3. CONSERVATION PLANS IN KENYA

3.1 Historical Development of Resource Use Planning in Kenya

3.1.1 Before 1900: The Pre-Colonial Period

During the pre-colonial era, resource management in the interior of Kenya depended very much on whether a group was agrarian or pastoral. The agrarian societies depended very much on tilling the land for crop production. The pastoralists on the other hand believed that all livestock was given to them by God. Most groups lived almost wholly on milk, blood and flesh, supplemented with what they obtained through barter trade with the agrarian societies along the border areas. The pastoralists also had better-organised warriors to extend and protect their territories. Both the agrarian and pastoral societies left large tracts of land for resource management purposes, whose disruption constituted a major environmental problem in Kenya.

Along the Kenya coastline the seeds of colonialism were sowed mainly with the coming of the Portuguese in the 1500s. However, these were removed mainly by the people of Asian origin, especially the Arabs. When Seyyid Said made his imperial seat in Zanzibar, then about 20 km strip from the coastline to the interior was annexed as part of his empire along the East Coast of Africa. This disadvantaged the people of African descent because the strip had land of high agricultural production potential.

3.1.2 1900-1930: Settlement in the White Highlands

The colonial white settlers erroneously perceived any tract of land left fallow as no man's land and annexed it. The colonial white settlers began to move into these territories, thus effectively creating barriers that separated the different societies which hitherto interacted freely as in, for example, Thika District between the Kikuyu and Akamba people or in the Limuru area between the Kikuyu and Maasai. Then other groups such as the Maasai were moved from areas where land was of high potential to areas of low potential. The net effect was to increase population densities in the low potential areas such that by 1930 some pockets had densities of up to 500 people per km^2, which led to accelerated land degradation.

3.1.3 1931-1953: Consolidation of White Settlements

A European Settlement Board (ESB) was formed in 1945 with an annual budget of £2 million per year provided by the Colonial Government. By 1960, the Board had settled 493 White farmers on about 1.2 million ha of land. Most of the Europeans settled in the former "Kenyan White Highlands" between 1918 and 1948. During this period the African land resources development was mainly administered through the African Land Development Board (ALDEV), without any specific plan up to 1946. Development was essentially piecemeal in the African areas and limited almost entirely to subsistence crops such as maize, beans, etc.

It was during this period that the degradation of African land was realised. This was as a result of the fact that both the agrarian and pastoral societies had been

concentrated in smaller areas compared with the 1900 extent, to make room for the White settlers. The accelerated degradation of African lands has had an effect on land productivity even to the present day.

3.1.4 1954 -1963: The Swynnerton Plan Period

During this period Africans were greatly disadvantaged (table 3, 4, and 5). For example, the Agricultural Ordinance of 1955 had reserved 3.1 million ha for the Whites only. By 1960 the Africans therefore controlled hardly any money economy as the following statements will show. About 80% of marketed agricultural produce came from the European farms. The Africans provided about 90% of the labour force but received about 45% of the total wage earnings. Further, the Africans earned only 4% of the Kenyan GDP by 1960. With such impoverished status the Africans could not finance any environment-related projects in their areas.

The Swynnerton Plan was aimed at intensification of agricultural production in the African areas. It dwelt mainly with land tenure and ownership, agricultural production and marketing. Between 1954 and 1960 about £10.9 million was spent on financing the plan. Cash crop income from the African areas increased from £5.2 million to £7.1 million in 1954 and 1960, respectively. The non-monetary value of the plan was, for example, the "improved living standards" of the families concerned. However, African areas still face problems such as poorly developed roads and poor agricultural produce and marketing system. The last one is still controlled by the White farmers, by organisations such KCC, KFA, etc. Credit facilities are also not readily available to the African farmers. The whole arrangement greatly disadvantaged the Africans.

It is noted that in 1953, Swynnerton proposed that after consolidation and demarcation of land, the soil in each plot was to be conserved. That is the necessary mechanical measures for soil conservation were to be introduced at the outset. However, punitive measures were used in some areas to force the Africans to conserve the soil. Soil conservation was thus rejected and so after independence (in 1963) some of the earlier initiated conservation works collapsed. Certainly the soil conservation policy is seen to have been wrongly introduced, a factor that still affects present day conservation practice.

Table 3. Population of Kenya, 1961

Racial group	Population size
African	7,800,000
Asian	169,000
European	61,000

SOURCE: Hazlewood, 1979.

Table 4. Agricultural production in the African areas, 1960

Product	Kenyans (%)
Livestock	25
Coffee	25
Cereals (mainly maize)	15
Minor crops (cotton, tobacco, oilseeds, sugar & pyrethrum)	36

SOURCE: Hazlewood, 1979.

Table 5. Classification of the African land

Description	Characteristics	Area (million km^2)	Remarks
High potential	Rainfall: 600-900mm Soil: good	47,000	Crop & dairy production
High potential grazing	Rainfall: 600-900mm Soil: mainly shallow Fertility: low	27,000	Arable farming discouraged Dairy production
Low potential grazing	Rainfall: 500-600mm Tsetse fly infested	38,500	Ranching area
Very low potential grazing	Rainfall: 250-500mm		
	Erratic rainfall	383,000	Nomadic pastoralism
	Total	495,500	

SOURCE: Bank for Reconstruction, 1963.

3.1.5 1964-1983: Central Government Planning Period

The National Development Plans (NDPs) of 1964-1968, 1969-1973, 1974-1978, 1979-1983 were done centrally. Kenya was also under the leadership of the first president, Mzee Jomo Kenyatta, from 1963-1978. Just as in the previous planning periods a lot of emphasis was focussed on rural development. Land therefore played a major role in terms of economic development and environmental planning.

This was the period that saw massive land transfers from the former colonial White Settlers in the then so-called White Highlands to Africans (table 6). The transfers were of three types: smallholder settlements, large group owned holdings, and private individuals. Groups owned about 191 large-scale farms covering 165,000 ha. The large-scale farms owned by individuals covered about 600,000 ha.

