FEDERAL MINISTRY OF ENVIRONMENT OF NIGERIA

NATIONAL ACTION PROGRAMME TO COMBAT DESERTIFICATION

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1.0 INTRODUCTION

The severity of desertification in the drylands of the world prompted the United Nations Organization to adopt a Convention to Combat Desertification (CCD), in 1994 for which National Action Programme (NAP) which Nigeria ratified in 1997. As a principal tool for the implementation of the Convention, parties are expected to prepare and implement NAP.

Nigeria is a large country with a substantial part of its area extending into the Sudano-sahelian belt, which, together with the neigbouring northern Guinea savanna, constitutes the drylands of the country. With an estimated population of 113 million, human pressure on the land particularly in the marginal areas has continued to take its toll on the environment, resulting in desertification.

Desertification is made very severe in the drylands of the country by increasing human attempts to exploit the resources of the ecological zone in the face of persistent drought. Before now, Nigeria has been tackling the problem of desertification the best way it could, but with little success. It is now obvious that the menace should be addressed in a holistic manner in order to ensure that the drylands of the country continue to support human and natural resources.

This National Action Programme (NAP) spells out critical activities to be taken in a holistic manner to tackle the menace of desertification of the country. To facilitate a clear understanding of the NAP, an outline of the country's environment is given, followed by a description of the extent and severity of desertification in the area. Also highlighted are the earlier efforts made to combat the menace, and the lesson learnt from such efforts. The NAP itself presents, guiding principles, issues, strategies and priority projects.

2.0 THE NIGERIAN ENVIRONMENT

2.1 Location and Extent of Nigeria

Nigeria is located approximately between Latitudes 4^{o} and 14^{o} north of the Equator and between Longitudes 2^{o} 2' and 14^{o} 30' east of the Greenwich Meridian. To the north, it is bordered by the Republics of Niger and Chad, to the east by the Republic of Cameroon, to the south by the Atlantic Ocean and to the West by the Republic of Benin (Figure 2.1).

The surface area of the country is approximately 923,770 m^2. About 35% of this land mass is believed to be arable while 15% is said to be used as pastures, 10% as forest reserve, 10% for settlements and the remaining 30% is considered uncultivable, for one reason or the other. However, another estimate puts the surface area as 91.07 million hectares, 57% of which is believed to be either under crops, or pastures while the remaining 43% is divided among forest, water bodies and other uses (Cleaver & Shreiber, 1994). This point is illustrated in Table 2.4 later.

2.2 The Physical Environment

2.2.1 Climate

By virtue of its location, Nigeria enjoys a warm tropical climatic condition with relatively high temperatures throughout the year and two seasons; the dry and wet seasons. The climate of the country is influenced by the interaction of two air masses: the relatively warm and moist tropical marine air mass (mT) which originates from the Atlantic Ocean and is associated with Southwest winds in Nigeria; and the relatively cool, dry and relatively stable tropical continental air mass (cTs) that originates from the Sahara Desert and is associated with the dry, cool and dusty North-East Trades (Harmattan). The boundary surface area between the two air masses is known as the Inter-tropical Discontinuity (ITD) or the Inter-tropical Convergence Zone (ITCZ). The ITD migrates north and south of the country bringing rainfall or dryness to different areas of the country at different times of the year. Roughly, its northward movement brings the wet season to all areas south of its location, while its southward migration brings the dry season to areas north of its location. In general, while there is hardly any dry season in the extreme southern tip of the country, the wet season hardly lasts for more than three months in the northeastern part of the country. Similarly, annual rainfall totals range from over 2,500mm in the south to less than 400mm in parts of the extreme north.

2.2.2 Geology, Landform, and Soils

The geology of Nigeria is dominated by igneous structures that form most of the highlands and hills. The rocks of the Basement Complex, mainly of igneous origin, are encountered in over 60% of the surface area. Younger Granites are intruded into these rocks in Jos Plateau and environs. Volcanic rocks are also extruded on to the surface in places such as Jos Plateau and Adamawa Highlands. Areas of sedimentary formations are restricted to the coastal belt; the Niger-Benue Trough, including the southeastern scarp land and the Sokoto-Rima basin; and the Chad Basin.

The landforms can simply be classified into highlands, plateaus, hills, plains and river valley systems. Suffice it to state that the landforms are more deeply dissected in the southern parts than in the northern parts. Indeed, except for the Eastern Highlands in Adamawa area and the Jos Plateau, basins characterized by broad gently sloping plains dominate the northern half of Nigeria. An extensive section of this area is identified as the High Plains of Hausa land (Udo, 1970).

Table 2.1: Productivity Potential of Nigerian Soils

Soil Productivity Grade	FAO Productivity Classes	Area	
		Km^2	% of Total
High (1)	-	-	-
Good (2)	Fluvisols, Gleysols Regosols	50.4	5.52
Medium (3)	Lixisols, Cambisols, Luvisols, Nitosols	423.6	46.45
Low (4)	Acrisols, Ferralsols, Alisols, Vertisols	289.2	31.72
Low (5)	Arenosols, Nitosols	148.8	16.32

Source: Originally from FAO and reported in Agboola, S. A. 1979. An Agricultural Atlas of Nigeria, Oxford University Press, Oxford, Modified by IAR&T, Ibadan. 1996

The geology and the geomorphological processes that shaped the landforms have greatly influenced the soils. The major soil types in Nigeria, according to the FAO soil taxonomy legends are fluvisols, regosols, gleysols, acrisols, ferrasols, alisols, lixisols, cambisols, luvisols, nitosols, arenosols, and vertisols. These soil types vary in their potential for agricultural use as shown in Table 2.1. Clearly none of these soils is rated as Class 1 with high productivity by the FAO. Indeed, over 48% of Nigerian soils fall into classes 4 and 5. These are mainly vertisols, alisols, acrisols, ferrasols, and arenosol. These soils usually have low productivity due to inadequate moisture retention capacity and low organic matter. What is more, except for the ferrasols, they are the most dominant types found in the northern dry parts of the country.

2.2.3 Drainage and Hydrology

There are three major drainage systems in the country. These are: the River Niger drainage system; the coastal drainage system and the Lake Chad inland drainage system. The River Niger drainage system consists of the River Niger and its tributaries, prominent among which are: the Benue, the Sokoto-Rima, the Kaduna, the Gongola and the Anambra. The Lake Chad inland drainage system draws the following in-flowing rivers from Nigeria: the Komadougou-Yobe (with headstreams including Hadejia, Jama'are and Misau) and the Yedseram. However, the Chari and Lagone rivers from the Central African Republic constitute the most important inflow.

The coastal drainage system consists of rivers and short streams draining directly into the Atlantic Ocean. Two sub-sets of this system can be recognized. There is the eastern system consisting of rivers and streams east of the Niger delta such as the Cross, Imo, Qua Iboe and Kwa rivers. The western system consists of the Ogun, Oshun, Owena and Benin rivers. The total area of inland water bodies is estimated to be slightly over 12 million hectares as shown in Table 2.2.

Table 2.2: Summary of Water Surface Area of Lakes, Reservoirs and Major Rivers in Nigeria

Body of Water	Area (ha)	% of Total
Lake Chad (Nigerian Sector)	550,000	4.46

Kainji Lake	127,000	1.03
Major Rivers	10,812,210	87.62
Reservoirs	275,000	2.23
Flood Plains	575,000	4.66
Total	12,339.21	100

Source: Adapted from Ita *et al* (1985)

The hydrology of the country is influenced by the geologic structure. Areas of igneous structure are dominated by surface runoff while the areas of sedimentary formation are characterized by ground water retention. Most of the Chad Basin and the Sokoto-Rima Basin in the drier north are associated more with groundwater than surface water.

2.2.4 Vegetation

There is hardly any vegetation that has not been affected by human activities in the country. Farming, logging, grazing, hunting, urbanization, road construction and other development activities by the rapidly expanding population have together reduced the nation's natural plant cover to isolated remnants. Based on the climatic conditions, the following vegetation types are recognized in the country: the mangrove and fresh water swamps, the rain forest, the Guinea Savanna, the Sudan Savanna and the Sahel in a south-north transect. Between the rain forest and the Guinea Savanna is a modified vegetation transition consisting of light deciduous forest and derived savanna (Figure 2.2).

The southern forest that is, both the swamps and the rain forest constitutes the country's main source of wood. The derived savanna zone, about 250km wide, was once the northern part of the forest zone, but transformed by such activities into a vegetation type consisting largely of deciduous trees and grasses. The vegetation still supplies some wood. Most of the remaining part of the country is the Sudan Savanna accounting for more than 25% of the surface area, and expanding at the expense of the Guinea Savanna. At the northeastern and northwestern corners of the country is the Sahel that ordinarily does not account for more than 5 - 10% of the surface area, but is now growing larger at the expense of the Sudan zone. Indeed, it is now more meaningful to take the two driest zones together as the sudano-sahelian zone.

This is the ecological zone described as the Nigerian dryland by many researchers, containing most of the rangeland of the country. This zone constitutes the main source of fodder and grazing land for livestock. However, there is also the expansion of cultivation and extreme climatic variations that combine to reduce the grazing areas, and degrade the zone, including changes in plant species.

2.3 The Socioeconomic Environment

In this section, the term environment is used to include the human resource base, starting from human population. Other variables of the human environment considered are: agricultural activities, commercial and industrial activities, human and animal health and human poverty.

2.3.1 Population and Urbanization

The population of Nigeria in 1991 was put at 88,514,501 by the head count of that year, divided almost equally between females (49.68%) and males (50.32%). The distribution of this population by states is given in Table 2.4. However, since the population is increasing very rapidly at the rate of 3.2% per annum, the

current estimate is about 120 million, with the ratio probably shifting in favour of females. Thus, today, Nigeria accounts for about a quarter of the total population of the African countries, south of the Sahara, and its people consist of over 200 ethnic groups, speaking about 395 languages and dialects.

Besides the rapid increase in the total population, there has been a rapid rate of urbanization over the years. It is believed that the rate of urbanization is between 5 and 10%. The main reason for the rapid rate of urbanization is the creation of more growth poles through the creation of more states and local government areas. The provision of infrastructure at the headquarters usually aggravates the inequality between the rural and poles, leading to increased rural-urban migration. Rapid urbanization results in rapid construction and clearance of vegetation within and outside the urban centres to satisfy the needs of the urban people as well as urban congestion.

