13 wildlife conservancies

have been established countrywide. At national level the conservancies are represented by the Kenya Wildlife Working Group. There is considerable diversity of wildlife to be found in these private protected areas, with much of Kenya's habitats and vertebrate fauna represented.

Some of the main problems affecting wildlife which the post independence governments in Kenya have had to address have their origin in the colonial period. The main category has been the declining wildlife population due to poaching and clearing of forests to create farming land which has destroyed substantial portions of the wildlife habitat. The situation is aggravated by the disruption of indigenous lifestyles, by the encroachment of the new values at the advent of colonial administration and the forces of the new market economy. This has undermined many of the traditional approaches to human co-existence and escalated human-wildlife conflicts. Consequently, large numbers of the big game have been lost. The elephant population decreased from 165,000 to a mere 18000 between 1973 and 1988; and the black rhino decreased from 20000 to only 350 between 1970 and 1986.

The Government is in the process of updating the policy on wildlife conservation and management (as contained in Sessional Paper No. 3 of 1975) and the Wildlife Conservation and Management (Amendment) Act of 1989 to respond to changing conditions and objectives of wildlife and biodiversity conservation. The new policy framework centers on three main goals: (i) conserving of biological diversity and representative indigenous ecosystems; (ii) promoting environmentally sustainable tourism; and (ii) promoting compatible land use in priority biodiversity areas, and channeling the benefits thereof to the local communities. A revised policy and legislation will delineate the roles and responsibilities of the Kenya Wildlife Service and of other Government and non-Government stakeholders in the implementation of this participatory approach. The draft policy is being prepared by the Kenya Wildlife Service.

Landscapes and Forests

The immediate importance of forests in Kenya is that they are a source of vital raw materials, especially those used in the construction industry, forage for domestic animals and for cultural purposes. Forest products are used as sources of raw material for wood-based industries producing saw timber, pulp, paper and panels. There are however less *visible* and tangible functions of these forests but which are no less important. Forests serve as carbon sinks thus lessening the harm to the environment that arises from the releases of energy during industrial and related activities. Forests also perform other environmental functions such as the prevention of soil erosion protection of water catchment area provision of wildlife habitat and the conservation of biological diversity.

The National Forest Policy

Kenya's first official forest policy was formulated in 1957 through White Paper No. 85. This policy was subsequently restated by the Government of Kenya in 1968 (Government of Kenya, 1968). Kenya's forest policy sets out ten basic principles under

which forests will be managed for the greatest common good. The national forest policy stipulates that sufficient land should be reserved for forestry purposes in view of the importance of provision of forest products and other indirect benefits. Furthermore, the policy states that forests should be managed on a sustained yield basis, so that Kenyans will continue to receive forest products in perpetuity. Forests are also recognized as being important for recreation and as habitat for the country's wildlife. Additionally, this policy envisaged a situation whereby forests under the respective County Councils would be managed jointly by the Forestry Department and the relevant County Councils.

The Forest Act

The Forests Act (1962), Cap. 385 of the Laws of Kenya, which was revised in 1982, 1992 and 2005, addresses reservation, protection, management, enforcement and utilization of forests and forest resources on Government land. Though the Forest Act allows the Forestry Department to protect forest resources on unalienated Government land, the Act is mainly applicable to gazetted forest area (Forest Reserves) and specifically covers:

- Gazettement, alteration of boundaries, and degazettement of Forest Reserves (Section 4).
- Declaration of Nature Reserves within Forest Reserves, and regulation of activities within Nature Reserves (Section 5).
- Issuance of licenses for activities within Forest Reserves (Section 7).
- Prohibition of activities in Forest Reserves (removal) of forest produce, grazing, cultivation, hunting etc) and on un-alienated Government land (removal of trees, collection of honey, lighting of fires) except under license from the Director of Forestry (Section 8).
- Enforcement of the provisions of the Act, penalties and powers accorded to enforcing officers (Sections 9-14).
- Power of the Minister to make rules with respect to sale and disposal of forest products, use and occupation of land, licensing and entry into forests (Section *15).*

The KFS which falls under the Ministry of Environment and Natural Resources is the main agency concerned with the *in situ* conservation and management of forests. The other key players are the National Museums of Kenya and Kenya Wildlife Service. The Forest Department is also extensively supported by the work of the Kenya Forestry Research Institute (KEFRI). KEFRI conducts a wide range of activities but particularly significant in the context of *in-situ* conservation are its research involving the socio-economics of communities living in and around key forest areas and also its efforts at supporting the propagation and cultivation of indigenous tree species. The Kenya Forestry Research Institute (KEFRI), which operates under both the Science and

Technology Act (CAP 250) and the state Corporation Act (CAP 446, was established in 1986.

