
Rotational Bush Fallow Cultivation and Environmental Degradation as an Impediment to Food Security in Nigeria: The Problem in Cross River State

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Abstract

Although the discovery of rotational bush fallow cultivation marked a stage of settled life, civilization, and progress for the semi-wandering primitive man in Africa, it has been the main contributor to environmental degradation in Nigeria. It deforests, degrades and converts high forest areas into derived savanna grass land. Thus, it sets the stage for annual bush fires that destroy food and cash crops, forest resources, including wild life, wetland areas, watersheds and household property. Burning also intensifies soil erosion, leaching, loss of soil fertility, and decline in crop production. This paper examines environmental degradation problems in the state against the inability of federal and state environmental institutions to identify and stem the problems for the achievement of food security in Nigeria. Some key of the recommendation should be highlighted here. Some key measures that can stem the challenges include the replacement of bush fallow cultivation with a better system, and the creation of awareness of environmental challenges among the rural farmers to achieve the objectives.

Archaeological and botanical evidence have made it increasingly obvious that burning of vegetation is as old as man himself. Charcoal and herbaceous pollen preserved in peat deposits indicate that forest burning in Europe began to increase markedly in the Neolithic time (Tivy 1982). The deliberate clearing and firing of vegetation to open up areas for the growth of crops and to facilitate hunting was employed by the primitive man (Hagget, 1976, Monshard, 1979, and Tivy 1982). The process has been continued to this day despite clear evidence of global environmental threats that have led to climate change, environmental degradation and declining crop production in Cross River State.

Vegetation in the humid tropics would not burn naturally, but by girdling or felling of trees could be dried sufficiently in the dry season to burn (Hagget 1976.p172). Both shifting and rotational bush fallow cultivation employ the “slash” and “burn” process to open up forest areas for cultivation. “Shifting cultivation is said

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to be as old as the history of agriculture itself. Its origin could be traced back to about 7000/ 8000 B.C. when man made attempt to switch to food production from gathering activities (Sign and Dhillion, 2000 p.293). In the primitive “slash“ and “burn” (shifting cultivation) primary species were able to reinvade the abandoned areas because fruiting species and animals seed carriers were close by, and so the rain forest soon returned to its original state. The primitive “slash” and burn (shifting cultivation) was thus compatible with the maintenance of the rain forest ecosystem (Strahler and Strahler, 1977. p.374) than the present “slash” and “burn” rotational bush fallow system.

In the primitive shifting cultivation the “slash” and “burn “process opened the forest for farming until when crop production declined in a particular plot after farming for a number of years. At that point, the farmer was forced to transfer both the dwelling place and the farm plot to a new forest area. At that time man was still in a semi-wandering stage. Some communities in the rain forest areas of Cross River state were still practising this system of farming up to the advent of colonialism to the country. In rotational bush fallow farming system, the dwelling place (house stead and later village) became permanent while the farm plot is rotated through the bush fallow areas.

Step to Increased Agricultural Production

The ability of man to wrest a permanent place (house stead or village) according to Oyeleye (1988) developed from man’s mastery of six important techniques. These are

1. The domestication of plants
2. The domestication of animals
3. The Construction of shelter
4. The manufacture of containers
5. The manufacture of tools
6. The Pooling together of socially accumulated observation and experience

In developed countries these developments were accompanied with a chain of inventions that included the ox drawn plough, the wheel cart, metallurgy (manufacture of tools) and the discovery of irrigation practices. These induced surplus food production over, and above the consuming need of food producers. More inventions facilitated more intensive use of the land with increased in crop production. Areas with surplus food production gave rise to agglomeration of economic activities that soon gave rise to the growth of towns and cities. In turn the growth of towns and cities with increased demand for food and cash crops facilitated agrarian commercialization. The agrarian revolution in British in the 17th century came before the industrial revolution.

By contrast the ability of man in the developing countries to wrest a permanent dwelling place for himself was not followed with similar stages of development in the manufacture of containers and tools, and increase in crop

production, there has been little agglomeration of economic activities, to the growth of towns and cities, as well as agrarian commercialization.