Table 6. Land transfer to smallholder settlement

Scheme	Area (ha)	No. of holdings	Average holding size (ha)
Million acre	470,00	35,000	13.4
Harambee	6,500	400	16.25
Haraka	105,000	14,000	7.5
Total	581,500	49,400	11.8

SOURCE: Hazlewood, 1979.

There was a significant increase in agricultural production in most areas rather than stagnation as had been expected. However, in some cases the Africans could not cope with the new area-specific environmental conditions. Those who came from humid areas with red soils found it difficult to manage cracking clays of Planosols which were quite extensive in the plateau areas of the White Highlands. This was mainly because the said settlement exercise did not go hand-in-hand with the creation of awareness on the "new" agricultural production techniques, suitable at specific localities.

During the White Settlements (1900-1963) it was mainly the pastoralists who lost most of their high potential land. However, during the transfer of these lands to Africans, it is the Agrarian Societies who benefited more. Consequently, this had in some cases created tension between the two groups. Between 1992 and 1994 it resulted in the so called "Tribal Clashes", with serious consequences manifested in the health of man and the natural environment.

3.1.6 1984 to Present: District Focus Strategy for Rural Development

President Moi's period of governance began in 1978 and development planning was initially wholly by the central government between 1979 and 1982. However, from

1983 onwards, the District Focus Strategy for Rural Development (DFSRD) was introduced to go hand-in-hand with the Central System of Planning. By this strategy, more emphasis has been laid on the district as the focal point of all planning in Kenya.

This planning period, which spans several National Development Plans, includes the 1984-1988, the 1989-1993, the 1994-1998, and the Sessional Paper of 1986. It should be noted that the period was preceded by various economic problems in the country. These included domestic inflation and world recession (which began in the 1970s) of the early 1980s. The devastating drought of 1984 also drained funds geared towards resource development. During this period of development, planning was mainly geared towards stabilisation of rural and urban populations.

The growth of secondary towns and smaller centres was to be encouraged throughout the country. Their growth was to be stimulated and financed by agriculture-based industries. It was hoped that such a growth would avoid excessive concentration of population in the largest cities of the country. Such cities are usually associated with environmental health and pollution problems. During the period under consideration, the key development planning aspects are presented as follows:

Land Resource: Getting suitable land constituted the main drawback in agricultural expansion and intensification. Only about 8.6 million ha of the land surface of Kenya is of high to medium potential and devoted to agriculture. Of this, 3.4 million ha is still devoted to extensive grazing, national parks, and game reserves. It is therefore on the 5.2 million ha of land that most of the agricultural production is based. This puts a lot of stress on the high potential land which is characterised by high rates of soil erosion and plant nutrient mining.

Irrigation and Land Reclamation: In order to expand the area under crop production, irrigation was required. However, large-scale (more than 9000 ha) irrigation schemes, where water pumping was required, had to receive government subsidies. Hence, of the large-scale irrigation projects only Mwea Tabere was having positive cash flows.

Land under crops could also be expanded through land reclamation in lowland areas and flood plains. However, in the case of the Tana Delta, flood control has brought conflicts between environmentalists and developers. During this period it was also suggésted that agricultural land could be expanded into valley bottoms and water-logged lands. But the aesthetic and monetary values of the biodiversity in these wetlands were not adequately considered (as there was no EIA) before draining was carried out.

Arid and Semi-arid Lands (ASALs) Development: About 80% of Kenya's land surface is ASAL. About 20% of the human and 50% of the livestock populations are found here. The ASALs are characterised by fragile ecosystems which are subject to degradation under intensive use. However, due to population pressure in the high and medium potential areas, more people are likely to migrate into the ASALs. These lands therefore represent a potentially important resource which if well-managed can improve incomes, employment and food sufficiency in the country.

During the 1984-1996 planning period, livestock development, breeding of sheep and goats suitable for ASALs was to receive high priority. Also more emphasis was to be given to the control of livestock diseases. The infrastructural elements planned for included water supply and livestock routes.

Concerning crop production, breeding of drought resistant crops and pasture grass was proposed. Soil and water management was to include soil conservation, irrigation and water harvesting.

Energy Requirements: In the rural areas where agriculture is the main economic activity, fuelwood is consumed while charcoal is important in small urban centres. In the ASALs especially, tree growth and regeneration is very slow and can lead to depletion of forests and/or bushlands. Measures to curb this include transporting fuelwood to the ASALs. Agroforestry development, reforestation and woodfuel plantation were suggested as means of fulfilling the demand for wood. Electricity generation using hydro-power was considered as a suitable alternative to the use of woodfuel. However, its distribution is still very much limited to the urban centres. Also dams along the Tana River, for example, have reduced the flood waters and hence the irrigation potential in the lower parts of the basin, thus leading to highland-lowland conflicts in water resource use.

Petroleum products, despite their associated problems of high cost and pollution, were being used widely. Plans to reduce their consumption included improvement of the public transport system and energy conservation by industries (table 7). However, this has not worked out well.

Table 7. Non-electrical energy requirements, 1985-2000 (1000 tonnes)

Source	1985	2000	Growth rate (% p.a.)
Fuelwood	14,972	23,480	3.0
Wood for charcoal	8,754	17,513	4.7
Commercial wood (timber)	1,077	2,588	6.0
Biomass	1,112	2,177	4.5
Petroleum	2,080	3,821	4.1
Coal/Coke	97	180	4.2
Electricity (Kilowatt hours)	2,480	6,077	6.2
Electricity capacity (Megawatts)	586	991	3.6

SOURCE: Republic of Kenya, 1986.

Urban Development: The line ministries and local authorities were to be instructed to adapt and follow more appropriate engineering technologies and standards for the construction of infrastructure such as roads, water supplies and sewage systems. It has been noted that some roads in urban areas do cause accelerated soil erosion as well as sedimentation of water bodies.