The Environmentally Significant Areas (ESA) Program

Section 54 of the Environmental Management and Co-ordination Act (EMCA) of 1999 calls for the protection of ESAs which are natural areas that have been identified as significant areas worthy of protection based on criteria such as ecological, socio-economic, or historical functions, or other specified functions, and earth science features. Such areas may also be significant because of non-ecological reasons. An area designated as an ESA does not necessarily preclude it from development or use. The status and condition of the ESA will dictate whether or not it should be protected, that is, preclude human interference, or whether it can be used conditionally with the goal of maintaining the integrity of the area. NEMA is in the process of actualizing a national ESA programme. The programme will be a big boost to the national efforts for in-situ conservation. As part of the management strategy, a database of the gazetted ESA will be created and maintained.

One of the ecological criteria to be used in the identification and designation of ESAs in Kenya, according to the national guidelines developed by NEMA, is biodiversity. Potential ESAs can therefore include areas which contain the variety and variability among all living organisms from all sources, and the ecological complexes of which they are a part and the diversity within and among species, and ecosystems: areas which contain significant, rare or endangered plant or animal species; Areas which provide an important linking function and permit the movement of wildlife over considerable distances, including migration corridors and migratory stopover points: and areas which are unique habitats with limited representation in the region or are a small remnant of once large habitats which have virtually disappeared.

Important Bird Areas (IBAs)

Nature Kenya, an International NGO which foresees on the conservation of birds has designated areas as IBAs (important bird areas). The conservation benefits of designating an area as an IBA are enormous. For example the government immediately sees the need to include that area in its protection list. Likewise if the area was already protected its profile is raised as awareness of its value increases. Some IBAs outside protected areas which have drawn the attention of the government include North Nandi, Yala, Cherangani and Kinangop. Recognition for the IBAs benefits proposals to the GEF, the financing mechanism for biodiversity conservation. Currently there is an IBA strategic plan still in draft form which also contains action plans for IBAs that are threatened. A threat analysis has given three main categories of IBAs, namely high, urgent and critical. It is expected that the strategic plan will soon be endorsed by government and subsequently mainstreamed to al other relevant sectors.

Goal 2: Promote the conservation of species diversity

Species diversity conservation is promoted as a consequence of ecosystems and habitat conservation. A lot of research work involving single species has been done in Kenya.

In fact traditionally the single species conservation approach was the most common type of research projects. Unfortunately this approach yielded data on those species of immediate and obvious economic importance. These included the elephant, rhino, lion, cheetah, leopard, some birds, fish, and even snakes and birds. In most cases the studies led to the development of policy frameworks and in some cases management guidelines. For example the conservation of fish biodiversity is a well co-ordinated programme in the country.

Kenya's fish resources are found partly in inland water sources and partly in marine areas. The inland water fishes include those found in freshwater and alkaline lakes, as well as those found in rivers. The main lakes that supply fish are Lake Victoria, Lake Turkana, Lake Naivasha and Lake Baringo. Marine areas are also important potential source of fish, even though they have certain notable limitations. One of these limitations is the rather narrow continental shelf, with a floor covered with coral formations. The coral formations are not conducive to traditional trawling techniques. But the coastal have important micro habitats for fish, especially in the estuaries of major rivers, mangrove swamps, and tidal zone and reef areas. The deep sea also has significant stocks of fish. All in all, Kenya has valuable fish resources of real economic and scientific importance.

The legal regime for the conservation of fish resources exists at a general level and a specific level. The general aspect of this regime is closely linked to the Minister's conservation powers given by the Wildlife Conservation and Management Act; and the specific level relies on more focused legislation, namely the Fisheries Act and the Government Fisheries Protection Act. By virtue of the Wildlife (Conservation and Management) Act, the Minister of tourism and wildlife is empowered to establish conservation areas. This power has been used to establish the Malindi National Marine Park and the Watamu National Marine Park.