Despite its obvious advantages system over shifting cultivation, the uncontrolled “slash” and “burn” rotational bush fallow cultivation coupled with increased population, first shortens the fallow period, paves way for over farming of fallow plots, and thus ushered in environmental degradation and low crop yield.

Although Nigerian governments have since the 1980's, recognized the dire consequences of environmental problems in the Koko toxic waste dump that led to the establishment of the Federal Environmental Protection Agency (FEPA) in 1989, along with state agencies, and ministries of environment, environmental degradation is still continuing at an alarming rate. To properly manage and protect the Nigerian environment, the federal government through the Federal Environmental Protection Agency (FEPA) formulated the National Policy on the Environment in order to achieve sustainable development. Some objectives of the goal of the policy are:

- To raise public awareness and promote the understanding of the essential linkages between environmental resources and development, and to encourage individual and community participation in environmental improvement effort.
- To conserve and use the environment and natural resources for the benefit of the present and future generations, etc.
- To restore, maintain, and enhance the ecosystem, and ecological processes essential for the functioning of the biosphere to preserve biological diversity and the principle of optimal sustainable yield in the use of living natural resources and ecosystems.

With the escalating rate of environmental degradation and decline in crop production that leaves many Nigerians hungry, how does government intend to achieve food security as one of its transformations agenda? Have Nigerian governments raised enough public awareness, particularly among rural farmers, to the level that Nigerians now understand the link between the environment and sustainable development? Have Nigerian governments started the implementation of the National Policy on the Environment that covers all aspects that can lead to environmental sustainability in the country? In this study the author tries to bring out clear evidences about the destruction of forests, in Cross River State, environmental degradation, and low crop yield that militate against food security and environmental sustainability in Nigeria.

Rotational Bush Fallow (“burn” and “slash”) Cultivation Before and During Colonial Administration in Cross River State

Rotational bush fallow cultivation in Ogoja province before and during colonial era was limited to the guinea savanna areas that Inter-spaced the high forest area. These savanna areas were burnt annually for farming, and to facilitate hunting in forest areas. In order to make the grasses burn well to ease the process of clearing, farmers selected plots and pushed down the grasses before bush burning. After this

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the grasses were cleared before tilling or the making of mounts. In reality, this process was the “burn” and “slash” rotational grass fallow cultivation.

With long fallow years of between 10- 15 years coupled with the accumulation of ash over the years, there was good yield of yams, cassava, maize, groundnut, etc. mainly for subsistence. Confined mainly to grassland areas, there was little environmental degradation since grasses have renewed growth only when they are burnt. Since tropical forests are not easily burnt, they formed a protective boundary to annual bush burning.

Thus, the colonial period in Nigeria can be seen as the golden era of environmental protection and conservation. In Cross River State the colonial administration created Twelve (12) forest reserves, from the north to the swamp forest bordering the Atlantic Ocean in the South.

These were:

- | | | |
|----------------------|-------------------|----------------------|
| 1. Yache, | 2. Gabu/Bekwara | 3. Nitrigon |
| 4. Cross River North | 5. Afi River | 6. Cross River South |
| 7. Ukpon River | 8. Umon Ndealichi | 9. Uwet Odot, and |
| 10. Oban North | 11. Oban South | 12. Ekinta River |
- reserves

(fig 1).

Apart from these colonial forest reserves, there were community forests in all parts of the state. These forest reserves were rich treasures of major forest resources – timber and fire wood, as well as hundreds of different kind of minor forest resources. Fortunately, part of Calabar province in Cross River State was completely covered with tropical equatorial high forest that was home to vast forest resources. With no climate change then, there was rainfall all the year round that allowed no room for rotational bush fallow cultivation.

Rotational Bush Fallow (“slash” and “burn”) Cultivation after Independent in Cross River State

Due mainly to the negative price policies of marketing boards, the production of palm products declined rapidly after independence and by the end of the civil war in 1970s, there was complete cessation of export production. With petroleum export, and bad governance Nigeria lost her leadership position in palm products export to Malaysia. Her leading position in cocoa, groundnut and cotton production was also lost.