Policies for the transfer of land from the urban authorities (township, municipalities and cities) have not been clear. This has led to the indiscriminate acquisition of public land (schools, parks, vehicle parking areas, etc.) by private persons, sometimes referred to as politically-correct and well-connected developers or investors. Vegetated areas in urban centres are also important since they act as carbon dioxide (CO_2) sinks, yet their habitats (e.g., City Park, in Nairobi) are under developers' threat.

3.2 The Legal Framework

3.2.1 Indigenous and Western-style Constitutional Order

The constitutional mandate of the legislative authority and the kind of constitution in place play a significant role in nature conservation. The traditional African cultural 'constitutions' (often unwritten) were predominantly supreme during the pre-colonial period. Such constitutions governed the management of natural resources and ensured sustainable conservation practices. With the advent of colonialism, the imperial masters in a way suspended the essence of these traditional governance systems and imposed in their place Western-style legal frameworks for natural resources management. In some areas the consequences have been severe.

3.2.2 Pre- and Colonial Legislations

The pre- and colonial laws which significantly impacted on the Kenyan scene with respect to environmental management were: the Indian Lands Acquisition Act (1894), the Crown Lands Ordinance (1902, 1915), the Native Lands Trust Lands Ordinance (1938), Crown Lands (Amendment) Ordinance (1938) and the National Parks Ordinance (1945). These laws generally led, among other things, to the forceful acquisition of productive land from the African people for exclusive use by the White farmers, thereby marginalising Africans. Perhaps this period could be seen as the epitome of environmental degradation.

Hardly any policy or law designed for environmental management in broad terms existed in the early colonial period. Certainly there was no comprehensive legislation dealing with natural resources prior to the 1940s. Furthermore, it is noted that even after this period any legislation with a bearing on natural resources remained predominantly fragmented. Perhaps the Royal National Parks of Kenya Ordinance (Cap 377, 1962) was a modest attempt at addressing selected environmental issues related to the management of park areas in Kenya.

In general, British laws imposed on Kenya were based on the foundation of property rights that were alien to the Kenyan people. These laws emphasised ownership other than rational use of resources. The trend persisted from the colonial to the post-colonial Kenya.

3.2.3 Post-colonial Legislation

The Kenyatta Administration: From the beginning, the post-colonial government engaged a unitary constitution with a unicameral legislature. Hence there was a plurality of sectoral laws, each dealing with specific and scattered conservation issues. The result was laws such as the Agriculture Act (Cap 318), the Food, Drugs and Chemical Substances Act (Cap 254), the Forests Act (Cap 385), the Plant Protection Act (Cap 324), the Grass Fires Act (Cap 327), the Public Health Act (Cap 242), the Water Act (Cap 372, 1972), the Merchant Shipping Act (Cap 389) and the Factories Act (Cap 514). Arguably, each of these legislations had some stake in the management of natural resources, though not a comprehensive one. Some of them were enacted during the colonial era but have been amended by post-independence Parliaments.

Indeed, the period under the Kenyatta administration (1963-1978) saw a proliferation of the enactment of a wide range of natural resource-related laws that had relevance to natural resource management. Unfortunately these still maintained the sectoral format perfected during the pre-independence period. The only environment-specialised agency created during this period was the National Environmental Secretariat (in 1974), then under the Office of the President. The Secretariat was later moved to the Ministry of Environment and Natural Resources, thus resulting in its diminished significance.

The Moi Administration: On the other hand, the period under the Moi administration epitomises the consolidation of some of these laws as well as the creation of specialised bodies to deal with special interests in the management of natural resources. Examples of such laws include the Kerio Valley Development Authority Act (Cap 441, 1980); the Pest Control Products (Act No. 20, 1982); the Lakes and Rivers Act (Cap 409, 1983); the Government Lands Act (Cap 280, 1984); the Kenya Wildlife (Conservation and Management) Act (Cap 376, 1985); the Lake Basin Development Authority Act (Cap 442); the Coast Development Authority Act (Cap 449); the Ewaso Ngiro North River Basin Development Authority Act (Cap 448); the Ewaso Ngiro South River Basin Development Authority Act (Cap 447); the Tana and Athi Rivers Development Authority Act (Cap 443); the Irrigation Act (Cap 434); and the Radiation Protection Act (Cap 243). Among the specialised bodies or agencies created during the Moi administration are: the Presidential Commission on Soil Conservation and Afforestation (in 1981) and Presidential Commission on Drought Monitoring and Relief.

Land Resource Base and the Law: One important resource in Kenya is land. The controversial aspect of the resource has resulted in the enactment of specific and focused legal instruments which include: Land Control Act (Cap 302), Land Consolidation Act (Cap 283), Land Adjudication Act (Cap 284), and the Land (Group Representatives) Act (Cap 287). Other related legislations are: the Land Disputes Tribunal Act (No. 18, 1990), the Land Planning Act (Cap 303), and the Land Titles Act (Cap 282).

Genetic Resources: In retrospect, laws affecting the conservation of genetic resources and environment have, over the years been developed on piecemeal basis, with the original purpose not necessarily being conservation. Thus there exists numerous glaring gaps in these legislations, making them rather cumbersome to implement. The situation has been exacerbated by lack of a comprehensive national policy on genetic resources and the environment. More seriously, there is no law that regulates the collection and marketing of plant genetic resources, and even the regulation of its utilisation by the traditional medical practitioners.

Socio-cultural Dimensions and the Law: In essence some cultural dimensions of social systems as they touch on natural resource conservation issues, have been adversely affected through interpretation of existing laws. Whereas the spirit of the Kenyan constitution is meant to protect such interests, the same constitution appears to deny indigenous communities social rights since the interpretation of modern laws regards traditional practices and regulatory norms as being repugnant.

Polarisation of Environmental Management Institutions: In the present context the polarisation of environmental management institutions should be seen as founded in the fragmented framework handed down from the central government through sectorally designed legislations, making the latter patchy and obscure. For instance, the National Environmental Secretariat (NES) created in 1974, has no statutory powers to co-ordinate sectoral institutions endowed with statutory powers. The same applies to the Presidential Commission for Soil Conservation and Afforestation (PCSCA) as well as the District Environmental Committees (DECs). Fortunately, Kenya's constitutional setting permits the devolution of powers to such institutions, which if done would empower them to make binding decisions and take binding actions. This option is yet to be tried and the failure of conservation plans could be partly attributed to inaction on the part of the executive arm of government.