The **Fisheries Act** is "*an Act of parliament to provide for the development management exploitation utilization and conservation of fisheries and for the connected purposes*." It is set out in four substantive parts dealing respectively with a) administration b) registration of fishing vessels c) licensing arrangements d) sanctions. The administration of the Act is entrusted to the Director of Fisheries, whose responsibility it is, working in cooperation with the appropriate private agencies and other departments of the government to promote the development of traditional and industrial fisheries, fish culture and related industries.

The Fisheries Department is entrusted with legislative authority to undertake the following:

- Declare closed seasons for designated areas, species of fish or methods of fishing;
- Prohibit fishing areas for all or designated species of fish or methods of fishing;
- Place limits on fishing gear, including mesh sizes of nets that may be used for fishing;

- Limit the amount, size, age, species or composition of species of the fish that may be caught, landed or traded;

- Regulate the landings of fish and provisions for the management of fish landing areas;

- Control the introduction into or harvesting or removal from any Kenya fishery waters of any aquatic plant.

The **Government Fisheries Protection Act** serves the more limited purpose of protecting specific types of fish resources. Although this Act is described in citation as an Act of parliament for the protection of government fisheries, it has focused more on objects such as prohibiting the removal and carrying away or exporting of biological materials, from the fisheries, or from any shore or banks in or about Kenya or the territorial waters. The government has undertaken under the 1994-1996 development plan to comply with strict management practices in enforcement of fisheries regulations, especially in relation to the 200 mile exclusive economic zone (EEZ). Such management is undertaken in collaboration with the provincial administration wing of the civil service; the Kenya Police, the Kenya Navy; the KWS; and private sector organizations.

Goal 3: Promote the Conservation of Genetic Diversity

Kenya's approach to conservation of genetic resources has taken both direct and indirect courses. It is arguable that the use of such legislation as the Forest's Act to protect forest resources, the Wildlife (Conservation and Management) Act to protect wildlife and the Fisheries Act to protect the fish biodiversity is an indirect course to the conservation of genetic resources. However, Kenya also acceded to the International Plant Protection Convention (1951) on 7 may 1974. This Convention seeks to maintain and enhance international co-operation in controlling pests and diseases that affect plants and plant products. It also seeks to prevent the introduction and spread of such pests and diseases across national boundaries. Kenya acceded to the Convention for the Protection Management and Development of the Marine and Coastal Environment of the Eastern African region (1985) as well as its Protocol Concerning Protected Areas and Wild Fauna and Flora in E.A region (1985) on 11 September 1990. This protocol provides for the protection of threatened species of fauna and flora, and important natural habitats in the EA region.

The national considerations for the genetic quality of seeds and plants in Kenya are covered in the Seeds and Plant Varieties Act. This is an act of parliament that confers power to regulate transactions in seeds including provisions for the testing and certification of seeds; for the establishment of an index of names of plant varieties; to empower the imposition of restriction on the introduction of new varieties; to control the importation of seeds; to authorize measures to prevent injurious pollination; to provide for the grant of proprietary rights to persons breeding or discovering new varieties. The Act has detailed provisions on seeds seed testing control of imports and prevention of cross-pollination and on plant breeder rights.

In pursuance of his powers under the Act, the Minister has made the Seeds and Plant Varieties (seeds) Regulations which provide for such matters as: prescribed seeds; seed testing station; seed regulation committee; seed allocation panel sub-committee; registration of seed growers; registration of seed merchants; seed inspection; seed certification; seed processing; seed sampling, packing; labeling and sealing; validity certification and quality declaration; seed sale; seed importation and exportation; offences and penalties; etc. These regulations have separate schedules on prescribed seeds, seed under compulsory certification, seed classes, field and laboratory standards, and field inspection fees.

