

COUNTRY PROFILE  
ON  
ENVIRONMENT

KENYA

**February 2002**

**PLANNING AND EVALUATION DEPARTMENT  
JAPAN INTERNATIONAL COOPERATION AGENCY**

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## FOREWORD

### Composition and the Contents of this Report

This report presents information on the Environment of the Country in the following arrangement

#### **1. KEYWORDS**

Keywords to understand features of the country and major environmental issues are presented briefly on a page, which helps to overview the whole figures.

#### **2. FACT SHEET**

Major significant index of economy, demography, society and natural resources of the country as well as the characteristics of the natural and social environment are presented.

#### **3. ORGANIZATION AND LEGISLATION**

##### 3.1 Organization

Organizations in charge of each environmental issue stated in Chapter 4 and their duties are shown in the matrix. Responsibility, organization and duties of the relevant organizations are also described. For NGO, name and their main activities are shown.

##### 3.2 National Policy on Environment

National policy on the environment such as national environmental action plan is stated.

##### 3.3 Legislation

Laws and regulations on the environment and their coverage are presented.

##### 3.4 Environmental Impact Assessment

EIA system in the country including history and procedure etc. are presented.

#### **4. CURRENT ENVIRONMENTAL ISSUES**

This chapter summarizes the current status of the following environmental sectors and presents the organization in charge, applicable standards, past cases and relevant laws and regulations are presented. In the Chapter 4.3, current environmental issues to be considered are described based on the Local Consultant's report.

4.1 Air Pollution	4.7 Wastewater Management
4.2 Water Pollution	4.8 Forest Conservation and Desertification
4.3 Other Pollution	4.9 Biodiversity
4.4 Solid Waste Management	4.10 Natural Resources Management
4.5 Energy Conservation and Renewable Energy	4.11 Natural Disaster
4.6 Water Supply	4.12 Environmental Education

#### **5. INTERNATIONAL RELATIONS**

Economic and technical assistance by the foreign donors in the country are reviewed. Chapter 5.2, "International Convention on the Environmental Protection" list the conventions ratified or signed by the country. Chapter 5.3, "International Donor's Project on the Environment" list the assistance project on the environment by the bi- or multilateral donors with the information on the project.

#### **6. INFORMATION SOURCES**

Contact persons of the organizations in the country concerning the environment are listed.

#### **7. REFERENCES**

References quoted in this report are listed.

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## 1. Keywords

### 1.1 Keywords to understand the Environment

<b>Gross Domestic Product or Gross National Product – 2000*</b>	
GNP per capita : 341 US\$	GDP per capita : 271 US\$
Total GNP: 9984 million US\$	Total GDP: 8833 million US\$
<b><u>Arid and Semi-Arid Country</u></b>	
More than 75% of the country is classified as arid and semi arid. This area is predominantly used for livestock production and conservation of wildlife. A few irrigation schemes e.g. Mwea rice irrigation scheme in Embu district and Bura Irrigation Scheme in Tana River district implemented in this zone.	
Food crops such as maize, wheat, beans, bananas, assorted vegetables and fruits are mostly grown in the remaining 25% of the country. Cash crops such as coffee, tea, pineapples, pyrethrum among others are also grown here. Large and small scale dairy farming is also practiced in this area.	
<b><u>Tourism</u></b>	
One of the most important sources of foreign exchange for the country. Majority of the tourists (56.5%) come from Europe.**	
In the year 2000, a total of 1.6 million tourists came to visit Kenya's attractive coastal beaches and wildlife sanctuaries.	
The country is promoting "eco-tourism" since it is less destructive to the environment.	
<b><u>Tribal Diversity</u></b>	
The major ethnic groups are Kikuyu, Luo, Luhya, Kisii, Meru, Kamba, Kalenjin, Masai, Turkana, Taita, Giriama among others.	
Kiswahili and English are the official languages.	
Majority of the people live in rural areas where they practice subsistence farming. The number of people migrating from rural areas to urban centers in search of economic opportunities is increasing steadily.	
<b><u>Topographical Diversity</u></b>	
Highlands: Central, Nairobi, Central (Mt. Kenya – 5,199 m), parts of Nyanza province and Western (Mt Elgon – 4375 m) province;	
Arid areas: North Eastern province and parts of Eastern province;	
Plains: Rift Valley province, parts of Nyanza province (Kano plains) and parts of Coast province;	
Lakes/Marshes: Lake Victoria (Nyanza), Lake Turkana, Lake Nakuru, Lake Bogoria, Lake Naivasha, Lake Elementaita (Rift Valley)	
Coastal Zone: Coast Province bordering Indian Ocean	

Source: Ref. 1), 2), 3)

### 1.2 Key Environmental Issues

#### Land degradation

- Soil erosion
- Overgrazing resulting in a reduction in the economic potential of the affected areas
- Negative impact on the environment as a result of infrastructure development
- Poor farming methods e.g. ploughing on steep slopes, indiscriminate use of inorganic fertilizers
- Cultivation in marginal areas
- Wanton destruction of forests
- Continuous mono-cropping of the same fields every year
- Weak institutional collaboration among institutions that provide extension services
- Increasing sedenterisation of pastoral communities as of establishment of various institutions such as schools, hospitals etc

### Loss of Biodiversity

- Indiscriminate clearing of forests to create room for agricultural purposes (shamba system)
- Over exploitation of certain tree species such as the slow growing Acacia which are targeted for their excellent quality of charcoal
- Over reliance on monocultures
- Human-wildlife conflict
- Erosion of indigenous knowledge related to biodiversity
- Poaching of wildlife
- Introduction of the highly predacious Nile Perch in Lake Victoria has led to extinction of many species that were indigenous to the lake. (Ecoforum Vol. 25 Number 2 Cold Season, 2001)

### Water Resources and Land Use Pattern

- Inequitable access to water resources in both urban and rural areas
- Influx of people from high potential zones to marginal areas exerting more pressure on the fragile local environment
- Unreliable rainfall in arid and semi arid areas
- Inadequate water conservation techniques
- Use of inappropriate land management techniques
- Inadequate extension services
- Subdivision of prime land into uneconomical parcels especially in Rift Valley province
- Frequent conflicts among pastoral tribes (Pokot, Turkana, Kipsigis, Masai etc) over grazing rights

### Pollution of Lakes and Rivers

- Discharging of municipal and industrial pollutants into the lakes and rivers especially in Lake Victoria and Nairobi River.
- Pollution of lakes and rivers resulting from improper use of pesticides and organophosphates in agricultural activities in the highlands
- Invasive aquatic plants such as water hyacinth that impede water transport especially on Lake Victoria.
- Destruction of catchment areas resulting in marked receding of water levels in rivers and lakes.
- Salutation of rivers and dams due to surface run-off resulting in adverse effect on hydropower production projects located on River Tana.

### Forests

- Forest comprises less than 3% of the total land area of Kenya.
- Deforestation is on the increase due to charcoal burning, illegal logging, etc.
- Frequent forest fires

## 2. Fact Sheet

### 2.1 Socio-Economic Indicators

Indicators	Data	Year of data	Ref.
Population	29.3 million (Average annual growth rate : 2.1 in (2000)	2000	1), 2)
Ethnic Groups	Kikuyu 22%, Luhya 14%, Luo 13%, Kalenjin 12%, Kisii 6%, Meru 6%, Other African 15%, Non-African (Asian, European and Arab) 1%	2001	4))
Religion	Christian: 66%, Muslim: 7%, Indigenous Religions: 26%	2001	4)
Literacy	Female adults: 62% Male adults: 82%	2000	7)
Urban Population	34 % (10.0 million people)	1999	7)
Life Expectancy	55.7 years (Average of 1990~1999)	1990-1999	1), 2)
Births/Deaths	Births: 424,503 Deaths: 175,383	1999	7)
GNP	9,984 million US\$ (341 US\$ per capita)	2001	1), 2)
GDP	8,833 million US\$ (271 US\$ per capita)	2001	1), 2)
GDP Composition	Agriculture: 24 % Industry: 13.1 % Services: 62.9 %	2000	1), 2)
Industry	Tourism, light industry, petroleum products	2000	1), 2)
Natural Resources	Soda ash, limestone, fluorite, gold, timber, sugar cane, coffee, maize, tea, cotton, sisal	2000	1), 2)
Access to Safe Water *1	Urban areas: 74 % Rural areas: 50 %	2000	5)
Human Development Indicators ( HDI )	0.5035	1999	6)

\*1: Access to Safe Water is the percentage of the population with reasonable access to an adequate amount of safe water including treated surface water and untreated but uncontaminated water, such as from springs, sanitary wells and protected boreholes.

Sources: Ref. 1), 2), 3), 4), 5), 6), 7)

### 2.2 Geological and Geographical Features

Area: Total: 582,646 km <sup>2</sup> (1.5 times that of Japan)
<b>Geological Features</b> The geology of Kenya is defined based on the following major rock types: <ul style="list-style-type: none"> <li>• Archean – Paleoproterozoic granite greenstone terrain in Western Kenya in Lake Victoria.</li> <li>• Neoproterozoic Kisii group (Kisii Series).</li> <li>• The Mozambique Belt, Upper Paleozoic to Mesozoic Karoo sediments Central, North Eastern and Western part of Kenya</li> <li>• Tertiary and Quaternary sediments in Eastern and the Coastal strip bordering the Indian Ocean</li> </ul>

Sources: Ref. 8)

## 2.3 Meteorological Features

Average Temperature	National annual average temperature: 20°C
Climate	Kenya has two distinct seasons – rainy and dry seasons. The climate is controlled by variations in the inter-tropical convergence zone (ITCZ) which in turn is influenced by altitude, location and the monsoon winds which blow from the Indian Ocean in most of the year keeping the temperature below 40°C. Due to its location on the equator, Kenya has no marked seasonal changes except in the arid and semi-arid areas.
Agroclimatic Zones	<p>National annual rainfall average: 621 mm  Rainy season – March to May and October to November  Dry season – January to February and June to September</p> <p><u>Agroclimatic zones</u></p> <p>(1) <i>Coastal region (humid – semiarid)</i>: Agroclimatic zone III-V  - Mean annual rainfall: 800-1,200 mm;  (2) <i>Arid and semi-arid</i>: Agroclimatic zone VII  - Mean annual rainfall: 150 – 400 mm,  (3) <i>Plateau to Lowland Region (semi-arid to arid)</i>: Agroclimatic zone IV-Vi  - Mean annual rainfall: 400-1000 mm  (4) <i>Afro-alpine to highland (cool to very cold)</i>: Agroclimatic zone I-III  - Mean annual rainfall: 1,000-2,700 mm</p>
Winds	Quite windy for most part of the year. The wind blows more intensely in April.
Climate	<p><i>Annual average temperature</i>: 40°C.  <i>Annual rainfall</i>: 621 mm  Climatic classification;  (1) Afro-alpine climate (&lt;16-20°C; 1,000-2,700 mm/year)  (2) Tropical climate-humid to dry sub-humid (20-26°C; 1,550-2,400 mm/year)  (3) Dry sub-humid to semi-arid (24-28°C; 255-1,000mm/year)  (4) Semi-arid(20-25°C; 255-550 mm/year)  (5) Arid(20-25°C; 200-510 mm/year)  (6) Very arid(24-28°C; 150-500mm/year)  (7) Desert(&gt;28°C; &lt;400mm/year)</p>

Sources: Ref. 9)

## 2.4 Ecological Features

Bio-geographical classification
1) Humid; 2) Subhumid; 3) Dry subhumid, 4) Semiarid; 5) Arid; 6) Very Arid
Classification related to biodiversity
1) Critical sites; 2) Montane forests and associated habitats; 3) Remnants of Lowland forests, 4) Wetlands; 5) Coastal Sacred groves (Kayas), Mangrove forests and the Coral Reefs
Known species: Total 35,000 (fish:638, reptiles:101, amphibians:211)

Sources: Ref. 10), 11), 12)

## 2.5 Hydrological Features

<u>Major Rivers</u>
Main River (total length of river): Tana (1012 km), Nzoia (> 70 km), Yala (> 70 km), Nyando (>50 km), Mara (> 70 km), Sondu-Miriu (> 70km), Athi (>300 km)
<u>Lakes:</u>
Main Lakes (Surface area): Fresh water; Baringo (129 km <sup>2</sup> ), Victoria (3,755 km <sup>2</sup> ), Naivasha (210 km <sup>2</sup> ) Brackish; Turkana (6,405 km <sup>2</sup> ) Saline water; Elementaita (21 km <sup>2</sup> ), Nakuru (52 km <sup>2</sup> ), Magadi (104 km <sup>2</sup> ), Bogoria (34 km <sup>2</sup> ), Jipe (39 km <sup>2</sup> )

Sources: Ref. 8)

### 3. Organization and Legislation

#### 3.1 Organization

##### 3.1.1 Governmental Organisation

##### (1) Environmental Issues and the Relevant Governmental Organisation

Although Kenya has established laws and policies in most of the key environmental sectors, enforcement of these laws has been generally weak. Consequently, the country's natural resources especially forest resources continue to get depleted due to illegal logging, indiscriminate clearing of forests to pave way for agriculture among others. This contributes to the various environmental problems the country is experiencing for example soil erosion, saltation of rivers and lakes, eutrophication in lakes/rivers, deteriorating marine environment, etc.

Kenya's framework environmental law, entitled The Environmental Management and Coordination Act, 1999 is a product of a new methodology for the development of environmental law in the history of the country. Views and aspirations of a wide range of stakeholders both at national as well as at local levels were solicited and incorporated in the Act. This is a major shift from the traditional centralised mode of policy formulation that did not involve the public. The Act is thus designed to promote greater public participation in the management of natural resources and the environment in general. Establishment of relevant structures for implementation of the Act is currently underway.

