

1. INTRODUCTION

Nigeria is committed to a national environmental policy that will ensure sustainable development based on proper management of the environment. This demands positive and realistic planning that balances human needs against the carrying capacity of the environment. This requires that a number of complementary policies, strategies and management approaches are put in place which should ensure, among others, that:

- * environmental concerns are integrated into major economic decision-making process;
 - * environmental remediation costs are built into major development projects;
 - * economic instruments are employed in the management of natural resources; environmentally friendly technologies are applied;
- Environmental Impact Assessment is mandatorily carried out before any major development project is embarked on.

This policy, in order to succeed must be built on the following sustainable development principles:

- * The precautionary principle which holds that where there are threats of serious or irreversible damage, the lack of full scientific knowledge shall not be used as a reason for postponing cost-effective means to prevent environmental degradation;
- * Pollution Prevention Pays Principle (3p+) which encourages Industry to invest positively to prevent pollution;
- * The polluter pays principle (PPP) which suggests that the polluter should bear the cost of preventing and controlling pollution;
- * The user pays principle (UPP), in which the cost of a resource to a user must include all the environmental costs associated with its extraction, transformation and use (including the costs of alternative or future uses forgone);
- * The principle of intergenerational equity which requires that the needs of the present generation are met without compromising the ability of future generations to meet their own needs;
- * The principle of intra-generational equity which requires that different groups of people within the country and within the present generation have the right to benefit equally from the exploitation of resources and that they have an equal right to a clean and healthy environment; and

* The subsidiary principle which requires that decisions should as much as possible be made by communities affected or on their behalf by the authorities closest to them.

This new policy thrust is based on fundamental re-thinking and a clearer appreciation of the interdependent linkages among development processes, environmental factors as well as human and natural resources. Since development remains a national priority, it is recognized that the actions designed to increase the productivity of the society and meet the essential needs of the populace must be reconciled with environmental issues that had hitherto been neglected or not given sufficient attention.

In enunciating a national policy on the environment, cognisance must be taken of the various institutional settings and professional groupings, as well as the complex historical, social, cultural and legal considerations which have been and continue to be involved, in the identification and implementation of measures designed to solve national environmental problems. The provisions of the Policy have thus been informed by recent national policy initiatives in Science and Technology, Agriculture, Health, Industry, Oil and Gas, Population, Culture, etc., as well as major international efforts in the field of environment. The Policy aims to provide a rational, practicable, coherent and comprehensive approach to the pursuit of economic and social development in a way that minimizes contradictions and duplications, while enhancing inter and intrasectoral co-operation and effectiveness at all levels.

Since the health and welfare of all Nigerians depend on making the transition to sustainable development as rapid as possible, this National Policy on the Environment provides the concepts and strategies which will lead to the procedures and other concrete actions required for launching Nigeria into an era of social justice, self-reliance and sustainable development as we enter the 21st Century.

2. POLICY GOAL

The goal of the National Policy on the Environment is to achieve sustainable development in Nigeria, and, in particular to:

- a. secure a quality of environment adequate for good health and well-being;
- b. conserve and use the environment and natural resources for the benefit of present and future generations;
- c. restore, maintain and enhance the ecosystems and ecological processes essential for the functioning of the biosphere to preserve biological diversity and the principle of optimum sustainable yield in the use of living natural resources and ecosystems;

- d. raise public awareness and promote understanding of the essential linkages between the environment, resources and development, and encourage individual and community participation in environmental improvement efforts; and
- e. co-operate in good faith with other countries, international organisations and agencies to achieve optimal use of transboundary natural resources and effective prevention or abatement of transboundary environmental degradation.

3.0 CONCEPTUAL FRAMEWORK

The National Policy on the Environment is basically a programme of actions rooted in a conceptual frame within which the linkages between environmental problems on the one hand and their causes, effects and solutions on the other hand can be discerned. This is achieved in the Policy document through five major policy initiatives:

- a. preventive activities directed at the social, economic and political origins of the environmental problems;
- b. abatement, remedial and restorative activities directed at the specific problems identified, and in particular:
 - problems arising from industrial production processes;
 - problems caused by excessive pressure of the population on the land and other resources; and
 - problems due to rapid growth of urban centres.
- c. design and application of broad strategies for sustainable environmental protection and management at systemic or sub-systemic levels;
- d. enactment of necessary legal instruments designed to strengthen the activities and strategies recommended by this POLICY;
- e. establishment/emplacement of management organs, institutions and structures designed to achieve the policy objectives.

4.0 STRATEGIES FOR IMPLEMENTATION

The implementation of the National Policy on the environment depends on specific actions directed towards all sectors of the economy and problem areas of the environment. Consequently, the approach to problem-solving adopted in this Policy is predicated on an integrated, holistic and systemic view of environmental issues.

The actions envisaged will establish and/or strengthen legal, institutional, regulatory, research, monitoring, evaluation, public information, and other relevant mechanisms for ensuring the attainment of the specific goals and targets of the policy.

It is also expected that these strategies will lead to:

- a. the establishment of adequate environmental standards as well as the monitoring and evaluation of changes in the environment;
- b. the publication of up-to-date environmental data and the dissemination of relevant environmental information;
- c. prior environmental assessment of proposed activities which may negatively affect the environment or the use of a natural resource.

The proposed implementation strategies for the various sectors are as detailed below:

4.1 Human Population

The most valuable national resource is the human resource base - the people of Nigeria. Consequently, the protection and enhancement of the health and well-being of the people constitute a major responsibility of government. By their individual and collective behaviour, humans make significant positive or negative impact on the natural resources and non-human environment of the country.

Environmental sustainability will be impossible unless human numbers and resource demands level off within the carrying capacity of the Earth. Since a major objective of the national environmental policy is to encourage measures which sustain a balance between population and environment, intersectoral cooperation, involving all tiers of government is envisaged. This policy will, therefore, be implemented with the National Population Policy in mind to ensure not only the survival but also the sustainable improvement in the quality of life of Nigerians.

The strategies to be adopted include the following:

- a. addressing the issues of population growth and resources consumption in an integrated way;
- b. setting goals for the stabilization of national population at a sustainable level;
- c. integrating resource consumption and demographic goals with the other sectors and economic objectives;
- d. monitoring trends in population and resource consumption and assessing their implications for sustainability;
- e. encouraging and involving the private sector, NGOs and the public in the implementation of strategies and actions aimed at achieving stated goals;
- f. the prevention and management of natural disasters such as flood, drought and desertification that more directly impact the lives of the populace;
- g. integration of population and environmental factors in national development planning;
- h. solving public health problems associated with rapid urbanisation and squalid urban environments;
- i. prevention of the depletion of forests through judicious search for alternative energy sources and control of the demands and patterns of land resources usage;

4.2 Culture

The various communities living in the different ecological zones of the country have developed, over many generations, their individual and unique traditional strategies for understanding and exploiting their environments and the available natural resources. This is embodied in the culture of the people and consists of their social, economic, legal and political institutions; their beliefs and values; their creative abilities; and their habits and materials as manifested in their housing, food, clothing, medical practices, tools, etc. Consequently, at every stage of a sustainable development plan, the interrelationships between culture, the natural environment and the rational utilization of available resources should be clearly comprehended.

To achieve and reinforce these objectives, appropriate machinery will be put in place to:

- a. enhance the understanding of the development of indigenous knowledge and technology and link these to established sciences in order to promote the sustainable management of natural resources;
- b. encourage communities to incorporate their values and traditional knowledge into community development programmes;
- c. promote and protect traditional intellectual and cultural properties and customary practices with emphasis on traditional medicine and crafts;

- d. inculcate environmental awareness into cultural habits and entrench individual and collective responsibilities to protect the environment for the benefit of the future generations;
- e. identify and ensure the preservation of artefacts and areas of historical importance as part of the national heritage;
- f. encourage the traditional modes of leisure that can promote environmentally sound tourism activities;
- g. promote sustainable urban culture;
- h. promote proven traditional architecture that are compatible with sustainable development.

4.3 Housing and Human Settlements

The goal of the National Housing Policy is to ensure that all Nigerians own or have access to decent housing accommodation at affordable cost within the foreseeable future. The attainment of this goal as well as the provision of housing which satisfies basic and environmental needs of the populace on sustainable basis would necessarily require the active participation of all tiers of government and the greater involvement of the private sector.

The Policy places human comfort and survival at the centre of concerns for sustainable development as man strives to achieve a healthy and productive life in harmony with nature. Rapid urbanization reinforced by high rate of population growth and sprawl of cities into wider geographical areas will continue into the 21st Century. In order to mitigate the unbalanced geographical development of human settlements and effectively reinforce the creation of a dynamic economy in an environmentally sustainable manner, governments at all levels (i.e. local, state and federal) should encourage the development of balanced and environmentally friendly settlement structures.

On housing, mechanisms would be put in place to:

- a. strengthen appropriate institutional framework to facilitate effective planning in housing development;
- b. ensure the development of housing that is functional and conducive for family development;
- c. encourage the restructuring of all existing public institutions involved in housing delivery at the Federal, State and local government levels with a view to making them more effective and responsive to the needs of

Nigerians;

- d. strengthen the executive capacity of local governments to enable them contribute more effectively to housing delivery at the grassroot level;
- e. produce and update regional development sites and services to facilitate home ownership and orderly urban and rural development;
- f. improve the quality of rural housing, rural infrastructures and environment;
- g. strengthen the operational effectiveness of the National Housing Fund (NHF), through the inclusion of environmental and safety concerns in the assessment process;
- h. encourage research into and promote the use of locally produced building materials as a means of reducing building costs without compromising environmental concerns;
- i. increase the supply of, and improve the quality of man-power needed in the housing sector;
- j. discourage overcrowding both with respect to the number of houses per unit area and dwellers per unit of housing.