At the loss of palm products exports, the people of Cross River State made effort to have another cash crop economy to replace palm products export trade. By accident, they discovered that the “slash” and “burn” farming in the tropical high forest areas gave far richer and better food crop yield than in grassland areas. According to Harget (1976 p. 173) burning a 40 years old tropical high forest produces massive doses of nutrients that can be used by planted crops. The main

elements in proportion are: calcium (100 units), potassium (32 units) Magnesium (19 units) and phosphate (5 units). He added that burning savanna wood/land releases less than one tenth (1/10) as many nutrients, but relatively greater share of potassium.

Without any knowledge of the composition of nutrients, the high yield of food crops from the process, encouraged farmers to increase deforestation for food crop production. With the assurance of very rich harvest, farmers became more determined to replace the lost income from palm products. This high yield of very big yams, large tubers of cassava, large ears of maize (corn cobs), big heads of plantain and banana, etc,escalated the process deforestation in all parts of the state. Between the mid 1960s and 1980's, forest reserve and community forests in the northern part of the state had been completely destroyed. Only isolated forests and those considered as sacred to the natives were spared.

With climate change and longer dry periods in the late 1980s rotational bush fallow farming was intensified in the southern part of the state, Calabar province with in-migration of farmers to these areas. coupled with weak forest policies, of Cross River State Forestry Department (CRFD), the reserved forest, and the unreserved community forest, including the planted gmelina forests, have all gone in the process.

In 1991 the federal government of Nigeria, with the active collaboration of the Nigeria Conservation Foundation (NCF), created a National Park in these forest reserves at Akamkpa and Boki L.G.As. Enclosing 3300km². Although part of the National Park has been attacked in this process of rotational bush fallow farming, the National Park appears to have more effective protection and conservation machinery than the CRFD.

According to Balogun (1994), nowhere in Nigeria has the clearing of the forest for agriculture ceased, until all the accessible forests have been cleared. Intensification while land is still available for expansion will only occur when agricultural technology is available that will give a return to the extra labour invested in farming on previously cleared land that is greater than that from using the labour to clear and farm new land. These technologies do not exist at present, and the developments of such technologies is not a priority within the agricultural research system. If Nigerian agricultural research system fails to device a new farming system, with effective conservation methods, then the consequences of environmental degradation on food production will continue to intensify hunger and food insecurity in the country.

Environmental Degradation, Poverty, and Food Insecurity in Cross River State

Without effective environmental protection, forest reserves and community forests of the State in Ogoja, Yala, Bekwara, Obudu and Obanliku have been deforested and degraded. Abi Local Government suffers the same fate. Obubra and Yakurr have few areas in isolated areas left, just like Biase and Odukpani, while Akpabuyo and Calabar South have their coastal areas covered with swamp forest.

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Ikom and Etung have some forest areas left, while Boki and Akamkpa are the only LGAs with larger areas of THF left (see fig. 2).

Degraded fallow areas at Yala, Ogoja, Bekwara, Obudu, Obanliku, Abi, Obubra and Yakurr, are now covered with derived savanna that burns annually intensifying erosion and loss of soil fertility increase in population, deforestation and resource degradation (Adofu and Awoyemi, 2010, p.32) declining crop yield is now the order of the day. The very fat yams, large tubers of cassava, heavy cobs of maize, etc, are now replaced with small yams, cassava tubers, etc. Hunger is everywhere evident even among the farmers. Although rotational bush fallow farming system still give more than subsistence harvest to some farmers, low producer prices discourage increased production, a situation that greatly contributes to food scarcity and hunger even among farmers in Nigeria.

For effective implementation of the federal government commercial agricultural programmes, Nigerian environmentalists should immediately commence the implementation of the National policy on the Environment, while our agricultural scientists, particularly the agricultural extension officers, should educate our rural farmers to adopt new farming methods with the application of new technologies that can transform the traditional agricultural practice in the country. Highlighting the disadvantages of traditional agriculture, Scultz (1964:16) stated thus:

The man who farms as his fore fathers did, can not produce much food no matter how rich the land or how hard he works. The farmer who has access to, and knows how to use what science knows about soils, plants, animals and machines can produce an abundance of food though the land can be poor. No need, he works nearly so hard and long. He can produce so much that his brothers and some of his neighbors will move to town to earn their living. Enough farm produce can be produced without them. The knowledge that makes this transformation possible is a form of capital, whenever it is an integral part of the material inputs farmers use, and whenever it is a part of their skills, and what they know.... Incentives to guide, and reward farmers is a critical component; once there are investment opportunities, and efficient incentives; farmers will turn sand into gold.