Governmental Organization	Environmental Issues (No. indicates the relevant chapter)	4.1	4.2	4.3			4.4	4.5	4.6	4.7	4.8	4.9	4.1	4.11	4.12
		Air Pollution	Water Pollution	(1) Soil Contamination	(2) Noise	(3) Offensive Odor	(4) Radioactive Waste	Solid Waste	Energy	Water Supply	Waste Water Treatment	Forest Conservation	Bio-diversity	Natural Resources	Natural Disaster
Ministry of Environment and Natural Resources								n.a.							
Ministry of Local Government				-											
Ministry of Energy			-	-			n.a.	-		-	-	-			-
Ministry of Health					-		-	-	-	-	-	-	-		
Ministry of Transport and Communications				-		-	-	-	-	-	-	-	-	-	-
Directorate of Occupational Health and Safety, Ministry of Labour				-				-	-	-	-	-	-	-	-
Ministry of Lands and Settlement		-		-	-	-	-	-	-					-	-
National Water Conservation and Pipeline Corporation		-		-	-	-	-	-			-	-	-	-	
Permanent Presidential Commission on Soil Conservation and Afforestation		-			-	-	-	-		-				-	
Ministry of Agriculture and Rural Development		-			-	-	-	-	-	-					
Office of the President		-	-	-	-	-	-	-	-	-	-	-	-		-

Note) : Relevant, - : Not relevant, n.a. : No information available



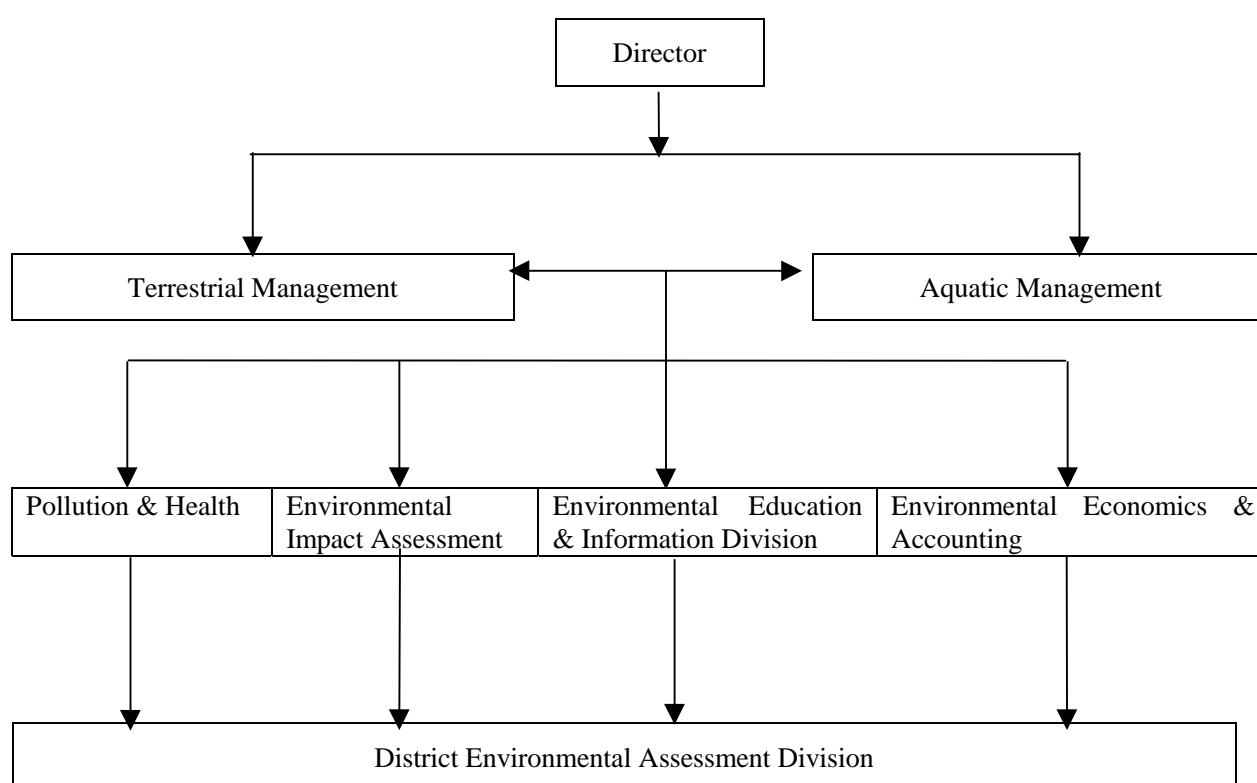
## (2) Environmental Coordination

Until now environmental activities by the various environmental agencies, are coordinated through the Interministerial Committee on Environment (IMCE). The National Environment Secretariat is the overall coordinator of the IMCE meetings which meets once every three months. This structure has been modified under the new Environment Management and Coordination Act 1999. The National Environment Management Authority (NEMA) is soon to become the overall coordinating agency of all environmental matters in the country. In addition, the Act provides for the establishment of the National Environment Council whose principal function will be to formulate policies and set national goals and priorities for the protection of the environment.

## (3) National Environmental Secretariat (NES), Ministry of Environment and Natural Resources

National Environmental Secretariat (NES) was established in 1974 to perform a coordinative and catalytic role in the protection and enhancement of the environment. It was initially in the Office of the President but later moved to the Ministry of Environment and Natural Resources in 1979. Currently it has 102 employees.

Its main objective is formulation of policies on conservation, protection, improvement and management of the natural and man-made environments.



**Fig. Organization Structure of NES**

*\* This structure is in the process of being changed in line with the new Environmental Management and Coordination Act 1999 (Source: Ref.10)*

## Activities

- Convenes the Interministerial Committee on Environment (IMCE).
- Coordination of the implementation process of the National Environment Action Plan (NEAP).
- Facilitation of Kenya's participation in UNEP's Governing Council.

- Coordinates the implementation of Agenda 21.
- Prepares environmental policy papers.
- Spearheaded the formulation and the enactment of the Environmental Management and Coordination Act of 1999.
- The Secretariat has posted District Environmental Conservation Officers to 68 districts around the country to serve as Coordinators of the District Environmental Management Committees.
- Promotes environmental awareness among the general public through a variety of media e.g. Posters, brochures, radio, television etc.

*Source: Ref.14)*

#### (4) Other Organization Relevant to the Environment

Organization	Relevant Department	Activities
Ministry of Local Government	a) Department of Cleansing b) Department of Environment	<ul style="list-style-type: none"> <li>• Solid waste disposal</li> <li>• wastewater treatment</li> <li>• Enforcement of effluent discharge by laws</li> <li>• Water supply</li> <li>• Development of urban nature parks</li> <li>• Conservation of urban forests</li> </ul>
Ministry of Energy	a) Technical Division b) KENGEN c) Kenya Power and Lighting d) Biomass Division e) Agroforestry Division f) Alternative Energies Section	<ul style="list-style-type: none"> <li>• Development and promotion of national energy policy</li> <li>• Research in alternative forms of energy</li> <li>• Production of energy</li> <li>• Distribution of power</li> <li>• Research and development of biomass as a sustainable sources of energy</li> <li>• Research and development of agroforestry as a sustainable system of biomass production</li> </ul>
Ministry of Health	Department of Public Health	<ul style="list-style-type: none"> <li>• Policy formulation</li> <li>• Monitoring of public health situation</li> <li>• Conducting of research and development in epidemiology and pharmacology</li> </ul>
Ministry of Transport and Communications	Division of Engineering	<ul style="list-style-type: none"> <li>• Radioactivity material monitoring</li> <li>• Development of regulatory mechanisms for the transport sector</li> </ul>
Ministry of Labour	Directorate of Occupational Health and Safety	<ul style="list-style-type: none"> <li>• Occupational health and workers safety monitoring</li> <li>• Development and enforcement of labour laws</li> </ul>
Ministry of Lands and Settlement	a) Department of Lands b) Lands Commission c) Department of Surveys	<ul style="list-style-type: none"> <li>• Formulation of land-use policy</li> <li>• Land demarcation</li> <li>• Land adjudication</li> <li>• Preservation of public trust land</li> </ul>
Ministry of Agriculture and Rural Development	a) Division of Extension Services (Crops) b) Division of Extension Services (Livestock) c) Biotechnology Centre d) Kenya Agricultural Research Institute e) Division of Soil Surveys f) Agriculture Information Centre	<ul style="list-style-type: none"> <li>• Formulation and implementation of national food policy</li> <li>• Provision of extension services</li> <li>• Ensuring availability of farm inputs on timely basis</li> <li>• Promotion of agro-biodiversity</li> <li>• Development and promotion of national framework on genetically modified organisms in conjunction with the Ministry of Science and Technology</li> <li>• Conducting agronomic research</li> <li>• Soil mapping</li> <li>• Production of TV and radio programmes</li> <li>• Maintains a public information service</li> </ul>

Organization	Relevant Department	Activities
Ministry of Environment and Natural Resources	a) National Water Conservation and Pipeline Corporation b) Water Department c) Department of Remote Sensing	<ul style="list-style-type: none"> <li>• Development of water policy</li> <li>• Development and implementation of a national framework for equitable distribution of water resources</li> <li>• Monitoring vegetation patterns using satellite imageries, aero-surveys and ground verification surveys</li> </ul>
Permanent Commission on Soil Conservation and Afforestation	Office of the Chief Executive	<ul style="list-style-type: none"> <li>• Development of strategies for improved watershed management</li> <li>• Creation of public awareness regarding effective conservation of soil, water and forest resources</li> </ul>
University of Nairobi	Chemistry, Geology, Meteorology and Institute of Nuclear Science	<ul style="list-style-type: none"> <li>• Environmental science research in, air, water and effluent, soil, solid waste</li> </ul>
Moi University	School of Environmental studies	<ul style="list-style-type: none"> <li>• Environmental studies, biological, chemical, physical and social research</li> </ul>
Kenyatta University	Faculty of Environmental studies	<ul style="list-style-type: none"> <li>• Environmental studies, biological, chemical, physical and social research</li> </ul>
Kenya Wildlife Service	a) Research Division b) Conservation Division	<ul style="list-style-type: none"> <li>• Policy analysis</li> <li>• Monitoring and documentation of dynamics between wildlife and their habitats</li> <li>• Human/wildlife conflict resolution</li> </ul>
Kenya Forestry Research Institute	Office of the Director	<ul style="list-style-type: none"> <li>• Policy analysis on forest resources</li> <li>• Research in silviculture</li> <li>• Research in agroforestry</li> <li>• Training of medium and high level human resources</li> </ul>
Forest Department	Office of the Chief Conservator of Forests	<ul style="list-style-type: none"> <li>• Development of national framework for effective forest resources management</li> <li>• Establishment of commercial forests</li> <li>• Conservation of indigenous forests</li> <li>• Promotion of community afforestation schemes</li> </ul>
Office of the President	National Disaster Operation Center	<ul style="list-style-type: none"> <li>• Development and maintenance of a national early warning system</li> <li>• Coordination of relief and rehabilitation activities in the country</li> </ul>
Jomo Kenyatta University College of Agriculture and Technology	Office of the Vice Chancellor	<ul style="list-style-type: none"> <li>• Research in horticulture</li> <li>• Research in biotechnology</li> </ul>
Museums of Kenya	a) Center for Biodiversity  b) Kenya Resource Centre for Indigenous Knowledge	<ul style="list-style-type: none"> <li>• Conducting of national inventory of biodiversity</li> <li>• Monitoring of changes in biodiversity</li> <li>• Establishment of permanent sampling plots</li> <li>• Documentation of indigenous knowledge on biodiversity</li> <li>• Creation of awareness on biodiversity</li> <li>• Development training programmes on biodiversity</li> </ul>

Sources: Ref. 22), 27), 28), 29), 30), 39), 40), 64), 65)

### (5) Local Authorities

The environment departments and agencies of Local governments have limited executive powers as well as human resource capacity to undertake environmental management projects effectively. More over, local authorities lack the desirable financial base to enable them finance the necessary environmental schemes in the face of growing population. Through the support of the Local Government, the Ministry of Environment and Natural Resources and NGOs, most Urban authorities are able to set by-laws and outsource funds and skilled manpower to implement some activities. However, finances and the goodwill to implement full-scale projects and programmes is lacking.

Sources: Ref.42)

### 3.1.2 Non-governmental Organisations (NGOs)

Kenya is one of the countries in Africa with a large number of NGOs and community based organisations (CBOs) working in diverse sectors. NGOs are required under the law to be registered by the NGO Bureau before they become operational. The NGO Bureau is a government agency operating at the national level with the mandate to ensure NGOs function according to the law (NGO Act , 1990). CBOs operate at the grassroots level and are registered at the local Culture and Social Services Offices. According to the information available at the Bureau, there are currently 1560 registered international as well as national NGOs. Some of the key NGOs in the field of environment include, CARE International, World Vision, AMREF, Plan International, OXFARM, Medicines Sans Frontiers (MSF), IUCN, ITDG, IIRR, Environment Liaison Center International, East African Wildlife Society, Econews Africa, Friends of the Lake (Osienala), Climate Network Africa among others

The NGO Council is the umbrella body playing a regulatory function in accordance with the code of ethics developed by NGOs themselves.

Organization	Established	Major activities
African Biodiversity Institute (ABI)	1986	<ul style="list-style-type: none"> <li>• Strategic environmental assessment and environmental impact assessment</li> <li>• Environmental accounting</li> <li>• Evaluation of economic methods and regulations for the purpose of environmental policies</li> <li>• Short-term lessons about EIA, environmental economics and policy analysis for masters and doctoral courses</li> <li>• Technological support to the government and other relevant organizations</li> </ul>
The African Centre for Technology Studies (ACTS)	1988	<ul style="list-style-type: none"> <li>• Environmental policy analysis</li> <li>• Advising African governments on modalities for formulation of national framework law on environment</li> <li>• Organising conferences and symposia on environmental law</li> <li>• Publishing reports/books on environmental law</li> </ul>

Organization	Established	Major activities
The African Medical Research Foundation (AMREF)	1957	<ul style="list-style-type: none"> <li>• Encouraging the local people to play a more active role in combating controllable diseases</li> <li>• Capacity building of local organizations and institutions</li> <li>• Monitoring and evaluation of its health programmes and activities</li> <li>• Applying social sciences to sanitation</li> <li>• Training community women groups in primary health care</li> <li>• Dissemination of information on primary health care</li> <li>• Technological support to the government and other relevant organizations</li> <li>• Settlement and housing problems</li> <li>• Provision of flying doctor services particularly to remote parts of the Eastern African region</li> </ul>
The African Network for Prevention and Protection Against Child Abuse and Neglect (ANPPCAN)	1986	<ul style="list-style-type: none"> <li>• Lobbying against juvenile labour</li> <li>• Advocating children's rights</li> <li>• Strengthening the capacity of community organizations working on children's rights</li> <li>• Conducts research and documentation of juvenile labour activities</li> </ul>
African Water Network (AWN)	1989	<ul style="list-style-type: none"> <li>• Publishing bimonthly newsletters</li> <li>• Monitoring and documentation of quality of drinking water</li> <li>• Monitoring the impact of development projects on water resources</li> <li>• Maintenance of a database of information concerning community water schemes and traditional technologies</li> <li>• Provision of consulting services in the water sector</li> </ul>
African Wildlife Foundation (AWF)	1961	<ul style="list-style-type: none"> <li>• Protecting endangered species</li> <li>• Strengthening the capacity of community organizations in wildlife conservation</li> <li>• Implementing wildlife projects</li> <li>• Publishing books and reports on wildlife and ecosystems</li> </ul>
Climate Network Africa (CNA)	1993	<ul style="list-style-type: none"> <li>• Collecting and disseminating meteorological information</li> <li>• Maintaining and managing a database on environmental NGOs</li> <li>• Giving meteorological advice to environmental NGOs</li> <li>• Conducts training related to climate networks, information exchange and communications technologies</li> <li>• Preparing a bibliography focusing on climate change</li> </ul>
Council for Human Ecology (CHECK)	1977	<ul style="list-style-type: none"> <li>• Development and promotion of low-cost housing</li> <li>• Promotion of indigenous knowledge</li> <li>• Conservation of biodiversity</li> </ul>
Danish Association for International Cooperation (MSC)	1944	<ul style="list-style-type: none"> <li>• Provision of financial and technical support to NGOs/CBOs in the implementation of the Convention to Combat Desertification (CCD) at community level</li> <li>• Strengthening the administrative as well as programmatic capacity of NGOs/CBOs</li> <li>• Providing financial support to the Kenya NGO Earth Summit 2002 process</li> <li>• Supporting Lake Victoria ecological projects implemented by NGOs and community based organisations</li> </ul>