Recently, Kenya's participation in the development of the Cartagena Protocol was led by the National Council for Science and Technology (NCST). NCST has continued to operate as the Lead Agency subsequent to the completion of the Protocol and plays host to a National Biosafety Committee as they await formation of the National Biosafety Authority. This Committee is inter-ministerial and cross-sectoral in nature and is aimed at ensuring effective planning as regards modern biotechnologies. The Kenya Plant Health Inspectorate Services (KEPHIS) and the Kenya Agricultural Research Institute (KARI) have both also had a significant role to play in this field. The main difficulties in the field of biosafety in Kenya have been questions of resources and capacity. Despite the fact that Kenya has relatively impressive capacity in biotechnology, in both scientific and policy terms, for a sub-Saharan African country this is still stretched to the limit when addressing biosafety concerns.

Kenya Forestry Seed Centre

The Kenya Forestry Seed Centre (KFSC) was established in 1985 with support from German Agency for Technical Cooperation (GTZ). The aim was to provide certified, high quality tree seed in sufficient quantities to meet the rising demand. KFSC has its headquarters at Muguga, about 25 km northwest of Nairobi. It is a sub-programme under Service Programme of Kenya Forestry Research Institute (KEFRI) in the Ministry of Environment and Natural Resources. The centre is a duly registered seed merchant by Kenya Plant Health Inspectorate Service (KEPHIS).

Seed collection is carried out by a network of 8 collection centres distributed in all ecological zones of Kenya. Seed collection is done by the Center's trained tree climbers under the supervision of experienced foresters. Seeds are collected from selected and established seed stands of both exotic and indigenous species. The Centre collects over 4,000 kg of clean seeds annually from more than 120 different tree species. Seed quality testing (moisture content, germination and purity) is done in the Center's state-of-the-art research laboratories and glasshouses by qualified technologists and technicians before they are dispatched to various clients. International Seed Testing Association (ISTA) guidelines are followed in setting appropriate quality control standards.

The seed store is composed of 3 cold rooms with a volume of about 75 m^3. One room is maintained at 10^0C and in it is stored the orthodox species. The other rooms are maintained at $+3^0$C and 1^0C where the more heat sensitive seeds are stored. The seeds are put in air tight plastic containers after they are dried to the species specific moisture

content level, which is around 8-10 % for most species. These standards have been adopted from International Seed Testing Association (ISTA) where applicable, developed locally through research or adopted from research results from collaborators. Some base collections are stored at the National Gene bank of Kenya whose bulk collection is of plants other than forest species. The processing period depends on the species and the centre has a capacity to use a hot room for seed drying when the weather does not permit sun drying. There are plans to expand, duplicate and establish *ex situ* conservation stands. Furthermore, although the facilities for short term storage of these forests tree seeds are adequate, there is need to expand on the long term storage facilities which are presently minimal.

Each seed-lot is documented comprehensively with data of the seed lot and its seed source. All is maintained in a computerized data base that has been locally designed. The program enables the back up of the documentation and backup. There is a published catalogue made available to users through several distribution outlets (post, seminars, agricultural shows etc.) free of charge. Networking within the East African Tree Seed Centre Region, where each centre circulates to the other centres its seed catalogue, was initiated formally during the Annual Coordinating Meeting of Tree Seed Centres in East Africa held in October 1994.

The KFSC holds the national forestry genetic collection in form of bulk seed to meet seed demand for on going tree planting programmes. The KFSC stocks about 6,000 kg of clean seeds in cold storage. Over 4,000 kg of seeds are dispatched to various clients annually. KFSC is a short term gene bank with a storage capacity of about 12 tones, consisting of 200 different tree with emphasis on indigenous species. Exotic species that are planted in the country are also included in the collection. The main clients are Forest Department, NGOs, individual farmers, local and international organizations involved in tree planting and environmental conservation. Dispatched seeds are accompanied by information on seed handling and treatment before sowing. This information includes the species name, germination percentage, pretreatment method, planting zones and the last date tested for purity. The centre is also involved in research and training in tree seed technology.

KFSC has divided the country to different seed zones and any collection done is specific in terms of species and the seed zones. To be able to capture all the genetic diversity of a species, collections must be made from all possible seed zones although the present collections do not meet this important requirement due to lack of funds. Furthermore, some species of trees that are not routinely used in aforestation purposes are not given priority. The centre can not with the present budget consistently dedicate resources to achieve this important goal.