Thus, the key factors hindering the development of Nigerian agriculture are firstly, the need to transform traditional agriculture of which commercial agricultural fund by the Federal government should by all means start to address. Secondly, there is an urgent need to initiate the implementation of the National policy on the Environment, by creating environmental awareness among Nigerians, particularly among rural farmers. And finally, there is need to provide an efficient system of price incentives to farmers, in order to stimulate increased agricultural production.

Strongly warning Africans against destroying her basic capital and creating a vicious cycle of low agricultural yield, McNamara (1990) stated thus:

With each burning some nutrients are lost into the air or washed away and valuable wood goes up in smokes. Now, as population grows farmers are

forced to shorten the period of fallow. Soil erosion increases and fuel wood becomes scarce. As substitute, people burn animal dung and crop residues further denying nutrients to the soil. A major result of this vicious cycle is low agricultural productivity and environmental damage... It must be recognized that this environmental degradation does not occur in isolation. Its causes and consequences are broad and deep, and it is inextricably linked to Africa's growth and development. The land in a fundamental sense is Africa's basic capital – its basic patrimony. If this capital is destroyed through over use or misused, it will have the same effect as a company carelessly depleting its financial assets; at the end Africa will be out of business. (pp.9 and 15)

Without effective and urgent measures that can stem environmental degradation, the federal and states government environmentalists and agricultural scientists are carelessly allowing the State land resources to be depleted, and from now on, her farmers may completely be out of high yield farming business. The talk about food security does not have any meaning if no effort is made to stop environmental degradation that is now escalating.

Just like forest areas on dry land have been deforested and degraded, the state's wetland areas have also been deforested and degraded for the cultivation of rice, cocoyam, etc, with grave consequences. According to Uluocha and Okeke (2004 p. 154) Nigeria's wet land areas supported a great variety of exotic floral and faunal wild life species. They are home to most of the country's threatened and endangered species, including reptiles, birds, fish and mammals. Unfortunately, owing to senseless destruction of wetland in the state, and watersheds, some rivers, streams, wells, springs, etc, have completely dried up: intensifying water scarcity problem in the rural areas of the state.

Quoting Board (1994), Adawo (2004: 38) stated that “those who are poor and hungry will often destroy their immediate environment in order to survive. That they will cut down forest, over graze the grassland with their livestock, over use marginal land, and in growing numbers they will crowd into congested cities”. The cumulative effect of these, he noted, is so much as to make poverty itself a global scourge. In other words, He sees poverty as the primary cause of environmental destruction.

This is not true at all. Rural farmers deforest and produce rich food crops but receive low producer prices that make them poor. Even as they over-farm and degrade the environment, the Federal and State environmental agencies have failed to create the awareness of environmental challenges to farmers as well as implement the National Policy on the Environment. Surely, if these poor and hungry farmers refuse to sell their food crops to the above scholar if there is a ban on food import, he will die and leave these poor hungry farmers behind. What we need now is a new rural development strategy (Matiki, 2008) that can develop towns, reduce population pressure on the environment, and commercialize agriculture and industrial production

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that can provide producer price incentives to farmers, for sustainable food crops production and food security in Nigeria.

Conclusion

By achieving mastery of some techniques that gave him the ability to settle down in villages, man discovered rotational bush fallow farming system. In Africa this gave him the ability to settle down and to make socio-economic and political progress. In Cross River State, colonial forest policy coupled with the environmental-friendly farming practice, gave good yield of food crops for food self sufficiency as well as increased production of palm products that gave high income to rural farmers. The cessation of palm products export made farmers to introduce the slash and burn cultivation that gave them rich harvest of food crops. But low producer prices on one hand has kept them below the poverty line. While on the other hand, over farming of fallow plots has now degraded the environment with low agricultural production. Low producer prices discourage increase in crop production and intensify hunger even among rural farmers. Unless environmental challenges are addressed and farmers are provided with producer price incentives, food self sufficiency or food security will remain a far cry in Nigeria.