2.3.2 Agriculture

Agriculture in Nigeria involves four broad systems of land use: crop production, animal husbandry, fishery and forestry. Crop production involves three types of farming in the country: rotational fallow; semi-permanent or permanent cultivation; and mixed farming. There are variations of each type. For example, the permanent cultivation may be under rain-fed system, or irrigated system. Rotational fallow, land rotation type is common in sparsely populated areas. The system allows a cultivated field to rest for a few years (known as fallow years) before it is cultivated again. However, as the population of a place increases, the fallow period becomes shortened until a permanent cultivation is enthroned. It is an irony of fate that the dryland of Nigeria is where permanent cultivation, as a result of pressure of people on the land, is practiced more than in other areas.

Animal husbandry in Nigeria is mainly the pastoral type. This is a nomadic system under which the herdsmen, usually the Fulanis, move with the seasons, southwards as far as the deciduous forest during the dry season and northwards as far as the Sahel during the wet season. The system also has international dimensions as herders from the neighboring countries infiltrate into Nigeria during the dry season.

Mixed farming, that is, a mixture of crop and animal production, is also practiced on a permanent basis. This system combines semi-permanent crop farming with grass fallow for grazing. The plots are then rotated after one or two years. The combination varies. Where crop production predominates, the farmer keeps only a few animals. Where livestock dominates, crop production will be a minor activity, and the rangeland type of agriculture is practiced. The land use types indicating these agricultural activities are illustrated in Table 2.3.

Table 2.3: Land Use Patterns in Nigeria

Land Use	Area (Million ha)	% of total
Cropland	30.96	34
Pasture	20.94	23
Forest	14.57	16
Rivers/lakes/Reservoirs	11.66	13
Others	12.93	14
TOTAL	91.06	100

Sources: Cleaver and Shreiber, 1994. Reversing the Spiral; FAO: WRI/HED 1988 (P264-265); WRI 1992 (P262); Ita, 1993.

Protection and plantation forestry are both practiced in Nigeria. The former predates and dominates the latter. About 10% of the country has been reserved as forests through protection forestry, which is practiced extensively as a public enterprise. These are spread in files all over the country. There also patchworks of shelterbelts and woodlots planted mainly by government in the north, with assistance of development partners such as the World Bank and the European Union.

Fishery practice in Nigeria is mainly capture fishery with the bulk of the catch being marine. About 600 metric tones are produced this way with inland fisheries in the drylands contributing about 12% of the catch.

2.3.3 Commerce and Industry

With its large population, Nigeria presents a very important market in Africa south of the Sahara, a fact not lost on the world. The state headquarters, particularly Lagos, Kano, Ibadan and Aba are great commercial centres. A few other urban areas, not state headquarters, e.g. Onitsha, are also great commercial centres. Some of these commercial centres are also industrial growth poles with the Lagos-Ibadan industrial axis leading the pack. Solid mineral mining and crude oil extraction are important activities in the rural areas. No doubt, these mining and extraction industries have devastated large tracts of land on the Jos Plateau and the Niger Delta.

2.3.4 Health: Pests and Diseases

Urban congestion, drought and excessive exploitation of natural resources have led to an inadequate supply of some basic resources such as land and water for both human beings and animals. Pollution from industrial and other development activities has also impaired the quality of water supplied and led to the multiplication of pests and diseases in both human and animals. For example, it is believed that inadequate and poor quality of water supplied to the human populace in many parts of the country account for the increasing incidence of typhoid, cholera and malaria in urban and rural areas of the country. Similarly, the current outbreaks of grasshoppers and quela birds, leading to a devastating destruction of crops in the dryland of the country are linked to cycles of drought.

Box 2.1

"Insufficient water supply resulting from drought leads to increased contamination of the remaining sources of water and enhances the transmission of waterborne and water washed diseases such as typhoid, infectious hepatitis and cholera"

Source**:** Betterton and Gadzama, 1987

2.3.5 Poverty

The rapid population growth and urbanization described earlier have fueled a rapid economic development in Nigeria. The interaction of these phenomena leads, on a positive note, to the expansion of agriculture and changes in the agriculture practiced. However, when the increased population and its demands are pitched against dwindling resources of government and the introduction of the Structural Adjustment Programme (SAP), it is seen clearly that the citizens of Nigeria have been greatly impoverished in recent years. As would be expected, the rural populace has been the most affected by these and other inappropriate economic policies of the government. Consequently, the continuously increasing population exerts increasing

pressure on urban and rural land and water resources. One of the most serious consequences of such adverse economic policies is the large number of people that live under conditions of extreme poverty and deprivation.

Many small-holder-farmers simply lack the means to increase food production without degrading the land. This is especially true of the people in the fragile dryland of the country where the soils are characterized by low nutrient status and equally low water holding capacities. The farmers in such areas are particularly vulnerable.

Box 2.2

"The benefits of economic development are not shared equally among the inhabitants of a country. It is often the poorer people, forced to live on the worse lands who are the most directly involved in causing desertification, the most seriously affected by it, and the least able to prevent it from happening."

Source: The Threatening Desert by Alan Grainger

3.0 THE STATE OF DESERTIFICATION IN NIGERIA

3.1 The Dryland of Nigeria: Physical Characteristics

The dryland of Nigeria forms an undulating plain at a general elevation from about 450m to 700m. More than half of the region is covered by ferruginous tropical soils which are highly weathered and markedly laterised. A large proportion of the region is also characterized by sandy-fixed undulating topography. The sandy soil is usually low in organic matter, nitrogen and phosphorus and may degrade rapidly under conditions of intensive rainfall (Mortimore, 1989). When over-use occurs in this generally sandy environment, denuded patches may appear when the wind-blown sand becomes mobile.

Average annual rainfall in dryland of Nigeria varies from 500mm in the northeastern part to 1000mm in the southern sub-area, but it is unreliable in many parts. Unpredictability and unreliability characterize the pattern of rainfall. As in other arid and semi-arid areas of the world, it is not just the total amount of rainfall that is important, but the timing and distribution. In this respect, the pattern of rainfall in the region is highly variable in spatial and temporal dimensions with an inter-annual variability of between 15 and 20 percent. The nature of the rainfall in the region supports mostly savanna vegetation. Thus, apart from some relic forests in low lying ground along the southern boundary, the whole region is covered by savanna vegetation consisting of Southern Guinea Savanna, Northern Guinea Savanna, Sudan and Sahel with the density of trees and other plants decreasing as one moves northwards. Because of its generally low and variable biological production, the savanna ecosystem of the dryland in Nigeria is very sensitive to human and animal population pressure.

In addition to high inter-annual variability, the rainfall regimes of dryland of Nigeria are characterized by high concentration in a few months, intermittence and violence of storms. Thus the region is, by nature, prone to recurrent and sometimes intense and persistent periods of drought. Droughts may result in the depletion of soil and shallow groundwater resources and are capable of disrupting, even if temporarily, the low level of resilience of the natural ecosystems of the affected areas. In general, short-lived droughts may not necessarily achieve permanent environmental damage, but are capable of administering shock to the ecosystems. However, protracted droughts that are being experienced in the region since the 1970s have more serious impact. During such extended dry periods, the land is under increased stress from both humans and livestock, and this may be severe enough to cause severe damage to the environment. Once the precarious equilibrium of the plant communities adapted to the characteristically variable climate is upset by persistent drought, complete ecological recovery may be impossible, even when the rains return.

The high water deficit associated with this zone has compelled municipal, state and federal governments to explore and exploit groundwater sources which is more available in the zone than surface water as hinted earlier. Currently, the extraction of groundwater through boreholes and hand-dug wells is tapping one or more of the aquifers underlie the area. However, there is the general fear that there is over-pumping of groundwater such that the water table of the area continues to fall. For example, Carmalt & Tibbisalts (1969) recorded a decline of 6.5 m in the mean groundwater level, measured from a concrete well in Maiduguri, between 1963 and 1972. In the same period, a decline of 1.5 m was recorded in the dynamic level from boreholes in Dalori area of Maiduguri. The situation is currently probably worse in most parts of the dryland. Thus, a full study of the exact recharge rate and the magnitude of the recharge area are required.

Also, the soils in most part of the dryland, though well drained, are sandy, low in soil organic matter and are characterized by low water holding capacity as cited earlier. The only exception to this observation is the fadama soil that is fine-textured with a higher organic matter content and relatively higher water-holding capacity. Furthermore, this zone is the most grazed as well as where increasing drought incidents have caused changes in plant species, such as the invasion of the Kano area (Sudan) by thorn bushes native to the Sahel. It is also the zone where farmers have encroached on grazing reserves and climatically marginal areas, leading to increased incidence of pastoralists-farmers conflict and desertification.

Moreover, in terms of human activities, the dryland areas of Nigeria have been inhabited and cultivated for centuries. It is a zone where the period of fallow has been reduced to the barest minimum in many areas, or non-existent over a radius of 30km around some urban centers. Thus the pressure on the land is much more than it is in some other parts of the country.

3.2 Desertification in the Drylands of Nigeria

According to Part 1 Article 1 of the CCD, desertification is defined as land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors, including climatic variations and human activities.

The extent and severity of desertification in Nigeria has not been fully established neither the rate of progression properly documented. Nevertheless, there is a general consensus that desertification is by far the most pressing environmental problem in the drylands parts of the country. The visible sign of this phenomenon is the gradual shift in vegetation from grasses, bushes and occasional trees, to grass and bushes; and in the final stages, expansive areas of desert-like sand. It has been estimated that between 50 % and 75 % of Bauchi, Borno, Gombe, Jigawa, Kano, Katsina, Kebbi, Sokoto, Yobe, and Zamfara States in Nigeria are being affected by desertification. These states, with a population of about 27 million people account for about 38 % of the country's total land area (Table 3.1). In these areas, population pressure resulting in over grazing and over exploitation of marginal lands has aggravated desertification and drought. Entire villages and major access roads have been buried under sand dunes in the extreme northern parts of Katsina, Sokoto, Jigawa, Borno, and Yobe States.

The pressure of the migrating human and livestock populations from these areas are absorbed by pressure point buffer states such as the Federal Capital Territory, Plateau, Adamawa, Taraba, Niger, Kwara and Kaduna states. It is reported that these buffer states have about 10-15 % of their land area threatened by desertification. This action leads to an intensified use of fragile and marginal ecosystems resulting into progressive degradation even in years of normal rainfall.