Political Pluralism: The current multiparty system of political representation in Parliament should invoke, with time politically-motivated judicial challenges of the constitutionality of some environmental legislations. This process has already begun. Nevertheless, Kenya is contending with internal contradictions with a single legislative authority which manifests in fragmented and sometimes contradictory laws and institutions, especially those touching on the environment.

The Environmental Management and Co-ordination Bill (1995): Kenya lacks the legal framework for sustainable development of the natural environment. However, the statutes that are regarded as environmental laws are sectoral and administrative, concerned mainly with the regulation of the use of water, land, minerals, forests and protection of both wild and marine life. Some seventy-seven (77) statutes in force today touch and affect the environment (Annex I).

It is, however, gratifying to note that the proposed Environmental Management and Co-ordination Bill of 1995, if and when put to debate in Parliament and subsequently made law, could be a step in the right direction. The Bill in its present draft form has made reasonable attempts to consolidate existing pieces of environment-related laws and regulations into a single document, as a new body of the environmental law in

Kenya. The enactment of the proposed Bill should hence improve environmental management in the country. The many statutes which have been touched upon in the proposed Bill are listed in Annex I.

4. MAJOR ENVIRONMENTAL ACTORS AND THEIR MANDATES

4.1 Central Government Ministries

Following each national election, the President of the Republic of Kenya is constitutionally empowered to create government ministries and appoint ministers. In principle, the created ministries are supposed to be approved by the Members of the new Parliament before they become functional. The same should ideally apply to the dissolution of any such ministry. This has not been so in practice. The mandates of the central government ministries with interest-claims in environmental management are presented in table 8.

4.2 Specialised Agencies and Presidential Commissions

The government has also established organisations to handle specific aspects of the environment. The relevant mandates of these agencies are outlined in table 9. These agencies are generally semi-autonomous to avoid for example bureaucratic red tapes in their activities, which is expected to hasten their operations.

4.3 Resources Mapping and Survey Agencies

4.3.1 The Survey of Kenya (SK)

The Survey of Kenya is charged with surveying and mapping land resources. It sets Triangulation Points, which are used as reference points during cadastral mapping for the whole country and the development and production of topographic maps. The organisation is also involved in land demarcation and sub-divisions. It is the custodian of all official mapping information and materials on the Republic of Kenya. It also has an institute that trains professionals in various fields, including Surveying, Cartography, Photogrammetry, and Remote Sensing.

4.3.2 Department of Resource Surveys and Remote Sensing (DRSRS)

Among other activities the DRSRS is mandated to gather alpha-numeric information, aerial photographs and remote sensing products on natural resources. The information covers wildlife and livestock distributions in Kenya's rangelands, settlement patterns, land use types, drought conditions (NOAA satellite data), etc. From its database, planning data on resources distribution and crop forecasting are derived. Early Warning Systems are developed for use by other government agencies. Geographical Information Systems (GIS) applications are also supported.

Table 8. Central government ministries

No.	Ministry	Department	Mandate
1.	Environment and Natural Resources	i. Forestry ii. Fisheries iii. Geology and Mining iv. National Environment Secretariat	• forest conservation and extension • regulation of natural fisheries • extension of aquaculture • geological survey • mining and regulation • co-ordination of all environmental matters
2.	Land Reclamation Regional and Water Development	i. Land Reclamation ii. Water Development	• reclamation of: ➢ wetlands ➢ degraded lands ➢ pest-infested areas ➢ salinised soils ➢ polluted soils ➢ polluted water bodies • provision of water to all Kenyans
3.	Agriculture, Livestock Development and Marketing	i. Agriculture ii. Livestock Development	• ensuring food security for all Kenyans. • liasing agricultural research • co-ordinating crop product marketing • veterinary services • co-ordinating livestock marketing
4.	Energy		• regulating marketing of petrochemicals • research on renewable sources of energy
5.	Health		• promotion of primary health care • health facilities and services
6.	Education		• education facilities • curriculum development
7.	Culture and Social Services		• cultural programmes and projects
8.	Tourism and Wildlife		• wildlife conservation • ecotourism

Table 8. *Contd.*

No.	Ministry	Department	Mandate
9.	Economic Development and Planning	i. Economic Planning ii. Kenya Bureau of Statistics	• drafting development planning • supervising development of the plans • collecting lineal and numerical data
10.	Finance	National Treasury	• revenue collection • monitoring government expenditure
11.	Commerce and Industry	i. Commerce ii. Industrial Development	• development of commercial centres • development and regulation industries
12.	Research, Technical Training and Manpower Development	i. Research ii. Technical Training and Manpower	• co-ordinating the semi-autonomous research organisations • co-ordinating the technical training institutes
13.	Labour		• monitoring education /training • monitoring the labour market
14.	Local Government		• regulating local authorities
15.	Land Physical Planning and Housing	i. Adjudication ii. Survey iii. Lands iv. Physical Planning	• identification and demarcation of land claims • fixing land boundaries • land registration • infrastructure plans (roads & railways)
16.	Transport and Communication	i. Transport ii. Kenya Meteorological Department	• provision of communication lines and their regulation • collection of meteorological data • climatical data analysis
17.	Information and Broadcasting		• informing the public through mass media • educating the public through mass media
18.	Office of the Attorney General		• provides for: ➢ allocation of natural resources ➢ regulation of the use of natural resources ➢ setting of standards for provision of harmful waste disposal ➢ controlling development impact on the environment