The Strategies to achieve objectives of sustainable human settlement shall include:

- a. provision of guidelines for appropriate planning, design, construction, maintenance and rehabilitation of shelters, infrastructures and other facilities;
- b. removal of barriers and eradication of discrimination in the provision of shelter for all Nigerians;
- c. maintenance of an acceptable balance in the allocation of land use functions, including the containment of urban sprawl on prime agriculture land and encouragement of productive investments in job creation and social infrastructures development in small and medium-sized cities, towns and villages;
- d. encouragement of research and studies to promote and develop indigenous planning and design techniques that are compatible with the actual needs of local communities;
- e. stimulating public participation in assessing real user needs, especially gender needs as an integral part of the planning and design processes;

- f. promotion and support for the development of locally produced, environmentally sound, affordable and durable basic building materials in co-operation with all other interested parties;
- g. provision of advice and technical assistance to museums and other cultural institutions to establish parks, game reserves and other recreational facilities;
- h. identification and protection of holy places and places of cultural and historical importance;
- i. provision of guidelines for environmentally sound masterplans for urban development, industrial and rural settlements;
- j. design and development of geographically balanced model cities and villages;
- k. application of modern urban planning and management techniques to housing, transport, employment opportunities, environmental conditions and community facilities;
- l. focusing attention on priority human settlements programmes and policies aimed at reducing urban pollution resulting especially from inadequate water supply, sanitation and drainage, poor industrial and domestic waste management and air pollution;
- m. development and implementation of a phased and systematic programme for the enhancement of the aesthetic appeal and living conditions in Nigerian cities and villages through tree-planting and related anti-erosion landscape management measures.

4.4 Biological Diversity Management

In Nigeria, economic development has not been sustainable partly because biological resources are improperly managed. The trends which manifest by the misuse of biodiversity, the underestimation of the benefits of biological conservation, the non inclusion of the full costs of biodiversity losses in economic accounting, and the biodiversity must all be reversed. The following strategies shall be pursued:

- a. workout ways of using ecosystem sustainably thereby improving their social value;
- b. protect the remaining natural ecosystems;
- c. maintain as large an area as possible of modified ecosystems to support a diversity

- of sustainable uses and species;
- d. promote sustainable agro-ecosystems without compromising natural ecosystems;
- e. increase awareness and understanding of biodiversity to society;
- f. conserve and facilitate access to genetic resources that are important to agriculture, medicine and industry;
- g. support the sharing of the benefits and knowledge, expertise and technologies in the use of biodiversity in a fair and equitable manner;
- h. support the integration of biodiversity conservation objectives in sectoral policies, programmes, strategies, regulations and educational programmes at all levels;
- i. take the full social cost and benefits of biodiversity into account when converting land to agriculture and urban systems;
- j. restore and rehabilitate degraded ecosystems;
- k. ensure implementation of Nigeria's Biodiversity Strategy and Action Plan;
- l. promote national biodiversity conservation through monitoring and identification;
- m. strengthen centres for the exchange of data and information of relevance to the conservation of biological diversity.

4.5 Natural Resources Conservation

The nation's boundaries encompass rich natural resources which are unevenly distributed. The human resources are also abundant though much of the population still lives in poverty. As a result, the natural resources are being overexploited thereby decreasing their productive potential for current and future generation. Improvement in the quality of life for the people will require long-term economic growth which is itself dependent upon improved management and conservation of the natural resource base. Therefore, this policy will aim to pursue the following strategies:

- a. support and promote technologies that use resources more efficiently;
- b. integrate economic policies and environmental considerations in every effort to increase the benefits obtainable from natural resources;
- c. ensure that development also maintains essential ecological processes and life

- support systems;
- d. ensure that resource users pay the full cost of the benefits from natural resources;
 - e. eliminate constraints to the sustainable utilization of the resource base of the nation,
 - f. upgrade in general, natural resource and environmental management;
 - g. support national income accounting systems which include the degradation and depletion of natural resource stocks;
 - h. promote co-operation to harmonise various sectoral policies;
 - i. promote resource mapping and the use of remote sensing technologies for land use planning;
 - j. ensure the development of shared natural resources such as rivers or their basins to make them much more sustainable;

4.6 Land Use and Soil Conservation

Land is the basic resource upon which most development efforts are based. Activities utilizing this vital resource usually interact and are often conflicting. It is necessary, therefore, to plan the utilization and management of land in an integrated manner. Integrated management of land should be harmonised and co-ordinated at the various levels of government. Additionally, the impacts of the various social and economic activities on natural resources such as soil, water, air and biota should routinely be assessed at every stage of the development process. This is necessary for appropriate allocation and utilization of land and its resources that will ensure transition to sustainability.

Accordingly, suitable strategies shall be adopted to encourage the:

- a. compilation of detailed land capability inventories and comprehensive land classifications;
- b. assessment of the current land use practices and the causes and extent of soil degradation;
- c. establishment and the strengthening of guidelines of the regulatory framework for

- sustainable land use;
- d. adoption of soil conservation principles in highway and other construction activities;
 - e. ensure sound management of soil through monitoring and control of changes in land use.
 - f. ensure implementation of guidelines for traditional grazing system;
 - g. expansion of protected area system to meet IUCN requirement as reserves and parks, for conservation purposes;
 - h. promotion of afforestation and reforestation programmes including community based agro-forestry for soil improvement;
 - i. improved management of soil and water resources;
 - j. co-ordination of the activities of the various agencies dealing with land management;
 - l. intensification of public awareness of the causes, consequences and remedies of land degradation

4.7 Agriculture

The viability or otherwise of the agricultural sector is crucial to the growth and development of a nation. The agriculture sector strongly impacts food security, industrialisation efforts, quality of life, economic growth, political stability and, to a certain extent, a nation's position in international relations and trade. The sustainability of this important sector should, therefore, be of paramount importance. Consequently, it is essential to establish a balance between efficient agricultural enterprise and environmental protection.

The emphasis should be the promotion of ecologically sound and profitable farming systems and suitable rural development programmes principally aimed at small scale farmers. In order to increase agricultural productivity, vigorous programmes have to be established and supported to ensure proper use of natural resources and judicious application of agricultural inputs. In order to ensure the attainment of these objectives, strategies shall be put in place to:

- a. support research aimed at developing farming systems that combine optimum production with land resource protection and which are compatible with the socio-economic conditions of all peoples;
- b. promote farming systems based on natural adaptations across ecological zones; ensure maintenance of soil quality and capability through sound management;
- c. develop, through research, sustainable agro-forestry techniques for the prevention and remediation of erosion and checking desertification;
- d. discourage the cultivation of marginal lands and encourage off farm contributions.
- e. prescribe and regulate appropriate land preparation and agriculture mechanisation techniques in collaboration with the Ministry of Agriculture;
- f. encourage and support ecologically appropriate livestock and poultry production;
- g. promote efficient use of crop and livestock waste products;
- h. develop and support efficient fish production, processing, storage and marketing through promotion of improved technology and management practices; encourage conservation of grazing reserves and enforce strict range resource management programmes;
- i. minimize agricultural products losses by promoting efficient processing techniques, improved transportation infrastructures, appropriate storage facilities and efficient marketing strategies;
- j. regulate the production, use, storage, transportation, marketing, sale and disposal of agricultural chemicals;
- k. maintain an up-to-date register of approved agro-chemicals and provide “Safe Use of Pesticides” Guides;
- l. encourage the production of high yield crop varieties requiring minimum agro-chemicals input;
- m. monitor pesticide and agro-chemical residue levels in air, soil, water, sediments, flora, fauna and human, and document the environmental fate of such chemicals;
- n. promote farming, using manures and other soil conditioners.

- o. Promote integrated pest management.

4.8 Water Resources Management

Water is a vital resource governing the viability of all ecosystems and providing the basis for socio-economic development. The proper management of this vital resource through the incorporation of environmental concerns is essential to minimize supply shortages, pollution, land degradation and associated health hazards. To ensure sustainability, comprehensive medium and long term national plans for water resources management and conservation should be put in place taking into consideration demand and availability. These will be achieved through:

- a. provision of water in adequate quantity and quality to meet domestic, industrial, agricultural and recreational needs;
- b. environmental impact studies of water resources development;
- c. increased support to promote efficient water use and management;
- d. specification of water quality criteria for different water uses;
- e. continuous monitoring of the public health implications of water resource development projects such as dams and irrigation schemes;
- f. control of point and non-point sources of pollution;
- g. establishment of adequate controls and enforcement procedures to check contamination and depletion of water resources;
- h. adherence to the use of the Sustainable “River Basin” concept in water management;
- i. improved water management technology including the safe disposal of waste water, waste water reuse and recycling;
- j. provision of guidelines for water damage prevention through flood control, damage water collection and treatment and amelioration measures;
- k. encourage improvement of water fronts for recreation;
- l. maintainance of systematic and comprehensive inventory of national water resources and application of appropriate analysis and prediction techniques capable of minimizing the impacts of natural disasters;
- j. implement water allocation decisions through demand management, pricing mechanisms and regulatory measures.
- k. consideration of the impacts of climate change on water resources.