Table 3.1: Desertification Frontline States of Nigeria

	Land Area		Population	
States	(km^2)	% of Nigeria	No.	Density/Km^2
Bauchi/Gombe	64,605	6.99	4,294,413	66
Borno	70,890	7.67	2,596,598	37
Yobe	45,502	4.93	1,411,481	31
Kano	20,131	2.18	5,632,040	280
Jigawa	23,154	2.51	2,829,929	122
Katsina	24,192	2.62	3,878,344	160
Sokoto/Zamfara	65,735	7.12	4,392,391	67
Kebbi	36,800	3.98	2,062,226	56
Total/Average	351,009	38.00	27,097,422	77

Source: Annual Abstract of Statistics: Facts and Figures about Nigeria

As vulnerable as it is, the zone has a high carrying capacity and is a home to over a quarter of the Nigerian population. It supports about 90 % of the cattle population, about two-thirds of the goats and sheep and almost all the donkeys, camels and horses found in the country. The zone has also played a dominant role in the agricultural modernization of the country; promotion of export crops such as cotton, groundnuts and gum arabic and of food crops, most especially in the production of the import substitution crops, notably rice and wheat.

Additional pressure is put on the pasture resources by livestock from other Sahel countries, especially from Chad, Niger and Cameroon respectively. Livestock from these countries are attracted to these zones because of the abundant supply of fodder around the patches of the wetland areas of Lake Chad and beyond. Water has been made available in the Chad Basin since the late 1950s, when large numbers of boreholes were put down on rectangular grid with spacing of roughly 16 km to tap artesian and sub-artesian water. The overall consequence of this is increasing rate of desertification which is estimated to be progressing at the rate of about 0.6 Km per year.

Box 3.1

In reference to the West African environment, Stebbing had observed that "the people are living on the edge, not of a volcano, but of a desert whose power is incalculable and whose silent and almost invisible approach must be difficult to estimate...the tract of country now directly threatened by the Sahara, over which the next big stride forward will, things continuing as they are being made, is contained by West-East line through Asongo on the North, and West-to-East line through Sokoto-Katsina-Kano eastwards on the South".

3.3 Causes of Desertification in the Nigerian Environment

Natural Causes

The natural causes of desertification include the poor physical conditions of soils, vegetation, topography as well as the inherent extreme climatic variability as evidenced in periodic droughts. Climate variation is perhaps the most important natural cause of desertification and drought in the dry lands of Nigeria.

The history of the sudano-sahelian zone of Nigeria is replete with severe and prolonged drought events, some lasting several years. The zone started the 20th century with a prolonged drought of 1903 culminating in that of 1911-1914. Other droughts included those of 1919; 1924; 1935 and 1951-1954. Rainfall was relatively abundant in the late 1950s and the early 1960s. Since then average rainfall has fallen below the 1930-1960 mean for almost three decades with lows in both 1972-1973 and 1984-1985. In terms of rainfall deficiency, river discharges and Lake Chad level, the period 1983-1985 was the driest period in this century in this zone as the lake fell to its lowest level and shrank to its smallest area.

Evidence seems to suggest that the 1979-85 drought was a function of tropical anomalies associated with the global atmospheric pattern. There is growing tendency to treat the 1969-1985 drought as one and to regard that of 1972-73 and 1983-85 as lows in the continuum. Rainfall in the sudano-sahelian zone barely improved in 1975 over that of 1972-73 but was still much below 1941-77 mean value. In 1976, large rainfall was recorded throughout the region while the length of the rainy season was unusually long. The slight recovery was immediately followed by a rainfall deficiency in 1977-78, which was at least as low as that of 1972. The year 1984 was the driest in the sudano-sahelian region within the period of instrumental records and this was evident from low rainfall, low river discharges and low water level in the Lake. With series of severe and prolonged droughts as witnessed since the 1950s, the sudano-sahelian environment, already a fragile environment has become more vulnerable than ever.

Human Activities

The anthropogenic factor is mainly the disruption of the ecological system caused by poor land use and ever-increasing pressure put upon the available resources by the expanding population. More specifically there are four primary causes, notably over-exploitation, over-grazing, deforestation and poor irrigation practices, and these are influenced by factors such as changes in population, climate and socio-economic conditions. It is obviously a complex inter-relationship, which includes:

?? poor physical conditions in terms of soils, vegetation, topography and inherent extreme variability of climate as manifested in frequent drought;
?? disruption in ecological balance caused by poor land use and ever increasing demand being made on the available resources by the expanding population and socio-economic systems of the affected areas; and
?? improper land-use practices and poor land management.

3.3.2.1 Wood Extraction for fuel and Construction

Without alternative sources of energy in the sudano-sahelian zone, the demand for fuel wood has been on steady increase by the increasing population and rapid urbanization despite the existing Felling of Trees (Control) Edict in the various States. In addition, wood is also exploited for building, arts and crafts in this environment. The United Nations Sudano-Sahelian Office (UNSO) has identified forest depletion as the

major agent of desertification in Nigeria. As a result of the demand for wood for construction, building, fuel, fishing industry and other uses, the removal of trees, shrubs, herbaceous plants and grass cover from the fragile land of the Sahel will continue to accelerate the degradation of the soil to desert-like conditions. The people in the surrounding countryside find the sale of wood to the town people a useful supplement to their meager cash incomes.

It has been estimated that nearly three-quarters of Kano City's yearly firewood requirement, which is about 75,000 tones, are brought in by donkeys mainly within a radius of about 20-km. As the degree of urbanization increases rapidly at rates of between 5- 10 per cent per annum, one can expect the woodland to become very sparse. This situation is further compounded by the people, who clear areas for the purpose of making and transporting charcoal to urban centres for additional income. Pastoralists also contribute significantly to woodcutting as they cut foliage to feed their animals and use branches to build enclosures. The consequence of human dependence on Wood for fuel and construction is that about 350,000ha of land is under the threat of deforestation annually while the annual rate of reforestation is estimated at about 30,000ha.

3.3.2.2 Bush Burning

Bush burning is an agent in the process of deforestation. Owing to the low relative humidity of the semi-arid zone coupled with very dry harmattan wind, there is always a high incidence of bush fires every dry season. The occurrence of fire within the zone can be attributed to

- bush burning by villagers during land clearing for agriculture,
- hunters who in search of game, set fire onto the vegetation, and
- cattle herdsmen who set fire to dry grass to stimulate growth of dormant grass buds.

3.3.2.3 Grazing

Livestock population in Nigeria has been estimated to consist of 16 million cattle, about 13.5 million sheep, some 26 million goats, approximately 2.2 and 150 million pigs and poultry respectively. The dry lands of Nigeria is said to support much of the country's livestock economy, hosting about 90 % of the cattle population, about two-thirds of the goats and sheep and almost all donkeys, camels and horses. In the Sudan and the Sahel zones, which carry most of the livestock population, nomadic herdsmen graze their livestock throughout the area and are constantly in search of suitable pastures.

Additional pressure is also put on pasture resources by livestock from neighbouring countries, notably Cameroon, Chad and Niger respectively. The frontline states as well as the buffer zone are located along two of the pastoral corridors of Nigeria. The corridors are:

- ?? the northwest corridor, running from Niger/Benin Republics through Sokoto/Kebbi/Zamfara /Katsina, Niger and Kwara state axis, and terminating in Oyo State.
- ?? the north-east corridor emanating from Niger/Chad Republics and running through Adamawa, Borno, Jigawa, Kano, Plateau and Yobe, and terminating in the Benue/Niger river basins. Other sub-routes emanating from all the states through which they criss-cross service the two corridors. Both corridors form parts of Sahel eco-zone and run through Sudan Savannah, terminating at the Guinea zone of the middle-belt and some southern states. These corridors carry millions of heads of cattle annually.

The total wetlands (fadama) dotting the pastoral corridors are estimated to be 3 million hectares. Evidence

seems to suggest that these wetlands experience over-stocking, especially during the dry season. A study conducted along these corridors showed that average livestock population density was 12.33 per hectare, well above the carrying capacity. Available evidence tends to suggest that the sudano-sahelian zone experiences over-stocking. Overgrazing resulting from overstocking cannot be completely ruled out as a major cause of desertification.

3.3.2.4 Cultivation of Marginal Land

Cultivation of marginal areas is one of the causes of desertification. In periods of higher than normal rainfall, people tend to extend farming activities into the marginal areas. When the years of plenty is followed by dry years, exposed land with very little vegetal cover is at the mercy of the winds. The fine clays and silts are carried away as dust, and the sand drifts into dunes. The effect of this could be irreversible except through carefully planned rehabilitation programme.

3.3.2.5 Faulty Irrigation Management

Irrigated cropping can turn land into desert if not properly designed and managed as a result of waterlogging, salinized or alkalinization. This scenario is already a reality on a number of irrigation projects in Nigeria today, such as the Bakolori Irrigation, South Chad Irrigation and the Hadejia – Jamaare Irrigation Projects.

3.3.2.6 Poverty

Perhaps the most subtle and often neglected cause of desertification is poverty. Although statistical data are hard to come-by, evidence seems to suggest that the vast majority of the inhabitants of the drylands of Nigeria live below the Poverty level. To a large extent therefore, they depend heavily on the natural resources of the area. Thus, the well known interrelationship between Poverty and Environmental, degradation obtains whereby poverty generates environmental degradation (desertification) which in turn accentuates poverty.

Overall, the drylands of Nigeria are the least developed in terms of the ability to meet basic needs. Per capita income is not only low, but the population growth rate is high, morbidity and mortality rates, are high, medical services are lacking, the transportation system is chaotic and food security is not guaranteed. Therefore over-stocking, overgrazing, overpopulation, cultivation of marginal land, and poaching are seen as possible responses to a harsh and inhospitable environment and poverty. For any conservation measure to be successful in this environment, it must address the issue of poverty squarely.

3.4 Impact of Desertification and Drought

3.4.1 Socio-economic Impact

Desertification and drought have severe impact on food security, livelihood, economic, social and cultural activities of the affected people. This has aggravated the food situation in the area resulting in low food security index.

Drought causes a lot of economic disruption, for example, it was held responsible for the drastic fall in the GDP of 18.4 percent in 1971-72 and of 7.3 percent in 1972-73 (at constant 1974-75 prices). It was also seen as causing the rapid rise in price index for foodstuff and relative decline in non-oil exports.

Studies have shown that the most usual, but probably not the least traumatic response to the hazards of drought and desertification is migration. Most of the movements in this zone are directed to the urban centres in northern and southern states. The other pattern of migration is rural-rural, particularly directed to the floor of Lake Chad to graze cattle and cultivate cowpea and maize and also to fish.

A major consequence of desertification/drought induced migration is separation of families as men usually abandon the women and children to seek for employment in the urban centres.

