

FEDERAL REPUBLIC OF NIGERIA

Report on:
The Problem of Encroachment on
Arable Land in Nigeria

Prepared for the:
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Encroachment on Arable Land in Africa
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THE PROBLEM OF ENCFACMENT ON
ARABLE LAND IN NIGERIA.

1. INTRODUCTION

1.1 The Land Resources of Nigeria:

Nigeria has a land area of 925,768 km² or approximately 92.4 million ha., which places her as the 14th largest country in Africa. With a population estimated at 80 million, every inhabitant theoretically has only 1.15 ha. of land available for meeting basic economic, industrial and social needs. Lying between latitudes 4°N and 12°N, on the west coast of Africa and with 680 km of coastline, land is not homogenous and is therefore not fully accessible and utilisable for any or all of these basic needs. Information from various sources, confirmed by surveys using the Side-Looking Airborne Radar (SLAR) in 1973-77, revealed the wide ecological variation, land-use pattern and practices as well as the forest resources for which the SLAR investigation were principally designed.

The three broad vegetation types as we commonly know them range from the coastal mangrove swamp through the tropical lowland rainforest to the savanna belts in the north. From 12°N latitudes upwards stretching across the country from East to West, is area designated as the Arid Zones because of its poor ecological quality and low agricultural potential. The area occupies about one-fifth of the land area of Nigeria with a population of about 28 million people.

At the extreme south the mangrove belt occupies 5% or about 4.6 million ha (46,200 km²) of the country. This area, like the arid zone, is ecologically disadvantaged in terms of ease of cultivation or afforestation as compared with the rest of the country. They, nevertheless, constitute an immense economic potential agriculturally.

The savanna belts (Derived, Guinea, Sudan and Sahel, in that order moving from south to north) occupy 80% of the total land area of Nigeria. While most of savanna is suitable for efficient production of arable crops, they are easily susceptible to soil degradation and erosion. The rate of rejuvenation of disturbed vegetation is slow due to slow growth occasioned by water stress, high temperatures, and frequent and regular fire outbreaks which have characterised our farming and hunting methods. The Guinea zone, occupying approximately 50% of the land area of Nigeria has been identified as having an immense potential for agriculture including afforestation.

1.2 The Landuse Pattern and Practices:

Table 1 shows the Nigerian landuse pattern as revealed by the NIRAD Forestry Project in 1978.

Land Use	Area (000 ha)	% of total land area
Forest and other wooded area:		
Forest	31,339	33.9
Open woodland	35,786	38.8
Arable and land under permanent:		
Crops	24,605	26.6
Others	<u>647</u>	<u>0.7</u>
Total =	<u>92,277</u>	<u>100.0</u>

Approximately 10% of the total land area of Nigeria is the forest estate legally constituted forest reserves, widely spread over the whole of the country, embodying forested lands as well as savanna woodlands. In practice, only 2% of the total area of Nigeria is productive commercial forest land, and this occurs mainly in the high forest region of the south. Approximately, 34% of the land area is forest of different levels of densities and

Arable land and land under permanent crops occupy about 27%. Thus at least 70% of Nigeria's land surface is cultivable land. Landuse practices and farming systems are characteristically influenced by tradition as much as by physical factors of climate, soil and vegetation. In the closed forests of the south heavy rains prevent effective mechanisation and farming remains laborious. In the savanna woodlands, however, the sparse vegetation coupled with the low rainfall encourage mechanisation practices, but not without the attendant problem of soil erosion when land is poorly managed. What seems to be an intractable problem is that of finding an alternative to the age-long practice of shifting cultivation. However, recent changes in emphasis in our agricultural policies have stimulated both large-scale agricultural enterprises on one hand and small-scale farmers on the other. The major problem arising from this is that of land acquisition and land management under agriculture: Where can the land be found? How can it be acquired? What compensations need to be paid? How secure is such land for agricultural investments? If the land is secure from human influences or encroachments of all kinds it is not insured against climatic or natural disasters such as floods, droughts and epidemics.