The Way Forward to Environmental Sustainability for Food Security in Nigeria

The policy goal, conceptual framework and strategies for the implementation of National Policy on the Environment are well focused, detailed, and cover all sub-sectors of the nation's economy for sustainable development. In great details it covers agriculture, water resources, forestry, industry, energy, health, education, trade, transport and communication, tourism, science and technology. This is a clear drive towards achieving sound environment and sustainable human development (Chinsman 1997). To reverse the trend and achieve food security and sustainable development, The Federal and State governments should take immediate steps to achieve the following:

- (i) To introduce new farming system to replace bush fallow farming system.
- (ii) Nigerian governments must realize the fact that sound environmental management and economic development go together. Steps must thus be taken to create awareness and the understanding of environmental problems to rural farmers in order to speed economic development.
- (iii) Government must also take steps to provide price incentives to rural farmers. It is true that agricultural improvements cannot succeed without corresponding changes in the country's spatial structure. This can be seen with industrialized counties. "Any such strategies must of course be linked to generate growth strategies which see urban and rural areas as inseparable parts of an integrated whole; high-technology agriculture needs urban development, and urban development needs the impetus of agricultural growth (wheeler, 1989 p. 18)."

References

- Adawo, M. A. (2004) Environment and rural Poverty Reduction in Nigeria, *Global Journal of Social Science*, 3 (1&2),37-45
- Adofu, I. & Awoyemi, T. T. (2010), Population Density, Resource Degradation and Migration in Nigeria. *International Journal of Sustainable Development*; Accra, Ghana, 3 (9), 31-34
- Bolagun, F. (1994) The impact of social and economic issues on Forestry in Cross River State, Nigeria *Commissioned Report By The British Government programmer*, Calabar John Hudson, ODA.p.7.
- Chinsman, B. (1994). *Environment and Sustainable Human Development: An Address Delivered at the General Assembly of the Social Science Council of Nigeria*” (SSCN) On Environment and Sustainable Development in Nigeria, Abuja, 30 June, 1997.
- Federal Environmental, Protection Agency (1989) *National Policy on the Environment*, Abuja: The Presidency.
- Hagget, T. (1976). *Geography: A Modern Synthesis* London: Happer and Row International.
- Idachaba, F. S. (1980) Concepts and strategies of integrated rural development: lesson from Nigeria, *Policy Technical Research Paper No1*, Ibadan: University of Ibadan Press.
- Matiki, R. E. (2008). A New Rural Development Strategy for Rapid and Sustainable Development in Developing Countries, *Journal of Rural Development*, India: No 3, National Institute of Rural Development (N I R D) Hyderadad, 27 (3) 449-467.
- McNamara, R.S. (1990). *Africa’s development Crisis, Agricultural Stagnation, population, explosion, and Environmental Degradation*; An Address to Africa Leadership Forum, Ottan, Nigeria.
- Monshard, W. (1979) *Tropical Agriculture*, London: Longman, p.53.
- Oyeleye, D.A. (1988) *Lecture Notes on Agricultural systems in West Africa (GRY 932)* Department of Geography, University of Lagos.
- Schultz, T.W (1964) *Transforming Traditional Agriculture*, New Heaven : Yale University Press

The Coconut

Sigh, J. & Dhillon, S.S. (2000) *Agricultural Geography*, New Delhi: Tata McGraw Hill.

Strahler, A. H. & Strahler, A.M. (1977), *Geography and Maris Environment*, New York: John Willey & Sons.

Tivy, J. (1982) *Biogeography: A Study of Plants in the Ecosphere*, New York: Longman.