Box 3.2

Reporting the agricultural and human impact of the 1972-3 drought in Dambatta District of Kano, Mortimore (1989) recorded as follows:
"the rains of 1972 had begun late and ended early. Guinea corn was affected worse than millet, but some farmers harvested little of neither; from less than half, down to as little as 10 per cent of the expected yields. As for livestock, the village head estimated that there had been losses by death of 4,400 cattle, 6,400 sheep, 5,000 goats, 500 donkeys and most of the fowls. Mortality in some herds was reported to be 30-50 per cent, and hardly any young had been bred during this year. Cattle tax was being collected at the time, accentuating distress. Almost everywhere, groundwater levels had fallen, leaving dry wells and necessitating repeated deepening. Prices of foodstuffs had risen by 400 per cent and smaller markets were sometimes without grain. Only by selling their goods or animals could most people afford to buy. Yet it was said that even the richer farmers were in difficulties. No deaths or epidemics were reported, but people were leaner and weaker than in a normal hungry season".

3.4.2 Land and Water Resources

In addition to the socio-economic impacts, drought and desertification do have serious consequences on available water resources. Long term drought could adversely affect the level of upper ground water and stream flows, as well as the underground water. They also affect the level of large lakes, thereby affecting riparian access as in Lake Chad, which has receeded beyond the borders on Nigeria.

3.4.2 Resource Use Conflicts

Desertification and land degradation encourage economic and social strife as shown in wars of the Sahel and the Horn of Africa in the last two decades. This is often accentuated by lack of proper natural resource planning and management as well as rapid population increase in the arid zone, and the diminishing environmental resource base.

In the drylands of Nigeria, conflicts over land resources are focused on areas of high productivity, especially those that provide seasonally critical resource such as the wetlands. The most which have competitive uses amongst the various rural land users, notably farmers, herders, fishermen and hunters.

3.4.3 Destruction of Habitat and Loss of Bio-Diversity

The flora and fauna of the sudano-sahelian zone have been badly depleted as a result of climatic variation

and human mismanagement and/or over-exploitation of the environment. Some fauna species such as the sitodunga antelope, cheetah, lion, giraffe and elephants are endangered. Other endangered species are the crowned crane, the bustard, palearctic migrants, ostriches, fulvov tree ducks. With regards to flora, most of the indigenous plant species that were identified in the 1960s, are now hard to come by, especially those with medicinal value and edible qualities such as *A. senegalisis* (**madac**i – Hausa) and *Mitrogina* spp (Giyaya Hausa).

The above mentioned multi-sectoral consequences of desertification necessitate genuine efforts to address the problem in an holistic manner. National efforts in this regard are addressed in the next section.

4.0 EFFORTS AT COMBATING DESERTIFICATION IN NIGERIA

The Federal Government of Nigeria, within the overall framework of protecting the Nigeria environment, has given prominence to the twin environmental problems of drought and desertification. This section evaluates the past and present efforts of governments. This is with a view to isolating current efforts that need to be strengthened and identifying new initiatives that are considered desirable. Emphasis of the review is on National Policies, Institutional and Legislative Framework , Sectoral Programmes and Partnership Building that have been put in place to address the problem of drought and desertification. Some selected On-going and of past and present efforts of government in combating desertification

4.1 National Policies

Constituent elements to combat desertification and mitigate the effects of drought, within the framework of the National Policy on Environment, include the following:

- ?? Development of a National Action Programme to Combat Desertification and mitigate the effects of drought towards the implementation of the Convention to Combat Desertification (CCD) in Nigeria;
- ?? Integrating public awareness and education on causes and dangers associated with drought and desertification, as well as the constraints of the CCD
- ?? Strengthening of national and state institutions involved in drought and desertification control programme.
- ?? Promoting sustainable agricultural practices and management of water resources including water harvesting and inter-basin transfers.
- ?? Encouraging individual and community participation in viable afforestation and reforestation programmes using tested pest and drought-resistant and/or economic tree species;
- ?? Encouraging the development and adoption of efficient wood stoves and alternative sources of energy.
- ?? Establishing drought early warning systems.
- ?? Involvement of the local people in the designing, implementation and management of natural resources conservation programmes for combating desertification and ameliorating the effects of drought.
- ?? Intensifying international cooperation and partnership arrangements in the areas of training, research, development and transfer of affordable and acceptable environmentally sound technology and provision of new and additional technical and financial resources;
- ?? Inventorizing degraded lands, and implementing preventive measures for lands that are not yet degraded or which are slightly degraded.
- ?? Adopting an integrated approach to address physical, biological and socio-economic aspects of desertification and drought
- ?? Intensifying cooperation with relevant inter and non-governmental organizations in combating desertification and mitigating the effects of drought;
- ?? Strengthening the nation's food security system;
- ?? Establishing, reviewing and enforcing cattle routes and grazing reserves.

4.2 Institutional and Legislative Framework

The establishment of FEPA by Decree 58 of 1988 was probably the most far-reaching initiative undertaken by the Federal Government of Nigeria for the purpose of addressing the multifarious environmental problems (drought and desertification inclusive) and protecting the Nigerian Environment. Government further demonstrated its commitment to environmental issues through Decree 59 of 1989, which increased the powers given to FEPA by government. The decree provided legal backing of the Agency was with a broad mandate and specific powers of sanctions in the implementation of the National Environmental Policy. By Law, FEPA is therefore the apex institution for all issues relating to environmental protection.

The Federal Environmental Protection Agency also facilitated the establishment of State Environmental Protection Agencies (SEPAs) in the 36 states of the Federation and the Federal Capital Territory (FCT). The State Environmental Protection Agency has mandate for addressing all environmental problems (including Drought and Desertification) at the state level.

As earlier stated, Nigeria signed the Desertification Convention on the 31st October, 1994 and ratified same on the 8th July, 1997 thereby qualifying the country as a Party to the convention with effect from 6th October, 1997. As part of the implementation strategies, a National Co-ordinating Committee to combat desertification control in 1993 was established with Secretariat at the then FEPA. The committee, which comprises of representatives of line Ministries, Agencies, relevant research Institutes, and Non-governmental Organizations (NGOs), has responsibility for co-ordinating the implementation of the convention to combat Desertification. It must be noted that most states of the Federation have legislation relating to environmental protection, such as edicts on bush burning and deforestation.

The creation of the Department of Drought and Desertification Amelioration in the new Federal Ministry of Environment strengthens the existing institutional arrangement for more effective coordination of activities by Government towards the implementation of the CCD in the country. This will further ensure a sharper focus to rehabilitation and restoration of desertified and desertified-like conditions in the affected areas.

4.3 Sectoral Programmes

In Nigeria, several sectoral and multi-sectoral programmes have been put in place over the years to tackle the twin problem of drought and desertification. A brief review of some of these programmes is given below:

4.3.1 Management of Water Resources

Towards promoting sustainable utilisation of water resources in the drylands, Nigeria established River Basin Development Authorities (RBRDAs) under the supervision of the Federal Ministry of Water Resources. These are actively involved in development of water resources particularly for irrigation (see box 4.1). These efforts include damming and diversion of rivers, and in some areas exploiting underground water. The RBDAs are also involved in improvement of community water supplies and provision of watering points in rangelands. The RBDAs that operate in the semi-arid region of Nigeria include the Sokoto-Rima, Hadejia-Jama'are, Upper Benue, Niger River and Chad Basin Development Authorities.

The Federal Government of Nigeria, with World Bank assistance, has also implemented a programme tagged National Fadama Development Project for the purpose of optimally utilizing the water resources of the wetlands of Nigeria for small scale irrigation. The project was under the guidance and supervision of the Agricultural Development Programmes (ADPs) of the various states. The project provided gainful

employment for the rural populace during the dry season thereby cutting down on the number of peasants that engage in off-season trade in firewood.

Box 4.1

Functions of River Basin Development Authorities (1987)

(a) to undertake comprehensive development of both surface and underground water resources for multi-purpose use with particular emphasis on the provision of irrigation infrastructure and the control of floods and erosion and for water shed management.

(b) to construct, operate and maintain dams, dykes, polders, wells, boreholes, irrigation and drainage system and other works necessary for the achievement of the authority's functions and hand over all lands to be cultivated under the irrigation scheme to the farmers.

(c) to supply water from the Authority's completed storage schemes to all users for a fee to be determined by the Authority concerned, with the approval of the Minister:

(d) to construct, operate and maintain infra-structural services such as roads and bridges linking project sites; provided that such infra-structural services are included and form an integral part of the list of approved projects.

(e) to develop and keep up-to-date a Comprehensive Water Resources Master Plan, identifying all water resources requirements in the Authority's area of operation, through adequate collection and collation of water resources, water use, socio- economic and environmental data of the River Basin.

4.3.2 Forestry Programmes

An Arid Zone Afforestation Project (AZAP) was instituted by the Federal Government in 1976 to tackle the problems of desertification through the establishment of woodlots, shelterbelts and windbreaks. Over 10 million seedlings were raised annually between 1978 and 1984. About 150 kilometers of shelterbelts, 3,680 hectares of woodlots, 24 boreholes, 70 tree nurseries, and Forestry Vocational Schools were established.

The EEC supported a pilot project in Katsina State covering a total area of 1.6 million hectares involving the establishment of shelterbelts, windbreaks, woodlots and trees on farmlands. In addition, the World Bank also financed a similar project in the five arid zone states. The emphasis is on farmer participation and extension. Areas of focus of the Forestry Programme include the following:

- ?? Land Use Policy
- ?? Fuel Energy
- ?? Mass Tree Planting Campaign
- ?? Prevention of Bush Fire
- ?? Silvo-Pastoral System
- ?? Sand Dune Fixation

4.3.3 Agricultural Development Programme

The Federal Government of Nigeria with World Bank Assistance has expended enormous resources to establish Agricultural Development Programmes (ADPs) in all the 36 states of the Federation and the

Federal Capital Territory. The ADPs operate the Training and Visit (T & V) system of unified extension system covering the areas of Crop Production and Protection, Livestock Production and Animal Health, Fisheries, Agro-forestry and Gender related issues in Agriculture popularly referred to as Women-In-Agriculture. This unified extension system is employed for the dissemination of proven agricultural technologies (aimed at ensuring sustainable development) to the small-scale, resource poor farmers who are responsible for well over 90 percent of the national food production. With adequate supplementary funding, the existing extension structures in Nigeria could be positively used to promote sustainable agricultural practices and increase awareness of the need for environmental protection, particularly desertification control, amongst the predominantly agrarian grass-root population.

4.3.4 Energy Resources

Although Nigeria is blessed with abundant renewable energy resources, there is currently a heavy reliance on fuelwood and fossil fuels. Sourcing of fuel wood for domestic and commercial uses is a major cause of desertification in the arid zone states of Nigeria. Currently, fuelwood is the dominant source of energy in the domestic sector. Nigeria consumes well over 50 million metric tonnes of fuelwood annually; a rate that far exceeds the replenishment rate through various afforestation programmes.

