

THE BIO-ENVIRONMENT - AFRICAN DIMENSIONS

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It is my pleasure to begin this paper with a short quotation taken from a paper presented by Dr. Vlavianos-Arvanitis in Berlin in 1986 during a WFUNA meeting. The theme of her paper was "Biopolitics - a Pathway to International Co-operation". Dr. Agni Vlavianos-Arvanitis stated in her paper that "bios is the most precious possession on our planet and our planet is unique as far as we know up to the present in having the greatest gift of creation which is life itself".

This paper therefore will look at this precious possession on our planet as it relates to our immediate environment in Africa with particular reference to Nigeria. I have taken Nigeria as a case study because of its unique position in Africa. She has the problem of the Sahara and a problem of deforestation which can be found in most of the African countries. Nigeria as it is known has the greatest concentration of the black race in the world spread within an environment of 923,768 square km. Its present population is about 74,595,000 as published by Collins-Longman. The Northern part of Nigeria which has a border with Niger and Chad is under constant threat by the Sahara Desert. Some parts of Northern Nigeria fall within the grassland belt which is ideal for wildlife preservation. There is the famous Yankari Games Reserve in Nigeria. There are also forest reserves in almost all the States in Nigeria. In the South, the Atlantic Ocean forms a border and it filters inwards some rivers and creeks and some of these face oil pollution in the oil producing areas of the Bendel and Rivers states of Nigeria. There are wetlands in the South, some of which have been reclaimed to form dry lands for settlement by the people. The reclamation process has brought about the total extinction of the animal life in the wetlands.

Following the advent of industrialisation in Nigeria, industrial pollution became a threat to the air, river and lagoon in our environment. This area of menace will be treated in a later part of this paper and it concerns pollution from the oil industry.

1. Sahara Encroachment And Reforestation Programme

Five states in Nigeria, Sokoto, Kaduna, Borno, Bauchi and Kano are called the arid zones states. These states are found within latitude 12 degrees north of Nigeria. However, there are some other areas which have some characteristics of the arid zones. The arid zones are known to have harsh climatic conditions, fragile soils, low annual rainfall and periodic destructive droughts which affect the population of man and animals in the area. In fact, the population of the arid zone area according to the FAO/World Bank Appraisal Report of 1983 was 28 million and the Nigerian livestock (cattle, sheep and goat) was about 58 million in 1980 and a large proportion of this came from the arid zones. The population in these areas is decreasing due to the destruction of natural vegetation for farming. The people in these areas are mainly nomads who follow their cattle about in search of grazing lands. Attempts have been made to improve the conditions of life in the arid zones by planting forest trees. In fact, from records available, the aforestated programme which the Nigerian Government embarked upon many years ago has resulted in many forest trees such as shelter belts and woodlots for checking desertification.

2. Forest Reserves

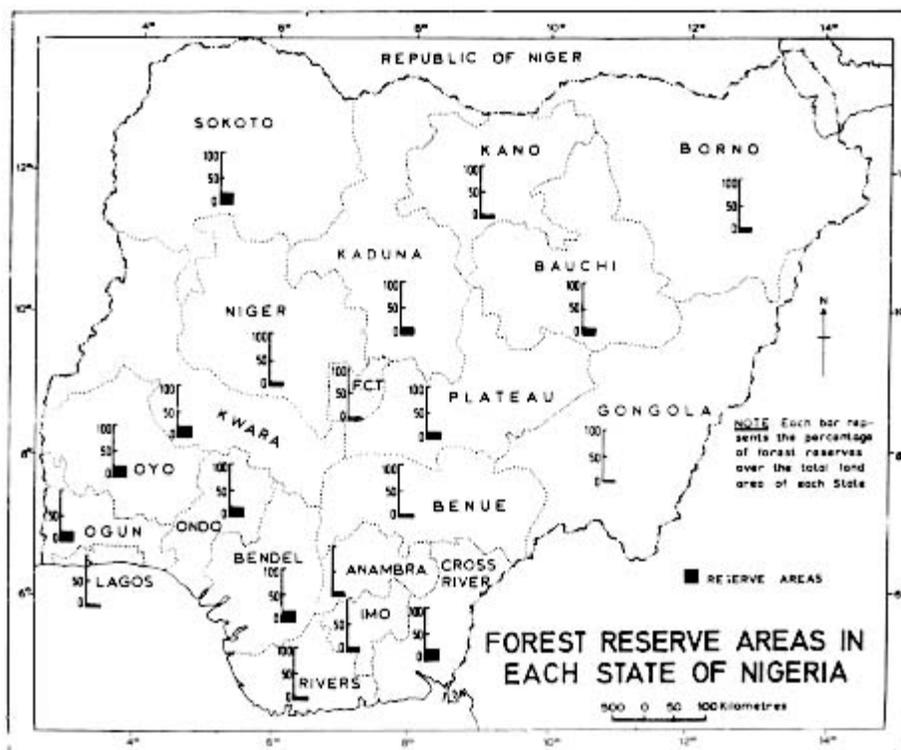
The increase in Nigeria's population has brought about demand for farmland. As a result of extensive clearing of lands, there is soil degradation with erosion. Some extensive clearings have extended illegally to the forest reserves where the trees have been used as fire wood or fuel woods. The result is that such forest reserves when encroached upon will no longer serve the purpose of protection of environment for which they were made. Forests play an important part in food security in an environment. They are the principal source of genetic stocks from which food producing species derive. They contribute to the maintenance of both physical and biological environmental conditions favourable to food production, and provide fruits, tubers and leaves for direct consumption. Forests help to protect water sheds and prevent soil erosion. They protect wind erosion mainly in arid and semi-arid areas. In the arid and semi-arid zones, deforestation for agricultural settlement and grazing have degraded the land and have contributed to severe drought in the areas.