4.9 Forestry, Wildlife and Protected Natural Areas

It is true that there have in recent years been increasing deforestation, soil degradation, deterioration and desertification in Nigeria. All these have been due to the spread of agriculture, commercial timber felling and local cutting of wood for fuel at will. This is further aggravated by accidental forest fires as well as farming and game related bush burning. The need is, therefore, to secure development while at the same time sustaining the productivity of the natural vegetation, protecting wildlife, maintaining genetic diversity and avoiding forest and soil destruction.

The strategies for achieving these objectives include:

- a. promoting the rational exploitation of forest resources to meet domestic consumption needs and to achieve a significant export activity on a long term basis;
- b. regulating forestry activities to enhance conservation and environmentally sound management practices;
- c. monitoring the quantitative and qualitative changes of forest cover and their effects using conventional means and modern technology such as multi-spectral satellite imagery;
- d. providing data on the balance between the nation's forest biomass and the prevailing environment and changes in the forest biomass considered to have a significant impact on the environment;.
- e. strengthening forest protection programmes to ensure adequate vegetation cover in critical areas and to discourage developments likely to cause harmful changes;
- f. assessing the state of natural vegetation resources and identifying endangered sites and species for priority action;
- g. protecting flora and fauna in danger of extinction as well as forest reserves for scientific, recreational and other cultural purposes;
- h. encouraging reforestation and afforestation programmes and activities with a view to rectifying forest losses and the adverse effects of deforestation;
- i. combining desirable features of traditional approach with modern scientific methods of conservation;
- j. increasing support of non-governmental organisations (NGOs) and community tree planting programmes;

- k. promoting the development of alternative sources of energy while supporting programmes for the development of more efficient methods of wood energy use;
- l. protecting forest from bush and forest fires and taking measures to discourage wanton destruction of forest resources;
- m. strengthening programmes for the identification and study of the natural heritage in fauna and flora and for establishing a national inventory of forest resources;
- n. establishing germplasm conservation programmes;
- o. establishing programmes for the efficient utilisation of vegetation resources including reduction of wastes and improved technologies for product consumption;
- p. encouraging appropriate agro-forestry practices and the search for multi-purpose plant species for achieving increased productivity for a unit area of land;
- q. developing and disseminating scientific and technological information conducive to more efficient use of forest resources and wildlife;
- r. supporting the goals of the National Conservation Strategy for Nigeria.

4.10 Marine and Coastal Area Resources

In order to maintain and improve the quality of the unique environmental resource endowment and the physical characteristics of the coastal areas, Ecological Master Plans (EMP) will be prepared based on detailed baseline ecological data to guide the use of coastal areas for the diverse and often conflicting industrial and social needs of the nation so that continued viability of all aspects of the ecosystems will be secured. To achieve this objective, all applications for project development in the coastal and nearshore areas must mandatorily be accompanied by Environmental Impact Assessments with strict adherence to public hearings before permission is given for such developments.

In addition, mechanisms must be put in place to:

- a. study and highlight the vulnerable components of the marine and coastal ecosystems bearing in mind their limited stocks of living and non-living exploitable resources;
- b. identify and map critical and sensitive habitats (Environmental Sensitivity Index

maps) to enable project planners and developers to incorporate appropriate measures to minimize damage and disturbance to breeding, nesting and feeding areas of estuarine and coastal water species;

- c. provide timely data and operational standards for project planning and implementation, especially for fishing, drilling, construction of offshore oil production platforms and loading terminals, dredging, pipe laying and seabed mining;
- d. study the prevalent coastal and nearshore geomorphologic processes and identify the land forms that are indicative of coastline changes over time especially with regard to coastal submergence/emergence, subsidence, sediment balance, coastal sand transport with depositional or erosive tendencies, sediment compaction and tidal and current erosion;
- e. monitor the rate of coastline progradation or recession and establish coastal protection measures with a view to timely intervention to arrest irreversible negative changes;
- f. establish measures to discourage and prevent or at best minimize point and non-point pollution of the entire coastline and nearshore marine waters;
- g. prepare Ecological Master Plans for the management and control of coastal and nearshore marine industrial and social development activities to minimize pollution and protect the resources;
- h. encourage the recreational use of coastal and nearshore marine water-fronts areas for the enhancement of tourism;
- i. discourage upstream water use that can negatively impact estuarine and coastal habitats, water quality and quantity and thus endanger marine life living and/or reproducing in such habitats;
- j. establish measures against the transboundary movement of toxic and hazardous substances within Nigerian marine and coastal waters;
- k. create public awareness of the dangers of dumping toxic and hazardous wastes, sewage and other domestic and industrial wastes in coastal and marine waters;
- l. establish national and regional contingency plans for maritime tanker accidents, oil well blow outs and accidental oil spills in coastal and nearshore waters;
- m. establish stringent standards for effluent discharge from mines, thermal nuclear plants and oil exploration and production operations in coastal and continental

- shelf waters;
- n. effect regular environmental audits of all development projects located in or bordering the coastal zone in order to promptly correct the undesirable negative environmental impacts of such projects.
 - o. highlight vulnerable species and ecosystems bearing in mind the limited stocks of living and non-living exploitable resources;
 - p. sustain ecological diversity and productivity;
 - q. provide data and operational standards for project planning and implementation, for example, in fishing, dredging, and mining;
 - r. prepare controls for land-use, coastal and marine-based activities to minimise pollution and protect coastal and marine resources;
 - s. establish restoration, rehabilitation and mitigation and or compensation programmes for loss of marine and coastal resources;

4.11 Mining and Mineral Resources

The growing profile of the solid mineral extraction sector within the economy dictates that attention be focused on its tendency to cause extensive environmental degradation.

Mining and associated beneficiation activities should, therefore, be carried out in an environmentally sound manner. In order to achieve this objective, the approval to initiate mining should mandatorily be preceded by an Environmental Impact Assessment (EIA). In addition, mechanisms shall be put into place to:

- a. facilitate orderly development of minerals for real economic growth, improvement of the living standards of the people and the creation of favourable investment climate through prudent use of the nation's mineral resources and the adoption of rational conservation measures;
- b. prevent haphazard opening of quarries to minimize soil erosion, land degradation and uncontrolled damage to vegetation, wildlife and water resources;
- c. prescribe operational standards aimed at minimizing dust and noise pollution from open quarries and to reduce the impact of dust on vegetation, surface and groundwater and humans;
- d. minimize environmental degradation associated with beneficiation and refining of minerals;

- e. prescribe minimum safety standards in the construction of mines and the use of personal protective equipment (PPE);
- f. establish stringent standards for effluent discharge from mines and monitor compliance;
- g. ensure the existence and workability of mine safety contingency plans and provision of first-aid facilities at the mines;
- h. monitor the health of the workers involved in mining and mineral beneficiation and protect miners from excessive exposure to dust, particulate matter, radioactive and toxic materials in and out of the mines and make provision for adequate treatment of mining related diseases;
- i. prescribe stringent regulations for the stacking and ultimate disposal of mine and beneficiation tailings and dumps in a way to ensure their long term stability;
- j. stipulate and monitor compliance with approved procedures for the reclamation and the restoration of land, top soil and vegetation of mined out areas and monitor the recovery of such areas;
- k. maintain regular environmental audit to stimulate the adoption of environmentally sound practices and technologies in all mining operations.

4.12 Industry

Sustainable industrial development can be achieved through policy initiatives that seek, among others to ensure:

- i. availability of indigenous technological materials;
- ii. availability of industrial raw materials;
- iii. possession of a viable research and development base that is capable of selecting, adapting and developing technology; and
- iv. creating awareness to promote and sustain technological and industrial growth.

Strategies to achieve these objectives include:

- a. preparation of a national classification/categorization of industries that will ensure optimal utilisation of common services by industries that produce similar effluents;
- b. ensuring strict adherence to landuse zoning and demarcation of industrial areas to encourage the optimal utilisation of shared facilities;

- c. ensuring that major industry locations are selected on the basis of raw material, socio-cultural and environmental considerations rather than on strict economic and political considerations;
- d. preventing industries from being sited close to ecologically sensitive areas, historic and archaeological monuments, national parks, scenic areas, beaches and resorts, coastal areas and estuaries, bird and animal sanctuaries, natural lakes, swamps, floodplains, wetlands etc.;
- e. reducing the trend to appropriate forest reserves and prime agricultural lands for industrial use;
- f. prohibiting the siting of industries close to residential areas;
- g. ensuring the rational and sustainable exploitation and use of industrial raw materials taking into consideration the best conservation practice and prevention of resource depletion;
- h. encouraging the use of state-of-the-art equipment and environmentally sound technologies in process operations to enhance in-plant safety and healthy out-plant environments;
- i. encouraging existing industries to produce Comprehensive Industrial Master Plans that will show novel and more effective methods for phased pollution abatement and waste management, and compliance with set environmental standards;
- j. ensuring that production processes incorporate realistic programmes for waste minimization through material recovery and recycling;
- k. ensuring that sufficient space is provided on site for solid waste storage and primary effluent treatment;
- l. ensuring the establishment of specialized facilities for the handling and disposal of toxic and hazardous wastes from industries;
- m. considering the assimilative capacity of the environment before approving/adopting any waste disposal system;
- n. enforcement of in-plant safety regulations and emergency procedures by compelling management to provide Personal Protective Equipment (PPE) and making it mandatory for workers to use them through their labour unions;
- o. ensuring workers good health through periodic monitoring of their state of health

and provision of emergency and first aid services;