The Federal Government, through the Energy Commission of Nigeria (ECN), has put in place the following programmes for the purpose of promoting optimal utilization of renewable energy resources with a view to reducing deforestation associated with fuelwood sourcing:

- ?? training programmes on renewable energy technology
- ?? biogas and biomass utilization projects
- ?? solar photovoltaic electrification projects for remote rural areas

All energy-related environmental projects that are being implemented in Nigeria are guided by the National Policy Guidelines on Energy.

Box 4.2

National Policy Guidelines on Energy (1987)

Our main energy policy guideline has, as its thrust, the environmentally conscious exploitation and utilization of our energy resources in the overall interest of our people, for the present, and the future. Strategies for achieving the goal include:

- Developing and maintaining a regular inventory of our energy resources, current and projected needs including human and material resources.

- Guaranteeing the continuity and adequacy of energy supply in the short, medium and long terms, including appropriate conservation policies.

- Supplying energy at economically favourable cost in the long term;

- Giving due and timely consideration to security and the needs for environmental protection of the public and the working population from hazards arising from the exploitation, conversion, and utilization of energy.

- Improving and intensifying our technological performance capability in the energy sector consistent with self-reliance and the need to attain economic competitiveness; and

- Providing a co-ordinated framework for the implementation of these policy issues.

4.3.5 Integrated Programmes Targeted at Poverty Alleviation

The Federal Government of Nigeria realises that poverty alleviation is a major weapon for combating desertification. Consequently, a number of poverty alleviation programmes have been put in place. Notable amongst these are the Northeast Arid Zone Development Programme (NEAZDP), the FMENV/UNIMAID Linkage model village project, the Katsina State Agricultural and Community Development Project (KSACDP), and the Sokoto Environmental Protection Programme (SEPP).

The North East Arid Zone Development Programme (NEAZDP), funded by the Federal Government of Nigeria with European Union assistance, commenced in February 1990 with the main objective of motivating and assisting the rural population to improve their standard of living through proper resource use and management. The programme covers an area of about 25,000 km^2 in the extreme northern part of Yobe State. Rainfall in the area, which occurs between July and September, is extremely unreliable in amount and distribution (less than 300mm) and in many years barely adequate to support the cultivation of millet which is the primary grain crop of the area. Obviously, major environmental problems of this area are drought and desertification.

The major components of this programme include water resources development and management (including irrigated agriculture), provision of micro-credit for off season economic activities, cottage industries, livestock fattening, rural banking and popularisation of animal traction for land preparation for agricultural activities.

The Federal Ministry of Environment/University of Maiduguri Linkage Centre on Drought and Desertification Control, based at the University of Maiduguri, initiated a model village project at Sabongarin Nangere, Yobe State in 1995. Activities carried out at the model village include establishment of community woodlots and roadside tree planting, provision of energy efficient wood stoves, provision of biogas for domestic cooking, provision of Ventilated Improved Pit (VIP) latrines and provision of solar powered water pump for the community boreholes. The model village project, though presently constrained by lack of funds, is no doubt a major success that deserves replication in other parts of the drylands of Nigeria.

The Katsina State Agricultural and Community Development Project (KSACDP) was conceived as the first stage of an IFAD strategy to speed up and intensify rural development in the drylands, of Nigeria. The rationale was to improve resource management through community participatory processes, principally in-group mobilisation for credit supply and joint action against the serious degradation threatening the agricultural productive capacity of the land. Achievements recorded include improvement in farming practices (in both uplands and fadamas) to make their more sustainable, investments in community and amenity development in the villages and in off-farm income generating activities for groups of poor and landless households with emphasis on those headed by women.

The Sokoto Environmental Protection Programme covers an area of about 17,500 km^2 in the north-eastern part of Sokoto State. The objective of Programme was to improve the utilisation of resources to achieve long-term sustainable growth and environmental protection. The Programme is jointly financed by the Federal Government of Nigeria, Sokoto State Government and the European Union under the Sixth European Development Fund (Lome III). The programme components include Afforestation, Livestock and Rangeland management, and development of rural infrastructures, Irrigation, Women development and Adult literacy. All aspects of the project involve community awareness mobilisation and development. This integrated project has recorded great successes in the various components and has given rise to considerable

improvement in standard of living of inhabitants of the 17,500-km^2-project area.

4.3.6 Building Partnerships

Government has recognised that the hydra-headed problem of desertification cannot be tackled by itself alone. To this end, it has facilitated the involvement of other actors including the Private Sector, Non-Governmental Organizations (NGOs) Community based Organizations (CBOs) and Donors. At present, a number of NGOs are actively involved in the implementation of CCD in Nigeria. Some of them participated very actively in the negotiation process. The Regional Annexes of the Convention and the Resolution on Urgent Action for Africa spell out the expected roles for NGOs as follows:

- ?? Action Programmes, Co-ordination Mechanisms and Partnerships.
- ?? Capacity Building, Education and Public Awareness
- ?? Financial Resources and Mechanisms

Some of the NGOs in Nigeria are actively participating in the activities of the Global NGO network on Desertification. As a matter of fact, the Nigerian Environmental Study/Action Team (NEST) is the sub-regional focal point of this network for Anglophone West Africa. Other prominent national and international NGOs that are actively involved in the implementation of CCD include the Nigerian Conservation Foundation (NCF), Forestry Association of Nigeria (FAN), International Union for Conservation of Nature (IUCN).

Box 4.3

a) The Nigerian Conservation Foundation (NCF)

One of the most active NGOs in Nigeria today, NCF was formed in 1982 with the following objectives:

i. raise public awareness on conservation matters,
ii. encourage and fund conservation research and projects,
iii. protect threatened species and habitats.

The organization has been assisting in the improvement of the Nigerian environment through conservation of existing forest resources and improvement of wood stoves, for an efficient utilization of forest resources.

b) The Nigerian Environment Study/Action Team (NEST)

NEST was formed in 1987, with the sole objective of collecting, collating and disseminating information on the state of Nigerian environment. It makes use of case studies of environmental problems as a basis for mobilizing public opinion against environmental abuse and is a major pressure group for government on all issues relating to the environment.

c) Forestry Association of Nigeria (FAN)

This association was founded in 1970 to sensitize government and the public on conservation issues. It initiated the celebration of the World Environmental day and the launching of the National Tree Planting Campaign in the country.

d) The IUCN

The IUCN established the Hadejia-Nguru Wetlands Conservation Project (HNWCP) in 1987, and it is actively supporting its implementation.

The project was set up in 1987 and is presently managed by IUCN. This project promotes the sustainable use of renewable natural resources through conducting studies, developing management plans and guidelines, advocacy, participatory management, awareness campaigns and demonstration projects. It has demonstrated the viability of ecosystem approach to the management of these resources through its activities in the Hadejia-Nguru wetlands.

Other NGOs, which have general concern for the protection of the environment, include Nigerian Field Society, Young Foresters Club, the Fauna Conservation Society, Ecological Society of Nigeria, Horticultural Society of Nigeria, Nigerian Society for Environmental Management and Planning, Nigerian Environmental Society, Nigerian Society for Biological Conservation, Development Exchange Centre, Edom Development Group, Farmers' Development Union, Forum for Environmental Protection, Green-Crop-Foundation, Nigerian Concerned Group for Environment, Population and Development, Population, Environment and Development Agency, Women Farmers Association of Nigeria, Women Health, Environment and Development Agency, Savannah Watch, Friends of the Environment amongst others

5.0 LESSONS FROM PAST EXPERIENCES

Despite the various national efforts discussed in Section 4, desertification continues to be a serious problem in the drylands of Nigeria. These include the top-down approach to environmental resource management, frequent policy shifts, inappropriate technology and the neglect of indigenous technology in natural resource use and management.

5.1 Top-down Approach

Environmental conservation strategies in Nigeria have been top-down, with limited consultation between and among the various stakeholders. Such strategies usually turn out to be at variance with the basic needs of the people. Resource users and other stakeholders commonly have no access to the decision-making process in decisions that directly affect them and their resources.

Most farmers are marginalised by the process of development and alienated from their productive bases. This has made them to become more vulnerable to environmental hazards of drought and desertification. Increasingly, more people are being pushed to the marginal lands, which seems to be contributing to the process of environmental degradation. It is the marginalisation of this peasantry by the social system, and not the behaviour of the peasantry itself, which appears as the ultimate cause of the destruction of the environment.

5.2 Frequent Policy Shifts

Efforts to combat desertification have been adversely affected by frequent shifts in policy by government. Such policy shifts have been observed to be, as frequently as leaders-come-and-go and such shifts are dictated by the country's economic fortune or misfortune.

Most of the programmes examined in Section 4 have been affected by these changes. A good example is the River Basin Development Authorities (RBDAs), which was an attempt to develop the country's water resources for multi-purpose use to combat desertification as well as mitigate the negative consequences of drought in this zone. The RBDAs have since the 1970s witnessed a number of policy shifts and bodies have

undergone a number of re-organization exercises. Thus RBDAs expanded from 3 in 1973 to 11 in 1976, and to 18 in 1984, further reduced to 11 in 1986 following the economic reforms of the early 1980s, which culminated to the adoption of the structural adjustment programme (SAP). As a result, subventions to RBDAs were reduced to the barest minimum while subsidies on diesel, petrol, engine oil and farm inputs, notably fertilizers, tractor hiring services, herbicides, pesticides and improved seeds were withdrawn. In addition, farmers were expected to fully pay for all the infrastructural services enjoyed by them, including water, which has led to a hike in water charges, especially irrigation fees. All these indicate a non-coherent approach to the management of the water and agricultural resources that management of the water and agricultural resources that were intended for the RBDAs.

5.3 The Use of Inappropriate Technology

The Federal Government's response to the Sudano-Sahelian droughts of 1972-74, and the accompanying ecological and human disasters was the adoption of medium and large scale irrigation. However, this has exacerbated rather than ameliorated the hazards of desertification and drought in Nigeria as it has increased income inequality as well as inequality of access to the productive resources. Technological manipulation of the environment in form of irrigation often produces new hazards such as salinity, water-borne diseases, weed infestation, and accentuates animal, human and plant diseases.

In Nigeria, construction of upstream dams has meant loss of productive base as well as productivity for the down-streamers as witnessed by the construction of the Tiga dam in Kano that is now depriving the water users in Hadejia of access to water. Also in the South Chad Irrigation Project uncontrolled land clearing had exposed much of the area to intense desertification process, which is worsened by the recession of the lake.

5.4 Neglect of Indigenous Knowledge (IK).

A major lesson from the previous efforts is that the lack of incorporation of indigenous knowledge poses a serious problem to adaptation of recommended amelioration measures by the people.