2. IDENTIFICATION OF WHAT CONSTITUTE ENCROACHMENT ON ARABLE LAND:

2.1 Institutional Relationships.

Apart from environmental causes of encroachment on land, certain interdisciplinary activities themselves constitute encroachment in relation to one another's roles. What constitutes a productive activity for one discipline for instance, forest clearance for arable crops, is a negative activity for forest production. Similarly, grazing in a forest plantation attracts the discomfiture of forestry because of the dangers involved in such multiple landuse of forest lands. Thus, incompatibilities exists in attempting to maximise the varying benefits and these have led to management conflicts in the past. Nevertheless, the new policy on integration of

conflicts and will rather emphasise interdisciplinary linkages in agricultural production. The principal agency for effecting this change is the River Basin and Rural Development Authorities (RBRDA's) whose duties, entail provision of agricultural infrastructures and inputs aimed at motivating the small-holders with whom about 80% of Nigeria's agricultural production rests. The RBRDA's would practice integrated agriculture and hopefully integrated land use in the near future.

2.2 The major agents or phenomena encroaching upon arable land in Nigeria may be classified into 2 categories as follows: (a) causative factors and (b) catalytic factors i.e those factors which tend to accelerate or worsen the process of encroachment.

(a) Causative factors are:

- (i) Mineral exploration
- (ii) Farming activities
- (iii) Physical developments

(b) Catalytic factors are:

- (i) Desertification
- (ii) Floods
- (iii) Soil Erosion

2.3 Minerals prospecting and Exploration:

Perhaps the greatest single human encroaching on arable land is minerals prospecting. The two most important minerals in this category are tin mining in Jos Plateau and petroleum in the high forest of the south. Associated with gas flaring since the early 50's in Nigeria, petroleum prospecting and mining has claimed large expanse of potential farmlands. Characteristically, forests are cleared and exploration grids and sites are cut across farms and when oil is discovered existing assets and even structures are not spared because of the value of the minerals underneath.

and forest areas of Nigeria. IN some cases, fresh water swamps are covered in crude oil, killing all the fish, and food crops are literally drowned in oil spills. Gas flaring literally burns all crops and soil around flaring points

Because this phenomenon affects livelihood of a large number of people, The Federal Government of Nigeria has accorded oil pollution a national disaster status.

In Jos Plateau, however, tin mining activities which began in the 50's have up-turned agricultural soils over a large area of the plateau resulting in soil impoverishment. Only forest trees can grow in most of these areas. At some stage it was obligatory for mining companies to spread the huge piles of earth accumulated during mining before quitting mining sites. Such areas were planted up with Eucalyptus by the communities in what eventually constituted part of the communal forest areas (CFA's) in the north of Nigeria.

Payment of cash compensations has been popular with the people in petroleum areas for land acquired by oil prospecting firms. Usually the proceeds are not invested in agricultural development but in other capital investments. An ecological disaster relief fund was set up to administer relief dispensation when natural disasters strike.

2.4 Farming Activities:

The farming activities which tend to erode arable land are large-scale land clearing, dam construction, shifting cultivation, nomadic livestock grazing and annual bush fires.

The development of large-scale commercial farms and plantations by both the private and public enterprises in particular, beginning from 1979 was accompanied by mechanised large-scale bush clearance which is however, essential for developing commercial farms. In some cases land was prepared than was needed for planting resulting in severe erosion.

Frequently this blamed on poor funding but sometimes targets have been over-ambitious, having been drawn up in anticipation of some level of expected revenue.

Farming activities which are closely associated with physical development e.g., construction of dams and feeder roads, are described in section 2.5 under physical development.

Shifting cultivation is a traditional farming system in Nigeria as it is in most of the tropical world. The system, as was originally practised entailed bush-fallowing for 10-15 years thus permitting a cultivated land area to rejuvenate sufficiently between two periods of active cultivation. In recent times, however, the rapid increase in population coupled with the ever-increasing need to feed the growing population has drastically reduced the fallow period to between 2 and 3 years. Thus, the derived guinea savanna of Nigeria stretching in parts between lat. and °N derived its name the original vegetation having been persistently disturbed by frequent farming and annual fires.

Livestock grazing in Nigeria is characterised by a nomadic culture. Grazing is uncontrolled and excessive. It is believed that a programme of re-settlement of cattle herdsmen would be socially unacceptable to them even though the advantages of intensive grazing in grazing reserves far out-weigh those obtainable in an extensive grazing scheme. If the land-use option is creation of grazing pastures, alternative uses for cropping must then become secondary. However, creation of grazing reserves will reduce the incidence of forest fires caused by herdsmen who stimulate pasture growth through burning.

Bush burning and forest fires have been referred to in the preceding paragraph. In Nigeria forest fires form part of the landscape. Fires have been used both as a cultural and a management tool in agriculture. In the wet south, there is no cheaper alternative means of land preparation than

that of slashing and burning large heaps of debris. Besides, how else can the large influx of weeds be controlled in a situation in which widespread application of herbicides is either not well understood or expensive to practise.