- p. rewarding all existing industries that articulate viable programmes of environmental remediation, facility sharing, and those with facilities for waste management through economic incentives such as tax holidays, soft loans, outright grants etc.
- q. prescribing strict adherence to the polluter-pay principle;
- r. ensuring that EIA reports are submitted by all proposed industrial enterprises prior to approval of licenses to operate;
- s. ensuring that development finance institutions insist on the inclusion of environmental remediation at least up to primary level in their appraisal procedures and the inclusion of treatment plants costs in the total project cost prior to granting of loans;
- t. ensuring sustainable development through the maintenance of industrial infrastructural facilities particularly water, roads, electricity, telecommunications etc.;
- u. initiating periodic detailed environmental audit of major industries and compiling comprehensive inventory of pollutants;
- v. monitoring of effluents from factories and other non-point sources as well as leachates from approved industrial waste disposal sites to reduce/ prevent contamination of air and groundwater.
- w. monitor, on continuous basis, the Quality Assurance Standards/Requirements (such as Ecolabelling) of potential foreign market blocks (e.g. EEC) and ensure that local products meet the set standards.

4.13 Energy

Energy sources are multivarious and the technical expertise for their harnessing and exploitation vary from very simple to very complex. Their impacts on the environment also vary markedly from low level environmental disturbances as in the case of peat and coal mining and burning to extremely severe environmental damage associated with nuclear power plant accidents. Thus, the specific environmental concerns will vary depending on the energy type, source, the mode of exploitation and the technology employed in harnessing and transmission. In energy production and use, therefore, attention should be focused on the following:

- energy source;
- mode of procuring the energy fuel on sustainable basis;
- mode of power generation;
- energy transmission and use; and
- conservation

Nigeria is blessed with an abundant variety of energy resources. The most important for development in the 21st Century are likely to be the conventional hydrocarbons (oil, gas and coal) and non-conventional sources particularly Tar Sands and solar energy which are expected to play increasingly more important roles in future years.

As energy consumption increases with increase in industrialization, it is essential to ensure a more balanced mix of the various energy types used. Their procurement and use must also be compatible with sound environmental practice and in tune with the principle of sustainable development through ensuring minimal negative impacts on the environment.

Strategies to achieve this objective include:

- a. implementation of detailed Environmental Impact Assessments (EIA) of all existing and planned energy projects backed by detailed baseline ecological data against which subsequent environmental changes and/or impacts can be measured;
- b. developing a rational National Energy Utilization Master Plan that balances the need for conservation with the utilization of premium energy resources for premium socio-economic needs;
- c. encouraging the use of energy forms that are environmentally safe and sustainable;
- d. establishment of stringent safety standards in all national energy production processes while promoting safe and pollution-free operations in energy production and use;
- e. prescribing and enforcing stringent standards for the disposal of radioactive and toxic wastes from energy production processes and controlling the level of human exposure to nuclear radiation at mines, power plants and reactors through periodic audit checks of ambient radiation levels at such environments;
- f. monitoring and controlling the levels of particulates, toxic chemicals and noxious gaseous effluents of energy production and use such as CO, CO₂, NO_x, SO₂ and non-methane hydrocarbons;
- g. monitoring the ambient temperatures and other physical and chemical properties of cooling effluents of energy plants to prevent or reduce their severe impacts on

human health and the aquatic plants and animals;

- h. ensuring that site selection for energy construction projects emphasises the right of way (R.O.W) of transmission lines, in such a way as to ensure minimal loss or disturbance of habitats, vegetation, wetlands, wildlands, and human habitation;
- i. adoption of a multi-sectoral approach to the monitoring and control of environmental problems associated with energy production and use;
- j. Licensing and periodic inspection and monitoring of all energy waste disposal sites;
- k. encouraging research and development programmes that promote environmentally sound utilisation of the abundant coal resources as a domestic energy source through the reduction of the ash and noxious chemicals content;
- l. establishment of standards for the control of fuel additives especially with respect to trace metals especially Pb, S, Va, Ni, Cr and Zn;
- m. promotion and encouragement of research for the development and use of various locally available energy sources especially non-conventional resources such as geothermal, solar, wind and bitumen or tar sands;
- n. preparation of guidelines for energy production and use in consonance with the environmental implications of the National Energy Policy.

4.14 Oil and Gas

The Oil and Gas Sector has continued to be the backbone of the Nigerian economy, contributing over 90% of the nation's foreign exchange earnings and at least 80% of the GDP. This situation is likely to continue unchallenged in the near future and well into the third millennium. The sustainable development of the Oil and Gas Sector is, therefore, of utmost importance, especially since virtually all of the activities in both the upstream and downstream sectors are not only pollution-prone, but readily provoke social discord.

Accordingly, sustainable exploitation strategies to be adopted nationally will seek to:

- a. evolve a realistic national conservation policy that ensures optimum economic returns from oil and gas exploration and production, while ensuring adequate provisions for strategic reserves and taking into consideration the welfare

of the local inhabitants of the oil and gas producing areas;

- b. ensure minimal disturbance of the soil, topography, vegetation, sensitive ecological zones, including critical wildlife habitats, wetlands, avian migratory routes, etc. during the process of exploration, production, refining, transportation and marketing of oil and gas;
- c. proscribe all forms of oil and gas exploration and production in estuaries, coastal waters, beaches and resorts, take such measures as will minimize disturbance to and contamination of benthic and aquatic habitats;
- d. minimize disturbances/displacement of the local inhabitants, their artefacts, roads, historical sites, sacred groves/places of worship, etc., source of livelihood (agriculture, fishing, transportation etc.) and pay adequate compensation for proven cases of pollution;
- e. prescribe stringent regulations for the efficient collection, treatment and disposal of oil field wastes (drilling muds and additives, formation waters etc);
- f. monitor water quality in open drains, streams and other water bodies around oil and gas operations, as well as groundwater quality in all areas prone to pollution;
- g. inspect periodically pipelines, ships, barges, tanks and other oil field and refinery facilities for early detection of corrosion, leakages, damages etc. and ensure prompt maintenance;
- h. encourage all oil and gas operators to keep accurate records of crude oil and product spills as well as other accidents that impact environmental quality and report them promptly to the appropriate authorities;
- i. maintain an inventory of certified/approved oil spill control chemicals and document their toxicity levels and biodegradability;
- j. monitor air emissions and gaseous wastes (CO, CO₂, NO_x, H₂S, CH₄, SO₂ etc.) discharged at production platforms, refineries, petrochemical and gas processing facilities through continual air quality sampling as well as through daily visual checks for leakages around tanks, pumps, pipelines and transfer points;
- k. promote conservation and restoration of natural formation pressure through elimination of gas flaring and the re-injection of produced associated gas and formation waters;
- l. promote the complete utilization of produced associated gas, reduce gas flaring and the production of greenhouse gases;

- m. monitor regularly the functioning of well head and drilling platform devices to prevent blowouts, and install early warning electronic devices for their detection and prevention;
- n. install pressure monitoring gauges and automatic shut-off devices on pumps, pipelines and ensure their integrity through periodic inspection and testing;
- o. prescribe minimum standards of environmental safety in all upstream and downstream oil sector facilities and maintain regular environmental audits of all existing oil and gas production facilities to ensure the adoption of environmentally safe practices as well as compliance with set standards;
- p. prescribe minimum environmental and safety regulations for the protection of the health of workers, the general public and the environment and ensure compliance through teams of competent inspectors;
- q. prescribe a realistic Quality Control Assurance scheme for the adoption of all operators and monitor compliance;
- r. ensure the establishment of realistic Oil Spill Contingency Plans to contain oil spillage, accidental explosion, well blow outs and fire incidents;
- s. prescribe stringent penalties for deliberate sabotage of oil and gas installations;
- t. promote research aimed at accumulating baseline ecologic data on oil and gas production areas;

4.15 Construction

The act of constructing denotes more than the construction of mere buildings as its use encompasses the erection of various engineering (civil) projects such as bridges, dams, highways, railways, airports and runways, canals, embankments, wharfs, jetties, moles, heavy energy facilities e.g. refineries and power generating works, steel complexes, smelters, etc.

This wide range of engineering activities vary in size and technological complexity from those involving simple technology such as building construction with low level of environmental disturbance to the more highly complex activities such as the construction of refineries, power plants etc., with high levels of impact. The specific environmental concerns also vary and depend upon the nature of the project, the siting and the materials used.

The processes of construction often involve the use of heavy machinery and equipment,

with attendant large-scale disturbance of the land. Construction wastes also include several materials (e.g. asbestos) of public health significance.