Table 9. Government specialised agencies and presidential commissions

No.	Organisation	Environmental activities
1.	Kenya Wildlife Services	• Formulating wildlife conservation policy • Managing National Parks and Reserves • Extension of wildlife education • Raising fund for its work
2.	National Museums of Kenya	• Studying pre-historic man and his environment • Implementing various international conventions (biodiversity, wetlands, etc.)
3.	Kenya Tourism Board	• Implementing tourism policies • Regulating tour operators, hotels and lodges • Promoting ecotourism
4.	Kenya Bureau of Standards (KBS)	• Controlling standards of both locally manufactured and imported products • Controlling processed goods (coffee, tea, cotton, etc.) • Controlling products of cottage industries (*Jua Kali*)
5.	Presidential Commission of Soil Conservation & Afforestation	• Intensifying and co-ordinating soil conservation • Monitoring forest conservation and afforestation projects
6.	Presidential Commission on Drought Monitoring & Relief	• Monitoring possibilities of droughts occurrence using information from the Kenya Meteorological Dept. and the Department of Recourse Surveys and Remote Sensing (DRSRS) • Distributing food to people affected by famine through (natural) calamities (droughts, earthquakes, etc.)
7.	Kenya Institute of Public Policy Research and Analysis (KIPPRA)	• Analysing and improving Kenya's economic policies in order to alleviate poverty • Giving advice on appropriate economic reforms and structural adjustment programmes • Forecasting possible repercussions of economic policies • Incorporating environmental policies.

4.3.3 Kenya Soil Survey (KSS)

The KSS is charged with carrying out inventories of soils and related resources for the whole country. The surveys are carried out at different scales for various aspects

of planning. The Explanatory soil surveys [scale 1:1,000,000 or smaller] are used for national planning. For the regional and district levels of planning, Reconnaissance Soil Surveys (scales 1:100,000 or 1:250,000) are used. The semi-detailed soil surveys (1:20,000 to 1:50,000) are used for sub-regional and large-farm planning. Finally ordinary farms are planned using Detailed Soil Surveys (1:10,000 to 1:20,000).

4.4 The Role of Research Organisations

4.4.1 The Kenya Agricultural Research Institute (KARI)

KARI has the mandate of carrying out crop and livestock breeding in order to come out with more exotic breeds. These would not only be more productive but also suited for the different environmental conditions in Kenya. KARI also carries out research on soil and water management geared towards improving crop/pasture production. For the livestock, there is also animal husbandry research.

Different departments of KARI are also involved in pest/disease control research of both crops and livestock which, together with weed control require different agrochemicals. Research on the latter also guards against pollution, especially of soils and water bodies.

4.4.2 Kenya Forestry Research Institute (KEFRI)

As already indicated, forest cover in Kenya has been reduced drastically from 30% (1900) to 3% (1963) of the land surface of Kenya. Currently it is estimated to be below the said 3% cover. Since encroachment into these forestlands also takes place, there is a need for afforestation. Some forestland has been de-gazetted and used for activities unrelated to forestry (e.g., construction of urban infrastructure). Existing forests can not supply all the woodfuel and timber required in Kenya. Therefore, there is a need for agroforestry in the cultivated areas. It is therefore the mandate of KEFRI to carry out research on trees, afforestation methods and agroforestry practices.

4.4.3 Kenya Marine and Fisheries Institute (KEMFRI)

The annual production of 190,000 tones of fish and fish products from Kenya is said to be far below the potential. The industry will be improved by carrying out research on the fish environments (riverine, dams, lacustrine and marine), fishing methods, fish processing and aquaculture. KEMFRI has the mandate to do research on these aspects of the fish industry throughout the country.

4.4.4 Kenya Trypanosomiasis Research Institute (KETRI)

More than 80% of the land surface of Kenya is characterised by various degrees of tsetse fly infestation. The fly is a carrier of trypanosomiasis to both human beings (sleeping sickness) and livestock (*nagana*). So efforts to reclaim the infested areas have been going on since the 1950s. It is the mandate of KETRI to carry out research on the methods of controlling the tsetse fly.

4.4.5 Kenya Medical Research Institute (KEMRI)

Many diseases can be prevented if people took proper environmental health measures. For example, proper land drainage systems can prevent the spread of malaria and schistosomiasis (bilharzia). Malnutrition can also lead to body weakness, which is usually followed by illness. KEMRI therefore does research on environmental health matters and such medications, including the development of new drugs (some based on natural herbal products) or drug administration regimes, among other activities.

4.4.6 Kenya Industrial Research and Development Institute (KIRDI)

Since 1986, Kenya has laid a lot of emphasis on widening the country's industrial base. Such industries include raw materials processing, manufacturing and cottage ("Jua Kali") types. KIRDI has the mandate of carrying out research in order to innovate and develop industrial technologies, some based on environment-friendly indigenous technologies. Research on pollution control from such industries is also carried out, in collaboration with other research agencies and national universities (e.g., Jomo Kenyatta University of Agriculture and Technology).

4.5 The Role of Non-Governmental Organisations (NGOs)

Beginning in the mid-70s, there was a rapid proliferation of NGOs focusing on a wide range of welfare issues. However, following the oil crisis, some of these NGOs began to develop interest in environmental issues. At present Kenya boasts of one of the largest number of NGOs in the region. Among the activities they do is land rehabilitation, tree planting, and creation of community awareness on the health of the natural environment. Their efforts have encouraged hitherto marginalised communities to earn a living in somewhat harsh environments. These efforts also support government programmes as they operate within approved resource development policy.

4.6 Regional Authorities

During the Moi period (1978-to-present), many regional development authorities have been created. Examples include the Lake Victoria Basin Development Authority, the Kerio Valley Development, and the Coast Development Authority. These authorities focus on the development of natural resources within their jurisdiction. However, recent studies indicate that some of them are inefficient while others could benefit tremendously if they co-ordinated their activities with neighbouring authorities. It has also been observed that some of the projects undertaken by these authorities do not make economic sense and some are injurious to the natural environment.

5. WHY HAVEN'T THE CONSERVATION PLANS/POLICIES WORKED?

5.1 The Constitutional and Legal Framework

The state authority for the environment has not been clearly defined in the public law and constructed on the basis of detailed and integrated laws and regulations founded on constitutional mandate.