Box 5.1

"Rural people's knowledge is often superior to that of outsiders. Examples can be found in mixed cropping, knowledge of the environment, abilities to observe and discriminate, and results of rural people's experiment. Rural people's knowledge and modern scientific knowledge are complementary on their weaknesses. Combined, they may achieve what neither would alone.'' Chamber (1993)

Farmers and herders in the drylands of Nigeria have always existed in a precarious balance with the harsh and inhospitable environment, dominated by risk and uncertainty. They have, evolved over the years some traditional response mechanisms of coping with such risk and uncertainty in managing their environment. Emphasis should therefore be on building on existing knowledge and capacity.

5.5 Sectoral Approach

Lesson from past efforts is that the sectoral approach adopted has not been able to tackle the multi-dimensional problem of desertification. This approach has often meant that the relevant ministries and Agencies have been operating in compartmentalized fashion. There is also a high degree of overlapping and duplication of efforts as a result of lack of effective coordination at all levels.

5.6 Inadequate Finance

The magnitude of desertification problem in Nigeria requires funds that are far in excess of what is currently allocated by government. This has meant that the finances allocated so far have not been able to have any significant impact in combating desertification.

The lessons learnt from past efforts as stated above need to be taken into consideration in the formulation and implementation of the National Action Programme on Desertification.

6.0 THE NATIONAL ACTION PROGRAMME

6.1 Guiding principles

The long-term efforts at combating desertification and mitigating the effects of drought seems to lie in the reversal of the present development strategy to that of a programme of action, which makes the struggle for environmental purity, including agricultural development essentially endogenous affairs. Such a strategy must be based on the philosophy of self-reliant development, founded on self-determination at all levels. This involves the use of indigenous technology and resources, learning from the farmers and herders about their knowledge of environment and the various traditional survival strategies and ways and means of building on them. This is based on the bottom-up approach to development planning, and a relative autonomy for the local population to determine the nature of agricultural production and other land use practices.

In general, this National Action Programme, in accordance with the relevant provisions of the UNCCD, are based on the following guiding principles:

- ?? Subsidiary – action at the national level is subsidiary to that of the local leevel.
- ?? Inclusiveness – multisectoral
- ?? Synergy – linkages among all stakeholders and complimentarity of efforts.
- ?? Patnerships – among Resource Users, Private Sector, NGOs, government, Donors etc.
- ?? Incrementality – actions proposed are increamental to on-going activities.

6.2 Scope and objectives of NAP

The objective of the National Action Programme to combat desertification is to develop long-term, integrated strategies that focus simultaneously, in affected areas, on improved productivity of land, and the rehabilitation, conservation and sustainable management of land and water resources, leading to improved living conditions, in particular at the community level.

This National Action Programme, in line with Article 10 of CCD, addresses the following issues:

?? Identification of the factors contributing to desertification, and practical measures necessary to combat desertification and mitigate the effects of drought,

?? Specification of the roles of the various stakeholders

?? Strategies to combat desertification and mitigate the effects of drought, paying particular attention to the implementation of preventive measures for lands that are not yet degraded or which are only slightly degraded; and enhancing the capacities of the nation to provide drought early warning.

One major thrust of the NAP is the promotion of alternative livelihoods and improvement of national economic environments with a view to strengthening programmes aimed at the eradication of poverty and at ensuring food security; sustainable management of natural resources; sustainable agricultural practices; development and efficient use of various energy sources; institutional and legal frameworks; strengthening of capabilities for assessment and systematic observation, including hydrological and meteorological services, and capacity building, education and public awareness.

6.3 Actors / Stakeholders and Expected Roles

Actors/stakeholders for desertification control and drought mitigation are classified under the following headings: Resource Users, NGOs and CBOs; Private Sector; Public Sector; Academia and Development Patners. Expected roles for these actors are presented Table 6.1.

6.4 The Issues

Specific causes of desertification in the dry lands of Nigeria include land degradation resulting from drought, inherent low soil fertility/declining soil fertility, inadequate feed and fodder for livestock, depletion of surface and ground water resources, low forest cover, poor legislative framework, poor coordination of programme activities and inadequate capacity for programme planning, formulation and implementation. These specific issues relating to desertification and factors responsible for them are summarised in Table 6.2.

Table 6.1 Actors/Stakeholders in Desertification Control in Nigeria

Actors/Stakeholders	Expected Role
Resource Useers, NGOs and CBOs	?? Advocacy, Environmental Education and Public awareness ?? Mobilisation of resources and grassroot participation ?? Implementation and monitoring of Projects
Private Seector	?? Identification of Projects ?? Funding of desertification projects
Public Sector	?? Formulation of policies relating to Drought and Desertification ?? Implementation, Coordination and Monitoring of Projects ?? Mobilisation of grassroot participation ?? Environmental Education and Public Awareness ?? Funding of programmes and Projects ?? Extension Services
Academia	?? Carry out appropriate research in support of desertification control ?? Assist with project implementation
Development Partners	?? Provision of information and technical assistance ?? Incremental funding for programmes and projects ?? Capacity building.

Table 6.2: Issues Relating to Desertification in the Drylands of Nigeria

The Issues	Causes
Drought	?? Climatic variations ?? Low soil water holding capacity
Inherent Low Soil Fertility/declining soil fertility	?? Low soil organic matter levels of the drylands ?? Cultivation of marginal lands ?? Population pressure in reduced/eliminated fallow period ?? Land tenure problems
Inadequate Feed and Fodder for Livestock	?? Livestock population in excess of the carrying capacity of the rangelands ?? Increasing migration of livestock from neighbouring countries such as Chad, Niger, and Cameroon ?? Encroachment of crop cultivation into designated Livestock routes and grazing reserves.
Depletion of Water Sources (Surface and groundwater)	?? Damming of rivers, thus depriving downstream water users of access to water ?? Increasing human and livestock populations ?? Increasing demand caused by increasing urbanization and industrialization
Low Forest Cover	?? Excessive wood extraction for fuel and construction ?? Bush burning ?? Uncontrolled land clearing for agricultural purposes
Poor Legislative Framework	?? Low level of education and public awareness ?? Conflicting Policies and regulations ?? Poor enforcement mechanism
Inadequate Capacity	?? Uncoordinated research efforts on problems relating to drought and desertification ?? Obsolete research and meteorological equipment ?? Low and erratic funding for desertification projects
Poor Coordination of activities	?? Sectoral approach to project planning, formulation and implementation ?? Insufficient involvement of all stakeholders, particularly resource – users, in project planning, formulation and implemetation

6.5 Specific Actions and Strategies

Actions and strategies to address identified problems are presented in the following matrix:

MATRIX 6.1 Strategies and measurable indicators

Themes/Sub- Themes	Problems	Objectives	Activities	Responsibilities	Indicators	Cost	Time Frame	Assumptions
Themes 1. Agriculture Livestock, Landuse etc (a) Crop Production	?? Inherent low fertility ?? Low moisture holding capacity of the soil. ?? Poor crop production techinques ?? Inappropriate use of agro-chemicals ?? Inadequate storage distribution of food and raw materials	To achieve self-reliance in the prod. And supply of food and raw materials in sustainable manner	?? Strengthen the national integrated agricultural extension system ?? Produce up-to date land capability maps ?? Popularise on-farm soil fertility improvement practices ?? Promote production of organic fertilizers on commercial scale ?? Ensure adequate availability of inorg. Fertilizer and its appropriate use. ?? Popularise farm forestry ?? Popularise drought resistant, early-maturing crop varieties ?? Identify and strengthen indigenous coping mechanisms.	?? FMEnv. ?? Line Ministries and Agencies ?? Organised Private sector (OPS) ?? NGOs, CBOs ?? Development Patners ?? Resources users ?? Research Institutes/ centres.	?? Increased crop yield. ?? Increase in soil productivity and crop performance. ?? Adoption of on-farm soil fertility improvement practices. ?? Availability of packaged organic fertilizers ?? Ready availability of chemical fertilizers ?? Adoption of drought resistant, early-maturing crop varieties ?? Improved stored product quality and increase in shelf-life of products		0-5yrs	?? Political and economic stability ?? Adequacy of funds and its timely release ?? Availability adaptability and acceptability of required technology ?? Favourable climatic condition
	Problems	Objectives	Activities	Responsibilities	Indicators	Estimated Cost	Time Frame	Assumptions

Themes/Sub-Themes						Cost	Frame	
(b) Livestock production	?? Overstocking which leads to overgrazing ?? Declining fodder yield leading to shortage of food, paarticalarly inappropriate mgmt.. practices ?? Non-integration of local stakeholders with pastoralists. ?? Encroachment on grazing lands and stock routes ?? Inadequte level defined grazing reserves ?? Lack of qualitative pasture and water ?? Pests and diseases (Livestock Health) ?? Ineffective Livestock extension services. ?? Insecurity of land-tenure and access to land	To improve rangeland management for increased livestock production and efficient utilisation of resources	?? Integrate traditional pastoralists into the economic system through settlement in developed grazing reserves and granting of land tenure rights ?? Rehabilitate and protect lost grazing routes reserves and establish new ones. ?? Promote fodder bank establishment for dry season feeding ?? Review landuse decree to improve pastoralists access to land. ?? Strengthen livestock extension service to deliver comprehensive health care ?? Re-demarcate livestock routes and grazing reserves. ?? Create watering points at strategic locations in grazing reserves and along livestock routes.	?? FMEnv. ?? Line Ministries and Agencies. ?? Resource users ?? Traditional leaders/rulers ?? NGOs, CBOs ?? Organised Private Sector (OPS) ?? Development Patners	?? Clearly demarcated and gazetted grazing reserves and stock routes ?? Reduced farmer/pastoralist conflicts ?? Availability of good quality livestock feeds in adequate amount especially during dry season ?? Availability of livestock products to consumers at affordable prices		0-5yrs	?? Political and economic stability ?? Adequacy of funds and its timely release ?? cooperation of the primary resource users
2. Water Resources	?? Pollution of surface and underground water ?? Depletion and disappearance of water-body	To ensure coordinated approach to the mgmt. Of water resources among various stakeholders that will promote environmental sustainability	?? Institutionalise multi-sectoral and integrated water resources management approaches that promote rational utilisation and conservation based on community needs and priorities and the aprotection	?? FMEnv ?? FMWR ?? Other Line Ministries /Agencies	?? Reduced frequency of conflicts among water users ?? Increased output from		0-5yrs 5-10yrs	?? Political and economic stability ?? Effective coordination