Environmental concerns should, therefore, focus on the anticipated impacts of the following major aspects:

- the sustainable procurement of the construction materials;
- the adoption of processes/stages of construction that are environment friendly; and
- the effect of the completed structure(s) and the contained utility on the environment;

The strategies for ensuring sustainable development in the Construction Subsector of the economy include:

- a. the mandatory implementation of a detailed Environmental Impact Assessment of major construction projects;
- b. ensuring that remedial measures to mitigate the negative impacts of major construction projects on the environment are built into the project blue print before permission is given for work to commence;
- c. initiating post-construction environmental audits that ensure that the in-built mitigating measures satisfactorily address the anticipated environmental concerns;
- d. the introduction, in collaboration with the Standard Organisation of Nigeria and the Nigeria Society of Engineers, of stringent quality standards for various construction materials in order to guarantee the structural stability and durability of the construction works;
- e. enactment of environmental by-laws aimed at minimizing the negative impacts on the environment of the processes of material procurement, transport and utilization in construction industry especially with regard to:
 - noise abatement,
 - reduction of vibrations,
 - reduction of dust pollution,
 - careful handling and disposal of spent oils, fuels etc.,
 - minimization of noxious gas emissions (CO, SO, NO_x, O₂, etc.),
 - provocation of erosion, flooding, landslides, etc., and habitat destruction, and
 - conservation of local ecological resources;
- f. ensuring the safety of workers in the construction industry either on land or water by the provision and insistence on the use of appropriate personal protective equipment (PPE), and other safety gadgets (helmets, goggles, gloves);

- g. ensuring the good health of construction workers through periodic monitoring of the state of their health and the provision of on-site emergency and first aid services;
- h. establishment of contingency plans for rescue operations in case of accidents;
- i. ensuring that construction design and implementation are carried out in such a way as to minimize undesirable micro-climatic, geological/ geomorphological and other man-induced impacts such as fires, landslides, earth flows, gulying, debris avalanches, accelerated erosion, flood etc.;
- j. ensuring that quality control assurance mechanisms are integrated into the construction process such that work is stopped as soon as workers' safety is no longer guaranteed;
- k. prescribing a minimum quality level of aesthetics around construction sites and built-up areas that ensures good drainage, landscaping, sound insulation, ventilation, easy accessibility for purposes of fire fighting, rescue operations, waste collection and emergency evacuation, etc.;
- k. prescribing quality standards for the construction industry to ensure that construction does not radically and negatively alter the existing landuses, for example, through undue encroachment on valuable agricultural lands and does not detract from the beauty of the natural built-up environment;

4.16 Health

As there is no sustainable development without health, FEPA will work closely with the health sector to ensure the environmental and health improvement of the peoples of Nigeria.

The strategies to be pursued will include:

- a. cooperation with the health sector to improve environmental health within the framework and as a component of primary health care;
- b. placing a high priority on improving environmental services in support of public health programmes;
- c. improvement of environmental health services and conditions relating to water supply, sewage, solid wastes, pollution control and green areas housing;

- d. improving the health and quality of life of people in urban and rural areas by focusing on developments and the creation of physical, social, institutions and economic conditions that support health and well being;
- e. enabling rural populations and their leadership to maintain a sustained dialogue concerning health and environmental issues;
- f. strengthening local capacity of village, township, district and other local level authorities and institutions to promote health and environmental services for their populations;
- g. encouraging and promoting the use of appropriate technology and local expertise to raise community awareness of and standards of health and hygiene education;
- h. developing network and information exchange on health and environmental issues;
- i. creating closer ties and contacts between activities and programmes relating to environmental health, primary health care, nutrition, health of women and children and environmental hazards;
- j. supporting and maintaining priority programmes targeted at health and environment problem solving;
- k. provision of support for the preparation of legislation to regulate production and disposal of toxic waste and for organisation and mechanisms that work to implement such legislation;
- l. compiling and disseminating information on health and environmental risks from various sources;
- m. supporting education and public awareness programmes in sanitation issues;
- n. supporting community participation in the preparation and implementation of health and environmental activities and projects;
- o. ensuring that environmental impact assessments of development projects also contain the assessment of health impacts.

4.17 Education

Education is a dynamic instrument of change. As the relationship of man and nature is necessarily complementary, appreciation and protection of the environment should be fostered at all levels of both formal and non-formal education. Basic education provides the foundation for developing sound and sustainable means of resources exploitation. Non-formal education promotes mass public awareness towards changing and strengthening attitudes, values and actions that are congruous with sustainable development. It is also an effective means of encouraging popular participation in decision making. It is necessary to develop and support the education sector to ensure its responsiveness to changes and demands of all the other sectors. This will lead to inculcation of environmental ethics in the people and mobilising them, individually and collectively, to accept the responsibilities of protecting the environment and ensuring rational utilisation of the available natural resources.

To this end, Government shall:

- a. promote comprehensive curriculum reviews that integrate environment and development concepts in the educational curricula at all levels;
- b. support the development of courses and programmes leading to the award of degrees and diplomas in environmental sciences, environmental management and technology;
- c. encourage gender balance education at all levels including continuing education opportunities and literacy programmes;
- d. encourage practical training programmes for graduates of tertiary institutions to prepare them for labour market requirements and creation of sustainable livelihoods;
- e. strengthen vocational training that facilitates the development and assimilation of environmentally sound, socially acceptable appropriate technology and know how;
- f. establish and support centres of excellence in interdisciplinary research and education in the areas of environment and sustainable development;
- g. emphasize training and retraining of teachers, administrators and educational planners in environmental education and development issues;

- h. assist schools to design and sustain environment related activities including establishment of environmental awareness clubs and associations;
- i. support educational institutions to develop and provide appropriate training programmes on environment and development issues to decision makers, business class, journalists, community leaders; etc.;
- j. promote research on and development of indigenous knowledge to facilitate sustainable adaptation of relevant technologies;
- k. adopt community based approaches to public education and enlightenment through culturally relevant social groups, voluntary associations and occupational organisations;
- l. collaborate with media, entertainment and advertising agencies in enhancing environmental awareness;
- m. encourage the United Nations and other donor agencies to emphasize capacity building in all development programmes through adoption of the multi-disciplinary approach to skill transfer;
- n. encourage research linkages and staff/student exchanges between Nigerian educational institutions and institutions abroad in the areas of environmental studies and sustainable development;
- o. encourage public relations activities which tend to provide a forum and context for the debate on sustainable development and the articulation of the collective vision of the future;
- p. promote public awareness activities through traditional and mass media and NGO participation structures to keep them informed about all aspects of the policy;
- q. support public participation activities covering formal and informal education and training to help carry out needed changes or strengthen values knowledge technologies and institutions with respect to priority issues and also to support active concern for the quality of the environment;
- r. support Environmental Information Systems at a number of levels: national, regional and global.

4.18 Transport and Communication Systems

Transport and communication systems are the key to the movement of goods, people, information and ideas as well as access to markets, employment, schools and other facilities and landuse both within and between cities and in rural and other remote areas. The transportation sector is a major consumer of non-renewable energy and land and is a major contributor to pollution, congestion and accidents. Integration of the transport, communication systems and land-use policies and planning can minimize the negative impacts of current transport systems on the environment while yielding accessible, affordable, safe and efficient public transport modes.

Strategies for achieving this objective include:

- a. supporting an integrated transport policy that explores the full array of technical and management options and pays due attention to the needs of all population groups (e.g. the disabled, poor and the aged);
- b. coordinating land-use, communication systems and transport planning in order to encourage spatial settlement patterns that facilitate access to such basic necessities as workplace, school, health care, places of worship, goods and services and leisure thereby reducing the need to travel;
- c. encouraging the use of an optimal combination of modes of transport, including walking, cycling and public means of transportation, through appropriate pricing, spatial settlement policies and regulatory measures;
- d. introducing disincentives that discourage the increasing growth of private motorized traffic and thus reduce congestion;
- e. providing and or promoting an effective, affordable, physically accessible and environmentally sound public transport and communication system, giving priority to collective means of transport with adequate carrying capacity and frequency that support basic needs and the main traffic flows;
- f. promoting, regulating and enforcing quiet, use-efficient and low-polluting technologies, including fuel-efficient engine and emissions controls and fuels with a low level of polluting emissions;
- g. encouraging and promoting public access to electronic information services;
- h. bringing the private sector into the process of managing environmental pollution in the transport sector as one aspect of partnership in progress;
- i. establishing and enforcing emission standards;

- j. requiring new transport and communication projects to undergo environmental impact assessment;
- k. developing, where appropriate, criteria for maximum permitted and safe levels of noise exposure and promoting noise assessment control as part of environmental health programmes.

4.19 Trade

Reconciling the operation of a liberal trade regime with policies to conserve and protect environmental resources has emerged as a high priority issue on the international agenda. The overall objective is to seek ways in which the benefits of a liberal trade system can be reconciled with greater environmental protection. Nigeria, like many less-developed countries, is still heavily engaged in natural resources production and trade, and hence has a direct interest in natural resource-related trade questions. The main thrust of Nigeria's external trade policy objective is to achieve economic development through the attainment of healthy balance of payments, market expansion, net inflow of foreign exchange and the protection of infant industries. To attain these goals in the face of new and tougher environmental criteria confronting it in international markets, Nigeria will have to continually adapt to the environmental requirements of its major markets to remain competitive.