Organization	Established	Major activities
East African Wildlife Society	1943	<ul style="list-style-type: none"> <li>• Advocacy/lobbying for greater enforcement of the law regarding conservation of fauna and flora</li> <li>• Publication of a bi-monthly journal, Swara</li> <li>• Monitoring and documentation of state of fauna and flora</li> <li>• Networking</li> </ul>
Environment Liaison Centre International (ELCI)	1974	<ul style="list-style-type: none"> <li>• Promotion of networking among NGOs working on environment and development issues</li> <li>• Exploring more effective techniques for networking among NGOs in developing countries</li> <li>• Documentation and dissemination of best practices</li> <li>• Promotion of information exchange among NGOs on biodiversity and desertification issues</li> <li>• Publication of Ecoforum journal quarterly</li> <li>• Promotion of Environmental Law at grassroots level</li> </ul>
Kenya Forestry Working Group	1998	<ul style="list-style-type: none"> <li>• Lobbying against ongoing forest excisions</li> <li>• Creation of public awareness on issues affecting forest resources in the country</li> <li>• Maintaining a database of forest resources</li> </ul>
International Institute of Rural Reconstruction (IIRR)	1960	<ul style="list-style-type: none"> <li>• General regional development on a community basis</li> <li>• Environment and natural resources conservation</li> <li>• Promotion of improved community sanitation and nutrition</li> <li>• Capacity building (Organizational management and development)</li> <li>• Assessment of NGO/CBO needs</li> <li>• Training and social activities</li> </ul>
The Intermediate Technology Development Group (ITDG)	1965	<ul style="list-style-type: none"> <li>• Promotion of improved farming methods (crop production and livestock management)</li> <li>• Promotion of fuel saving devices at community level (<i>eg the Kenya ceramic jiko(stove), Kuni Mbili Stove, Half orange kilns, etc</i>)</li> <li>• Promotion of low cost housing materials</li> <li>• Conducting research and development in alternative forms of energy e.g. briquettes from rice husks.</li> <li>• Promotion of audio-visual technologies as a tool for community development</li> <li>• Sensitising communities about the concept of gender</li> </ul>
The International Union for Conservation of Nature (IUCN)	1948	<ul style="list-style-type: none"> <li>• Collecting environmental data</li> <li>• Analyzing the causes and effects of environmental destruction</li> <li>• Giving advice on effective environmental management to the government</li> <li>• Publishing books and reports on environmental education</li> <li>• Strengthening the capacity of NGOs to manage environmental projects more effectively</li> </ul>
Medicines Sans Frontiers (MSF) - France	1971	<ul style="list-style-type: none"> <li>• Providing services related to child nutrition and health</li> <li>• Providing training to communities in water and sanitation</li> <li>• Developing the capacity of local health centers through provision of medicines and equipment</li> </ul>
Network for Water and Sanitation (NETWAS).	1986	<ul style="list-style-type: none"> <li>• Training</li> <li>• Consulting on water and sanitation</li> <li>• Studying water and sanitation problems with the participation of communities</li> <li>• Dissemination of information on water and sanitation</li> </ul>

Organization	Established	Major activities
OXFAM	1942	<ul style="list-style-type: none"> <li>• Training pastoralist communities in improved livestock management</li> <li>• Encouraging women to pay attention to development projects through training</li> <li>• Promotion of low input, ecologically sustainable agriculture,</li> <li>• Community training in improved primary healthcare</li> <li>• Supporting family planning initiatives at community level</li> <li>• Promoting projects for the handicapped</li> <li>• Implementation of relief and rehabilitation programmes in parts of Rift Valley, North-Eastern and Eastern provinces</li> </ul>
Wildlife Clubs of Kenya (WCK)	1968	<ul style="list-style-type: none"> <li>• Training and awareness creation regarding the environment among primary and secondary school students</li> <li>• Maintains a library and an environmental information service at the headquarters (Langata Environment Resource Centre)</li> <li>• Coordinates a network of wildlife clubs in primary and secondary schools through out the country</li> <li>• Produces Komba journal once every six months</li> </ul>
The World Wide Fund for Nature (WWF)	1961	<ul style="list-style-type: none"> <li>• Conservation of fauna and flora</li> <li>• Conservation of wetlands</li> <li>• Promotion of sound techniques for forest resources management,</li> <li>• Promotion of eco-tourism</li> <li>• Provision of advisory services on environmental conservation to the government and NGOs</li> </ul>
Action Aid Kenya	1974	<ul style="list-style-type: none"> <li>• Supporting integrated development programs at community level (better farming methods and improved Livestock management)</li> <li>• Provision of financial support to NGOs</li> <li>• Supports lobbying activities for improved natural resource management</li> <li>• Maintains a training center for NGO/CBOs near Kisumu town</li> </ul>
Kenya Consumers Organization (KCO)	1985	<ul style="list-style-type: none"> <li>• Promotes consumer education on TV, Radio and newspapers</li> <li>• Conducts research to ascertain the quality of consumer products</li> <li>• Conducts random visits to factories to ensure compliance with the laid down production standards.</li> <li>• Maintains a database</li> <li>• Publishing reports and newsletters</li> <li>• Maintains facilities for product analysis</li> </ul>
Kenya Water for Health Organization (KWAHO)	1976	<ul style="list-style-type: none"> <li>• Development of micro- water projects at community level</li> <li>• Training community groups in improved water and sanitation management</li> <li>• Promotion of soil and water conservation activities</li> <li>• Creation of awareness about gender issues</li> </ul>
Samburu Aid in Africa (SAIDIA)	1986	<ul style="list-style-type: none"> <li>• Provision of training to communities in management of small scale water schemes</li> <li>• Supporting partnership among community based Organizations working on agricultural projects</li> <li>• Tree planting and soil management</li> <li>• Livestock management</li> </ul>
Pastoral Aid	1994	<ul style="list-style-type: none"> <li>• Training of pastoral communities in lobbying/advocacy skills</li> <li>• Provision of livestock extension services</li> <li>• Networking</li> </ul>
Environmentalists San Frontiers	1996	<ul style="list-style-type: none"> <li>• Networking</li> <li>• Policy Research in environment</li> <li>• Advocacy/lobbying</li> </ul>

Organization	Established	Major activities
EcoNews Africa	1993	<ul style="list-style-type: none"> <li>• Policy research in information and communication</li> <li>• Facilitation of NGO debate around the issue of debt</li> <li>• Capacity building of local environmental organizations</li> <li>• Advocacy/lobbying</li> </ul>
Paran Internation (Isiolo)	1998	<ul style="list-style-type: none"> <li>• Creation of awareness about unexploded ordinances (UXOs) in northern Kenya</li> <li>• Lobbying/advocacy</li> </ul>
RECONCILE (Nakuru)	1994	<ul style="list-style-type: none"> <li>• Environmental Law</li> <li>• Lobbying/advocacy</li> </ul>
Maendeleo Ya Wanawake	1963	<ul style="list-style-type: none"> <li>• Creation of awareness regarding gender issues</li> <li>• Lobbying for women's rights</li> </ul>
Kenya Youth Foundation	1996	<ul style="list-style-type: none"> <li>• Networking on environment</li> <li>• Advocacy/lobbying for increased participation of the Youth in environmental decision making</li> </ul>
Mazingira Institute	1976	<ul style="list-style-type: none"> <li>• Improvement of human settlement</li> <li>• Advocacy/lobbying for better management of natural resources</li> </ul>
African Academy of Sciences	1995	<ul style="list-style-type: none"> <li>• Policy research on environment and development</li> </ul>
Green Belt Movement	1982	<ul style="list-style-type: none"> <li>• Promotion of tree planting</li> <li>• Advocacy/lobbying against indiscriminate exploitation of Kenya's indigenous forests and other natural resources</li> </ul>
Public Law Institute	1993	<ul style="list-style-type: none"> <li>• Promotion of environment law among grassroots organisations</li> </ul>
Mikono	1995	<ul style="list-style-type: none"> <li>• Promotion of integrated community development activities among the pastoral communities of north eastern Kenya</li> </ul>
Osiendela (Friends of Lake Victoria)	1985	<ul style="list-style-type: none"> <li>• Building the capacity of the local communities to adopt sound management strategies for the natural resources found within and around Lake Victoria</li> </ul>
Kenya Institute of Organic Farming	1986	<ul style="list-style-type: none"> <li>• Training of farmers and high school leavers in organic farming techniques</li> </ul>
Tsunza Conservation and Development Programme	1998	<ul style="list-style-type: none"> <li>• Conservation of mangroves at the coast</li> <li>• Lobby/advocacy for greater grassroots participation in policy decisions regarding management of marine resources</li> </ul>
Resource Projects - Kenya	1995	<ul style="list-style-type: none"> <li>• Promotion of Community based natural resources management structures</li> </ul>
CARE International	1948	<ul style="list-style-type: none"> <li>• Promotion of relief and rehabilitation activities</li> <li>• Supporting refugee camps</li> <li>• Promotion of integrated community development activities</li> </ul>
World Vision International	1952	<ul style="list-style-type: none"> <li>• Promotion of relief and rehabilitation activities</li> <li>• Promotion of integrated community development projects eg water, agriculture, micro-enterprise, child sponsorship, etc</li> </ul>
Plan International	1968	<ul style="list-style-type: none"> <li>• Promotion of integrated community development activities</li> </ul>
NGO Council	1964	<ul style="list-style-type: none"> <li>• Serves as umbrella organization for all NGOs in the country</li> <li>• Promotes exchange of information and experiences among NGOs (networking)</li> <li>• Lobbies the government on matters that affect the NGO community and the civil society in general</li> </ul>

Sources: Ref. 43), 44)

### 3.2 National Policy on the Environment

Awareness regarding the relationship between the environment and economic development, has continued to grow since 1992 when Kenya joined the rest of the world in endorsing Agenda 21 as



the global blue print for sustainable development. To this end, Kenya has recognized the need for mainstreaming the environment in all aspects of its economic development. The following tables provide a summary of the various legal and policy instruments dealing with environment as an integral part of national development.

Policy	Formulated	Purpose	Authority
National Environmental Action Plan	1994	For more effective coordination of different players and resources in the implementation of the action plan through out the country.	National Environment Secretariat (NES)
Forestry a) Kenya Forestry Master Plan b) Forestry Policy b) Forestry Bill	1994 1994 2000	To prioritise activities and strategies for development of the forest sub-sector Provides for greater public participation in formulating policies and making decisions regarding management of forest resources.	Forest Department
Local Agenda 21 for Kenya	1999	To provide a framework for implementation of Agenda 21 in the country	National Environmental Secretariat (NES)
National Biodiversity Strategy and Action Plan	1999	Highlights activities and strategies for implementation of the National Biodiversity Action Plan within the country as well as with the neighbouring countries	National Environmental Secretariat (NES)

Sources: Ref. 45)

### 3.3 Environmental Law

Field	Key Issues
<u>Forest</u> a) Forest Act Cap.385 (1992) b) Timber Act Cap.386(1972) c) Registered Land Act cap.300 (1989) d) Fisheries Act Cap.378(1989) e) The Permanent Commission on Soil Conservation & Afforestation f) The Physical Planning Act, (1996) Cap.391 (1978) g) The wildlife Act Cap.376 (1976&89) h) Land (Group representatives) Act, Cap.287 (1970) i) The Local Govt. Act Cap.265 (1986) j) The Chief's Authority Act Cap.128 (1988) k) Trespass Act Cap. 294 (1982) l) The plant Protection Act Cap. 324 (1979) m) The Agriculture Act Cap.318 (1985) n) The Environmental Management and Coordination Act (1999)	<ul style="list-style-type: none"> <li>♦ The law is hardly applied and hardly effective.</li> <li>♦ Forest policies place emphasis on commercial forest products per se.</li> <li>♦ The penalty for violations is light.</li> <li>♦ The enforcement system is weak.</li> <li>♦ Some of the provisions of Forest and Agriculture Acts are conflicting in terms of application on the farms</li> <li>♦ The Environmental Management and Coordination Act (1999) provides for establishment of legal and institutional framework for effective management of environmental matters in the country.</li> <li>♦ The Forest Bill 2000 recognises the vital role played by NGOs and civil society organisations</li> <li>♦ in restoration as well as conservation of forest resources. The bill provides greater public participation in planning, implementation and equitable sharing of benefits derived from forest resources.</li> </ul>
<u>Air Pollution</u> a) The penal code Cap.63 (1970) b) The Public Health Act Cap. 242(1986) c) The Traffic Act Cap. 403 (1988) d) The Local Govt. Act Cap. 265 (1986)	<ul style="list-style-type: none"> <li>♦ They are hardly followed and hardly effective.</li> <li>♦ There are no standards for the environment or emissions, and air pollution is not monitored.</li> </ul>

<p>e) The Factories Act. Cap. 242(1986)</p> <p>f) The Civil aviation Act Cap.394 (1978)</p> <p>g) The Environmental Management Act No.8 (1999)</p>	<ul style="list-style-type: none"> <li>♦ The penalty for violations is light.</li> </ul>
<p><u>Water Pollution</u></p> <p>a) The Water Act Cap. 372, 1972</p> <p>b) The Public Health Act Cap. 242 (1986)</p> <p>c) The Permanent Commission on Soil Conservation &amp; Afforestation</p> <p>d) The Fisheries Act Cap.378 (1991)</p> <p>e) The Physical Planning Act Cap. 409 (1983)</p> <p>f) The Kenya Port Authority Act Cap.391 (1978).</p> <p>g) The Merchant's Shipping Act Cap. 409 (1983)</p> <p>h) The Wildlife Act Cap. 376 (1976 &amp; 89)</p> <p>i) The Suppression of Noxious Weeds Act Cap.325</p> <p>j) The Pest Control Products Act Cap. 346 (1985)</p> <p>k) The Plant Protection Act Cap. 324 (1979)</p> <p>l) The Geothermal Act. Cap</p> <p>m) The Food, Drugs &amp; Chemical Substances Act Cap. 254 (1980)</p> <p>n) The Agriculture Act Cap. 318 (1985)</p> <p>o) The Environmental Management Act No.8 (1999)</p>	<ul style="list-style-type: none"> <li>♦ There are efforts by some urban authorities to develop and implement effluent discharge standards. However, lack of skilled manpower and resources make it difficult for them to implement them.</li> <li>♦ A new Water Bill 2000 has been drafted and presented to parliament for enactment into law. The bill proposes measures that will ensure people and institutions are held accountable for any damage they create on the environment. The principle of "polluter pays" is thus proposed in the new Water Bill 2000</li> <li>♦ In addition, the bill places emphasis on increased community managed water resources</li> </ul>
<p><u>Noise</u></p> <p>a) The Penal Code Cap. 63 (1970)</p> <p>b) The Public Health Act Cap. 242 (1986)</p> <p>c) The Traffic Act Cap. 403 (1988)</p> <p>d) The Local Govt. Act Cap. 265 (1986)</p> <p>e) The Factories Act. Cap. 242 (1986)</p> <p>f) The Civil Aviation Act. Cap. 394 (1978)</p> <p>g) The Environmental Management Act No.8 (1999)</p>	<ul style="list-style-type: none"> <li>♦ There is general lack of effective mechanism for enforcement of these statutes.</li> </ul>
<p><u>Land</u></p> <p>a) The Physical Planning Act (1986)</p> <p>b) Land Planning Act Cap. 308 (1986)</p> <p>c) Registered Land Act Cap. 300 (1989)</p> <p>d) The Permanent Commission on Soil Conservation &amp; Afforestation</p> <p>e) The Wildlife Act Cap.376 (1976&amp;89)</p> <p>f) Land (group representatives) Act cap. 287 (1970)</p> <p>g) The Local Govt. Act. Cap. 265 (1986)</p> <p>h) The Chief's Authority Act Cap.128 (1988)</p> <p>i) (Trespass Act Cap.294 (1982)</p> <p>j) The Plant Protection Act Cap.324 (1979)</p> <p>k) The Agriculture Act. Cap. 318 (1985)</p> <p>l) The Environmental Management Act No.8 (1999)</p>	<ul style="list-style-type: none"> <li>♦ The Agriculture Act is the principle land use statute covering soil conservation and agricultural land use in general.</li> <li>♦ Land is under utilized in many parts of the country due to general lack of knowledge and skills in better land management techniques.</li> <li>♦ There is over exploitation of forest resources by logging companies and politically powerful people.</li> </ul>
<p><u>Environmental Impact Assessment</u></p> <p>a) The Environmental Management and Coordination Act (1999)</p>	<ul style="list-style-type: none"> <li>♦ The act is very progressive and people centred.</li> <li>♦ Under this act, every Kenyan is entitled to a clean and healthy environment.</li> <li>♦ For the first time ever, the government has included representatives from the NGO and private sector in the development of structures for implementation of the act.</li> <li>♦ The process of implementing the act is very slow. The National Environment and Coordination Authority (NEMA) is thus, not yet established.</li> </ul>
<p><u>Biodiversity Conservation</u></p> <p>a) The Physical Planning Act (1996)</p>	<ul style="list-style-type: none"> <li>♦ Although conservation policies and laws are not</li> </ul>

b) Land Planning Act Cap. 308 (1968) c) Registered Land Act Cap. 300 (1989) d) The Permanent Commission on Soil Conservation & Afforestation e) The Wildlife Act Cap. 376 (1976&89) f) Land (group representatives) Act cap. 287 (1970) g) The Local Govt. Act. Cap. 265 (1986) h) The Chief's Authority Act Cap. 128 (1988) i) Trespass Act Cap. 294 (1982) j) The Plant Protection Act Cap. 324 (1979) k) The Agriculture Act Cap. 318 (1985) l) The Forests Act Cap. 385 (1992) m) The Environmental Management and Coordination Act (1999)	effectively enforced, there is a growing number of NGOs and pressure groups who are carrying out lobbying and advocacy campaigns against fauna flora and their habitats. ♦ Under the previous land policies and the old land planning law (1968), no consideration was taken of the environment to prevent the loss of biodiversity in land use. ♦ Policies for land management and wildlife are seldom carried out.
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Sources: Ref. 31), 46)