As for the formal aspects of the Kenyan constitution, it rests on the fact that the constitution generally falls in that portion of the law which, on account of its pre-eminence, is made following special legislative procedures, and can only be amended in the same manner. For this reason, other laws such as City or Municipal by-laws are subordinate to the constitution. It is worth noting that a substantial portion of Kenya's natural resources are currently managed by local authorities using by-laws. The inherent implications of practical and assumed supreme authority has often led to conflicts in the concept of environmental conservation. This may have influenced the public psyche on the concept of conservation.

5.1.1 Environment and Constitutional Framework

The preamble in the Kenyan constitution lacks an article which establishes the principle of the management of its environmental resources. Perhaps the country's constitution gives greater eminence to individual property ownership as opposed to communal ownership, a feature that is alien in traditional or cultural laws of the African people. This could perhaps explain why, for example, government officials are reluctant to take action to control the wanton destruction of natural forests as this aspect of the broader mandate on development remains unspecified. Furthermore, the situation is made worse by lack of a solid national environmental policy, and a national environmental management act.

The broad government mandate should indeed anticipate environmental protection. To this end one can say that Kenya's fragmented legal instruments are in spirit observing the policy of conservation. Thus in future, the state authority should be clearly defined in the Public Law and constructed on the basis of detailed and integrated laws and regulations founded on constitutional mandate so as to promote the conservation practice.

5.1.2 Absence of a Consolidated Environmental Law and Its Impact

Environmental law aims at providing a regulatory framework for those human activities which may undermine the vital natural assets that support normal economic, cultural and social life. Hence, in law there should be substantive contexts or norms which affect conservation of natural resources and can be said to encompass international conventions. However, the enforcement of these conventions would rely on existing environmental laws. In this context international legal frameworks serve as a model of environmental protection. But this may not be enough if sovereign states lack commitment by way of signing and observing the said international conventions.

So far there is no comprehensive and consolidated environmental law in Kenya. However, an environment and development policy was recently adopted following the approval of the Cabinet and Parliament. Indications are that the recently published Environment Management and Co-ordination Bill of 1995, which is yet to be discussed by Parliament, could fill the gap. The proposed Bill seeks to provide parties aggrieved by any aspect of environmental destruction or degradation with a means to seek redress within the legal system. The Bill also provides for mandatory Environmental Impact Assessment (EIA) of all development projects and programmes in order to ensure that they do not inflict any damage on the environment.

In essence, there is need to entrench environmental conservation into the constitution as opposed to the current situation whereby a separate environmental law is envisaged to be enacted. In this context, it would be possible to put into perspective the observance of international conventions and environmental laws with a view to making them part of national laws on ratification. Only in this way is it possible to prioritise environmental concerns as well as integrate them into national development policies and programmes.

5.1.3 Lack of Constitutional Framework for Adherence to Religious Teachings on Environment

Some of the key tenets of the Kenyan constitution are: Unity of the Kenya State; the belief in one Supreme God; just and civilised humanity; and social justice for all the peoples of Kenya regardless of tribe, race or creed. In this framework every Kenyan enjoys the freedom of worship, which unfortunately has not been harnessed to enhance a healthy management of the environment.

Unlike atheists, most indigenous and other (e.g. Western-style, Asiatic, Islam, etc.) religions found in Kenya recognise the purity of the creation of God and hence the planet earth. In this regard, the maintenance of a good and healthy ecosystem is a responsibility which requires the participation of each member of the community in improving the carrying capacity of the environment. Nevertheless, lack of appropriate provisions in the constitution may have led to the lukewarm approach to environmental management in Kenya.

The religious debacle and the non-recognition of the indigenous religions and their supportive cultural laws on environmental affairs is perhaps one of the reasons why conservation plans have not worked well, since the underlying vast conservation potential remains untapped.

5.1.4 Lack of Focused Community Participation

Local participation in the identification and implementation of development projects is essential since the complex interaction between social, cultural, economic and environmental factors are best understood by those involved, and their contribution to the planning process would promote the preparation of appropriate development strategies.

Participation can be direct or indirect. It is seen as a process by which local people become managers of their own development and are simultaneously becoming more empowered. Participation entails the involvement of communities in designing, planning, implementing and the evaluating their resource development programmes. Thus a major hindrance to community participation has been the attitudes and behaviour of the public sector development workers. Save for the ASALs programme sponsored by The Netherlands Government, which appears to encourage community participation in the process of project development and implementation, little such effort is promoted by agencies concerned with environmental conservation. The Kenya Wildlife Services (KWS) only adopted this approach after community-based controversies on the management of certain natural resources, especially in the Maasai Mara Region of Kenya.

In retrospect the encouragement of local communities to participate in conservation practice should be given priority so as to ensure a sound foundation upon which relevant environmental policies could be effectively implemented.

5.1.5 Lack of Environmental Education

The bulk of the material relevant to the conservation practice is handled in school curricula for biology and geography. There is no provision for a specialised school subject on environmental education. Supplementary information is available to students through clubs such as the Wildlife Societies of Kenya (WSK). Thus there is very limited environmental education at all levels of education. Furthermore, there is a marked absence of programmes on environmental studies at the tertiary level. Only at Kenyatta University is there a full-fledged Faculty of Environmental Studies, the only one in the Eastern African Region. At Moi University, there is a Post-graduate School of Environmental Studies. Nevertheless, the impact of these two environmental training centres is yet to be felt nationwide, especially at the grass-roots levels.

5.2 Resource Management Issues

5.2.1 Lack of Land Use Policy and Land Planning and Its Impact

Land-use legislation in Kenya has been based on the assumption that land-use types are mutually exclusive. Legislation has thus been formulated largely in line with the different uses to which land can be put. In this context, statutory machinery regulates agricultural land, urban settlements, forestry, wildlife conservation, water catchments, etc. What is missing, however, is a land-use master plan, compiled on the basis of an inventory of natural resources (or ecological evaluation) and a comprehensive land-use policy and an integrated environmental law, the latter bringing together and harmonising all 77 or so statutes touching on various aspects of the environment. Policy objectives of land-use such as protection of available agricultural lands, environmental conservation, regulation of these changes or any other have not been articulated in a legal framework. The consequences have mostly been and continue to be adversely negative.