KFSC also stores seeds for the International Center for Research in Agro forestry (ICRAF) with the management of the germplasm being undertaken by ICRAF (now the World Agroforestry Centre). The need for a forestry seed centre arose when the government started an intensive campaign of tree planting to meet its energy requirements especially in the rural areas. At the same time, an awareness of the

potential and the importance of indigenous tree and shrub species has been developed. There was also need to regulate the import and export of the national tree germplasm.

The Forest Department maintains the Nairobi Arboretum that contains approximately 100 hectares of indigenous forest in the city centre. With the assistance of an NGO, the Friends of Nairobi Arboretum (FONA), there has been considerable success in the management of this asset.

The public universities principally the University of Nairobi (UoN), have played a significant role in *ex-situ* conservation activities at various times. This has mostly been based in botany and agriculturally related departments as part of their mandate. Activities at the universities are plagued by chronic under funding although a number of the public institutions like Moi and Kenyatta Universities have made efforts in running training programmes in biodiversity. The recent establishment of a Centre for Biotechnology and Bioinfomatics at Chiromo Campus, of University of Nairobi will boost biodiversity related operations at the University.

KMFRI has significant stations on the Coast and on Lake Victoria with a series of smaller field stations at other lakes around the country. It has some capacity for *ex-situ* conservation activities but of all the national research centres it probably suffers the most from under funding and consequent problems of capacity. With its headquarters in Mombasa the Institute also has problems of coordination as nearly all other research centres are based in and around Nairobi.

International Agricultural Research Centres located in Kenya include two with significant *ex-situ* collections, the International Centre for Research in Agro forestry (ICRAF) and the International Livestock Research Institute (ILRI). Both of these institutions contribute significantly to national level efforts both in terms of extension work and capacity building and more directly in terms of providing access to their collections. The International Centre of Insect Physiology and Ecology (ICIPE) also holds a small amount of material, particularly soil samples and microorganisms with insect pathogenic value. ICIPE also has significant capacity for insect breeding although this has not thus far been employed for *ex-situ* conservation and reintroduction purposes. Kenya is also host to other IARCs, particularly the International Maize and Wheat Research Centre (CIMMYT), the International Rice Research Institute (IRRI), the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), the International Institute for Tropical Agriculture (IITA), the International Centre for Tropical Agriculture (CIAT) and the International Potato Centre (CIP).

A number of community based organizations and NGOs conduct *ex-situ* conservation activities, mostly of a fairly locally oriented and low technology type. Such initiatives include the ethno-botany project of the llkerin Loita Development Project (ILDP), a Maasai CBO) and the establishment of community seed banks by the Intermediate Technology Development Group-Kenya (ITDG-Kenya). However it appears that much greater effort is needed to increase awareness and promote the establishment of community- based *ex-situ* conservation capacity.

Goal 4: Promote sustainable use and consumption

Ideal strategies to promote sustainable use and consumption would include: -

(i) Measures to ensure that biodiversity related products are derived that are sustainably managed consistent with the conservation of biodiversity.

(ii) Certification schemes especially establishment of diversity in those ecosystems which produce commerciable goods or products.

(iii) Reduction of consumption of threatened biological resources.

Kenya has so far not developed any of these strategies. For example, there is no forest certification scheme. Consequently forest harvested products (including charcoal) are traded without their sustainability plans in place. Even the selling of wood carvings has no restrictions as to whether the origin if hard or soft wood. In fact it is the carvers themselves who are making efforts to market soft wood products as opposed to those firm hard woods which take many years to mature. Organic agriculture is still very rudimentary in Kenya. There are no organic products' certification schemes.

Strategies to reduce consumption of threatened biological resources have not been very effective. For example, some of the over-exploited resources include the saddlewood *Oscin's sp*., the mangrove trees, some aloe *spp*, and the sea turtle. For most of these species presidential bans exist but these are easily violated and exploitation proceeds unabated. Compliance to CITES seems to be the only hope for Kenya to save threatened species.