### 3.4 Environmental Impact Assessment (EIA)

Part VI of the Environment Management and Coordination Act (1999) outlines procedures for conducting an Environmental Impact Assessment. Before any project is implemented, it is obligatory that an EIA is conducted based on the guidelines outlined in the Act. The project proponent is required to submit a request to the National Environment Management Authority (NEMA) for EIA to be conducted. The Ministry of Environment and Natural Resources maintains a register of authorized individuals and firms that can be contracted to undertake the EIAs. The register is open to the public at a modest fee. The Director-General of NEMA in consultation with the Standards Enforcement and Review Committee assess the application and provide a response within six months.

## 4. CURRENT ENVIRONMENTAL ISSUES

### 4.1 Air Pollution

Air pollution is not monitored at specific sites, and there are no data on the calculation of annual pollutant emissions. However, from various studies carried out in some parts of the country, air pollution has serious impacts on the environment and the health of the Kenyan populace. According to these studies, the main air pollutants in major cities such as Nairobi, Mombasa, Nakuru, Eldoret, Thika and other small ones such as Webuye, Kikuyu and Limuru just to mention a few are the Suspended Particulate Matter (SPM), Lead, Oxides of Sulphur (SO<sub>x</sub>), Carbon monoxide (CO), Hydrogen Sulphide (H<sub>2</sub>S), and Oxides of Nitrogen (NO<sub>x</sub>).

There are no set standards for most/all of these pollutants. But studies show that levels of some of these pollutants in some towns far exceed the WHO or other international standards.

In some of the municipalities such as Thika, standards are being developed and will be in force soon.

Relevant Organization
<u>National Level</u> <ol style="list-style-type: none"> <li>1) Ministry of Environment and Natural Resources - National Environmental Secretariat (NES),</li> <li>2) Ministry of Labour – Directorate of Occupational Health and Safety</li> <li>3) Kenya Bureau of Standards</li> </ol>
<u>Local Level</u> <ol style="list-style-type: none"> <li>4) Ministry of Local Government, Urban authorities</li> <li>5) University of Nairobi</li> <li>6) Moi University</li> </ol>
<u>Sectorial Level</u> <ol style="list-style-type: none"> <li>7) Ministry of Energy</li> <li>8) Ministry of Health</li> <li>9) Ministry of Transport and Communications</li> <li>10) Dept. of Resource Survey and Remote Sensing, Environment and Natural Resources</li> <li>11) Ministry of Labour, Directorate of Occupational Health and Safety</li> </ol>

Laws and Regulation	Existence	Title or References
Law relevant to air pollution		<ul style="list-style-type: none"> <li>• The Penal Code Cap.63 (1970)</li> <li>• The Public Health Act Cap.242 (1986)</li> <li>• The Traffic Act Cap. 403 (1988)</li> <li>• The Local Govt. Act Cap.265 (1986)</li> <li>• The Factories Act Cap. 242 (1986)</li> <li>• The Civil aviation Act Cap.394 (1978)</li> <li>• The Environmental Management Act No.8(1999)</li> </ul>

Note) : Exists      × : Never existed      : under development      ? : Not identified

Results of Various Surveys
<ul style="list-style-type: none"> <li>♦ The Mombasa Oil Refinery in Mombasa emits 2 tons of SO<sub>2</sub> per day</li> <li>♦ High acidity of the air was recorded due to the emission of SO<sub>2</sub> and NO<sub>2</sub> in Nairobi (UNEP, 1997)</li> <li>♦ The hourly concentration of NO<sub>2</sub> was recorded at about 0.5 ppm in Nairobi (Okech, 1994)</li> <li>♦ The main causes of SPM in Nairobi are, Construction work, production processes, unserviced vehicles and dust blown from unpaved roads.</li> </ul>

## 4.2 Water Pollution

The main causes of surface water pollution include effluent from agricultural activities and related industries, soil erosion, industrial and household effluent, and leachate from waste landfill sites. Water quality is not monitored regularly because of financial constraints and the absence of monitoring systems. Research carried out by some institutions mainly, Universities have revealed that polluting of water is rampant in almost all urban centers and cities. The informal sectors are also responsible for heavy metal, organic non degradable materials and general human waste disposal in these waters. Mwangi (2000) reported the pollution of Nairobi Dam water by the neighbouring Kibera slum. However, the pollutants act as nutrients to the fast spreading water hyacinth.

Relevant Organization
<u>National Level</u> <ol style="list-style-type: none"> <li>1) Ministry of Environment and Natural Resources - Dept of Water Development,</li> <li>2) Ministry of Environment and Natural Resources - National Environmental Secretariat (NES)</li> <li>3) Permanent Commission on Soil Conservation and Afforestation</li> <li>4) University of Nairobi</li> <li>5) Moi University</li> <li>6) National Water Conservation and Pipeline Corporation</li> </ol> <u>Local Level</u> <ol style="list-style-type: none"> <li>7) Ministry of Local Government,</li> </ol> <u>Sectorial Level</u> <ol style="list-style-type: none"> <li>8) Ministry of Lands and Settlement</li> <li>9) Ministry of Agriculture and Rural Development</li> <li>10) Ministry of Local Government</li> <li>11) Ministry of Planning and National Development</li> <li>12) Ministry of Transport and Communication</li> </ol>

Agricultural Effluent
<ul style="list-style-type: none"> <li>♦ The main pollutants: Fertilizers and Pesticides from agricultural industries (coffee and sugar plantations) and silt from the soil erosion</li> <li>♦ Inorganic fertilizers amounting to 0.4 million tons/year and pesticides amounting to about 10,000 tons/year are used.</li> <li>♦ Effects of pesticides, fertilizers and anti-fungal agents: Impacts on Tana and Athi Rivers and Lake Victoria, Lake Nakuru and Lake Naivasha</li> <li>♦ Water pollution due to soil erosion in the basins of many rivers</li> <li>♦ Volume of soil erosion by basin: Lake Victoria-Nzoia River Basin: 2 million tons/year, Rift Valley-Pekera River Basin: 0.1million tons/year, Athi-Central Athi River Basin: 8.5million tons/year, Tana River Basin: 4million tons/year</li> </ul>

Sources: Ref. 12), 47)

Industrial Effluent
<ul style="list-style-type: none"> <li>♦ Major agriculture-related industrial effluent: Coffee processing, sugar processing, sisal processing, fruit and vegetables this results to high BOD due to organic substances and residual pesticides are drained from the above-mentioned factories and long the rivers. River water contains extremely high levels of colon bacillus from the faeces of humans, and domestic and wild animals. When river water is used, it should be at least filtered and sterilized.</li> <li>♦ The survey of the Dagoretti slaughterhouse affecting the rivers of Nairobi and Kabuthia (ABI, 1994): Number of E. coli <math>5.42 \times 10^3</math>/100ml which was very high.</li> <li>♦ The survey of Nairobi Dam recorded a high colon bacillus count: &gt;18 MPN. (Mwangi, 2000)</li> </ul> <p>Lake Nakuru is stifled by heavy metal and pesticides residual pollution (JBIC, 2001)</p>

Sources: Ref. 15), 16)

### Water Hyacinth in Lake Victoria Basin

Cause: Water hyacinth, *Eichhornia crassipes*, which invaded L. Victoria in the early ninety's, had adverse effect on the social economic as well as environmental well being of the region. The emergence of water hyacinth in the lake was attributed to marked increase in levels of organic and inorganic compounds from industrial effluents and chemical residues from agricultural activities in Kenya, Uganda, Tanzania, Rwanda and Burundi the catchment area of the L. Victoria basin.

Lake Victoria Environment Management Programme (LVEMP): The LVEMP was established in 1994 to strengthen regional coordination in the management of Lake Victoria resources, including fisheries, water and other resources. Development of a regional strategy took a much longer period than was anticipated. This hampered the development of a regional strategy to the water hyacinth problem. Consequently, each riparian country devised national mechanisms for addressing the problem. These included, mechanical harvesting (mechanical hyacinth shredders and human labour), and biological (hyacinth eating weevils) among others. According to Kenya's National Secretary of LVEMP, the battle against water hyacinth has been won. The hyacinth in the lake has been reduced by 85% three years after the East African governments launched a full scale attack on the weed.

Kenya has spent a total of \$ 1.25 million on the war against water hyacinth.

According to a survey conducted by ELCI in August 2001, signs of resurgence of water hyacinth were evident at the mouths of Kuja and Nyando rivers.

Sources: Ref. 24), 38), 46)

### Main Areas Polluted by Industrial Effluent and the Sources of Pollution

Source	Polluted Area	BOD
A. Industrial Effluent (incl. households) . Nairobi . Eldoret . Nakuru	Nairobi and Athi river Sosiani river Lake Nakuru	>1,000 mg/l 400-1,000mg/l 1,471 tons/year
B. Local Industrial Effluent . Pan African Paper Manufacturing Plant . Chemical pollutants . Sugar factories . 1,800 coffee factories	Webuye, Nzoia rivers Sosian river, Nzoia and Nyando rivers	>600mg/l 800-1,000mg/l >1,000mg/l >1,000mg/l

### Breakdown of the Pollution Load on Lake Nakuru\*

Route of the Pollution	BOD (ton/year)	COD (ton/year)	Total Nitrogen (ton/year)	Total Phosphorous (ton/year)
Sewerage	626(43%)	807 (42%)	421(90%)	151(91%)
Rainwater runoff	161(11%)	215(11%)	12(2%)	13(7%)
Rivers	684(46%)	891(47%)	44(8%)	3(2%)
Total	1,471(100%)	1,916(100%)	547(100%)	167(100%)

Laws and Regulation	Existence	Title or References
Law relevant to water pollution		<ul style="list-style-type: none"> <li>• The Water Act Cap. 372, 1972</li> <li>• The Public Health Act Cap. 242, 1986</li> <li>• The Permanent Commission on Soil conservation &amp; Afforestation Policy</li> <li>• The Fisheries Act Cap.378, 1991</li> <li>• The physical Planning Act, 1996</li> <li>• The Kenya Port authority Act cap.391, 1978</li> <li>• The Merchant's shipping Act Cap.409, 1983</li> <li>• The Wildlife Act Cap.376 , 1976 &amp; 89</li> <li>• The Suppression of Noxious Weeds Act Cap.325</li> <li>• The Pest Control Products Act Cap.346, 1985</li> <li>• The Plant Protection Act Cap.324, 1979</li> <li>• The Geothermal Act Cap.</li> <li>• The Food, Drugs &amp; Chemical Substances Act Cap.254 , 1980</li> <li>• The Agriculture Act, Cap 318, 1985</li> <li>• The Environmental Management and Coordination Act No.8 , 1999</li> </ul>

Note) : Exists    ✕ : Never existed    : under development    ? : Not identified  
 Sources: Ref.23), 31)

### 4.3 Other Pollution

#### (1) Soil Contamination

In Kenya, there is concern about soil contamination by heavy metals. It is possible that soil will also be contaminated by the lead processing industry, exhaust gases, and cadmium from the agricultural sulphur fertilizers. At present, general monitoring is not being carried out. Research carried out at Nakuru in 2001 showed that there is heavy metal contamination on soils in various Hot Spots, where some industries/municipal dumps their waste.

Relevant Organizations
<u>National Level</u> 1) Ministry of Agriculture and Rural Development 2) Permanent Commission on Soil Conservation and Afforestation 3) Ministry of Environment and Natural Resources 4) University of Nairobi <u>Local Level</u> 5) Ministry of Agriculture and Rural Development 6) Ministry of Environment and Natural Resources –Department of Water Development 7) Ministry of Health 8) NGOs 9) Community Based Organisations (CBOs)

Laws and Regulation	Existence	Title or References
Law relevant to Land		<ul style="list-style-type: none"> <li>• Agriculture Act , Cap 318*</li> <li>• The Land Control Act, Cap 302</li> <li>• The Mining Act, Cap 306</li> <li>• The Local Government Act, Cap 268</li> <li>• Trust Lands Act, Cap 288</li> <li>• The Land Planning Act, Cap 303</li> <li>• The Government Lands Act, Cap 280</li> </ul>

\* The Agriculture Act is the principal land use statute covering inter alias, soil conservation and agricultural land use in general

Note) : Exists      × : Never existed      : under development      ? : Not identified  
 Sources: Ref. 46)

#### (2) Noise

The problem of noise is created by construction works, vehicle movement in major cities and on highways, factories, informal industries including workshops, loud music in public service vehicles and aeroplanes (NEAP, 1994)

Kenya does not have a specific legislation governing noise levels. However, Section 55 of Factory Act empowers the Minister of Labour to develop guidelines regarding noise in working places.