	?? Problems arising from seasonal flooding and wind erosion ?? Inadequate hydrological data ?? Inappropriate construction of dams and operation ?? Conflict among water users ?? Scarcity of water ?? Inefficient and uncoordinated exploitation of water ?? Siltation of water channels	sustainability	of the ecosystem. ?? Maintain a comprehensive database on the sources, quantity, quanlity, utilization and management of the nation's water resources. ?? Promote water conservation through improved water use efficiency and wastage minimisation schemes for all users ?? Regulate and ensure the rational use of fadamas and other wetlands to conserve and protect the ecology and habitat important to their unique biodiversity. ?? Undertake continuous monitoring and evaluation of the performance of irrigation projects to ensure optimum resource utilisation and maintenance	?? Farmers and other resource user ?? NGOs, CBOs ?? OPS ?? Development patners	irrigated agriculture ?? Functional data base on water resource ?? - Availability of portable water in adequate quality and quantity			evaluation and monitoring ?? Adequacy of funds and its timely release ?? Cooperation of neighbouring countries sharing the transboundary water resources
Themes/Sub-Themes	Problems	Objectives	Activities	Responsibilities	Indicators	Estimated Cost	Time Frame	Assumptions
			?? Encourage traditional/indigeneous methods of preventing/minimising water wastage and pollution. ?? Strengthen the capacity of relevant institutions to undertake research and programme implementation					

Themes/Sub-Themes	Problems	Objectives	Activities	Responsibilities	Indicators	Estimated Cost	Time Frame	Assumptions
3. Environmental Rehabilitation Regeneration and Conservation	?? Wood extraction for fuel and construction ?? Threat by invasive species ?? Mobility of sand-dunes leading to destruction of	To improve the quality of the environment in order to meet the need of the present and future generations	?? Facilitate Community based user participation in forest and wildlife conservation planning, management and development ?? Promote environmentation of the National Forestry Action plan	?? FMEnv ?? ECN ?? Other Line Ministries and Agencies ?? Farmers and other recourse users ?? Tranditional Leaders	?? Increased density of trees on farms ?? Incresed forest coverage in communities ?? Reduced consumption of fuelwood		0-5yrs 5-10yrs >10yrs	?? Political and economic stability ?? Strong political will

	destruction of arable land, settlements and roads ?? Mining – induced land degradation		?? Strengthen existing forestry and biodiversity conservation, related institutions and programmes to make them move effective ?? Adopt protection forestry and wildlife development strategies, including shelter belt establishment, afforestation of eroded sites, stabilization of sand dunes etc. ?? Develop snf rncourage the sustainable use of efficient alternative energy sources such as solar, wind, bio-gas and bio-mass stove at affordable prices. ?? Enhance capacity in forest and wildlife resources development and management including, manpower development and research into conservation and improvement of soil, genetic resources, silvi-culture, utilization of forest products, agro-forestry and wildlife.	Leaders ?? NGs and CBOs ?? OPS ?? Developments patners	of fuelwood ?? Ready availability of alternative energy sources ?? Greater number of parks			?? Positive attitudinal change on the part of resource users ?? Adequacy of funds and timely release

Themes/Sub-Themes	Problems	Objectives	Activities	Responsibilities	Indicators	Estimated Cost	Time Frame	Assumptions
4. Policy, Institution and Legal Framework	?? Poor enforcement of existing legislations ?? Conflicting sectoral policies ?? Obsolete polices and laws ?? Weak institutional capacity ?? Lack of proper consultation in policy formulation ?? Sectoral approach to Policy formulation and implementation	To develop a comprehensive policy streamline all legislations and regulations and ensure their enforcement for desertification control	?? Review existing policies and regulations to identify gaps ?? Streamline and update existing policies and regulations ?? Sensitize policy makers about desertification Laws and the need for enforcement mechanism ?? Strengthen relevant enforcement institutions ?? Monitor implementation of Policies and enforcement of the Laws and regulations	?? FMEnv ?? Fed. Ministry of Justice ?? Other Line ministries and Agencies ?? National /State Assembles ?? Local Councils	?? Harmonized Legislations on Desertification ?? Reduced conflicts in legislations ?? Effective Legislation enforcement mechanism		0-5yrs	?? Political and economic stability ?? Strong political will ?? Positive attitudinal change on the part of resource users

Themes/Sub-Themes	Problems	Objectives	Activities	Responsibilities	Indicators	Estimated Cost	Time Frame	Assumptions
5. Finance Implementation and sustainableility	?? Inadequate funding ?? Untimely release of funds ?? Inadequate funds participation of organized private sector ?? Misapplication of funds ?? Weak capacity for implementation ?? Limited participation beneficiaries in the project cycle ?? Poor maintenance culture	To mobilise adequate financial resources to address issues relating to drought and desertification in a sustainable manner	?? Develop a resource mobilisation strategy ?? Integrate costs for desertification control into annual budgets and rolling plans. ?? Take advantage of bilateral and multilateral funding mechanisms ?? Participate actively in the implementation of the UNCCD ?? Promote accountability and transparency in programme implementation ?? Ensure participation of all stakeholders in programme planning, formulation and implementation	?? FMEnv ?? Fed. Ministry of finance ?? National planning commission ?? Ecological funds office ?? Other Line ministries and Agencies ?? OPS ?? NGOs, CBOs ?? Development patner	?? Desertification Control Trust Fund established ?? Desertification control Integrated into Budget Lines ?? Accountability and transparency ensured		0-5yrs 5-10yrs	?? Political and economic stability ?? Strong political will ?? Cooperation of OPS and Development patners ?? Positive attitude on the part of progamme and project Implementors

7.0 FUNDING

7.1 Sources of Funds

The Federal Ministry of Environment and the Federal Ministry of Agriculture & Rural Development are the key institutions responsible for the implementation of desertification control in the country. However these institutions derive their funding from annual grants through the Federal Ministry of Finance, special grants from the Ecological Fund Office and residual funding assistance either in cash or in kind from bilateral and multilateral organisations.

7.1.1 Budgetary Allocations

Funds are released only for projects that have been admitted in the National Rolling Plan. Desertification control programmes have been admitted in the National Rolling Plan since its inception in 1975. The allocations for desertification control are channelled through projects in the Federal Ministries of Agriculture and Natural Resources and that of Water Resources and FMEn. The projects that relate to desertification control in the Federal Ministries include.

- ?? Fire Monitoring and control in National park
- ?? Protection of flora and fauna in National parks
- ?? Wildlife habitat protection and monitoring
- ?? Research into arid and semi-arid zone afforestation effort
- ?? Research into afforestation of ecologically degraded sites
- ?? Communal Forestry Development
- ?? Arid zone afforestation
- ?? World Bank Forestry II
- ?? Tropical Forestry Action Programme
- ?? EEC-Assisted Afforestation Projects in Katsina, Borno and Sokoto States
- ?? Building of dams in semi-arid areas
- ?? Provision of water for livestock
- ?? Soil erosion control projects

Under Federal Ministry Environment, the following projects relate to desertification control:

- ?? Implementation of conventions, protocols and agreement including Agenda 21;
- ?? Nigerian Environmental Management Project
- ?? Conservation Assessment and Management Plan;
- ?? UNDP Assisted Environment and Natural Resources Management Programme;
- ?? Environmental Impact Assessment Implementation Projects.

7.1.2 Ecological Fund

This is a special fund set aside by the Federal Government in 1981 for the amelioration of ecological problems. Originally, it was 1% of the Federation Account but was later increased to 2%. Funds have been released from this special vote to finance desertification and drought relief projects either through Federal Institutions or State Governments. It is an extra-budgetary source of funding targeted at mitigating environmental degradation. The Secretariat of the Fund is located in the Presidency and is responsible for processing all requests for funds, documentation of all disbursements, monitoring and co-ordination and general administration of the funds.

7.1.3 Bilateral and Multilateral Sources

These make their funds available to projects through the National Planning Commission for grants and the Federal Ministry of Finance in case of loans. The funds are meant to finance desertification control projects including policy, establishment of vegetation, poverty alleviation, awareness campaigns and other socio-economic activities. The key institutions financing desertification control in Nigeria include World Bank, European Union, African Development Bank, Secretariat of the Convention to Combat Desertification and the United Nations Development Programme (see section 6 for one list of stakeholders and their expected role).

7.2 Funding Mechanism

The following strategies are to be adopted for funding of desertification control programmes:

- ?? About 15-20 percent of the ecological Fund to be used for funding desertification control programmes/projects
- ?? Establish a National Desertification Control fund with contributions from governments, individuals and corporate bodies (with necessary tax incentives). Debt for environment swaps (both bilateral and three party models) can be used to feed the proposed National Desertification Fund. This Fund shall be revolving and will be managed by FMEn for financing desertification control programmes and for providing emergency assistance to victims of drought.
- ?? The Desertification Control Fund shall be replicated at the state and local government levels with state and local governments contributing 2 percent of their revenues into the fund for the purpose of financing drought and desertification control programmes at the state and local government levels.
- ?? Mobilize additional finance through imposition of taxes, fines and charges, where appropriate, on activities that degrade the land.

8.0 Monitoring and Evaluation

The set objectives of this National Action Programme cannot be achieved unless the implementation of the proposed actions is properly monitored and periodically evaluated.

For this purpose, the following strategies shall be adopted to ensure proper coordination and implementation of the proposed actions:

- ?? Strengthening of the National Coordinating Committee on Desertification Control (NCCDC) and review periodically the implementation of the National Action Programme.
- ?? Strengthening of the capacity of the NCCDC Focal Point and Secretariat in the Federal Ministry of Environment .
- ?? Development of Benchmarks for assessing progress of Programme Implementation.
- ?? Submission of Quarterly Progress Reports on the implementation of programmes to the National Focal Point.

Annex 1 Selected On-Going/Completed Projects

PROJECT	OBJECTIVES	FUNDING $ OR ₦	INSTRUMENTS/ ACTIVITIES	OUTPUT	INDICATORS
WORLD SOLAR PROGRAMME 1996-2005 (1) Integrated Rural Village Energy Supply (solar village).	To provide the energy needs of remote rural area	Int $2,084,379 Local ₦11,444,400	1. Feasibility studies 2. Equipment instillation 3. Training of local skills	Feasibility Equipment installation in the rural community trained artisers	Installation completed local skills trained.
(2) Development and dissemination of efficient Biomass stoves, oven and Briquetting Technology	To reduce the problems of shortages in the supply of fuelwood and the environmental degradation due to its large scale use	Int $417,934 Local ₦42,065,650	1. Design ,construction and dissemination of (a) Improved stoves (b) Briquetting Techniques 2. Training of local skills	- Briquettes - Improved stoves - Trained artiser	Nos of equipment produced and sisseminated Nos of local skills trained.
(3) Popularization of Biogas and Biofertilizer Technology	- To popularize the use of biogas and biofertilize - To improve local competent I the skill.	Int $725,406 Local ₦45,852,000	1. Construction of biodigester in selected locations nationwide.\training of local skills 2. Biogas stoves	- Biogas plant - Biofertilizers	200 Biogas units installed. Biofertilizers available
(4) Establishment and operation of woodlots	- To provide sustainable source of fuelwood for the rural areas. - To reduce erosion and desertification - To improve the environment.	Int $875,523 Local ₦11,388,300	Establishment of demonstration woodlots	- Local woodlots - Reduced desertification - Erosion prevented - Improved environment.	50 woodlots established.