Goal 5: Pressures from habitat loss, land use change and degradation, and unsustainable water use, reduced

In Kenya majority of the people prefer to own some piece of land in the rural areas on which they practice agriculture and also build homesteads. It is considered a weakness for a person not to own a piece however small on which he and his family would be buried when they die. This craze for land puts a lot of pressure to sub-divide existing large land parcels into small fragments. Poverty too adds to this pressure as people encroach even onto protected areas. The consequences are land use change, habitat loss and degradation. This trend more than anything else is the biggest cause of biodiversity loss. It emanates from the lack of a comprehensive operationalized land use policy, which currently exists in a draft policy form.

Goal 6: Control threats from invasive alien species

Recent reviews show that Kenya has been invaded by 34 species including 15 wetland invasive species (WIS). The monitoring and control of the introduction of alien species falls under the mandate of different agencies. Protection against invasive species may be affected by virtue of the Suppression of Noxious Weeds Act. This Act empowers the Minister by notice in the gazette to declare a plant to be a noxious weed in any particular area as may be specified in a notice. A person responsible for land within the area in question is required to report to a District Commissioner or to the Director of Agriculture the presence of the weed on his land, and to clear the weed or cause it to be

cleared from the land. Inspectors may enter such land and eradicate the noxious weeds, or order the occupier to eradicate them.

Most agencies, from the fisheries department to KWS have some actively engaged capacity in the field. The universities and other research institutions have also shown themselves to be innovative in addressing the impacts of invasive species. Although the breadth and depth of capacity available would seem to indicate a successful strategy there is once again a problem of coordination, particularly in planning and implementation. Examples of the impact of this can be seen in the numerous, often independent, strategies employed for controlling Water Hyacinth. This state of affairs can often be problematic as expertise is frequently highly sectoral and thus impact assessments, particularly of downstream impacts, can be flawed.

The legislative picture as regards alien species reflects this general situation. There is a Plant Protection Act but the alien species issue is also covered by the mandates of almost all lead agencies without any overall coordinating agency having been established. There is a good possibility that this problem can be addressed by the establishment of NEMA as the Environment Management and Coordination Act does make reference to alien species in several places, including articles 42(1)(c) and 51 (e). However, this is likely to require some sort of individual initiative as the mandate provided by the Act is not particularly clear.

Goal 7: Address challenges to biodiversity from climate change and pollution.

Kenya lies astride the equator and the impacts of climate change are getting more and more intense. Prolonged droughts are causing seasonal variation in vegetation cover and animal population dynamics never witnessed before. The drought of 2003/2004 led to deaths of wildlife and livestock and occasioned serious human – wildlife conflicts throughout the country. The current ongoing drought (2008/2009) is even more intense. Most of the small rivers are running dry as the water catchment areas fail to supply adequate water to flow. The situation is aggravated by the deforestation which continues to threaten all the catchment areas.

There is evidence that ecosystems structures are fast changing in response to global warming. For example, malaria transmitting mosquitoes have recently spread to cover highland areas which traditionally were out of their distribution range. This of course poses a national health challenge.

Agricultural biodiversity too is facing a challenge form climate change. For example in the ASAL tuber crops like the sweet potato are threatened with extinction. Unlike cereal or other grain crops which can be stored for a long time, the sweet potato can only survive if it is continuously growing. Drought of more than one year leaves the farmers with no planting material. Livestock too is threatened by climate change which also complicates the ecology and biology of the disease vector.

The marine corals have been observed to be undergoing bleaching as a result of high temperatures and pollution. Mangrove forests also are reportedly suffering from pollution and this will no doubt have negative impacts on the biodiversity structure therein.

It should, however, be pointed out that Kenya has not carried out a systematic evaluation of the consequences of climate change on biodiversity conservation. This needs to be done as a matter of urgency.

Goal 8: Maintain capacity of ecosystems to deliver goods and services and support livelihoods.

Ecosystem structures and functions have been recognized, e.g. marine and coastal, forestry, drylands, etc. There are no formal programmes to study the ecosystems in respect to their delivery of goods and services i.e. ecosystem valuations have not been done.

Goal 9: Maintain socio-cultural diversity of indigenous and local communities.

The ministry of culture and social services has programmes, especially at the NMK, which examine the livelihoods of indigenous and local communities in connection with their utilisation of biodiversity. However, nation-wide programmes towards this end have not yet yielded data that can be mainstreamed in national development programmes.