Relevant Organization
<u>National Level</u> 1) Ministry of Labour – Department of Occupation Health and Safety 2) Ministry of Environment and Natural Resources 3) Ministry of Transport and Communication <u>Sectorial Level</u> 4) Ministry of Transport and Communications 5) Ministry of Labour - Factories Inspectorate 6) Kenya Bureau of Standards



Laws and Regulation	Existence	Title or References
Law relevant to Land		<ul style="list-style-type: none"> <li>• Civil Aviation Act, Cap 394</li> <li>• Environment Management and Coordination Act, 1999</li> </ul>
Standards for noise		<ul style="list-style-type: none"> <li>• Factories Act, Cap 514</li> </ul>

Note) : Exists      ✕ : Never existed      : under development      ? : Not identified

### (3) Offensive Odour

The offensive odour or noxious smells of decay is a growing problem especially in major urban centres. It results from hydrogen sulphide released by decomposing garbage at disposal sites, dam reservoirs and broken sewage conduits. Other cases of odour include tanning plants at the Athi river, slaughterhouses and piggeries in Dagoretti, paper manufacturing plants in Webuye, leachates from the waste landfill sites, bonemeal plants, and wastewater from garbage collection vehicles. The Environment Management and Coordination Act 1999 Section 107 provides for procedures for the measurement and determination of noxious smells and ways of controlling them. This is a new development since there was no specific statute dealing with issue of offensive odour previously.

Relevant Organization
<u>National Level</u> <ol style="list-style-type: none"> <li>1) Ministry of Environment and natural Resources</li> <li>2) Ministry of Labour</li> <li>3) Kenya Bureau of Standards</li> </ol> <u>Local Level</u> <ol style="list-style-type: none"> <li>4) Ministry of Local Government</li> </ol> <u>Sectorial Level</u> <ol style="list-style-type: none"> <li>5) Ministry of Energy</li> <li>6) Ministry of Health</li> <li>7) Ministry of Labour - Directorate of Occupational Health and Safety</li> </ol>

#### (4) Radioactive Waste

Although there are no nuclear power stations in Kenya, radioactive materials may be used in consumer products such as tobacco, beer, rubber, tyre and steel manufacturing industries, oil well drilling, medical institutions and agriculture. Matters concerning the use, importation, exportation and introduction of radioactive materials and equipment are strictly managed by the Radiation Protection Committee set up under the Radiation Protection Act. There is much concern about radioactive pollution, including radioactive wastes dumped on uncontrolled landfill sites without inspection by local governments that may affect the health of garbage-related workers and scavengers, radioactive materials dumped on the coast that may affect the natural environment, and the international transport of nuclear wastes. The Kenyan government has signed several international agreements for the purpose of managing toxic wastes such as radioactive one.

Relevant Organization
<u>National Level</u> 1) Ministry of Health, Radiation Protection Board 2) Ministry of Environment and Natural Resources 3) University of Nairobi <u>Local Level</u> 4) Ministry of Local Government, Urban authorities <u>Sectorial Level</u> 5) Ministry of Labour, Directorate of Occupational Health and Safety

Laws and Regulation	Existence	Title or References
Law relevant to Radioactive waste		<ul style="list-style-type: none"> <li>• Radiation protection Act, Cap 243</li> <li>• Environmental Management and Coordination Act (1999)</li> </ul>

Note) : Exists      ✕ : Never existed      : under development      ? : Not identified

## 4.4 Solid Waste Management

About 12,955 tons of solid waste is generated daily throughout Kenya. Nairobi City generates 1,785\* tons a day. Relevant costs account for 23% (about US\$1 million) of the annual expenditures on public health in the country (Ref.53). About 45% of the annual total waste was collected in 1996. The main problems facing solid waste management in the country include:

- a) Lack of comprehensive national law on SWM
- b) Inadequate dump trucks
- c) Illegal and uncontrolled disposal of waste
- d) Lack of financial resources for investment and operation
- e) Lack of public awareness regarding SWM
- f) Inadequate space for expansion/development of dumpsites (especially in Nairobi city)

Relevant Organizations	
<u>National level</u>	
1)	Ministry of Local Government
2)	Ministry of Health
3)	Ministry of Labour
4)	Ministry of Environment and Natural Resources – Water Department
5)	Ministry of Lands
<u>Local level</u>	
6)	Ministry of Local Government - Urban authorities
7)	Ministry of Commerce and Industry
8)	Ministry of Health
9)	Ministry of Environment and Natural Resources – Water Department

Main Problems/Challenges
<ul style="list-style-type: none"> <li>▪ Irregular collection promotes individual burning→Offensive odour and air pollution</li> <li>▪ Household garbage thrown away along the road and in open spaces.</li> <li>▪ Open dumping→ in almost all municipalities</li> <li>▪ Dangerous, radioactive and medical wastes dumped on uncontrolled landfill sites without inspection by local governments→ Impact on garbage-related workers and scavengers</li> <li>▪ Shortage of disposal sites (e.g., only one disposal site in Nairobi)</li> <li>▪ Toxic wastes dumped in the forest near the water source.</li> </ul>

Annual average waste volume (generation and collection) in major cities

Location	Population (million)	Generation (1000t/yr)	Collection (ton)	Collected ratio (%)	Number of collecting vehicles
Urban	9.997	1859.4	na	50	16*
Rural	18.303	2805.85	na	67	na

Na: information not available

\* Nairobi City

Sources: Ref.13), 41), 53)

Laws and Regulation	Existence	Title or References
Law relevant to solid waste management, Hazardous waste management Law, Guidelines for Solid waste management		<ul style="list-style-type: none"> <li>• Public Health Act Cap 272</li> <li>• Local Government Act Cap 265</li> <li>• Environment Management and Coordination Act 1999</li> </ul>

Note) : Exists    x : Never existed    : under development    ? : Not identified

Sources: Ref. 41), 46), 53)

## 4.5 Energy Conservation and Alternative Energy

The main sources of energy are wood fuel, petroleum and electricity. Over 80% (about 22 million people) of the Kenyan population use biomass fuels. In rural areas, firewood accounts for 95% (about 18.7 million tons) of energy in use. Inefficient firewood cooking stoves used in most traditional Kenyan homes produce carbon monoxide which causes respiratory diseases. At least 80% of urban households depend on charcoal for their fuel needs. The current policy on wood fuel emphasizes provision of adequate supplies of wood to satisfy demand through a sustained yield, while at the same time conserving the environment. Programmes aimed at developing and promoting the adoption of efficient energy appliances such as improved wood fuel stoves are being encouraged. Agroforestry is also encouraged for sustainable fuel wood supply.

The drought experienced in the country over the last two years coupled with lack of adequate investments in new generation capacity, has had adverse effect on power generation in the country. Consequently, the government is intensifying efforts to complete projects identified in the Least Coast Development Plan, which includes Kipevu II, Olkaria III and Sondu Miriu. This is expected to boost the generation capacity by 318 MW. In addition plans are underway to upgrade the Kenya-Uganda transmission line from the present 132 KV to 220 KV with funding from the Uganda Electricity Board (UEB). Kenya and Tanzania have signed a Memorandum of Understanding (MOU) for a study towards construction of a power inter-connector between Arusha and Nairobi.

The long-term energy development strategy emphasizes private participation in power generation, transmission and distribution. In addition, research and development in alternative sources of energy is being conducted vigorously by both the government and the private sector.

Relevant Organization
<u>National level</u> 1) Ministry of Energy <ul style="list-style-type: none"> <li>▪ KENGEN</li> <li>▪ Kenya Power and Lighting</li> <li>▪ Electricity Regulatory Board</li> </ul> 2) Ministry of Environment and Natural Resources - National Environmental Secretariat(NES),
<u>Local level</u> 3) Ministry of Local Government
<u>Sectorial level</u> 4) Kenya Ports Authority 5) Kenya Industrial Energy Management Program 6) Forest Department 7) Private sector

Laws and Regulation	Existence	Title or References
Law relevant to energy use and conservation		<ul style="list-style-type: none"> <li>• Water Act, Cap 372</li> <li>• National Water Conservation and Pipeline Cooperation Order of 1988</li> <li>• Kerio Valley Development Authority Act Cap 441</li> <li>• The Tana and Athi Rivers Development Authority Cap 443</li> <li>• The Coast Development Authority No. 20 of 1990</li> </ul>
Law on Nuclear Energy Use		<ul style="list-style-type: none"> <li>• Radiation Protection Act Cap 243</li> </ul>

Note) : Exists      × : Never existed      : under development      ? : Not identified  
 Sources: Ref. 55)

**Petroleum Supply and Demand 1,000 tonnes**

Demand	1990	1995	1999	2000
Total Domestic	1,931.4	2,159.2	2,401.8	2,544.4
Exports of Petroleum fuels	534.2	367.1	627.3	441.9
Total Demand	2,465.6	2,526.3	3,029.1	2,986.3
<b>Supply of Imports</b>				
Crude oil	2,178.3	1,680.3	2,139.3	2,452.3
Petroleum fuels	132.6	719.7	1,250.9	874.9
Total	2,310.9	2,400	3,390.2	3,327.2
Adjustment	154.7	126.3	-361.1	-340.9
Total supply	2,465.6	2,526.3	3,029.1	2,986.3

Sources: Ref. 55)

**Present Energy Supply and Demand**

Main sources of energy: Biomass (63%), petroleum (24%), electricity (10%), imported coal (3%)  
 Biomass, firewood, charcoal, production residues (biogases (sugar cane residue), coffee grounds, sawdust)  
 Firewood: 95% of all energy in rural areas (18.7 million tons)  
 Domestic: Inefficient firewood cooking stoves causing respiratory diseases as the highest proportion of diseases in each regions

Energy for Industry and Commerce  
 About 3 million tons (1995, converted into petroleum), 3.7% annual increase  
 About 70% imported: Petroleum, coal, coke, hydroelectricity (from Uganda)

Energy users: Transportation ranks first, households second (others unknown)  
 Hydroelectric and geothermal power generation: 0.83million tons/year on average (converted into petroleum), output (29%) second to petroleum  
 Environmental impact of energy use  
 Air pollution: Leak or fire accidents of crude oil stored in the Mombasa Refinery or in transfer  
 Ocean pollution: Spillage of oil from tankers and ships in the Indian Ocean

Sources: Ref. 55)

**Alternative Energy Sources**

Kenya's Long-term Energy Development Strategy  
 Promoting alternatives: Solar, biogas, wind energy  
 The government has much interest in the use of atomic energy.  
 Nuclear waste disposal may become a problem in the future.

Sources: Ref. 55)

## 4.6 Water Supply

Although rivers are distributed across the country, many of them do not always have sufficient flow throughout the year. For example, the Athi River is one of the main rivers in Kenya but may dry up as a result of excessive water extraction in the middle reaches in the dry season. Main freshwater lakes are concentrated in the Rift Valley. Lakes Victoria, Baringo and Naivasha are freshwater. While Turkana and Nakuru are brackish or saltwater. The annual potential of underground water is reportedly about 600 million m<sup>3</sup>.

People who have drinking water available account for 75% of the urban population and 50% of the rural. These proportions are declining due to none performance of some of the water schemes.

Sources: Ref. 2), 57)

**Distribution of Water Resources by Major Drainage Basins in Kenya**

Basin	Safe Yield in m <sup>3</sup> per day	
	Surface Water	Ground Water
Lake Basin	11,993,184	118,622
Rift Valley	211,680	318,192
Athi River	582,336	222,319
Tana River	71,841,600	431,499
Ewaso Ng'iro	674,784	602,281

Sources: Ref. 39)

Relevant Organization
<u>National level</u>
1) Ministry of Environment and Natural Resources
<u>Local Authorities</u>
2) Community Water Supplies
3) Self Help Schemes
4) Lake Basin Development Authority
5) Kerio Valley Development Authority
6) Tana and Athi Rivers Development Authority
7) Coast Development Authority
8) Non-governmental Organizations
9) National Water Conservation and Pipeline Corporation
10) Permanent Commission on Soil Conservation and Afforestation
11) Ministry of Lands and Settlement

State of Surface Water
<ul style="list-style-type: none"> <li>Rivers at a stable level of water throughout the year: Tana, Nzoia, Yala, Nyando, Mara, Sondu-Miriu</li> <li>Rivers at an extremely unstable level of water: Athi      Depletion due to excessive extraction in the middle reaches in the dry season</li> <li>Partial location of freshwater lakes: Around the Rift Valley (Baringo, Victoria, Naivasha)</li> <li>Brackish lake (Turkana), saltwater lakes (Elementaita, Nakuru, Magadi, Bogoria)</li> </ul>

State of Underground Water
<ul style="list-style-type: none"> <li>Annual Availability: 600,000,000 m<sup>3</sup></li> <li>Deep aquifer about 30%, shallow aquifer about 70%</li> <li>Partial locations of freshwater lakes: Around the Rift Valley (Baringo, Victoria, Naivasha)</li> <li>Brackish lake (Turkana), saltwater lakes (Elementaita, Nakuru, Magadi, Bogoria)</li> <li>Underground water development: 282 water purification points and 232 bore holes were drilled in the country (1999/2000)</li> </ul>

Source: Ref. 2)

State of Drinking Water	
•	People who have drinking water available: 75% of the urban population and 50% of the rural Methods of use: Piping, boreholes, protected springs, swamps, dams
•	Provision of tap water systems: 1,780 systems provided by 1994 Administrative agencies: Ministry of Environment and Natural Resources (579 sites), National Water Conservation and Pipeline Corporation (188), Community Water Supply Corporation (339), Self-help Schemes (243), local governments (164), NGOs (266)
•	Water supply expenditures: US\$78 million (1995-96), US\$71 million (1997-2001 plan) for all over the country
Source: Ref. 22)	

Laws and Regulation	Existence	Title or References
Water Act		• Water Act Cap 372 • Public Health Act 242
Public Health Act		• Local Government Act Cap 265

Note) : Exists    × : Never existed    : under development    ? : Not identified

Sources: Ref. 46), 48)

## 4.7 Wastewater Management

Over half of the population do not have proper sanitation facilities. No more than 30% of the present 142 urban areas have sewerage systems due to financial and planning deficiencies. Where public sewerage is not provided, sewage is disposed of in various ways: e.g. the direct discarding of wastes, sewage disposal by underground permeation, regularly collected septic tank systems, and dug toilets.

Sources: Ref.42), 48)

Relevant Organization
<b>National level</b>
1) Ministry of Local Government
2) Ministry of Environment and Natural Resources ,
<b>Local level</b>
3) Urban authorities
4) Ministry of Environment and Natural Resources
5) Ministry of Health

### The Content of Sewage Treatment

Unit: 1,000m<sup>3</sup>

Year	Total Wastewater generated	Treated Water	Untreated Water
1980	422.11	413.85	8.26
1985	424.31	415.18	9.13
1990	517.02	492.81	24.21
1995	519.80	498.98	20.82
2000	613.25	591.20	22.05

Sources: Ref. 13), 41), 53)

Current State of Sewage System
<ul style="list-style-type: none"> <li>• There are sewerage systems in 42 of 142 cities (about 30%).</li> <li>• There are sewerage systems in no more than 20 towns in areas other than Nairobi and Mombasa.</li> <li>• Methods for the Disposal of Sewage in Areas without Sewerage <ul style="list-style-type: none"> <li>• Discarding wastes on the ground    Common, though unsanitary and odour</li> <li>• Underground permeation    Common in urban shanty areas Sanitary problems of sewage in the open spaces/streets</li> <li>• Tanking    Regularly replaced : Dry season: Once a week. Rainy season: Twice a week The collected sewage from septic tanks is put into the sewers</li> <li>• Dug toilets    Common in shanty areas in Nairobi, Mombasa and other cities There is concern that underground water may be polluted by the sewage permeating underground</li> </ul> </li> </ul>

Laws and Regulation	Existence	Title or References
Law on Sewerage		• Public Health Act Cap 242
Laws and Regulation on Industrial Wastewater Control		• Factories Act Cap 514 • Water Act Cap 372 • Local Government Act Cap 268
Effluent Standards		• Factories Act Cap 514 • Water Act Cap 372 • Land Planning Act Cap 303
Monitoring Results		• Environment Management and Coordination Act 1999

Note) : Exists    × : Never existed    : under development    ? : Not identified  
Sources: Ref. 48)



## 4.8 Forest Conservation and Desertification

Forests cover less than 3% of the country and may be largely divided into natural ones (about 2 million ha) and plantations (about 0.24million ha). To protect these limited forest resources, an area of about 2.4 million ha has been designated as reserves. Kenya, which has felled over 90% of its natural forests, ranks fifth in terms of the loss of forest in Africa. Forests are disappearing at a rate of over 5,000 ha per year following the settlement of people, cultivation, and development projects in the reserves.