Annual losses through forest or bush fires, particularly in severe drought years, are enormous and unfortunately such losses are often quantified only in terms of crop loss to the exclusion of soil loss. Recovery of burnt soil or vegetation is more apparent than real.

2.5 Impact of physical Development:

Physical development of land may include construction of highways and road networks, buildings, new airports and cities development, as well as irrigation dams construction. These physical structures are indicators of the level of development of a country. The last 15-20 years have witnessed the creation of new capital cities, the construction of large irrigation dams and hydro-electric power stations as well as construction of major highways and secondary road networks. In Nigeria, the desire to build a new capital city arose among other reasons, from the inadequacy of the present capital city (Lagos) in meeting the social needs of the society in terms of space, modern living conditions and capability for adjustments and modernisation.

High population growth rate (of 2.5-3.0%) coupled with the notorious rural-urban drift has been partly responsible for the uncontrolled rate of city growth. There are 19 state capitals to which has been added a new capital territory. The growth of these cities is usually mainly horizontal in contrast to vertical development because high capital costs are involved in construction of high rise buildings. Thus, farm lands, and land carrying permanent tree crops, including forest reserves, are encroached upon, and we have witnessed losses of private, plantations as well as destruction of amenity forest plantations, water catchments and

The development of an impressive network of highways beginning from 1975 saw the shifting of settlements, ~~contraction~~ of some villages and creation of new ones usually along the new highways. Besides, the major highways cut across plantations and farmlands, causing a sizeable loss of farms or plantations as well as potential farmlands.

The construction of large irrigation dams such as the Kainji and Bakolori dams, provides an opportunity for extending ~~artificially~~, the short growing seasons of the northern savanna areas. This is probably the history behind the location of most of the existing large dams in the savanna regions. But in recent times, however, experience with droughts has induced the construction of smaller dams in the humid areas. The large body of water so impounded at each dam site inundates large surface areas of arable land in the process of providing irrigation water. Besides, the large lakes so formed though provide fish or generate electricity, have caused wide-scale family displacement resulting in encroachment into arable land elsewhere. Where land supply is literally unlimited the overall effect may not be significant. On the other hand, if the supply of agricultural land is extremely limited, as is the case in densely populated areas of the country, then the effect becomes profound.

The development of airports in the last 10 years has been attributed to growth in the Nigerian economy as it has been to the rapid increase in the touring population. There are now 14 airports, most of which are new or were recently expanded. The new ones in particular have been built several kilometres away from the cities on farmlands, thus causing displacement of people from cultivable land.

2.6 Desertification and Drought:

The climatic conditions which prevail in the arid zone which falls into two climatic zones, the (Sudan and Sahel) give rise to negative influences on crop production. The low rainfall which ranges from as

little as 200 mm (8 ins) to 1,020 mm (41 inches) creates a great deal of water stress in the soil and atmosphere. The long dry season, lasting from 8 to 10 months, emphasises the need for prolonging the growing season by artificial means. The effects of the harsh climatic conditions, fragile soil, low rainfall and periodic disastrous droughts are aggravated by human population of over 28 million 1/ and a dense livestock population. Most of the 58 million 2/ livestock population in Nigeria comes from the five arid zone states of Bauchi, Kaduna, Kano and Sokoto. The area already degraded by desertification in the semi-arid zones is estimated at about 125,000 sq km about 13% of the total land mass of Nigeria.

The population pressure is expressed in the progressive degradation of the environment caused by destruction of the natural vegetation for farming, grazing, fuelwood and other purposes, leading to fuelwood shortages and soil erosion.

The Sahara Desert is said by experts to be advancing southwards at a rate of between 0.8 and 1 km per annum and may even be faster in some areas but its permanent effects are felt near the Nigeria-Niger border and in the sahel zone. Here, lone trees are found for square kilometres running and villages as well as trees are buried deep in sand dunes.

2.7 Soil Erosion:

Soil erosion sets in promptly as soon as the original vegetation cover is removed and a replacement is not found or provided immediately. Poor

1/ Jones, R.G. (1975) Report on soil cons. consultancy, Land Resources Report No 6 Central Nigeria Project.