The attainment of the policy objectives of Nigeria's external trade would therefore require the adoption of the following strategies:

- a. encouraging the use of recyclable, re-usable and returnable materials in packaging;
- b. establishing the machinery for "eco-label" awards for products meeting prescribed environmental standards;
- c. providing relevant environmental information and advice to importers and exporters with respect to the requirement of the International Organization of Standardization (IOS);
- d. organizing in-house awareness seminars involving all the stakeholders on the effects of environmental standards abroad on Nigerian imports and exports;
- e. requiring industries to use chemicals with minimal toxic or polluting components in their production processes (e.g. tanneries to use butane instead of PCP);
- f. ensuring that all new export projects conform with EIA procedures;

- g. requiring agro-chemical industries to adhere to environmental standards with respect to storage, handling, packaging and disposal of its products;
- h. encouraging (in special circumstances) the acquisition of foreign certification from importers to ensure acceptable standards, e.g. the United States certification of foreign slaughterhouses to ensure the quality of imported meats;
- i. imputing the costs of negative environmental externalities in the prices of goods;
- j. advising judicious use of trade measures as a way of uplifting environmental standards;
- k. supporting the harmonization of product standards, including environmental product standards among ECOWAS member countries not only for the purpose of increasing trade among themselves but also with the rest of the world;
- l. ensuring that environment and trade policies are mutually supportive with a view to achieving sustainable development;
- m. encouraging exporters to adopt new practices that generate less pollution in line with international environmental standards;
- n. providing assistance to exporters on environmentally friendly product development and financing.

4.20 Tourism

Great potentials exist in Nigeria for the development of eco-tourism, hence it has become an integral part of the official development policy. Specifically, the policy objective in this sector is to generate foreign exchange, encourage balanced development, promote tourism-based rural enterprises, create employment and accelerate rural-urban integration and cultural exchange.

To achieve this objective, strategies will be put in place to:

- a. reconstruct, rehabilitate and modernize the country's infrastructural facilities, especially road, bridges, air transport, water, electricity supply and communication systems with due concern for the environment;
- b. guarantee security of life and property;
- c. strengthen the capacity of the Nigerian Tourism Development Corporation

(NTDC) to effectively manage and develop eco-tourism;

- d. identify, designate and develop environmentally friendly centres of attraction for tourism development;
- e. establish effective organs for the planning, development, promotion and marketing of tourism within and outside Nigeria, including well-defined roles for the three tiers of government;
- f. ensure that the nation as a whole and the local populations on the fringe areas in particular truly benefit from eco-tourism development projects;
- g. regulate large scale and consumption-oriented types of tourism with the objective of limiting the flow of tourists to environmentally sensitive areas;
- h. establish norms for the use of restricted natural areas for eco-tourism;
- i. evaluate the environmental effects and cultural impacts of major tourism development projects on local populations.

4.21 Science and Technology

In Implementing this policy, it is important that everybody from policy makers to the general public understands the roles that science and technology have to play in achieving environmental protection and human development. There is need, therefore, to work closely with the Science and Technology Policy implementation programmes through the adoption of the following strategies:

- a. identify how scientific and technological programmes could impact development to become really sustainable;
- b. provide and support full and open sharing of information among scientists and decision makers;
- c. support national advisory groups to help society develop common values on environmental and development ethics;
- d. support environmental technology research programmes including ways to enhance the soundness of new technologies;
- e. develop scientific quality of life indicators covering health, education, social welfare and the state of the environment and economy;
- f. supporting research to improve the understanding of the links between the state of ecosystems and human health and the benefits and costs of different development policies;

- g. support scientific studies to map out national and regional pathways to sustainable development as well as the attitudes and behaviours that lead to environmental impacts and how environmental degradation affects global and local economies.

5.0 SPECIFIC ISSUES

5.1 Disasters

Nigeria has had a number of emergency situations arising from disasters - natural and man-made. The natural phenomena include tropical storms, land erosion, windstorms, floods, drought, desertification, human diseases, coastal erosion, livestock diseases, crop pests and diseases, wildfire, harmattan haze and landslides. Other potential hazards include earthquakes and volcanoes. The major man-made hazards include civil strife; road, water and air traffic accidents; and technological episodes such as oil spills, hazardous wastes dumping and industrial accidents.

All of above call for urgent action for the strengthening of our emergency preparedness to reduce our peoples' vulnerability and cushion the impact of disasters on our settlements, economy and environment. The following strategies are required to mitigate the negative impacts of natural and man-made disasters on the lives of the people.

- A) Prepare comprehensive hazard maps and vulnerability analysis for the country by;
 - a. compiling historical data of disaster occurrence.
 - b. analysis of meteorological, seismological, agricultural and environmental records.
 - c. employing satellite imagery and the GIS system to plot the hazard maps.
- B) Establish very effective early warning systems for meteorological, geophysical, biological, social and industrial hazards by;
 - a. enhancing the meteorological services.
 - b. effective monitoring of pests and disease epidemics.
 - c. resuscitation of seismographic stations and the existing seismological centres.

- d. development of reliable biological indicators.
 - e. building of a viable network for early warning information dissemination.
- C) Develop and maintain prompt emergency response mechanisms and contingency plans by:
- a. making an inventory of all existing resources for emergency response for easy marshalling at times of disasters.
 - b. establishing a body to coordinate emergency response to reduce duplication of efforts and enhance accountability.
 - c. formulating a national emergency policy and an emergency plan.
- D) Mount a sustained public awareness and education programme on hazard preparedness by:
- a. engaging military and para military forces as well as voluntary organisations in drills on emergency response including search and rescue.
 - b. preparing curriculum and integrating emergency preparedness into school.

5.2 *Drought and desertification*

Drought and desertification are the most important environmental problems affecting the northern states. Government, and at some instances in collaboration with donor countries, international organizations and institutions, has done a lot to combat desertification, and mitigate the effects of drought since early 1970s. Efforts have been made through more efficient utilization and alternative sources of fuel wood, promulgation of State Edicts, afforestation and reforestation programmes. Despite all these efforts, desertification has continued its down-south movement which currently renders the areas north of Latitude 15° either desertified or prone to desertification. This process coupled with the effects of drought have continued to cripple the socio-economic lives of the people living in the affected areas. The negative impacts on the lives of the people call for urgent actions to check the desert encroachment, rehabilitate affected areas and institutionalise drought ameliorating measures. The strategies needed to achieve this include:

- a) develop 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.

- b) Integrating public awareness and education on causes and dangers associated with drought and desertification, as well as the constraints of the CCD.
- c) strengthening of national and state institutions involved in drought and desertification control programmes;
- d) promoting of sustainable agricultural practices and management of water resources;
- e) encouraging of viable afforestation and reforestation programmes using drought resistant and/or economic tree species;
- f) encouraging the development and adoption of efficient wood stoves and alternative sources of fuel wood;
- g) establishing drought early warning systems;
- h) involvement of the local people in the designing, implementation and management of natural resources conservation programmes inimical to combating desertification and ameliorating the effects of drought;
- i) 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;
- l) inventorizing degraded lands, and implement preventive measures for lands that are not yet degraded or which are slightly degraded.
- (m) adopting an integrated approach to address physical, biological and socio-economic aspects of desertification and drought.
- (n) intensifying co-operation with relevant Inter-and Non-governmental Organizations in combating desertification and mitigating the effects of drought;
- (o) strengthening of the nation's food security system;
- (p) establishing, reviewing and enforcing cattle routes and grazing reserves.

5.3 Flood and Erosion

Flooding in one form or other affects at least 20% of the nation's population. It cuts across the society from the urban residents to the rural dwellers. Flooding is a threat to physical infrastructures, including residential accommodation, commercial, and industrial properties, roads, rail lines, bridges, port installations etc. It also destroys farmlands, including standing crops. Losses due to flooding run into many billions of naira per year.

On the other hand, 85 of the total land area of Nigeria is under severe sheet, rill and gully erosion with over 2000 active gully erosion sites spread and around the country. Erosion leads to impoverishment of the soil as nutrients are washed away, loss of livelihood as farmlands become wasteland thus increasing the menace of rural urban migration and pollution and siltation of available sources of drinking water. Human lives and properties especially buildings are endangered as they collapse into gullies.

Coastal erosion is widespread along the nation's 800km long coastline with estimated mean shoreline retreats of 2 - 30 metres per year. The worst affected areas include Victoria Beach in Lagos, Awoye/Molome in Ondo State, Ogborodo/Esravos and Forcados in Delta State, Brass in Bayelsa State and Ibeno - Eket in Akwa Ibom State.

To achieve effective management of urban, river and coastal flooding and stabilize all gully and coastal erosion sites and enforce management practices aimed at preventing/minimising the incidence of erosion, the following strategies are required:

For flooding:-

- a) Enforce compliance with planning/urban laws/edicts.
- b) Build embankments and levies along rivers and coastline prone to flood.
- c) Establish rainstorm early warning system
- d) Establish and monitor weather stations, river and tidal gauges
- e) Ensure appropriate management of dams
- f) Ensure proper maintenance of existing urban drainage channels
- g) Enforce environmental sanitation laws in towns and cities.

For Soil and Coastal Erosion it will be necessary to:

- a. prepare and implement a comprehensive national policy on soil and coastal erosion and flood control.
- b. Formulate and enforce regulations for soil and water conservation especially in erosion-prone areas.
- c. Carry out national watershed delineation and characterization for use as a basis for development of an aggressive management and enforcement programme to protect and maintain the quality of the nation's lands water and coastal resources and implement the programme.