Land tenure and land utilisation are two fairly interrelated issues since ownership affects land use and vice-versa. There are preliminary issues to be considered. It is a well known fact that land tenure is important in the sense that decision-making tools in respect of the utilisation of ASALs resources depends on it. Land in Kenya can be owned by the Central Government, Local Authorities, communities and individuals. Of late, the transfer of ownership has presented problems, with government land being taken by individuals illegally. This is despite the public outcry, which is an indication of loopholes in the existing legal framework for land management.

5.2.2 Management of ASALs Resources

The ASAL areas of Kenya cover approximately two-thirds of the total surface areas. Given such an expansive zone, many factors combine to make these areas a very fragile environment. These include ecological vulnerability, the growing sedentarisation of the ASAL populations, the land-use practices, and more importantly lack of comprehensive (or any) planning for the exploitation of the ASAL resources. From the point of view of land use conflicts, the ASAL, therefore, requires greater attention and closer monitoring than the rest of Kenya. This has not happened.

In addition to the suffering of ASAL people due to weather variations, the negative impacts of the historical heritage of the law are glaring. For instance, a number of land-use conflicts peculiar to the ASAL environment are on the increase and more so between agriculture, livestock, wildlife, water and human settlements, and in various combinations in each and every ASAL district.

The evolution of a land use and land tenure strategy that allows for sustainable utilisation of natural resources may only be achieved through some existing or specifically and appropriately tailored legislative/institutional policy framework. According to the 1988-93 National Development Plan (NDP), ASAL development is to be realised within the administrative framework of the District Focus Strategy for Rural Development (DFSRD). The NDP follows the same objective of the *Sessional Paper No. 1 of 1986* which emphasises the need of integrating the ASAL into the mainstream of the national economy and thereby raising the standard of living of ASAL population.

The NDP acknowledges that as a result of rapid population growth, the amount of land in medium and high potential land is not capable of generating adequate income using the present technology. Population pressure is therefore gradually compelling people to cultivate more marginal land every year. It is therefore government policy to increase productivity on all types of land. To prevent further deterioration of ASAL areas it may be necessary to curb population movements, curb further sub-division of ASALs into uneconomic units, curb the cultivation of unsuitable crops, and therefore check any further environmental deterioration.

In the absence of the operationalisation of an ASAL-specific development plan and given that ASAL-specific Environmental Action Plans (EAPs) developed through a World Bank initiative are yet to be implemented, the still highly centralised planning-

oriented District Development Plans (DDPs), coupled with the equally centralised DFSRD frameworks appear to be the only valid, albeit both equally defective, national and district policy frameworks, respectively, for overall development and conservation of natural resources in Kenya.

The DDPs have never been fully integrated into the NDPs as was initially intended, basically because both plans are usually prepared concurrently at different levels with limited consultations and liaison. The DFSRD does not provide sufficient institutional nor statutory framework for the operationalisation of district-based self-sustainable development process (i.e., implementation of the DDPs). The policy is basically an administrative service, courtesy of the Provincial Administration and was established to be lacking in the essential devolution of statutory decision-making powers and financial resources.

5.2.3 Management of Water Resources

Since water is consumed by humans, livestock, wildlife and industries, its use, availability and quality are important aspects in the sustainable development of Kenya. Equally important are the laws relating to its use in Kenya generally, as considered below.

The Water Act (Cap 372) is the primary water law in Kenya. It contains two important provisions.

(a) It confers proprietary control of water on the State.

(b) It defines the mechanism for controlling the use of water, both surface and ground water.

This law is based on the assumption that water is readily available. Its concern is therefore access, distribution and conservation of the resource. Water use rights are more critical in the ASALs where there is an absolute scarcity of water. The regime of statutory water law cannot therefore apply. In the typical pastoral/nomadic context, access to water means walking long distances to the sources to meet domestic requirements. Farming enterprises use large amounts of water to irrigate crops, often with serious impacts on the environment.

Traditional rules exist among ASALs communities for regulating consumption and conservation of water and its sources. But the typical context of the national water law does not always exist. The consequences of the above scenario on the quality of the living environment lead to serious environmental degradation.

In theory, the water law in the sedentarised parts of ASALs is the same as in the rest of the high potential areas of the country. The Water Act (Cap 372) regulates abstraction and use. But as most of these areas lack the resource itself, an administrative regime of law has emerged to regulate access, watering of animals, grazing around water points and consumption of water. This administrative law regime is the Chiefs' Authority Act (Cap 128). Chiefs' orders are the basis upon which access to and use of water are regulated. It is on the basis of the same administrative rules that the location of water points (boreholes and wells) are

determined. At this stage in the process of the development of transient communities it is therefore difficult to determine the precise content of water rights in these sedentarised ASALs communities.

5.2.4 The Approach to Forest Management and Its Impact

By 1966 the declared forest reserves of Kenya occupied slightly less than 3% of the country, a figure which was well below the optimum for a developing country in the tropics. The country has over the past 32 years experienced reckless destruction of forests.

The management of forests in the country has a lot to be desired. Consider for example the predominantly indigenous Zaina forest, which forms part of the Aberdares (Nyandarua) Mountain Ranges' forest system in Nyeri District. The portion of the forest planted between 1922 and 1948 with exotic trees such as cedar, *pinus patula*, cypress, and podo, have been virtually clear-cut in recent times. The government officials responsible for the management of this vital national heritage appear to be less concerned with the deteriorating status of the forest.

After 1987, the previously used effective system of allowing squatters to stay in the forest tending young seedlings for a period of 3 years, and then moving to newly logged sites, to repeat the process has since been curtailed through a dubious government policy of evicting all squatters from areas gazetted as forest land. The result has been that regeneration rates of new plantations have fallen to very low and unsustainable rates. This state of affairs does not depict an integrated interpretation of the mandate endowed on the relevant ministry.