(5) Rural Health care and potable water supplying solar-PV.	- To improve the quality of human capital through improved health care delivery. - Preservation of vaccines and drugs	Int $7,232,544 Local ₦14,843,125	Installation of solar pv to provide electricity and pump water.	- Vaccine and drug preservation modules - Electricity for health care centres	100 units solar PV installed
NPRP (Domestic Resources)	To finance poverty reduction at start level through govt. community and planning	$100 million per 5 person for the PRF	Finance enterprise Agric/non-agric community based social and economic lifestridre through cutting from local participation capacity building		
PRP (WB) other donor	Support the lagitute of Nation and strategy on poverty reduction	$50 milliom $50 milliom other donors			
PRD (UNDP)	Pilot in 6 countries				
Fat Trank Equipment generated prog.	To finance short term employment for unemployment youth through infrastructural work.	$100 million	Finding for labour intersive conspocy popth given priority to unemployed youth and women		
IFAD Kastina RDP	Poverty reduction and NRM	$30 million	Finding of enterprises development and community based natural resource magt.		
IFAD Sokoto RDP	-	$32 million	-		

H_2O Sector FADAMA II WB	Finance development of small scale irrigation through the use of fadama and wells.	$500 million	Rural credit		

Micro watershed PRM	NRM and protection of environment	$120 million	Financing of community based NRM		
Centre for Arid Zone Studies UNIMAID		4.12 million ECU	Research, Human Development and environmental monitoring	7 Ph.D several M.Sc. participated in boundary delineation through the National Boundary Commission, Farming Systems of North-East, Provide trained specialists in community Agric & Environmental problems	

PROJECT	OBJECTIVES	FUNDING $ OR ₦	INSTRUMENTS/ ACTIVITIES	OUTPUT	INDICATORS
Forestry II Project (completed) (Sokoto State)	- Afforestation - Control of desertification - Environmental education	$8.6 million	Shelterbelt estab. Seeding production Woodlots estab. Road side planting Orchards estab. Contact farmers reg. Researches Sand dones fixation Building construction World Bank funding Fed. Govt. Funding State Govt. Funding	410KM 14,000,000 331Ha 53km 445Ha 4160ND 80 Plots 80 Ha. 23 Units Adequate/timely Grossly inadequate and untimely. Satisfactory	Shelterbelt Seedling production Woodlots Road side planting Orchards Contact farmers Researches Sand dones fixation Building construction
SEP/EEC (Completed) (Sokoto State)	Desertification control and Environmental protection	$34.45 million	Shelter belts estab. Windbreaks estab. Woodlots estab. Amenity planting Tress on farmland	82km 150km 1300Ha 500,000 seedlings 2000 Ha	Improved farmlands productivity Protection of farmlands Improvement of income and land protection Provision of shade Improved productivity
SEPA (On-going) (Sokoto State)	Desertification control and Environmental protection	Federal and states funding	Woodlots estab. Windbreaks estab. Trees on farmlands Roadside planting	50Ha 215 Km 250Ha 26Km	Improved farmers income Improved productivity Roads protected and beautified
Sokoto Agricultural and community Development project SACDP/IFAD (On-going	To improve the livelihood of poor house holds through interventions designed to increase and sustain production in agricultural and small rural enterprises, and to arrest and reverse, where possible, environmental degradation.	IFAD – 77% FGN – 16% SG – 5% Farmers – 2%	1. Degraded/grazing lands development 2. Gross hedging 3. Gulley erosion control 4. Free-seedlings production	1,118ha established 3180 ha established 26 sites (1,400ha) established 548,000 (Assorted) seedling produced.	Farmers have been trained various techniques on soil conservation and reclamation as a result of which degraded farmlands have been reclaimed For productive and sustainable agriculture

PROJECT	OBJECTIVES	FUNDING $ OR ₦	INSTRUMENTS/ ACTIVITIES	OUTPUT	INDICATORS
Grazing Reserve Development Tullun Gwanki Grazing Deserve (On-Going) (Sokoto State)	Pasture production for L/Stock grazing and control of erosion plus Land reclamation	Federal government undertaken (PTF) ₦139,575,693.60 Approved ₦139.5m	Pasture establishment and development in the selected grazing reserve as well as the establishment of essential facilities and services covering all aspects of the rehabilitation components in buildings, infrastructures, plants, equipments and furniture.	Construction of dams (2 nos) at strategic locations of the reserve. Also construction of one borehole, one ring well, proposed g/res settlement (staff etc) Road network G/res. Boundary demarcation, proposed pasture development areas to be fenced using chain linke wire and angle iron etc.	Security for both livestock and the pastoralists; soil covers and green grass cover.

PROJECT	OBJECTIVES	FUNDING $ OR ₦	INSTRUMENTS/ ACTIVITIES	OUTPUT	INDICATORS
1. Stockroutes reserve development project (Sokoto State) A. Transhumance SRP – is (Completed) B. Others: (On-going)	1) Checking of soil – erosion and overgrazing in the grazing reserves 2) Checking of renge-fire outbreaks in the Grazing reserves	FGN/Sokoto Sokoto State under taking (₦2.5m) (₦2m)	Survey and demarcation of interr-national cattle route 2km apart	Demarcation of 286.2km stock routes in 14 LGAs of Sokoto State	Reduction of range fire outbreaks in forests and grazing reserves.
2. Grazing reserves development (Sokoto State) A. Tsauna Grazing Reserve (On going)	Production of pasture for animal grazing and soil cover for erosion control and land fertilization.	FGN/Sokoto State undertaking (N2m)	Pasture establishment and development in the grazing Areas and reserves	Established pasture to combat erosion by wind and rain in our grazing areas	Green – grass cover on top of the soil in our grazing areas.
FORESTRY II. (1987-1996)	a. Strengthen the structural base of the forestry sector through improved policies, manpower development, studies, revenue collection system and research. b. Stabilize soil conditions in threatened areas of the Northern and central regions of the country through increase in the supply of fuelwood, poles and fodder by supporting farm forestry and shelterbelt activities. c. Increase the supply of industrial wood by improving the management of existing high priority plantations and also the establishment of new industrial plantations.	US$ 95.4 Million (World Bank US$71.Omill.) (FGN-US$24.4 Million)	a. Afforestation Programme (AP). - Production of seedlines - Establishment of shelterbelts -Farm forestry activities- including establishment of woodlots, boundary plantings, on farm planting (scattered/clustered) and Orchard. - Development and distribution of efficient fuelwood stoves. b. Forest Management Programme (FMP) - Inventory of plantations and determination prescriptions.	a. Aforestation programme. - 130 million seedlings produced and distributed to farmers and institutions for planting. - 2,083km of shelterbelt established. - 330,000 farm families adopted and participated in farm forestry activities. - 4,882 ha of wood lots/orchards established. -3500 fuelwood efficient stoves	- Reports of meetings and surveys. -Reports of meetings with neighbouring countries; - Survey manuals produced; - maiduguri Lake Chad Research Institute identified as insectory; - Draft Action plan developed for Integrated pest management - Plantations, shelterbelts and woodlots established; -reports of studies conducted; - Staff trained; - fuelwood – efficient stoves fabricated and distributed; - Implementation completion

				efficient stoves fabricated/procured and distributed to rural households. b. Forest Management programme. - 10,942 Ha of plantation inventoried.	reports (Borrower's and Lender's)
			- Plantaton thinning - Establishment of new plantations. - General Management of existing old plantations including fire protection. This involved the coordination activities of FORMECU with its Regional Office, APCU, Kano. FORMECU provided implementation assistance to the project states in areas of project formulation, Trainings monitoring and evaluation, staff recruitment and studies.	- 3,226 km of forest roads/rides maintained. and monitoring visits to the project states. - 21 studies were carried out provision of 192 man years of technical assistance - 5,073ha of new plantation established. c. Programme Management. - 774 technical support - 1968 staff benefited from	

				trainings. - Operation and maintenance of two vocational training centres- FMDC, Oluwa and FVTC, Kano.	
National Forestry Action programme (planning Completed, 1992-1996)	Formulating a coherent development strategy for the forestry sub-sector in Nigeria, with proposed priority projects to address main issue identified.	US$ 695,500.00 ₦4.862 Million	- Establishing a National ordinating unit, 4 Regional Offices and State Coordinating Units. - Collection and Collation of data - Formulation of development plans to meet the needs of each state, region and the nation.	- National, regional and State Coordinating Units established. - State, Regional and National Forestry Action Plans Formulated. -Training, Workshops, Seminars organized and awareness created. - Equipment and vehicles acquired. - The public and policy makers sensitized.	- Nigerian Forestry Action plan development, with priority projects identified and ratified by FGN. - 7 study reports, 9 working Group reports. - 36 State Forestry Action plans. - 4 Regional Forestry Action plans. - Staff trained (13 Overseas, 94 local).
Environmental Management project, Forestry Node (1993-1998).	(i) To strengthen Nigerian environmental organizations, and to assist them in implementing their programmes; (ii) To establish a	WB-US$3.01 million FGN-US$0.19 million Total – US$3.20 million	- Organize workshops for review of LUV Maps and to review outcome of LUV assessment. - Train staff and provide institutional strengthening.	- field monitoring centres established. - A Remote Sensing and Geographic	- 42 staff trained (27 Overseas, 15 Local). - Vehicles and Equipment procured. - GIS Lab. In FORMECU - 6 Field monitoring centres at

	programme of data collection that enables the government to measure levels of environmental degradation and to be aware of environmental trends over time; and (iii) To complete a series of sector investigations and feasibility studies leading to soundly conceived programmes including capital investments necessary to redress the prevailing degradation. (iv) To create an effective environmental programme at the national and state levels that integrates environmental activities on an inter-sectoral and inter-regional basis.		- Procurement of vehicles and equipments, - Conduct studies.	Information System (GIS) Laboratory established; - Vehicles and equipments procured; - Studies conducted; - Establishment of Environmental Information system for networking. - pilot study developed for participatory Forest reserve Management.	Okitipupa, Kwale, Enugu, Mokwa, Zaria and Gubio. - Report of studies completed and implementation completion Reports. - Management plan for Wuda Taye (Borno), Kpashimi (Niger) and Omo (Ogun) Forest Reserves.

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