Goal 10: Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources.

There are no formalized arrangements to ensure the fair and equitable sharing of benefits arising out of the use of genetic resources. Material transfer agreements between Kenya and other countries exist but these really have got nothing to do with the actual owners of the resources. Nevertheless for the communities living just outside protected areas, some benefits sharing arrangements exist in some of them.

Goal 11: Parties have improved financial, human, scientific, technical and technological capacity to implement the Convention.

This goal has been discussed in Chapter II of this report.

Appendix I: Information concerning reporting Party and preparation of national report

a) Reporting Party

Contracting Party	**REPUBLIC OF KENYA**
National Focal Point	
Full Name of Institution	Kenya Mission to UNEP
Name and Title of Contact Officer	Timothy Kaluma
Mailing Address	P.O. Box 67830 – 00200, Nairobi
Telephone	254-20- 342950
Fax	254-20-315534
E-mail	kmunep@swiftkenya.com
CONTACT OFFICER FOR NATIONAL REPORT (IF DIFFERENT FROM THE ABOVE)	
Full Name of Institution	National Environment Management Authority
Name and Title of Contact Officer	DR. Muusya Mwinzi, Director General
Mailing Address	P. O Box 67839 – 00200 NAIROBI
Telephone	254 – 20 - 609694
Fax	254 – 20 - 608997
E-mail	dgnema@nema.go.ke
SUBMISSION	
Signature of officer responsible for submitting national report	
Date of submission	

b) Process of Preparation of National Report

This report was prepared by two consultants in consultation with key stakeholders. An initial briefing was held between the consultants and officials from the UNDP, NEMA and members of the taskforce responsible for guiding the process during which the format and content of the report were agreed upon.

The report preparation guidelines were circulated to key institutions involved in biodiversity management in the country with a request for them to provide information on relevant sections of the report. The information received was compiled and made available to the consultants. This included publications and official reports. In addition the consultants sourced information from websites of the respective national institutions as well as through interviews with officers of institutions for clarification and verification.

A draft report was prepared and this was subjected to a peer review. The reviewers' comments were discussed at a stakeholders' workshop where the report was adopted as a national document subject to the corrections suggested. A revision was subsequently carried out and the report was officially submitted to NEMA.

The consultants were:

Dr. Gideon H N Nyamasyo, University of Nairobi	-	Lead Consultant
Prof. J B Okeyo-Owuor, Moi University	-	Associate Consultant

Appendix II: Further Sources of Information

1. UNEP/CBD/COP/1
2. UNEP/CBD/COP/2
3. UNEP/CBD/COP/3
4. UNEP/CBD/COP/4
5. UNEP/CBD/COP/5
6. UNEP/CBD/COP/6
7. UNEP/CBD/COP/7
8. UNEP/CBD/COP/8
9. UNEP/CBD/COP/9
10. UNEP/CBD/BS/COP-MOP/1
11. UNEP/CBD/BS/COP-MOP/2
12. UNEP/CBD/BS/COP-MOP/3
13. UNEP/CBD/BS/COP-MOP/4
14. UNEP/CBD/WRGI/1
15. UNEP/CBD/WRGI/2
16. First Kenya National Report, 1998
17. Second Kenya National Report, 1999
18. Third Kenya National Report, 2005
19. Kenya 1st National Report on the Implementation of the Cartagena Protocol, 2007
20. Kenya Report on the Implementation of the Programme of Work for the Global Taxonomy Initiative, 2005
21. Kenya National Biodiversity Strategy Action Plan, 2000
22. KARI, Looking Back 2004 and Ahead 2005
23. Activities in Biosafety of Biotechnology Handled at KEPHIS
24. NEMA State of Environment Report, 2003
25. NEMA State of Environment Report, 2004
26. KWS Annual Report, 2007
27. KMFRI Bi-Annual Report, 2008/9

Appendix III: Progress towards Targets of Programme of Work on Protected Areas in Kenya

1.1 Goals: Establishment and strengthening of national and regional systems of protected areas.

Progress towards 2010

1. Kenya is divided into 8 regions with a system of parts (Landscape approach)

Offices have been created responsible for landscape ecosystems, devolution and respective regional offices to meet ecosystem approach. Senior wardens manage protected and neighboring unprotected areas.