2/ Country Report on Progress in Agrarian Reform and Rural Development Federal Ministry of Agriculture, Lagos. 1983.

land use practices and frequent bush fires combined with natural causes expose the soil to rain and wind, the two principal agents of erosion. Over-cultivation without conscious effort at conservation especially in densely populated areas such as in Anambra, Imo and Kano States, has ruined large expanse of agricultural land. In Anambra and Imo states gully formations characterise the landscape and landslides were recorded in Imo State in this rainy season (in August, 1985).

In an FAO study Onyeagocha (1980), estimated soil loss in Nigeria as 25 million tonnes per annum. Large-scale land clearance for farming in the wet high forest region and even in the dry zones which sometimes experience torrential and destructive rains, expose potential farmlands to high rate of leaching, sheet and gully erosion causing permanent inability to produce crops. Thus soil improvement exercises such as fertilizer application and other physical soil management practices become exceedingly expensive.

Mechanisation practices have not been fully perfected in Nigeria. In the humid south it is not favoured because of the inherent problems associated: removal of large tree roots with caterpillars not only compacts the soil but also scrapes off the top soil causing fertility loss. The drier savanna woodlands, however, lend themselves well to mechanised land preparation but are more susceptible to wind erosion particularly in over-farmed, over-grazed and poorly-managed soils. The hard pans formed in or just below the sub-soil can only be successfully cultivated through tillage, and although the no-tillage system conserves the soil, crop yield may be lower and restrictive and weed control more difficult. Agriculture, or the practice of it, is thus posing a threat to itself, as it were, since there is no restriction in the type of land forms (hill slopes, watersheds, etc) that are

deforested indiscriminately, annually. The change in land use is also an important factor in the rate of erosion. Thus replacement of original vegetation with arable crops such as maize, cowpea, etc, as is now common, encourages increased rate of erosion than placing the same land under plantation crops.

3.0 On-going Activities aimed at Preventing Encroachment on Arable land:

The following items will be considered:

- (a) The Arid Zone Afforestation Project (1975)
- (b) Landuse Policy
- (c) International interests, (d) Other Agencies.

3.1 The Arid Zone Afforestation Project:

This project was set up by the Federal Government of Nigeria in 1975 under the Federal Department of Forestry and its administration was transferred to the Arid Zone Afforestation Committee in 1977. Its main objectives was the raising and distribution of tree seedlings free to members of local communities, schools, institutions and individuals. These seedlings are used in establishing woodlots and shelterbelts in collaboration with states forest services. Over 20,000 ha. of woodlots and 4,000 ha of shelterbelts have been established.

Investigations have revealed that there have been increases in biomass and crop yields in areas cultivated between belts. The belts themselves, some of them 10-12 years old, have been admirably successful yet efforts so far are merely scratching the surface of the problem. It is important that a matrix of trees on farmland of a density of about 15-20 trees per ha is required over a large area of the arid zone to create the same effect as shelterbelts and at the same time, reduce costs and time of establishment. This traditional farming practice also permits multiple landuse by providing fodder for livestock which in turn enrich the soil.

3.2 Landuse Policy:

The landuse decree was promulgated in 1978 vesting ownership of all land on the state governments. Land acquisition for agricultural purposes was given prominent attention, as was the intention, with agricultural projects by the public and private sectors. In practice land is communally owned and the high cost of compensations that had to be paid on land even for government projects was crippling and prohibitive. Besides, the process of negotiating compensations even for standing crops or infrasture often introduces delays in projects implementation.

As far as the forest estate is concerned however, land therein is held in trust by state governments for the community to whom royalties are paid from fees charged during forest harvesting. There is expressed desire to increase the area of the estate but it has been easier converting parts of it for agricultural crops production or other uses of the state than increasing the size of the estate.

As has been indicated elsewhere in this report land has not been classified or evaluated nation-wide. There is no landuse plan and this may have led to many avoidable conflicts among landuses. In the absence of a landuse plan use pattern cannot and has not been evolved.

3.3 International Interests:

International agencies which have expressed interest in arid zone afforestation and related activities are:

- 1a) UNSO (United Nations Sudano/Sahelian Office). Draft project report was submitted to the Federal Government of Nigeria in 1983 covering several areas, including the improvement of cooking stoves and charcoal production, and assistance to the Arid Zone Afforestation Project.

- (g) IBRD (World Bank). There are proposals to incorporate the arid zone afforestation in the second World Bank Forestry project still in preparatory stage. It is intended that proposals would cover establishment of irrigated nurseries management and planning, research, extension and education.
- (d) IITA (International Institute for Tropical Agriculture). It is based at Ibadan in Oyo State of Nigeria. The Institute has been conducting research in the last 15 years in various aspects of agricultural development in the tropics, including farming systems as well as land preparation ...