The decrease in forests has led to the decline of important functions, including prevention of erosion, water yield, and the conservation of wildlife habitats and genetic resources. It has also caused problems of sedimentation in the lower reaches.

Overgrazing and felling have resulted in desertification in arid and semiarid areas.

Sources: Ref. 40)

Relevant Organization
<u>National level</u>
1) Ministry of Environment and Natural Resources
2) Kenya Forest Research Institute
3) Permanent Commission on Soil Conservation and Afforestation
<u>Local level</u>
4) Ministry of Local Government
5) Ministry of Environment and Natural Resources
6) Forest department
7) NGOs

Forest Conservation
<ul style="list-style-type: none"> <li>• Total Area under forest: 37.6 million ha</li> <li>• Distribution;               <ul style="list-style-type: none"> <li>a) Woodlands: 2.1 million ha</li> <li>b) Bushlands: 24.8 million ha</li> <li>c) Wooded grassland: 10.7 million ha</li> </ul> </li> <li>• Government land under forest: 2.197 million ha or 2.7% of the total area of the country.</li> <li>• Categorization;               <ul style="list-style-type: none"> <li>a) Gazetted government land - 1358915.0 ha</li> <li>b) Gazetted Trust land - 323266.36 ha</li> <li>c) Ungazetted government land - 182507.65</li> <li>d) Ungazetted trust land - 333234.44 ha</li> <li>e) Community forests - 9.4 million ha</li> </ul> </li> <li>• Conservation by the Provincial Forest Committee: Valuable arid and semiarid areas for firewood and charcoal</li> <li>• Annual decrease in forest preserves: Over 5,000 ha Main causes: Forest excisions by the government, cultivation and development activities in the preserves</li> <li>• Decrease in forest plantations</li> </ul>

Sources: Ref. 59)

### Fuel wood Supply - Demand Status 1990 – 2000

	1990	1995	2000
Supply from Yield	14,406,000	27,639,000	16,611,000
Supply from Stock	15,729,000	11,466,000	7,644,000
Total Supply	30,134,000	39,105,000	24,255,000

Sources: Ref. 59)

Impact of Forest Destruction
<ul style="list-style-type: none"> <li>• Factors in forest destruction: Conversion of forests into cultivated land or pasture, commercial felling, firewood cutting</li> <li>• Loss of forest functions: Soil conservation, water yield, wildlife habitats, valuable genetic resources</li> <li>• Impact of forest destruction near basins and wetlands: Problems of sedimentation in the lower reservoirs, lakes and dams, and the Mombasa Port</li> <li>• Silt problems: In the lakes of Baringo and Victoria and near the mouths of the Tana and Sabaki Rivers</li> <li>• Coastal siltation problems: Destruction of coral reefs and marine parks, and the decline in fish bait and plankton</li> </ul>

Desertification
<ul style="list-style-type: none"> <li>• Significant desertification of arid and semiarid areas</li> <li>• Factors in desertification: Decline of pastoral vegetation due to overgrazing, charcoal burning, poor farming methods, inadequate extension services, poor land tenure system, and Shifting cultivation</li> </ul>

Sources: Ref. 47)

**Major Forest Reserves (2001)**

Protected forest	Area (km <sup>2</sup> )
Aberdare-Kinangop	1,200
Mount Kenya	1,800
Cherangani-Kongelal	925
South West Mau Nature Reserve	430

Sources: Ref. 59)

**Forest Type (2001)**

Forest Type	area (million ha)
Commercial plantations	120,000
Nature reserves	5
Forest within national parks and national reserves	5,900
Other	5,200

Sources: Ref. 59)

Laws and Regulation	Existence	Relevant Statute
Forest Conservation Law		Forest Act Cap 385 Forest Bill 2000 Protected Areas Act Cap 204 Plant Protection Act Cap 324 Timber Act Cap 386 Trespass Act Cap 294 Wildlife Conservation and Management Act 376 Land Planning Act Cap 303
Law on Land Use		Agriculture Act Cap 318 Mining Act Cap 306 Land Control Act Cap 302 Trust Lands Act Cap 288 Land Planning Act 303 Government Lands Act Cap 280

Note) : Exists    × : Never existed    : under development    ? : Not identified

## 4.9 Biodiversity

About 35,000 species of animals and plants identified need to be protected by some measures. There are currently 22 national parks, 5 national marine parks, 22 national reserves, 5 national marine reserves, and 1 game preserve designated.

Sources: Ref. 18)

Relevant Organizations	
<b>National level</b>	
1) Ministry of Environment and Natural Resources	
2) Ministry of Information and Tourism	
3) Museums of Kenya – Center for Biodiversity	
<b>Local level</b>	
4) Ministry of Local Government	
5) Ministry of Agriculture	
6) Ministry of Lands and Resettlement	

### Identified species

Category	All	Indigenous	Known extinction's	Endangered	Vulnerable	Rare	Introduced
Fish	683	54	7	60	7	16	13
Reptiles	101	13	0	2	0	1	0
Amphibians	211	17	0	11	2	3	0

Sources: Ref. 25)

### Protected area and Important area

Protected Area	Site	Area (km <sup>2</sup> )
National Parks	22	29,050
National Marine Parks	5	54
Game Reserves	1	5
Forest Reserves	203	16,690
Private Preserve	6	133
Biosphere Preserve	5	13,346
Wetland under the Ramsar Convention (Lake Nakuru)	1	188
Planned Reserve	143	9,385
<b>Total</b>	<b>386</b>	<b>68,851</b>

Note) n.a.: Information not available

Laws and Regulation	Existence	Title or References
General Law for Conservation of Fauna and Flora		Environment Coordination and Management Act (1999)
Laws and Regulation on the Conservation of Species		Environment Coordination and Management Act (1999)
Laws and Regulation on Hunting		Environment Coordination and Management Act (1999)
Laws and Regulation on Protected Area		Environment Coordination and Management Act (1999) Forest Bill (2000)

Note) : Exists    × : Never existed    : under development    ? : Not identified

Sources: Ref. 18)

**Kenya National Parks and Reserves**

Park/Reserve	Area (km <sup>2</sup> )	Location (Province)	Management
<b>[ National Parks ]</b>			
Aberdares National Park	766	Central	Kenya Wildlife Service (KWS)
Mount Kenya N. Park	715	Central	KWS
Nairobi N. Park	117	Nairobi	KWS
Lake Nakuru N. Park	188	Rift Valley	KWS
Tsavo East	11,747	Coast	KWS
Tsavo West N. Park	9,065	Coast	KWS
Sibiloi N. Park	1,570	Rift Valley	KWS
Mount Elgon N. Park	169	Rift Valley	KWS
Saiwa Swamp N. Park	2	Rift Valley	KWS
Amboseli N. Park	392	Rift Valley	KWS
Hell's Gate N. Park	68	Rift Valley	KWS
Kisite /Mpunguti Marine Park	29	Rift Valley	KWS
Malindi Marine N. Park	7	Coast	KWS
Meru National Park N. Park	870	Coast	KWS
Ol Donyo Sabuk N. Park	18	Eastern	KWS
Watamu Marine N. Park	10	Eastern	KWS
Longonot N. Park	52	Coast	KWS
Central Island N. Park– in Lake Turkana	5	Rift Valley	KWS
South Island N. Park – in Lake Turkana	*	Rift Valley	KWS
Ruma N. Park	120	Rift Valley	KWS
Chyulu N. Park	471	Nyanza	KWS
Ndere Island N. Park	4	Coast	KWS
Mombasa Marine N. Park	10	Nyanza	KWS
Kora N. Park	1,787	Coast	KWS
Malka Mari N. Park – (Mandera district)	876	Eastern	KWS
Arabuko Sokoke N. Park	*	Eastern	KWS
<b>Game Reserves</b>			
Samburu National Reserve	165	Rift Valley	KWS
Shaba N. Reserve	239	Eastern	Garissa County Council
Rahole (Garissa district)	1,270	North Eastern	KWS
Shimba Hills	192	Coast	KWS
Tana River Primate Reserve	169	Coast	Garissa/Ijara County C.
Arawale N. Reserve	533	North Eastern	Lamu County Council
Boni N. Reserve	1,339	Coast	Lamu County Council
Dodori N. Reserve	877	Coast	KWS
Kiunga Marine N. Reserve	250	Coast	Baringo County C.
Lake Bogoria N. Reserve	107	Rift Valley	KWS
Losai N. Reserve (Marsabit district)	1,806	Eastern	Marsabit Count C.
Marsabit N. Reserve	1,132	Eastern	Transmara County C.
Maasai Mara N. Reserve	1,510	Rift Valley	KWS
Mwea N. Reserve	68	Central	Malindi County C.
Malindi Marine N. Reserve	213	Coast	Samburu County C.
Buffalo Springs N. Reserve	131	Eastern	Malindi County C.
Watamu Marine N. Reserve	32	Coast	KWS
Bisanadi N. Reserve	606	Eastern	KWS
Kisite/Mpunguti N. Reserve	11	Coast	Turkana County C.
Nasolot N. Reserve	92	Rift Valley	Kitui County Council
North Kitui N. Reserve	745	Eastern	Kitui County Council
South Kitui N. Reserve	1,833	Rift Valley	Turkan County Council
South Turkana N. Reserve	1,091	Rift Valley	E. Markwet County
Rimoi N. Reserve	*	Rift Valley	Baringo County C.
Kamnarok N. Reserve	88	Rift Valley	KWS
Kakamega N. Reserve	45	Western	KWS
Mombasa Marine N. Reserve	200	Coast	Nanyuki County Council
Laikipia N. Reserve	*	Central	

\* Data not available

Sources: Ref. 18)

## 4.10 Natural Resources

Natural resources form the life-blood of Kenya's economic development. Most of these resources are however under serious threat from over exploitation in the face of the growing population. Most people depend on natural resources for energy, food, fodder, building materials, medicine and for amelioration of the climate. In this regard, different ethnic communities have relied on their age-old knowledge and practices to obtain goods and services in a judicious manner from their natural environment. This traditional knowledge and practices have a profound element of natural resource conservation. The Environment Management and Coordination Act 1999 takes cognizance of the vital role indigenous knowledge can play in natural resource conservation efforts at both national as well as at local levels.

### (1) Land Use

Area and shares by land use category is shown in the table below.

Area and Shares by Land Use Category (year 2000)

Category	Area (hectares)	Share (%)
Cropland	2,730,000	6.3
Pasture land	39,300,000	68.2
Forest	2,197,000	3.5
Other	12,742,000	22.0
Total	56,969,000	100.0

Sources: Ref.47)

### (2) Soil erosion

Problems of Soil Erosion
<ul style="list-style-type: none"> <li>• Factors in Soil Erosion <ul style="list-style-type: none"> <li>- Decrease in the vegetation cover on arid and semiarid land</li> <li>- Land degradation resulting from unsustainable agricultural and stock raising activities</li> <li>- Floods and localized heavy rainfall</li> </ul> </li> <li>• Areas with high rates of soil erosion: West Pokot, Kajiado, Taita Taveta, Kitui and Embu at a rate of over 32 tons/ha a year</li> <li>• Arable land per capita: 0.1 ha/person</li> <li>• Impact of soil erosion: <ul style="list-style-type: none"> <li>- Sedimentary earth and sand in irrigated areas, ports, and reservoirs (including dams) in the lower reaches</li> <li>- Fishing grounds and coral reefs</li> <li>- Silt sedimentation in lakes including Baringo and Victoria and wetlands and near the mouths of the Tana and Sabaki Rivers flowing into the Indian Ocean.</li> <li>- Sedimentation along the coast has a considerable impact on coral reefs. Destruction of fish diet, decrease of plankton, and decline in the biological output of marine ecosystems.</li> </ul> </li> </ul>

**(3) Minerals****Production of major mineral resources**

	1996	1997	1998	1999	2000
Soda ash	223,000	257,640	242,910	245,680	238,190
Limestone	31,000	32,668	32,000	32,000	32,000
Fluorspar	83,000	68,700	60,854	93,602	100,102
Salt	41,000	6,280	21,742	44,886	16,359
Other	10,276	10,934	9,823	10,682	8,323

Sources: Ref. 2)

Relevant Organization
1) Ministry of Environment and Natural Resources
2) Ministry of Energy
3) Ministry of Lands and Settlement
4) Ministry Information and Tourism
5) Ministry of Culture and Social Services

Laws and Regulation	Existence	Relevant Statutes
Laws on Mineral Resources Management		Mining Act Cap 306 Trust Lands Act Cap 288 Local Government Act Cap 268 Land Planning Act Cap 303 Government Lands Act Cap 280 Land Control Act Cap 302
Laws on water resources		Water Act Cap 372 Agriculture Act Cap 318 Territorial water Act Cap 371 Lakes and Rivers Act Cap 409 Public Health Act Cap 242 Merchant Shipping Act Cap 389 Ferries Act Cap 410 Carriage of Goods By Sea Act Cap 392
Laws on Fishery Resources		Fisheries Act - No. 5 of 1989 Maritime Zones Act - No.6 of 1989
Laws on Marine Environment		Maritime Zones Act - No. 6 of 1989 Wildlife Conservation and Management Act Cap 376 Merchant Shipping Act Cap 389 Petroleum Exploration and Production Act Cap 308 Public Health Act Cap 242
Laws on Specially Protected Areas		Forest Act Cap 385 Wildlife Conservation and Management Act Cap 376

Note) : Exists    ✕ : Never existed    : under development    ? : Not identified  
Sources: Ref. 46)

### 4.11 Natural Disaster

Major natural disasters in Kenya over the past twenty years include floods and droughts. The heavy *El Nino* rains of 1997 dealt a major blow to the country's infrastructure and left thousands of families homeless. The perennial flooding of rivers Tana, Nyando and Yala deposit rich alluvial soils on their banks which local farmers cherish for growing crops. On the other hand, the flooding often destroys a lot of property and sometime even human lives are lost through drowning. Frequent droughts accelerate desertification to drive rural nomads into urban areas.

Sources: Ref. 60)

Contingency Plan for Environmental Disasters
An interministerial committee has been set up to develop strategies and coordinate environmental disasters. The committee is headed by the Disaster Office within the Office of the President.

Sources: Ref. 60)

Relevant Organization
<u>National level</u> <ol style="list-style-type: none"> <li>1) Ministry of Environment and Natural Resources</li> <li>2) National Disaster Management Committee</li> </ol> <u>Local level</u> <ol style="list-style-type: none"> <li>3) Ministry of Local Government</li> <li>4) Ministry of Agriculture and Rural Development</li> <li>5) Ministry of Lands and Settlement</li> </ol>

Laws and Regulation	Existence	Title or References
Laws on Natural Disaster Control		Environment Management and Coordination Act 1999

Note) : Exists      × : Never existed      : under development      ? : Not identified

## 4.12 Environmental Education

Environmental education is being formally given to elementary schoolchildren and high school and university students. A new curriculum with a strong environmental component has been developed and is being tested in various schools around the country.