- d. Prepare periodic masterplan on the management of soil and coastline erosion and flood, and advise the Federal Government on the financial requirements for the implementation of such plans.
- e. Carry out feasibility and scientific studies on soil erosion and related flood problems for the design of appropriate integrated remedial control measures.
- f. Carry out public enlightenment campaigns on environmental degradation arising from poor land and water management practices.
- g. Provide and promote training on environmental issues as they relate to flood, erosion, land degradation and water conservation.
- h. Promote integrated ecosystem management with other agencies connected with agriculture, land use, soil and water conservation, rural development and coastal resources management including environmentally sound recreational use.
- i. Strengthen national capacity through personnel development, provision of training facilities and research on combating climate-related ecological problems.
- j. Strengthen capacity of the Environmental Management Support System (EMSS) for Remote Sensing data gathering, GIS facilities and development of disaster/environmental data bank.
- k. Support agro-forestry and integrated Coastal Zone Management.
- l. Encourage planted fallow in abandoned farmland using soil enriching species.
- m. Promote conservation farming and use of organic fertilizer and soil conditioners.
- n. Establish viable contingency plans for tackling socio-economic and other problems resulting from coastal and other erosional disasters.

6.0 CROSS-SECTORAL ISSUES

6.1 Sanitation and Waste Management

Environmentally sound management of wastes requires an understanding of the range of treatment, disposal and re-use options available for sanitary and industrial effluents, raw domestic wastes and storm water. In order to ensure that improper

handling and disposal of wastes do not lead to the spread of disease and the pollution of land, air and water, priority shall be given to the environmental studies of industrial effluents as well as the variety of solid and liquid wastes generated in the various ecological zones of Nigeria. Appropriate guidelines shall be introduced for their collection and safe disposal.

These will be done through:

- a. study of the most reliable treatment systems that are appropriate for domestic and industrial wastes;
- b. engineering design and specification of appropriate waste disposal and treatment systems that take into consideration the geological and environmental setting, encourage recycling and guarantee the safety of surface and underground water systems;
- c. setting up and enforcement of standards for sanitary facilities for the disposal of human and other solid wastes in dwellings, housing estates and public facilities in both urban and rural areas;
- d. establishment of monitoring programmes and stations for the control of the dispersal of leachates from dumpsites into surface and groundwater systems;
- e. establishment of an early warning system for the identification of potential waste disposal hazards;
- f. provision of information on the appropriate methods and technologies for the treatment and disposal of wastes;
- g. regulation, registration and licensing of all major land-based waste disposal sites and systems;
- h. establishment of a mechanism for the identification and clean up of abandoned land-based waste dumps;
- i. introduction of effective protective measures against the indiscriminate discharge of particulate matter and untreated industrial effluents into lakes, rivers, estuaries, lagoons and coastal waters, taking into account the following additional factors:
 - the establishment of baseline studies to ascertain water quality at various points along the river or other water bodies;
 - the physical, chemical and biological characteristics of treated effluents;
 - the location and type of existing and projected uses of river water which will

determine the acceptable/optimal location of waste water treatment works and the level of treatment necessary, given the assimilative capacity of the rivers;

- the establishment of relevant standards based on river/water quality objectives;
- public health criteria; and
- the need for a comprehensive monitoring programme incorporating an early warning system for the down-stream users.

6.2 Toxic, Hazardous and Radioactive Waste Management

As part of the Environmental Policy, necessary administrative rules and legislation will be operated to govern the monitoring, introduction, manufacture, import, sales, transportation, use and disposal of toxic, hazardous and radioactive substances in Nigeria.

The appropriate governmental agencies shall therefore:

- a. maintain an up-to-date register of toxic, hazardous and radioactive substances;
- b. control the generation of toxic, hazardous and radioactive wastes and ensure that those banned shall be stringently controlled;
- c. monitor the effects of and control all phases of the life-cycle of all substances likely to have an adverse impact on human health and environment;
- d. determine and use environmentally safe and technologically sound techniques for the disposal of toxic, hazardous and radioactive wastes;
- e. set up regional framework and standards for "DUMP WATCH" against transboundary movement of toxic, hazardous and radioactive wastes and for the achievement of the environmentally sound management of hazardous substances;

6.3 Air Pollution

The atmosphere is very vital for the survival of man and other living animals. It provides air for respiration and photosynthetic processes. It also provides the safe environment surrounding man and other living organisms by shielding them from dangerous particles and rays. It is also the habitat for varied flying organisms and the medium for air navigation.

Strategies for achieving a clean air situation include:

- a. designating and mapping of National Air Control Zones and declaring air quality objectives for each designated Air Control Zone;
- b. establishing ambient air quality standards and monitoring stations at each designated zone;
- c. licensing and registering of all major industrial air polluters and monitoring their compliance with laid down standards;
- d. provision of guidelines for the abatement of air pollution;
- e. establishing standards for the control of fuel additives with respect to trace elements especially Pb, S, Va, Ni, Cr and Zn.
- f. prescribing stringent standards for the level of emission from automobile exhausts and energy generating plants and stations;
- g. monitoring and minimising the incidence of "acid rains";
- h. promoting regional cooperation aimed at minimising the atmospheric transportation of pollutants across international boundaries.

6.4 Noise Pollution

The reduction of noise levels and the control of noise pollution are requisites for the creation and maintenance of a comfortable and healthy living environment. In furtherance of these objectives, programmes will be established to:

- a. set up noise standards including acoustic guarantees;
- b. prescribe guidelines for the control of neighbourhood noise especially with respect to construction sites, markets, meeting places and places of worship;
- c. prescribe permissible noise levels in noise-prone industries and construction sites and ensure the installation of noise dampers on noisy equipment;
- d. set up quiet zones especially within game parks, reserves and recreational centres;
- e. provide guidelines for the control of aircraft noise by prescribing acceptable or permissible noise levels within the vicinity of airports;
- f. ensure compliance with stipulated standards by conducting periodic audit checks;

6.5 Working Environment (Occupational Health and Safety)

A considerable portion of a worker's life is spent within his work environment. It is therefore essential to ensure that environmental factors in the workplace conform to generally accepted standards to ensure optimal productivity as well as the protection of the health and safety of the worker.

In this connection action will be taken to:

- a. establish appropriate regulations and standards to guarantee the protection of workers against hazards that threaten their health and safety within the working environment;
- b. monitor and update levels of various pollutants permissible within the working environment consistent with nationally set standards for human health and well being;
- c. institute training and enlightenment programmes for the management, union leaders as well as workers on the dangers posed by industrial operations including excessive exposure to industrial emissions and other health hazards;
- d. establish minimum standards for recreational facilities and aesthetics within and around offices and factories for the enhancement of the comfort and productivity of workers;
- e. specify and ensure the provision of contingency plans for emergencies within the work environment and establish an effective system for the reporting and monitoring of industrial accidents;
- f. specify safety and health codes and guidelines based on the hazard levels of various industry types.

6.6 Public participation

In order to secure the involvement of the citizenry and assure its commitment to the principle of sustainable development, action will be undertaken to enlighten various levels of society on the essential linkages between environment and development. Action shall be taken to:

- a. ensure public input in the definition of environmental policy objectives;

- b. engage mass and folk media at all levels in the task of public enlightenment;
- c. review curricula at all levels of the educational system to promote the formal study of environmental concepts and sciences;
- d. boost environmental awareness and education through the involvement of indigenous social structures, voluntary associations and occupational organizations;
- e. secure public confidence in the administration of the environment, by demonstrating the resolve of government to enforce the environmental stewardship of government agencies and organs, corporate citizens and elite organizations;
- f. grant the citizenry access to environmental information and data thereby promoting the quality of environmental management and compliance monitoring;
- g. support the role of cognate NGOs, professional associations and other civic groups in activities designed to propagate environmental protection information, techniques and concepts.

7.0 Institutional and Intergovernmental Arrangements

A viable national mechanism for environmental management requires co-operation, co-ordination and regular consultation, as well as the harmonious management of the policy formulation and implementation process through the establishment of effective institutions and linkages within and among the various tiers and levels of government

- Federal, State and Local. For this purpose, Government will:

- a. strengthen and adequately fund the activities of the Federal Environmental Protection Agency (FEPA);
- b. strengthen the consultative and advisory roles of the National Council on the Environment and the State Environmental Protection Agencies (SEPA) particularly those relating to:
 - advising the President/Governors on environmental issues;
 - recommending and updating National/State policies to improve the environment;
 - encouraging the use of ecological information in the planning and development of resource-oriented projects at all levels;
 - emphasising their complementary role in ensuring the achievement of the overall objectives of the National Policy on the Environment.

- c. promote and strengthen research and development programmes in environmental technology;
- d. enhance co-operation among all tiers of government on environmental protection, planning, monitoring and enforcement;
- f. clarify and reinforce the role of Local and State government administrations in the management of wastes and other forms of pollution;
- g. ensure prompt payment of financial contributions and meet contributions to relevant international organizations such as the United Nations Environment Programme (UNEP);
- h. provide systematic and periodic briefing for public officials at all levels of government on environmental issues and legislation;
- i. ensure multi-disciplinary and intersectoral collaboration in environmental management, through institutions such as the National Resources Conservation Council and various other technical advisory committees;

8.0 LEGAL ARRANGEMENTS

The legal framework, as a component of the national environmental policy should directly and continuously drive policy in a way that recognises the organic nature of the environment and therefore the need to manage it in an effective and efficient manner.