Deforestation is practised widely in Nigeria and perhaps in most African countries, and in this regard, the culture and civilisation of our people play an important role. The forests are used as fuel woods and for agricultural settlement; sometimes they are lost through annual bush burning. Nigeria has planned some strategies to tackle the problem of desertification, including the improvement of the environment in arid zones by embarking on rural forestry development through the production and supply of seedlings to individuals and organisations. Effort has also been made towards development of forest plantation and forest protection to assist in the production of fuel woods, poles, gum arabic, shea butter and tanning plantations. There is a plan to protect the natural forest and the environment from fire. In fact, about 10 million tree seedlings were raised each year and distributed to communities and individuals.

Accurate measurement of water resources in Nigeria would require crucial planning, involving water data collection analysis and monitoring both underground and surface water resources. The Federal Department of Water Resources has completed the first steps of studies on a provisional Master Plan for the development of underground water resources in some parts of the country. A National Hydrological Network Programme for data collection of the country's major river system has commenced, and it is hoped that this project will bring sufficient information and data for water resources development and conservation in Nigeria.

The above notwithstanding, one is inclined to state that forest reserves are not only found in arid zones of Nigeria, but in almost every state of the Federation. The total area of forest reserves in Nigeria is about 10,019,758 ha which account for about 10% of the entire land mass of Nigeria (Appendix A).

Appendix A



3. Game Reserves

As part of the effort to preserve our natural environment, Nigeria has Game Reserves in all the states of the Federation (see Appendix B for location and species). African countries like Kenya, Tanzania, Ethiopia, Zimbabwe, have rich animal collections in their Zoos and Game Reserves. These animals range from lions, elephants, reptiles and birds of all kinds. The Game Reserves provide the facility for animal study in their natural habitats.

Appendix B

NATIONAL PARK AND GAME RESERVES IN NIGERIA

NAME	CATEGORY OF PARK OR RESERVE	CROSS AREA (KM ²)	DATE ESTABLISHED	PRINCIPAL FEATURES
1 Anambra State Udi/Nsukka	Game Reserve	65 km ²	Proposed	High forest: Bushpig, Antbear, various Antelopes
2 Anambra	Game Reserve	-	Proposed	High forest: Bushpigs, various antelopes
3 Bauchi State Yankari	Game Reserve	2,240 km ²	1957	Premier Game Reserve in Nigeria, Guinea Savanna/Fadama Grass Land, Wikki Warm spring visitors camp Elephant, Buffalo, Hertebeast, Hippopotamus, Roar Antelopes, Lion etc.
4 Lane/Bura	Game Reserve	2,059.67 km ²	Proposed	Sudan Savanna vegetation Delimi River, various Antelopes, Elephants, Klipspringer.
5 Bendel State Ologbo	Game Reserve	194.4 km ²	1981	Buffalo, Monkeys, Drills, Bushpig.
6 Orle	Game Reserve	54.4 km ²	1981	Bush-buck, Dukers, other Antelopes.