Mechanised land clearing on large scale by the River Basin and Rural Development Authorities and by the Agricultural Development Projects (ADP's) has been characterised by mass removal and loss of top soil to windrows and rain. Removal of trees with shear blades has been recommended in place of push blade. The conventional crawler tractors remove top soil and compact sub-soil, when push blades are used to remove tree roots.

A stable alternative to shifting cultivation has been found in the system of alley-cropping, in which fodder and soil improving trees are planted in rows, in between which agricultural crops are planted. The inter-row crops benefit from the mulching effect provided by fallen leaves of the trees which may be lopped for fodder or browsed by livestock.

The system is recommended for various benefits that are derived but it is unlikely for the alley trees (usually leguminous species) ^{1/} to do well beyond the 45" (1125 mm)

^{1/} Leucaena leucocephala, Gliricidia sepium are popular alley trees used in association with crops of maize, cowpea and yam. More species are being identified for crops and ruminant production.

annual rainfall regime. Nonetheless the advantages of alley cropping are many and they include the following: nutrient recycling, supply of Nitrogen, soil conservation, supply of mulch/green manure, weed control, sustained crop production with minimal inputs, supply of fuelwood and stake materials from the prunings, food production, supply of browse material or fodder. Alley cropping retains the basic principles and components of traditional agriculture while introducing important improvements.

- (e) FAO. One of the projects in which FAO has been interested in management capability development at the Federal Department of Forestry is in Forest Fire Protection. In collaboration with FAO, the project is engaged in training of forestry personnel in forest fire prevention and fire fighting. Some equipment was provided but this has been incapable in meeting the needs of the large scale afforestation programmes going on all over the country. The need is now for a more comprehensive forest fire prevention and protection programme involving inter-disciplinary inputs.

The soil erosion project carried out by Onyeagocha in 1980, mentioned at section 2.7 was also sponsored by FAO. And in 1984 FAO collaborated with the Federal Ministry of Agriculture, Water Resources and Rural Development in commencing preparatory work in the development of a Water Resources Master Plan, that would ascertain the total water requirements for agriculture, and provide a scheme for water management and development.

These projects and other related ones usually contain some element of conservation and soil management.

3.4 Other Agencies:

(a) The Nigerian Conservation Foundation - is a non-governmental, voluntary organisation founded in 1982, whose major aims and objectives is the conservation of the Nigerian environment.

Its specific aims and objectives are to:

- (i) raise public awareness in conservation matters.
- (ii) encourage and conduct conservation projects, and
- (iii) raise funds for executing these projects.

It is affiliated to the World Wildlife Fund International.

(b) The Federal Ministry of Housing and Environment. This Ministry is responsible for government housing programmes. It has a department which looks after the environmental problems associated with housing development as well as other forms of landuse.

4. Conclusions and Prescriptions:

The natural causes of encroachment on agricultural land - drought and desertification process - have large-scale effect which usually occurs across state boundaries. Although these are natural processes the on-set of desertification can be delayed or even prevented by reducing human interference which tend to accelerate them and up-set the ecological balance. Many agents or areas identified have direct bearing on physical development. These are desirable activities and are essential for growth of a nation.

What is not clearly appreciated yet is the process of land evaluation which includes land capability classification leading to a

expansion is in itself a very desirable and essential process of development.