Sources: Ref.61)

Relevant Organization
<u>National level</u>
1) Ministry of Environment and Natural Resources
2) Museums of Kenya – Environmental Education Section
3) Kenya Institute of Education
4) Kenyatta University
5) Moi University
<u>Local level</u>
6) Ministry of Local Government
7) Ministry of Education
8) Kenya Wildlife Service

Laws and Regulation	Existence	Title or References
Education Law		Education Act
Guidelines for the Environmental Education		In draft form (Kenya Institute of Education)
		Environment and Management Coordination Act 1999
Note) : Exists      × : Never existed      : under development      ? : Not identified		



## 5. International Relations

### 5.1 External Funding of Environmental Projects

Kenya has implemented various projects with the technical and financial support from various international organizations and advanced countries. The government is carrying out, or plans to carry out, environment-related projects implemented by various ministries. All the foreign assistance into the country is coordinated by the Division of External Resources in the Ministry of Finance and Planning.

The main donor countries and agencies active in the Environment sector in Kenya includes USA, World Bank, DFID, Netherlands, European Unions, Denmark, Sweden, Belgium, France, Finland, Austria, Italy and Germany. The poverty-focussed projects implemented by the respective aid agencies are outlined in the table below.

Title	Implementing Agency	Donor (s)	Duration	Contents
Water Supply & Sanitation	Ministry of Environment & Natural Resources (Directorate of Water Development)	Sweden	2000-2001	<ul style="list-style-type: none"> <li>Community water service delivery</li> <li>Policy and Institutional Support</li> <li>Rehabilitation of water supply system and community capacity building</li> </ul>
		Belgium	2001-2003	
		France Finland	2000-to date 2000-2001	
	National Water Conservation & Pipeline Corporation (NWCP)	Germany		<ul style="list-style-type: none"> <li>Study in two districts</li> <li>Community Training</li> </ul>
		AfDB	2001-2002	
		Italy	2001-2005	
	National Museum of Kenya (NMK) /Kajiado Community NMK/KWS	World Bank	2000-2001	<ul style="list-style-type: none"> <li>Urban Water Supply and Sanitary Management</li> <li>Rehabilitation and customer management</li> <li>Construction of Dam for urban water supply</li> <li>Emergency rehabilitation</li> </ul>
		Germany	2001-2003	
		SIDA Netherlands	1997-2003 1998-2003	
Biodiversity Conservation	Kenya Wildlife Service	World Bank/ GEF	Completed in May 2000	<ul style="list-style-type: none"> <li>Construction of Nairobi Safari Walk</li> <li>Establishment of a Wide Area Network to provide KWS with reasonable secure and reliable links for data communication between Management and Field Staff</li> </ul>

Title	Implementing Agency	Donor (s)	Duration	Contents
		WWF		<ul style="list-style-type: none"> <li>▪ Development of Management Plans for six protected areas, namely, Lake Nakuru, Lake Naivasha, Lake Olbollosat, Saiwa Swamp, Nyando, Sdai and Fourteen Falls.</li> <li>▪ Research and monitoring around all wetland sites which has culminated in the development of the wetlands database</li> <li>▪ Development of a formal wetlands training programme and also a commercial East Africa training course</li> <li>▪ Production of a draft National</li> <li>▪ Wetlands Policy which will set direction, strategies and guidelines for wetlands conservation throughout the country</li> <li>▪ Education and awareness programme for communities within and around all the key wetland sites includes production of posters, booklets, brochures, slides, etc</li> </ul>
		USAID		<ul style="list-style-type: none"> <li>▪ Land for resettlement allocated</li> <li>▪ Resettlement Plan for 247 families completed</li> <li>▪ Environment Impact Assessment done and accepted by World Bank</li> <li>▪ Land survey and demarcation completed</li> </ul>
Natural Environment	NMK/Kajiado Community	SIDA/IDRC	1998-2003	<ul style="list-style-type: none"> <li>▪ Designs, BQs, bid documents for residential houses and infrastructure development completed</li> </ul>
	Nmk/Kilifi	UNDP	1993-2008	<ul style="list-style-type: none"> <li>▪ Research work on 12 research sub-component has commenced and are scheduled for completion by June 2000</li> </ul>
	NMK/Kajiado Community		1994-2005	
	KMFRI, MENR, KARI & NES	SIDA/IDRC GEF	1998-2002	<ul style="list-style-type: none"> <li>▪ Forest restoration work</li> <li>▪ Two livestock/animal census</li> </ul>
	NMK/KWS/Tana River Community	GEF/World Bank	1998-2002	<ul style="list-style-type: none"> <li>▪ Land use/land cover mapping</li> <li>▪ Development of adaptive management plans</li> </ul>
	NMK/Stakeholders	GEF/UNDP	1998-2001	<ul style="list-style-type: none"> <li>▪ Wood fuel conservation to reduce land degradation</li> <li>▪ Butterfly farming</li> <li>▪ Ostrich farming</li> <li>▪ Research, monitoring and management of Lake Victoria and its catchment areas</li> <li>▪ Conservation of resources of Tana River National Reserve</li> <li>▪ Conservation of water in Rift Valley lakes of Kenya</li> </ul>

Title	Implementing Agency	Donor (s)	Duration	Contents
Taita Taveta Forestry Project	Forest Department	DANIDA	1991-2002	<ul style="list-style-type: none"> <li>▪ Nursery establishment</li> <li>▪ Woodlots establishment</li> <li>▪ Community training</li> <li>▪ Establishment of on-farm demonstration plots</li> <li>▪ Establishment of School woodlots</li> </ul>
Kenya Forestry College, Londian		GTZ	1994-2001	<ul style="list-style-type: none"> <li>▪ Construction of water supply system</li> <li>▪ Construction of sewage system</li> <li>▪ Completion of staff hostels</li> </ul>
Social Forestry Extension Model (SOFEM)		JICA	1997-2002	<ul style="list-style-type: none"> <li>▪ Development of techniques for establishment of trees in ASAL areas</li> <li>▪ Establishment of model farm forests</li> <li>▪ Training of extension agents</li> <li>▪ Promote social forestry</li> </ul>
Aberdares Natural Resources Development Project		African Development Bank (AfDB)	2000-2005	<ul style="list-style-type: none"> <li>▪ Management of Aberdare ecosystem and poverty eradication among the surrounding communities</li> </ul>
Mt Elgon Integrated Conservation Project	Forest Department and KWS	Netherlands Government through IUCN	1998-2000	<ul style="list-style-type: none"> <li>▪ Agroforestry development</li> <li>▪ Promotion of Ecotourism</li> <li>▪ Forest/wildlife management</li> <li>▪ Rural livelihood improvement</li> <li>▪ Community training</li> </ul>
Integrated Natural Resources Management and Conservation (Shimba Hills Forest and National Park in Kwale District)	Forest Department and KWS	GTZ	2000-2003	<ul style="list-style-type: none"> <li>▪ Mapping of forest resource use pattern</li> <li>▪ Development of integrated management plan</li> <li>▪ Community training</li> </ul>
Conservation & Management of Indigenous Forests (COMIFOR) – Mt. Kenya Forest reserve	Forest Department	European Union	1992-2001	<ul style="list-style-type: none"> <li>▪ Development of Management Plan</li> <li>▪ Community mobilization and training</li> <li>▪ Silvicultural management</li> <li>▪ Rehabilitation of degraded areas</li> <li>▪ Biodiversity studies</li> </ul>
Arabuko Sokoke Forest Management and Conservation	Forest Department & KWS	GEF	1997-2001	<ul style="list-style-type: none"> <li>▪ Training of local communities</li> <li>▪ Forest zoning</li> <li>▪ Promotion of micro-enterprises</li> <li>▪ Development of community supply schemes</li> </ul>

Title	Implementing Agency	Donor (s)	Duration	Contents
Forest Sector Support	Forest Department	Government of Finland	1997-2004	<ul style="list-style-type: none"> <li>▪ Strengthening Forest department Planning Unit</li> <li>▪ Development of wood processing technology</li> <li>▪ Development of Information Management System (IMS)</li> <li>▪ Seedling production</li> <li>▪ Community mobilization and training</li> <li>▪ Conservation of indigenous forests</li> </ul>
District Forest Development Programme	Forest Department	Government of Belgium	1997-2000	<ul style="list-style-type: none"> <li>▪ Staff training</li> <li>▪ Community training</li> <li>▪ Socio-economic and charcoal surveys</li> <li>▪ Promotion of agroforestry</li> <li>▪ District resource utilization and conservation options</li> </ul>
Coast ASAL Development Project	Forest Department	IFAD	1991-2002	<ul style="list-style-type: none"> <li>▪ Promotion of community afforestation projects</li> <li>▪ Conservation of mangroves</li> <li>▪ Conservation of dryland biodiversity</li> <li>▪ Poverty alleviation</li> </ul>

Sources: Ref. 14), 20), 21), 63)

## 5.2 Conventions Ratified or Signed Concerning Environment

Conventions Relevant to Kenya	Ratified
1. Waste Management and Hazardous waste	
• Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Base, 1989)	?
• International Convention on Oil Pollution Preparedness, Response and Cooperation (London, 1990)	?
• International Convention on Salvage (London, 1989)	?
• Convention on Early Notification of Nuclea Accident (Vienna, 1986)	?
2. Natural resources	
• African Convention on Conservation of Nature and Natural Resources (Algiers, 1969)	1992
• Convention Relative to the Preservation of Fauna and Flora in their Natural State (London, 1933)	?
• Convention on Continental Shelf (Geneva, 1958)	1969
• Convention on Fishing and Conservation of the Living Resources of the High Seas (Geneva, 1958)	1969
• Convention on the High Seas (Geneva, 1958)	1969
• International Convention for the Protection of New Varieties of Plants (Geneva, 1958)	1961
• Convention on the African Migratory Locusts (Kano, 1952)	1969
• International Tropical Timber Agreement (Geneva, 1983)	?
• Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Eastern African Region (Nairobi, 1985)	?
• United Nations Convention to Combat Desertification (Paris, 1994)	?
• Lusaka Agreement on Cooperative Enforcement Directed at Illegal Trade in Wild Fauna and Flora (Lusaka, 1994)	1974
• International Plant Protection Convention (Rome, 1951)	
3. Global climate	
• United Nations Framework Convention on Climate Change (New York, 1992)	1995
4. Marine pollution	
• United Nations Convention on the Law of the Sea (Montego Bay, 1982)	1989
• Protocol Concerning Co-operation in Combating Marine Pollution in Cases of Emergency in the Eastern African Region (Nairobi, 1985)	1990
5. General Environment	
• The Rio Declaration (adopted by UNCED)	1992
6. Cultural heritage	
• Convention Concerning the Protection of the World Cultural and Natural Heritage (Paris, 1972)	1991
7. Wildlife / Biodiversity	
• Convention on International Trade in Endangered Species of World Fauna and Flora (Washington, 1973)	1991
• Convention on Wetlands of International Importance (Ramsar, 1971)	1990
• Convention on Biological Diversity (Nairobi, 1992)	?
• Convention on the Conservation of Migratory Species of Wild Animals (Bonn, 1979)	?

Sources: Ref.46)

## 6. INFORMATION SOURCES

### 6.1 Governmental Organizations

Government Sector	Institution	Contact Person	Addresses
1) Meteorological Information	Meteorological Department	Director Dr. Joseph Mukabana	P.O.Box 52692, Nairobi Tel:567880 Fax:567889 e-mail: jmukabana@meteo.co.ke Web: www.meteo.co.ke
	Meteorological Department	Prof. R.B. Ogendo	P.O.Box 52692, Nairobi Tel:567880Fax:567745 Web: www.meteo.co.ke
2) Land Survey	Survey of Kenya	Prof. F.F. Ojwang Director H. Nyapola	P.O.Box 30046, Nairobi Tel:802241/2
	Department of Lands and Settlement	Director Mr. A. Sherif	P.O.Box 30450 Nairobi Tel:718050
	Lands	Director R.K. Mb wagwa	P O Box 30450, Nairobi Tel: 715050
3) Demography	National Council for Population & Development	Director (Mr. Simon Bullut)	P.O.Box 48994, Nairobi Tel:711600Fax:710281 Email: bullut@skyweb.co.ke
4) Soils	Soil Survey of Kenya	Director Dr. Muchena F.N.	P.O.Box 57811, Nairobi Tel:583301 Fax: 583344 E-mail: resource.centre@kari.org Web: www.kar.org
5) Agriculture	Department of Agriculture	Director Joseph K. Wanyama	P.O.Box 34188, Nairobi Tel 721005 Fax:720586
6) Forest Conservation/ Desertification	Forest Department	Director Ag. Mr. Mutie	P.O.Box 30513, Nairobi Tel:764010Fax:766647 E-mail: Fd_hqs@nbnet.co.ke
	National Environmental Secretariat	Director (Mr. Ben K'O mudho)	P.O.Box 67839, Nairobi Tel:24389 Fax:248855 E-mail: mec@nbnet.co.ke
7) Water Resources	Water Development Department	Director K.G. Chesang	P.O.Box 30521, Nairobi Tel:716103Fax:727622
8) Mines & Geology	Commissioner	L.K. Biwott	P O Box 30009, Nairobi Tel: 716103
	Nairobi City Council(Sewage Department)	Kimani Mwangi	P.O.Box 21522, Nairobi Tel:224281 Ext. 2181
	National Environmental Secretariat	Director (Mr. Ben K'O mudho)	P.O.Box 30126, Nairobi Tel:218079 Fax:214175
	Meteorological Department	Director Dr. Joseph Mukabana	P.O.Box 52692, Nairobi Tel:567880Fax:567889 e-mail: jmukaban@meteo.co.ke Web: www.meteo.co.ke
9) Energy Conservation	Biomass Division	Director Biomass Energy (Mr. D.K. Theuri)	P.O.Box 30582, Nairobi Tel:330048/502735 Fax:240910
	Petroleum & Geothermal Section	Chief Geologist Dr. Riaroh	P.O.Box 30582, Nairobi Tel:330048 Fax:240910
	Hydroelectric Power (Kenya Power & Lighting)	Mr. Samuel Gichuru (Managing Director)	P.O.Box 30177, Nairobi Tel:741181 Fax:750379