	Kwase	Game Reserve	13.4 km ²	1961	Forest Elephant
8	Okomu	Game Sanctuary	30 km ²	1985	Created within Okomu Forest Reserve. White Throated Monkeys.
9	Benue State Ikwe	Wildlife Park	40 km ²	Proposed	Gun Guinea Savanna
10	Opandia	Game Reserve	135.2 km ²	Proposed	Elephants, Buffalo, various Antelopes.
11	Okokio Game Sanctuary	Forest Reserve	0.80 km ²	Converted to Game Sanct. in 1985	Fencing, access Ad & cutline.
12	Enunabia G. R.	Proposed	32 km ²	Proposed in 1978	Survey yet to be carried out. Warm springs and streams.
13	Salegi G.R.	Proposed	155 km ²	Proposed in 1972	Access Ad molorable only in dry season. Hills and depression of interest and animals. River Konshisha and stream drains the reserve.
14	Borno State Sambisa	Game Reserve	686 km ²	1959 as Forest Res.) 1978 (as Game Res.	Southern Guinea Savanna. Elephant, Ostrich, Roan Antelop.
15	Lake Chad	Game Sanctuary	388 km ²	Proposed (but prot.)	Lake Chad. Elephant, Buffalo, Bird life including migratory species from Europe.
16	Chingurie/ Duguma	Game Reserve	354 km ²	Proposed (ungazetted)	Adjacent to Cameroon Republic. Migratory Giraffe.
17	Baderi	Wetland Reserve	48 km ²	Proposed	Important Wetlands Area: with Palearctic Birds.
18	Cross River State Obudu	Game Reserve	720 km ²	Proposed (but prot.)	Hilly, High Forest Reserve. Gorilla, Chimpanzee, High Forest Elephants, Manatee
19	Gongola State Gashaka/Gumti	Game Reserve	6,630 km ²	Undergoing Gazettment	Mountainous terrain, various Antelopes, Monkeys, Hippopotamus, Leopard, Lion, Crocodiles, etc.
20	Kambari	Game Reserve	414 km ²	1969	
21	Kashimbila	Game Reserve	1,396 km ²	1977	Montane/Savanna/Forest Vegetation. Katina-Aia River, Network of rivers. Hippopotamus, Manatee, Antelopes
22	Kaduna State Kamuku	Game Reserve	1,200 km ²	Proposed	
23	Kano State Falgore	Game Reserve	920 km ²	1972	
24	Hadejia Wetl. Reserve	Game Reserve	297.3 km ²	Approved for Gazettm.	Bird Sanctuary: Wintering ground for palearctic from Europe.
25	Kwara State Kainji Lake Nat. Park	Nat. Park	5,309 km ²	Aug. 1975	Kainji Lake: Boating, Fishing, Southern Guinea Savanna Woodland. Elephant, various Antelopes, such as Western Hertebeast, Roan Antelope, Duiker and kobs etc., Lions and other cats. Visitors Camp.
26	Ebba/Kampe	Game Reserve	117.3 km ²	Proposed	Various Antelopes.
27	Niger State Alawa	Game Reserve	296.20 km ²	Gazetted	Primates, Birds.
28	Dagida	Game Reserve	294.22 km ²	Gazetted	
29	Ogun State Meko	Game Reserve	966.1 km ²	Proposed	High Forest/Guinea Savanna woodland. Various Antelopes, Elephant.
30	Ondo State Ifon	Game Reserve	282.3 km ²	Proposed	High Forest. Forest Elephant, Buffalo, Primates.
31	Okeluse	Game Reserve	111.4 km ²	Proposed	High Forest. Bushpigs and Monkeys.
32	Oyo State Upper Ogun/ old Oyo	Game Reserve	1,100 km ²	1973	Forest/Southern Guinea Forest, Forest Elephant, various Antelopes, Buffalo, Avian and Reptile life.
33	Opapa	Game Reserve	-	Gazetted	-
34	Plateau State Jos	Wildlife Park	8 km ²	1972	Plateau Savanna vegetation. City park/Zoo various animals introduced include Manatee, Elephants, Lion, Leopards etc.
35	Pandan	Wildlife Park	224 km ²	1972	Pandan Lake, Boating and Fishing. Sudan Savanna woodland. Hippopotamus, various Antelopes, Aquatic birds etc. Visitors Camp.
36	Wase	Game Sanctuary	1,153 km ²	1972	Sudan Savanna vegetation, various Antelopes, various Reptiles.
37	Wase Rock	Bird Sanctuary	92.4 km ²	1972	Ancient volcanic plug over 900 ft high. Rosy Pelican Roosting site; other birds; Abdni's stork, etc.
38	Nasarawa (Bakono)	Game Reserve	1,900 km ²	Proposed	Elephant, various Antelopes
39	River State	Game Reserve	97.2 km ²	Proposed	Swamp/Mangroove Forest. Pigry Hippopotamus.

Nun River				Crocodile, Duikers
10 Stubbs Creek	Game Reserve	-	Proposed	Swamp/Mangroove Forest. Crocodiles, various Antelopes etc.
41 Sokoto State Kwanbara	Game Reserve	2,614 km ²	Gazetted	Elephant, various Antelopes

We in Nigeria believe that the survival of man will depend on increased respect for life not only for man but animals. In fact there is a recent decree (No. 11 of 1985) enacted by the Federal Government as required under the United Nations treaties to which Nigeria is a signatory. It provides for the conservation and management of Nigeria's wildlife and the protection of some animals in danger or extinction as a result of over-exploitation. The decree specifically prohibits the killing or trading of certain animals and restricts the exportation and importation of some animals, with stiff penalties.