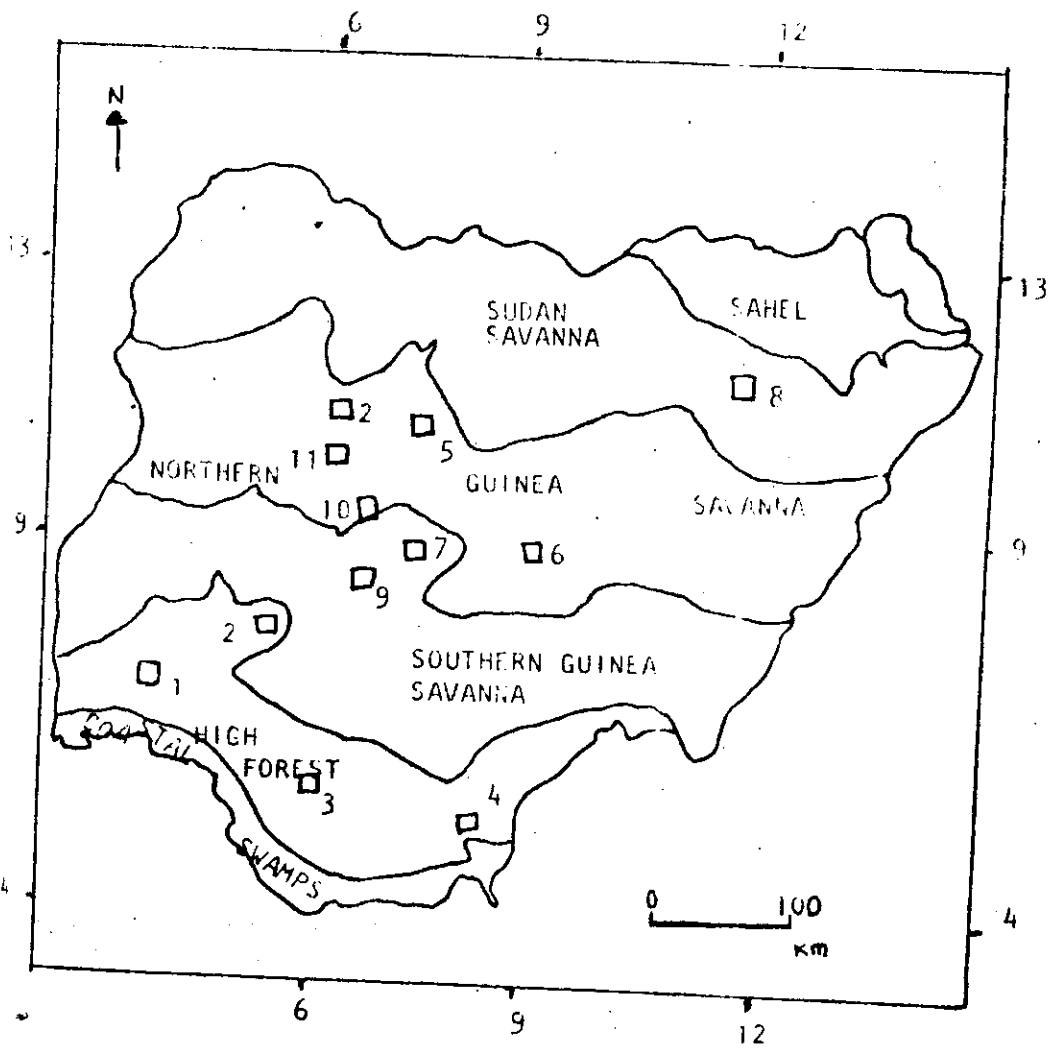
However, there have been instances in which it became desirable to alter the use of land, for agricultural or non-agricultural purposes, which have been identified as more pressing needs. Sometimes the change is desirable or should have been avoided if there had been a landuse plan, arising out of a sound landuse policy, backed by law. When this happens, the dangers associated with poor landuse will be reduced and conflicting interests resolved.

4.1 The following recommendations are made for the consideration of this workshop:

- (a) Set up a sub-regional body for study and application of control measures against agents of environmental degradation.
- (b) Establish landuse plan committees in African states to deal with national landuse problems.
- (c) Carry out, as a matter of urgency, landuse classification and evaluation in countries which have not done so and accelerate the process of formulating a national landuse policy backed by law.
- (d) Generate and analyse data and information that would be required for the above.
- (e) Integrate agricultural activities and relate them to other forms of landuse (from a multi-disciplinary approach), so that activities are seen to be complementary rather than competitive, thus creating awareness in soil conservation and good land management. At the moment, interests are isolated and co-ordination, where it exists, is hampered by administrative delays.

- (f) Place emphasis on rural development not only morally but also in budgetary provisions, to reduce rural-urban drift and improve agricultural practices. In this connection suitable alternatives to shifting cultivation must be found, e.g. use of alley cropping methods and good soil management.
- (g) Set up regional plans of actions for combating desert encroachment in line with the activities of UNSO.
- (h) Intensify research and training activities at national and intra-regional levels aimed at discovering new tree species for anti-desertification control as well as evolving new methods of approach.
- (i) Carry out integrated studies for the appropriate development and management of water and livestock resources in relation to soil conservation.

Fig. 1



Map showing the distribution of established conservation areas (strict Natural Reserves) in Nigeria. (SNR numbers 1-12).