To ensure this role, action shall be taken from time to time to:

- a. periodically evaluate current legislation with a view to updating existing provisions;
- b. streamline all legislation and regulations relating to the environment with a view to re-organising them into a holistic and integrated compact that recognises the cross-sectoral linkages of the environment;
- c. prescribe jurisdictional boundaries for law making among the various tiers of government;
- d. state the principles governing the enforcement of environmental regulations as guideposts for judicial and quasi-judicial bodies charged with the responsibility of obtaining compliance with environmental law.

9.0 INTERNATIONAL TREATIES AND OBLIGATIONS

Legislative action will be taken to incorporate Conventions and Treaties to which Nigeria is a party into the laws of Nigeria.

Nigeria will continue to participate in the development of international laws and guidelines on environmental protection, and will ensure the implementation of such laws and guidelines within and outside its territory.

10.0 FINANCING ENVIRONMENTAL PROTECTION AND NATURAL RESOURCES CONSERVATION

Huge financial investments are needed to implement the various programmes and activities for Environmental Protection and Natural Resources Conservation. With the increasing pressure on the environment and natural resources, the cost of in-action would rise exponentially and manifest in the expansion of desertified areas, loss of our agricultural and natural resources, declining agricultural productivity, impaired health of the citizenry, polluted surface and underground waters, expansion of coastlines into prime property and agricultural areas etc.

The financial requirements for environmental protection and natural resources conservation, calls for the need to streamline the current funding mechanism to make them more efficient and responsive. There is also the need to improve current funding levels and to provide new and additional financial resources that are both adequate and predictable to halt and reverse the current menace of environment and natural resources degradation.

Strategies/Activities

- a) ensure adequate annual budgetary provision for implementation of the National Policy on Environment; and in particular, the amelioration of key environmental problems;
- b) Access the 2% Ecological Fund (set aside from the Federation Account for the amelioration of ecological problems) for environmental protection, natural resources conservation and for evaluation and monitoring of projects.
- c) Set aside 25% of the 3% Federation Account to OMPADEC (Oil Mineral Producing Areas Development Commission) for environmental protection, restoration, remediation and rehabilitation of natural resources;

- d) Establish a Fund, to be funded by at least 3% of the Federation Account, for the restoration, rehabilitation and development of the degraded mine lands in all Solid Minerals Producing areas.
- e) Take full advantage of bilateral and multilateral technical and financial assistance in environmental protection and ensure maximum benefits from the financial mechanisms for the implementation of the Conventions and Protocols ratified by Nigeria;
- f) Establish an Environment Endowment Fund with contributions from governments, individuals and corporate bodies as a sign of their commitments to the environmental protection efforts. This fund shall be revolving and be managed by FEPA for emergency environmental clean-up of oil spills, industrial pollution accidents and restoration of abandoned mining sites and desertified areas.
- g) Mobilize additional finance through the imposition of taxes, fines and charges, where appropriate, on activities that deplete natural resources or degrade the environment.

The task of an economy is to produce the combination of goods and services that will promote the welfare of the members of the community within the limits of the resources and production techniques available. Sustainable development ensures that this production of goods and services does not destroy the environment irreparably; hence sustainable development is defined as "a process in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional change are all in harmony, and enhance both current and future potential to meet human needs and aspirations." Since the national development policy objective is to achieve rapid economic growth and improvement in individual welfare on a sustainable basis, a range of enabling policy instruments are required to propel the development process in the desired direction.

Among other things, action shall be taken to:

- a. grant pioneer industry status to only environmentally sound new projects;
- b. introduce performance bonds for hazardous waste;
- c. grant "soft" loans to firms, complying with environmental guidelines and standards;
- d. promote market-based extraction charges as well as emissions and effluent charges;

- e. encourage the use of ecological information in planning and development of resource-oriented projects;
- f. promote and strengthen research and development programmes in environmental technology;
- g. encourage and institute incentive measures for installation and provision of anti-pollution equipment and devices;
- h. allow costs of negative environmental externalities to be internalized in supply prices;
- i. incorporate environmental values in growth-promoting economic activities;
- j. encourage active participation, prompt payment of financial contributions and make contributions to relevant international organizations charged with protecting the environment;
- k. ensure the active involvement of all the citizens in pollution and waste management, especially in the urban areas;
- l. encourage economic policies conducive to sustainable development.
- m. prescribe and enforce regulatory measures aimed at preserving the environment;
- n. insist on multi-disciplinary and intersectoral collaboration in environmental management;
- o. adopt the principle of incorporating environmental concerns from the start in any project planning.

11.0 THE USE OF ECONOMIC INSTRUMENTS AND INCENTIVES IN THE MANAGEMENT OF ENVIRONMENT AND NATURAL RESOURCES.

Sectoral Policies, environmental laws and regulations are important, but cannot, alone, be expected to deal with the problems of environment and development. Prices, markets and governmental economic policies also play a complementary role in shaping attitudes and behaviour towards the environment.

Sustainable development requires that the exploitation of resources, the production of goods and services, the direction of investments, the orientation of technological

development and institutional change are all in harmony and enhance both current and future potentials to meet human needs and aspirations. Since our national development policy objective is to achieve rapid economic growth and improvement in individual welfare on a sustainable basis, a range of enabling policies, economic instruments and incentives are required to propel the development process in the desired direction

Strategies/Activities

Among other things, action shall be taken to:

- a) incorporate environmental costs in the decisions of producers and consumers so as to reverse the tendency to treat the environment as a "free good" and to stop passing these costs on to other parts of society or to future generations;
- b) integrate social, environmental and other costs of negative environmental externalities into economic activities so that prices will appropriately reflect the true and total value of resources and contribute towards the prevention of environmental degradation;
- c) include, wherever appropriate, the use of market principles in the framing of economic instruments and policies to pursue sustainable development, and in particular, to consider gradually building on experience with economic instruments and market mechanisms by undertaking to reorient policies, keeping in mind national plans, priorities and objectives.
- d) institutionalize "Polluter Pays Principle" so that the polluter bears the cost of environmental degradation or pollution; thus providing the positive incentives to limit degradation or pollution of the environment.
- e) develop and implement a mechanism for charging emission fees and fines for all pollutants and effluents (based on quantity, quality and detrimental effects) thereby internalizing all costs and other negative externalities into the production process and output prices.
- f) impose penalty taxes, fines, and charges for non-compliance to environmental standards and regulations so that violations to such regulation become costly to the violators
- g) encourage participation of all stakeholders in the management, harvesting and the utilization of revenue from the use of natural resources.
- h) adopt an appropriate pricing of natural resources and production inputs to encourage on optimal allocation, production and and consumption of these resources.

- i) Promote tax reliefs that encourage investment in pollution abatements through:
- * grant of accelerated depreciation allowance on pollution abatement equipment.
 - * the removal of import duty on abatement equipment
 - * the grant of tax holidays and pioneer status to environmentally sound new projects.
 - * the use of other tax credit schemes.
- j) promote market based extraction charges and appropriate taxes on the extraction of resources to discourage their destructive exploitation and inefficient use.
- k) require the submission of performance bonds to insure that industries comply with post resources extraction regulations and employee accident insurance schemes.
- l) allow, where appropriate, the direct transfers of financial assistance (subsidies)
- * to compensate specific groups which may be caused additional costs or hardship in complying with standards,
 - * to encourage groups to improve their environment.
 - * where conservation initiatives affect their immediate income
- m) develop a compensation framework for environmental damage which ensure that:
- the polluted environment is adequately compensated by way of remediation and restoration.
 - persons affected are equitably compensated, and
 - the offender or saboteur is made liable.
- n. employ appropriate insurance schemes and other risks management processes in remediation and restoration of polluted or degraded areas.
- o) encourage active participation and prompt payment of financial contributions to relevant international organisations charged with protecting the environment;

12.0. MONITORING AND EVALUATION

12.1 *Monitoring*

In keeping with the objectives of the National Policy on the Environment, there shall be established:

- a. a National Environmental Data Collection and Information System co-ordinated by the Federal Environmental Protection Agency (FEPA) which functions as a network involving as partners all relevant agencies at the Federal, State and Local government levels as well as NGOs, Universities and Research institutes;
- b. a national environmental monitoring and information management network;
- c. the collection, analysis and distribution of data of relevance to environmental impact assessments, policy analysis and environmental monitoring within the country as well as the preparation of periodic and national reports on the state of the environment.

Government responsibilities in this regard would include:

- a. the monitoring and enforcement of environmental quality standards and regulations;
- b. the regular assessment of environmental conditions and trends in rural areas and identification of programmes and actions needed to reduce or avoid further environmental degradation and pollution;
- c. the application of the national environmental assessment guidelines and procedures for all development policies and projects likely to have adverse environmental impacts within state and local governments;
- d. the development of Contingency Plans and capabilities to respond quickly and effectively to environmental emergencies;
- e. the collection, analysis and distribution of data of relevance to environmental impact assessments, policy analysis and environmental monitoring within the State and Local governments;
- f. the preparation of periodic public reports on the state of the environment in their area.

12.2 Analysis and Evaluation

Analysis and evaluation should be seen as problem solving opportunities not only for departments but also for task managers and project staff at all levels. To facilitate this, major programmes and policies affecting the environment would be carefully monitored and readily evaluated. Environmental standards and attainment targets will be set. Indicators for monitoring assessment of progress nationally, regionally and sectorally will also be worked out.

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**UNDER THE AUSPICES OF:
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