There have also been efforts from the private sector to preserve the life in our environment, for instance the African Wildlife Society in Kenya and the Nigerian Conservation Foundation (NCF). These private bodies are concerned with preservation and protection of our environment. The NCF has embarked on a campaign designed to educate Nigerians on the judicious use of their natural endowment so that it will be renewed for the succeeding generation.

4. Health Profile

A careful study of the pattern of mortality and morbidity in Nigeria shows clearly that infection and parasitic diseases dominate the scene. This is a reflection of widespread poverty and deprivation of our underdeveloped status and calls for a more vigorous emphasis on the implementation of the primary health care approach in the health sector in order to usher in a socially and economically productive life for our people. There is little need to emphasise that the above situation affects almost all African countries.

Environmentally induced diseases are still the major cause of morbidity and mortality in Nigeria and perhaps in most African countries, and can be divided into three categories: water-born, food-born and vector-born communicable diseases. The most important vector-born diseases in Nigeria are malaria and river blindness. The United Nations through its appropriate agencies has given aid to African countries in the field of health care, but there is still more to be achieved.

5. Industrialisation And Industrial Pollution

The discovery of oil in Nigeria ushered in different industries for many years, and has determined the economic strength of Nigeria. The most prominent of such industries is petroleum, petro-chemicals and the manufacture of its allied products. This area of industrialisation no doubt has its good and bad sides. It improved our economy and at the same time brought mishap to some Nigerians, especially those who live in the oil zones. The water was polluted with chemicals so fishing and agricultural farming became almost impossible. A study of the petro-chemical plants gave the following possible pollutants:

- a. Benzene
- b. Hydrofluoric acid
- c. Paraffin solvent
- d. Hydrogen sulphide
- e. Sour water
- f. Spent caustic
- g. Polymer waste including agglomerated material
- h. Propane - rich in butane-butane
- i. Ethylene
- j. Xylene etc.

A further analysis of toxicity and effect on environment of some of these pollutants is given in Appendix C. Pollutants are released into the air, land and water from the process of industrialisation and these have serious implications. It is known that well over 60,000 chemicals are frequently used daily and that the number increases at a rate of 200 to 1000 new chemicals per year.

Appendix C

List of Effluent/Emissions from Linear Alkyl Benzene (LAB) Plant

Compound	Threshold toxicity limit	Effect on Environment/Human/Vegetation
Benzene	10 ppm	Increases Biological Oxygen Demand of water system. Toxic to human beings causing dizziness, mental confusion, tightening of leg muscles and ultimately coma. Affect O ₂ carrying capacity of the blood.
Paraffin Solvent (N C10)	N/A	Non poisonous, irritating to the eye.
H ₂ S	10 ppm	Highly toxic. Exposure to low concentration. Produces conjunctivitis vision problems and digestive disturbances. It kills the cells by paralysis of the respiratory centres. On environment, burning produces SO ₂ and causes acid rain.
Sour Water	N/A	Contains ammonia, H ₂ S and traces of phenols which are harmful to the water system, especially phenols.
Spent Caustic	N/A	Contains sodium Carbonate bicarbonate and SO ₂ . This has to be neutralised by H ₂ SO ₄ before disposal into chemical sewer.

A. Air Pollution

There are three main sources of air pollution; domestic fire, industry and transport. Air pollution has been shown to be a factor in obstructive and restrictive lung diseases. Many African countries have enacted legislation to control air pollution.

B. Water Pollution

Industrial effluent is being discharged into water courses without treatment and thereby posing great danger to aquatic life, while sources of drinking water can also be contaminated. Even chemical fertilisers can reach into ground water. The uncontrolled use of pesticides which are toxic by untrained people can involve grave risks to health and environment and are known to be transported by water, wind and even plants. In fact, pesticide residue is found in the food chain subsequently consumed by man.

C. Noise Pollution

In Nigeria and perhaps in most African countries, we experience various types of noise, motor vehicles, aircraft, construction and demolition sites, noise in the town, advertisement and entertainment. The effect of community noise may be classified according to its severity and may result in deafness, reversible impairment of hearing, impairing communication and sleep disturbance and annoyance.

In conclusion, one can say from the foregoing that man is the architect of his misfortune in his environment. Certain factors like culture and technological advancement do affect the life of people in their area and can extend to other people's environment, as we have seen in recent time. There is therefore an urgent need for this Conference to call on the various governments of this great world to exercise restraint in all acts that are likely to affect the innocent lives on our planet. Our health problem in Nigeria and Africa in general is a result of our environmental condition and poverty, and African governments should be advised to invest in environmental health, particularly in the provision of water supply and basic sanitation. When the above health programme is achieved, it will bring about a healthier long life for all the people.

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