2. There are cross-border regional ecosysytems such as the Mt. Elgon ecosystem shared with Uganda, L. Natron (proposed for Ramsar site) shared with Tanzania, the Maasai Mara, Serengeti, and Amboseli National Reserves also shared with Tanzania.

3. Already have management plans for all parks and adopted new park management framework. Updated park management plans annually. KWS developed planning framework to ensure uniformity , science based and participatory with clear biodiversity conservation and meet targets- Protected Area Planning Framework (PAPF) - guides planning for all the parks

4. Kenya has put measures in place to ensure protection of biodiversity including:

    a) Plans for reduction of encroachment of protected areas.

    b) A strong anti-poaching program

    c) Anti-fire management program.

5. Other measures include

    a) Presidential Decrees on East African sandalwood. Biotechnology - Legal Notice 160 passed to guide benefits sharing.

    b) High level round table meeting for biological resource utilization was held in Mombasa in March 2009.

    c) KWS has 5 MOUs with local communities e.g. in Kakamega forest, aloe utilization - through community development trust fund - Baringo Aloi Enterprises

    d) Kenya banned harvesting of wild animals – except ostriches and crocodiles that are harvested under license.

2.2 Goal: Enhance and secure involvement of indigenous & local communities

Progress towards 2010

a) KWS community wildlife service is dealing with compensation, awareness and training.

b) The service has set up community conservancies (>20) and KWS provides technical services.

3.1 Provide an enabling policy, institutional and socio-economic environments for protected areas

Progress towards 2010

Kenya has:

a) Reviewed Wildlife Act and drafted a new Wildlife Bill.

b) A New wildlife policy containing – setting up corridors, biodiversity protected areas.

c) KWS has department of ecological monitoring and biodiversity valuation

3.2 Goal: Build capacity for planning, establishment and management of protected areas

Progress towards 2010:

a) KWS and Manyani training institutes for capacity building for multi-skilled rangers (provide security & collect data).

b) Human capital capacity is available with a high capacity in staff (5 Ph.D.s)

3.3 Goal: Develop, apply and transfer appropriate technologies for protected areas Progress towards 2010:

a) KWS has 5 MoUs with international corporations for Micro-organisms bio-prospecting.

b) Tracking and cornering animals using GIS.

c) Established wide area network

d) Use of smart cards by visitors at all national parks and game reserves

3.4 Goal: Ensure financial sustainability of protected areas and national and regional systems of protected areas Progress towards 2010

a) Income from tourist-marketing by KWS.

b) Reviewed tariffs to minimize high pops in parks Classified parks according to visitation.

c) Door marketing at the parks and in hotels near Tsavo.

d) Regular treasury allocations for salaries

e) Starting Endowment Fund by end of 2009

f) Income from tourists

g) Lease lodge designated areas in the parks

3.5 Goal: Strengthen communication, education and public awareness

Progress towards 2010

a) Has department of public education and awareness using all types of methodologies.

b) KWS has trained 2 people by UNEP on e-communication

c) KWS using media for comm. And education

d) Extend SEPA for other Conventions e.g. the Ramsar Convention, etc

4.1Goal: Develop and adopt minimum standards and best practices for national and regional protected area systems

Progress towards 2010

a) The Kenya Wildlife Service (KWS) is ISO 9000 on quality of services to customers-certificate ready and ceremony to be done in due course.

b) It Has standard operating procedures (SOPs) for all operations.

c) Has a strategic plan for 2009 - 2013.

4.2 Goal Evaluate and improve effectiveness of protected area management

Progress towards 2010

a) Has department for ecological monitoring with clear frame work for monitoring.

b) Developed guidelines, formats and frameworks

c) Framework status and trends of biodiversity conservation

4.3 Goal: Assess and monitor protected area status and trends

Progress towards 2010

The Kenya Wildlife Service and Kenya Forest Service have monitoring frameworks for fire, human wildlife conflict and changes in ecological status.

4.4 Goal: Ensure that scientific knowledge contributes to the establishment and effectiveness of protected areas and systems

Progress towards 2010

The Kenya Wildlife Service has a division headed by deputy director in charge of Research & Training works to meet these goals