The ecological catastrophe in the Aberdares has led to the destruction of water-catchment areas as streams are drying up, and now the main Chania River has acquired a new characteristic of turning brown during the rainy season due to uncontrolled upstream soil erosion. Forest conservation continues to be dismal in all forest-gazetted areas of the Republic.

5.2.5 Agricultural Land Resource Use

As cultivation becomes a more significant land use system, pastoralists are denied access to pasture, especially the dry season grazing that was of critical importance as fall-back areas during times of drought. The growing pastoral populations are increasingly finding dry season grazing curtailed by the settlement of farmers and the creation of conservation areas for wildlife and forests. Thus they end up concentrating on alternative grazing and watering points. In such areas, pasture has become limited as the carrying capacity of the range decreases. This trend often has adverse consequences to both land use systems. On the one hand, pastoralism is undermined, if not altogether replaced by some other land use system, while agriculture is often not as successful as it is expected to be, given the low rainfall levels, shallow soils and poor farming techniques. The result is unsustainable resource utilisation and environmental degradation.

Forest clearance and insufficient soil conservation measurers have contributed to soil erosion and disruption of the hydrological systems. The planting of crops that are susceptible to water deficits have exacerbated land degradation and either caused or increased the potential for drought and famine. They also upset the indigenous resource management systems which were evolved on the basis of their adaptability to the local environment and technological levels. Unfortunately, in areas such as Laikipia District, change in land use patterns with the simultaneous transformation of property ownership regimes (i.e., changes in tenure systems) has meant decreased productivity, environmental crisis and fierce land resource-use conflicts at all levels.

The problems of agricultural development in ASALs are compounded by the fact that smallholder farms do not produce adequate food for the household. On the other hand, some of the districts in ASALs such as Laikipia, Narok and Kajiado have in recent times experienced tremendously high migration. Since the migrants are usually farmers, they import with them technologies which are inappropriate to the more variable climate and less fertile soils often characteristic of ASAL areas. The consequence has been out-migration of the majority of able-bodied men and women, in search of off-farm employment in the urban centres to obtain cash to supplement the farm produce. This has led to poor farm management, which in turn contributes to low productivity and environmental degradation.

5.2.6 Wildlife Resource Use and Conflicts

Most of the key production areas of ASALs regions have been gazetted as National Parks or Forest Reserves as a way of resolving the conflict in favour of wildlife or forest preservation, as opposed to livestock husbandry. In this way, as in the encouragement of farms in the wetter parts of ASALs, e.g., in Ndoto Mountains in Baragoi division of Samburu District, and in a small part of Marsabit District, the process has led to the marginalisation of pastoralism as a productive system.

It is estimated that between 65 to 80% of Kenya's wildlife live outside the designated conservation areas, seasonally migrating in and out of the parks. This mobility has created conflicts with all the other land use systems in place. Wildlife consume or destroy agricultural crops such that in some areas up to 50% of agricultural produce does not reach maturity. Conflicts between wildlife and pastoralists also arise due to the predatory nature of some wildlife species such as lions, leopards, hyenas and jackals, and also due to transmission of diseases to livestock.

During drought, when pastoralists do not have access to forest resources, there is a conflict between local and national demands resulting from the conflicting demands for tourism and the welfare of local pastoralists. In some areas, increased fencing of privatised land has tended to block varying wildlife ecological niches as well as keeping away indigenous peoples from accessing hitherto seasonal grazing grounds. The disruption of this system of man and animal movements has resulted in the over-utilisation of a few areas for grazing purposes, with the resultant of environmental degradation. Examples abound in Laikipia, Kajiado, Narok Districts, in Shimba Hills in Kwale District, and in the Trans-ara region.

5.2.7 Tourism Resource Management and Impact on the Local Communities

Most ASALs have high populations of wildlife which, when combined with the scenic beauty, give these areas a special potential as tourist resorts. These resorts have been earning the country fairly high foreign exchange revenues over the past decade. It is therefore prudent that some of the revenue earned from tourism be ploughed back into the development of local areas to compensate the local communities who may have sacrificed their own economic rights in order to sustain wildlife and conserve the environment. This has not taken root as a policy for developing local communities using revenue generated from local-based conservation reserves and parks.

5.2.8 Urbanisation and Sedentarisation of Nomads

Socio-economic factors such as the availability of social services (such as schools, health and veterinary services and water) and relief provisions following drought and famine, all contribute to the development of emerging urban centres. Since most of these centres develop in less arid parts of ASALs, urbanisation can be said to further contribute to environmental degradation and the shrinkage of the productive areas. The result is an emerging pastoral community *without livestock*. In essence, the urbanisation trend is largely irreversible and carries dire consequences for the environment and resources of the affected areas.

6. FUTURE PROSPECTS

6.1 Constitutional Change

Given that the natural environment creates the very basis of social and economic development in addition to specifying the limits of availability of resources, it is imperative that the governance of natural resources be enshrined in the national constitution. The current Kenyan constitution is, nevertheless, inadequately endowed in this regard to ensure effective management of the environment in the context of sustainable development of natural resources through an integrated institutional framework. The latter is the most broad-based element of governance existing at the formal level, yet including the norms and behaviour at the local level.

In Kenya, as in other African nations, environmental governance was the main preoccupation of traditional resource management systems. It was hence enshrined in the various indigenous cultural constitutions. Cultural taboos, for example, played a significant regulatory role within the traditional world view. In this context, decision-making was based on local knowledge in resource dynamics. Unfortunately these aspects of culture have not been effectively captured in the Kenyan constitution, as demonstrated by the provision in the current constitution that, "... no right, interest or other benefit under African customary law shall have effect ... so far as it is repugnant to any written law".

The main reason for this state of affairs are resource management legacies created by the colonial government. For example, the alienation of land from indigenous peoples