Government Sector	Institution	Contact Person	Addresses
	National Environmental Secretariat )	Director (Mr. Ben K'Omudho)	P.O.Box 30126, Nairobi Tel:218079 Fax:214175
10) Waste Management	Nairobi City Council	Mr. S.W. Opiyo (Director, Operations)	P.O.Box 30004 Nairobi Tel:226372 Fax:214780
	Radiation Protection Inspectorate	Chief Radiation Officer Peter Mutua	P.O.Box 30016, Nairobi Tel:717077 Fax:722531
	Directorate of Occupational Health	Director (Att: Mr. H.A. Onyoyo)	P.O.Box 40326, Nairobi Tel:542130 Fax:214175
11) Habitat/Sanitation	National Environmental Secretariat	Director (Mr. Ben K'Omudho)	P.O.Box 30126, Nairobi Tel:218079 Fax:214175 E-mail: mec@nbnet.co.ke
	Nairobi City Council, Sewage Department	Kimani Mwangi	P.O.Box 21522, Nairobi Tel:224281 Fax:214780
12) Natural Disaster and Poverty	National Environmental Secretariat	Director (Mr. Ben K'Omudho)	P.O.Box 30126, Nairobi Tel:218079 Fax:214175 E-mail: mec@nbnet.co.ke
	Poverty Reduction Strategy	Permanent Secretary Ministry of Finance and Planning	P O Box 3007, Nairobi Tel: 338111 E-mail: prsp@treasury.go.ke Web: www.treasury.go.ke/prsp
	Disaster Control Centre (Office of the President)	Director Disaster Control	P O Box 30510, Nairobi Tel: 227411
	Arid Lands Resource Management Programme (Office of the President)	Director	P O Box 53547, Nairobi Tel:227496 Fax: 227822 E-mail: alrmphq@africaonline.co.ke
13) Urbanization	National Council for Population Development	Director (Mr. Simon Bullut)	P.O.Box 48994, Nairobi Tel: 711600 Fax:710281
14) Institutional Issues	National Environmental Secretariat	Director (Mr. Ben K'Omudho)	P.O.Box 30126, Nairobi Tel:218079 Fax:214175 E-mail: mec@nbnet.co.ke
	National Environmental Action Plan	Prof. M.K. Koech	P.O.Box 30126, Nairobi Tel:218079 Fax:214175
15) Legislation and Institutions	National Environmental Secretariat	Director (Mr. Ben K'Omudho)	P.O.Box 30126, Nairobi Tel:218079 Fax:214175 E-mail: mec@nbnet.co.ke
	National Environmental Action Plan	Prof. M.K. Koech	P.O.Box 30126, Nairobi Tel:218079 Fax:214175
16) Atmospheric Pollution	National Environmental Secretariat	Director (Mr. Ben K'Omudho)	P.O.Box 30126, Nairobi Tel:218079 Fax:214175 E-mail: mec@nbnet.co.ke
	Directorate of Occupational Health )	Director (Attn: Mr. H.A. Onyoyo)	P.O.Box 40326, Nairobi Tel:542130 Fax:214175
	National Academy of Sciences	Prof. S.O. Wandiga (Chairman)	P.O.Box 39450, Nairobi Tel:721345 Fax:721138
17) Water Pollution	Water Development Department	Director (2) Nyagah and Omwenja	P.O.Box 18150, Nairobi Tel:716148 Fax:727622
18) Other Pollution	National Environmental Secretariat	Director (Mr. Ben K'Omudho)	P.O.Box 30126, Nairobi Tel:218079 Fax:214175 E-mail: mec@nbnet.co.ke

Government Sector	Institution	Contact Person	Addresses
	Directorate of Occupational Health	Director (Att: Mr. H.A. Onyoyo)	P.O.Box 40326, Nairobi Tel:542130 Fax:214175
19) Waste Management	Nairobi City Council	Mr. S.W. Opiyo (Director, Operations)	P.O.Box 30075, Nairobi Tel:226372 Fax:214780
	Radiation Protection Inspectorate	Chief Radiation Officer	P.O.Box 30016, Nairobi Tel:717077 Fax:722531
	Directorate of Occupational Health	Director (Att: Mr. H.A. Onyoyo)	P.O.Box 40326, Nairobi Tel:542130 Fax:214175
20) Waste Water Control	Radiation Protection Inspectorate	Chief Radiation Officer	P.O.Box 30016, Nairobi Tel:717077 Fax:722531
	Directorate of Occupational Health	Director (Att: Mr. H.A. Onyoyo)	P.O.Box 40326, Nairobi Tel:542130 Fax:214175
	Nairobi City Council (Sewage Department) )	Kimani Mwangi	P.O.Box 21522, Nairobi Tel:224281 Ext. 2181
21) Biodiversity	Department of Forestry	Director Mutie Ag.	P.O.Box 30513, Nairobi Tel:762195 Fax:760034
	African Biodiversity Institute	Director Dr Latigo	P.O.Box 30126, Nairobi Tel:218079 Fax:214175
	National Environmental Secretariat	Director (Mr. Ben K'Omudho)	P.O.Box 30126, Nairobi Tel:218079 Fax:214175
	African Biodiversity Institute	Dr. Alfred A.R. Latigo (Director)	P.O.Box 14126, Nairobi Tel:447595 Fax:580602
	IUCN	Director Dr. Eldad Tukahirwa	P.O.Box 68200, Nairobi Tel:890605 Fax:890615 e-mail: mail@iucnearo.org Web: www.iucn.org
	Kenya Wildlife Service	Director Mr. Nehemiah Rotich	P.O.Box 40241, Nairobi Tel:501081 Fax:505866 e-mail: kws@kws.org Web: www.kws.org
22) Natural Resources Management	Department of Forestry	Director (Dr. P.M. Mung'ala)	P.O.Box 30513, Nairobi Tel:762195 Fax:760034
	National Environmental Secretariat	Director (Mr. Ben K'Omudho)	P.O.Box 30126, Nairobi Tel:243088 Fax:214175 E-mail: mec@nbnet.co.ke
	IUCN	Director Dr. Eldad Tukahirwa	P.O.Box 68200, Nairobi Tel:890605 Fax:890615 E-mail: mail@iucnearo.org Web: www.iucn.org
	Kenya Wildlife Service	Director Mr. Nehemiah Rotich	P.O.Box 40241, Nairobi Tel:501081 Fax:505866 E-mail: kws@kws.org Web: www.kws.org
23) Natural Disasters	National Environmental Secretariat	Director (Mr. Ben K'Omudho)	P.O.Box 30126, Nairobi Tel:218079 Fax:214175



Government Sector	Institution	Contact Person	Addresses
	Meteorological Department	Director Dr. Joseph Mukabana	P.O.Box 52692, Nairobi Tel:567880 Fax:567889 E-mail: jmukabana@meteo.co.ke Web: www.meteo.co.ke
24) Environmental Education	National Environmental Secretariat	Director (Mr. Ben K'Omudho)	P.O.Box 30126, Nairobi Tel:218079 Fax:214175
	National Environmental Action Plan	Prof. M.K. Koech	P.O.Box 30126, Nairobi Tel:229261 Fax:338272
25) Environmental NGOs	Environmental Liaison Centre International	Director Dr. Barbara Gemmill	P.O.Box 72461, Nairobi Tel:576119 Fax:576125 e-mail: info@elci.org Web: www.elci.org
	NGO Bureau	Director (Mr. Isaac Lukalo)	P.O.Box 44617, Nairobi Tel:214044 Fax:250702
26) Transboundary Issues	National Environmental Secretariat	Director (Mr. Ben K'Omudho)	P.O.Box 30126, Nairobi Tel:218079 Fax:214175
27) International Cooperation	Ministry of Finance External Relations Dept.	Director (Mr. Ogallo)	P.O.Box 30007, Nairobi Tel:338111 Fax:217593

## 6.2 Environmental Non-Governmental Organizations (NGO) and United Nations Organizations

Organizations	Contact Person	Addresses
Intermediate Technology Development Group	Director Elijah Agevi	P.O BOX 39493, Nairobi Tel: 719413 Fax:710083 E-mail: itdgEA@itdg.or.ke Web: www.itdg.org
United Nations Environment Programme(UNEP)	Director Dr. Klaus Topfer	P.O. BOX 30552, Nairobi Tel:621234 Fax: 624490 E-mail: unon@void.org Web: www.unep.org
United Nations Centre for Human Settlement (Habitat)	Director Dr. Klaus Topfer	P.O. BOX 30552, Nairobi Tel: 621234 Fax 624490 E-mail: unon@void.org Web: www.habitat.org
International Centre for Research in Agroforestry(ICRAF)	Director Danish Garrity	P.O. BOX 30677, Nairobi Tel: 524000 Fax: 524001 E-mail: icraf@cgiar.org Web: www.cgiar.org/icraf

## 7. REFERENCES

- 1) Kenya Monthly Economic Review, July 2001, Ministry of Finance and Planning, Government of Kenya
- 2) Economic Survey 2001, Ministry of Finance and Planning, Government of Kenya
- 3) 1999 Population and Housing Census, Ministry of Finance and Planning, Government of Kenya
- 4) Volunteering Worldwide, 2001, Netherlands Institute of Care and Welfare
- 5) National Policy on Water Resources Management and Development: Sectional Paper No. 1 of 1999
- 6) UNDP, 1999
- 7) Statistical Abstract, 2000, [www.treasury.go.ke](http://www.treasury.go.ke)
- 8) Mathu, E.M. & Davies, T.C. (1996): Geology and the environment in Kenya. *Journal of African Earth Sciences*
- 9) Meteorological Department
- 10) National Environment Secretariat
- 11) Kenya Agricultural Research Station
- 12) University of Nairobi, Geography Dept
- 13) Nairobi City Council Cleansing Department reports and discussion.
- 14) Briefing by the Documentation Officer- NES
- 15) Mwangi M. S (2000): Analysis of Nairobi Dam Water. Research Project, University of Nairobi.
- 16) Mwavura, W.J. and Wangila, P.T. (2001): The Current Pollution Status by Heavy Metal and Pesticide Residues in Lake Nakuru, Kenya. JBIC Workshop, Nakuru.
- 17) Ayiemba J.A., Theuri J., Mwariri M. (Eds) (1999): Kenya Agricultural Research Institute; Annual Report 1999
- 18) Kenya Wildlife Service.
- 19) Ministry of Finance and Planning, (June 2001): Poverty Reduction Strategy Paper for the Period 2001-2004, Vol. I.
- 20) Ministry of Finance and Planning, (June 2001): Poverty Reduction Strategy Paper for the Period 2001-2004, Vol. II.
- 21) Ministry of Finance and Planning, (June 2001): Second Report on Poverty in Kenya, Incidence and Depth of Poverty, Vol. I.
- 22) Ministry of Water Resources (1999): Sectional Paper No. 1 of 1999. National Policy on Water Resources Management and Development.
- 23) Hirji R., Patorni F. & Rubin D. (Eds.) (1996): Economic Development Institute of the World Bank: Seminar on Integrated Water Resources Management in Kenya – Nanyuki, Kenya, January 22 – 25<sup>th</sup>, 1996.
- 24) Ecoforum, Volume 25 No. 2 Cold Season 2001: Lake Victoria: Economic Lifeline, Regional Toilet.
- 25) National Museums of Kenya: Annual Report 1997/98
- 26) World Atlas of Desertification, Second Edition (1998): Water Erosion Risk in Kenya: A survey Using the SOTER Methodology.
- 27) Department of Chemistry, University of Nairobi.
- 28) School of Environmental Studies, Moi University
- 29) Faculty of Environmental Studies, Kenyatta University
- 30) Various Individual Ministry information Centres.
- 31) The Environmental Management and Coordination Act, 1999.
- 32) Kimani, I.M. (2001): Environment-Development Profile for Nakuru Town (A Situational Analysis) JBIC Workshop, Nakuru.
- 33) Kenya Gazette Supplement Acts, (2000): Environmental Management & Coordination Act, No.8 of 1999
- 34) Ministry of Lands & Settlement (2001): National Development Plan 2002-2008 (draft)
- 35) Kenya Bureau of Statistics (2000): National Population Census Report Vol.1&2 of 1999.
- 36) Wafula, G.A. (1999): Measurements of Some Air Pollutants in Selected Areas of Nairobi and in surrounding Environs and in other Industrial Sites.
- 37) ACTS-UNEP (2001): The Making of Environmental Law in Kenya
- 38) World Bank (1995): Lake Victoria Environmental Management Programme Proposal.
- 39) Rafik H., Patorni F. & Rubin D. (Eds.), 1997: Proceedings of the Seminar on Integrated Water Resources - Management in Kenya, Nanyuki 1996
- 40) Government of Kenya and UNEP, 2000: Devastating Drought in Kenya – Environmental Impacts and Responses.
- 41) Development Profile for Nakuru Town, Kimani, I.M.
- 42) Ministry of Local Government.
- 43) Kenya NGO Earth Summit 2002 Forum, 2001, Report of the Sub-national workshop on Agenda 21 held at Naivasha, 28<sup>th</sup> August – 1<sup>st</sup> September 2001
- 44) NGO Bureau, Library Reports
- 45) National Environmental Action Plan.

- 46) UNEP/ACTS: The Making of a Framework Environmental Law in Kenya, 2001.
- 47) Ministry of Agriculture and Rural Development.
- 48) Ministry of Environment and Natural Resources.
- 49) Ministry of Labor – Directorate of Occupational Health and Safety.
- 50) Ministry of Labor – Factories Inspectorate.
- 51) Kenya Bureau of Standards.
- 52) Ministry of Health – Radiation Protection Board.
- 53) The Study of Solid Waste Management in Nairobi City, 1998, JICA.
- 54) Nairobi University – Department of Planning.
- 55) Ministry of Energy.
- 56) Kenya Power and Lightning.
- 57) Ministry of Water Resources.
- 58) National Water Conservation and Pipeline Cooperation.
- 59) Current Status of Forests in Kenya, Forest Department (internal report).
- 60) Office of the President.
- 61) Ministry of Education.
- 62) Kenya Institute of Education.
- 63) JICA report 2001.
- 64) [www.unep.org](http://www.unep.org)
- 65) [www.kar.org](http://www.kar.org)

## ABREVIATIONS

ABI	African Biodiversity Institute
ACTS	African Centre for Technological Studies
ASALs	Arid and Semi-Arid Lands
BOD	Biochemical Oxygen Demand
CBO	Community Based Organisation
CFC	Chlorofluorocarbons
CH <sub>4</sub>	Methane
CO <sub>2</sub>	Carbon dioxide
CO	Carbon monoxide
COD	Chemical Oxygen Demand
DANIDA	Danish International Development Agency
DDT	Dichloro-Diphenyl-Trichloroethane
ENA	Econews Africa
EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency (USA)
EPS	Environmental Profile Survey
GHGs	Greenhouse Gases
GOK	Government of Kenya
H <sub>2</sub> S	Hydrogen Sulphide
IFAD	International Fund for Agricultural Development
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for Conservation of Nature and Natural Resources
JICA	Japan International Cooperation Agency
KIFCON	Kenya Indigenous Forest Conservation Program
KWS	Kenya Wildlife Services
MBIs	Market Based Instruments
MENR	Ministry of Environment and Natural Resources
NAAQS	National Ambient Air Quality Standards
NCC	Nairobi City Council
NEAP	National Environment Action Plan
NES	National Environment Secretariat
NGO	None Governmental Organisation
NMK	National Museum of Kenya
NMVOC	non-methane volatile organic compounds
N <sub>2</sub> O	Nitrous oxide
O <sub>3</sub>	Ozone
ODA	Overseas Development Agency
OECD	Organization for Economic Cooperation and Development
PIP	Public Investment Program
SO <sub>2</sub>	Sulphur dioxide
SPM	Suspended Particulate Matter
TSP	Total Suspended Particle
UNDP	United Nations Development Program
UNEP	United Nations Environmental Program
USA	United States of America
USAID	United States of America International Development Agency
UV	Ultra violet
WHO	World Health Organisation

### UNIT OF MEASUREMENT

dB	Decibel
Ece	Electrical conductivity
ha	hectare (0.01 km <sup>2</sup> )
µg/m <sup>3</sup>	Microgram per cubic meter
Gg	Giga grams ( 10 <sup>9</sup> grams)
GJ	Giga joule (10 <sup>9</sup> joules)
Tg	Tera grams (10 <sup>12</sup> grams)
MT	Million metric tonnes
m.a.s.l	meters above sea level