Uluocha, N.O. & Okeke, I.C. (2004) Implication of wetlands degradation for water Resources management: Lessons from Nigeria. *Geo Journal*, 61151 – 154., Kluwer, Netherlands,

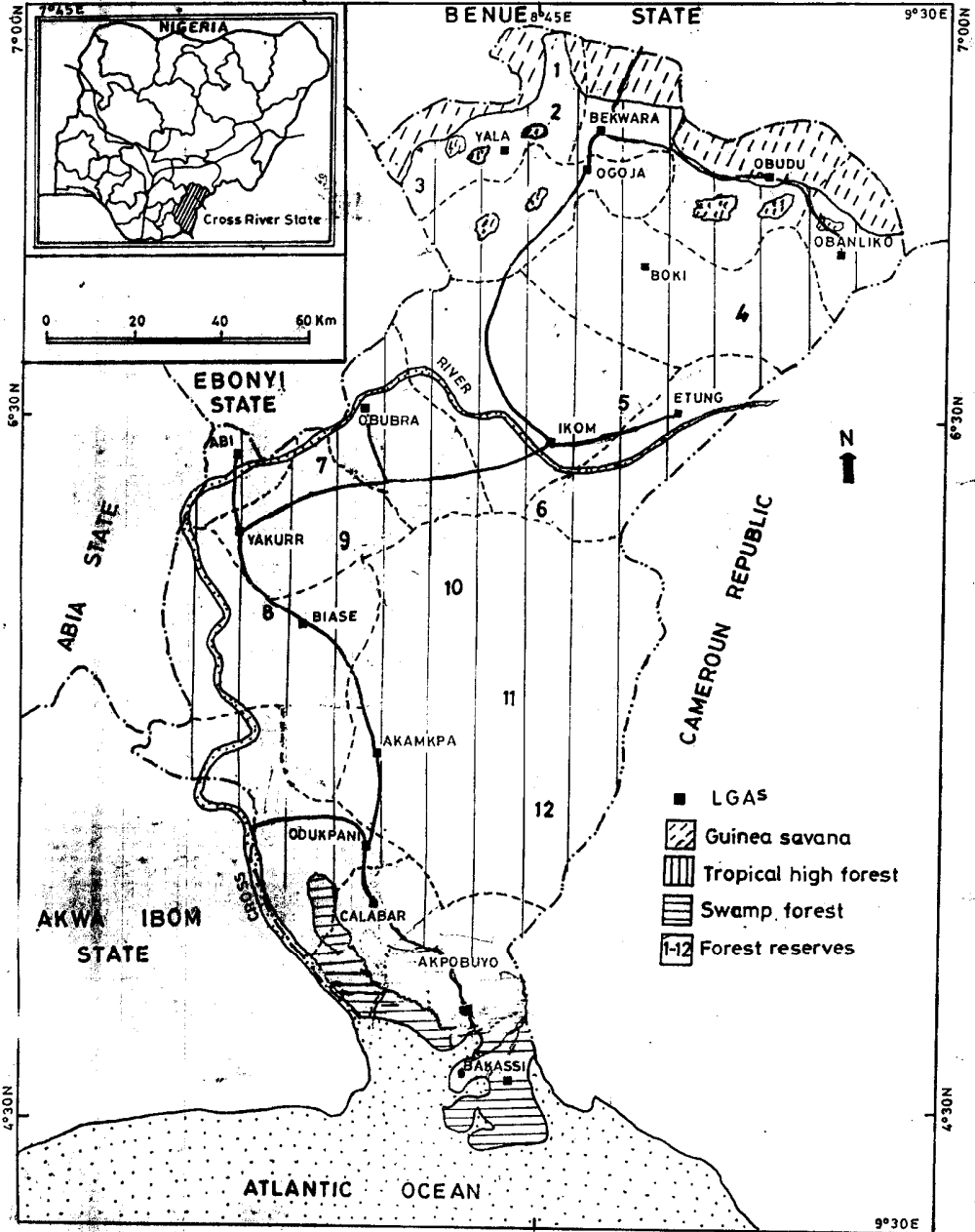
Wheeler, J.C. (1989) *Development cooperation in the 1990s*, Paris: OECD, 18.

Attachments

Fig 1: Map of Cross River: Vegetation during colonial era Page 7b

Fig 2: Cross River State: present forest Page 11b

FIG. 1 : MAP OF CROSS RIVER STATE: VEGETATION DURING COLONIAL ERA



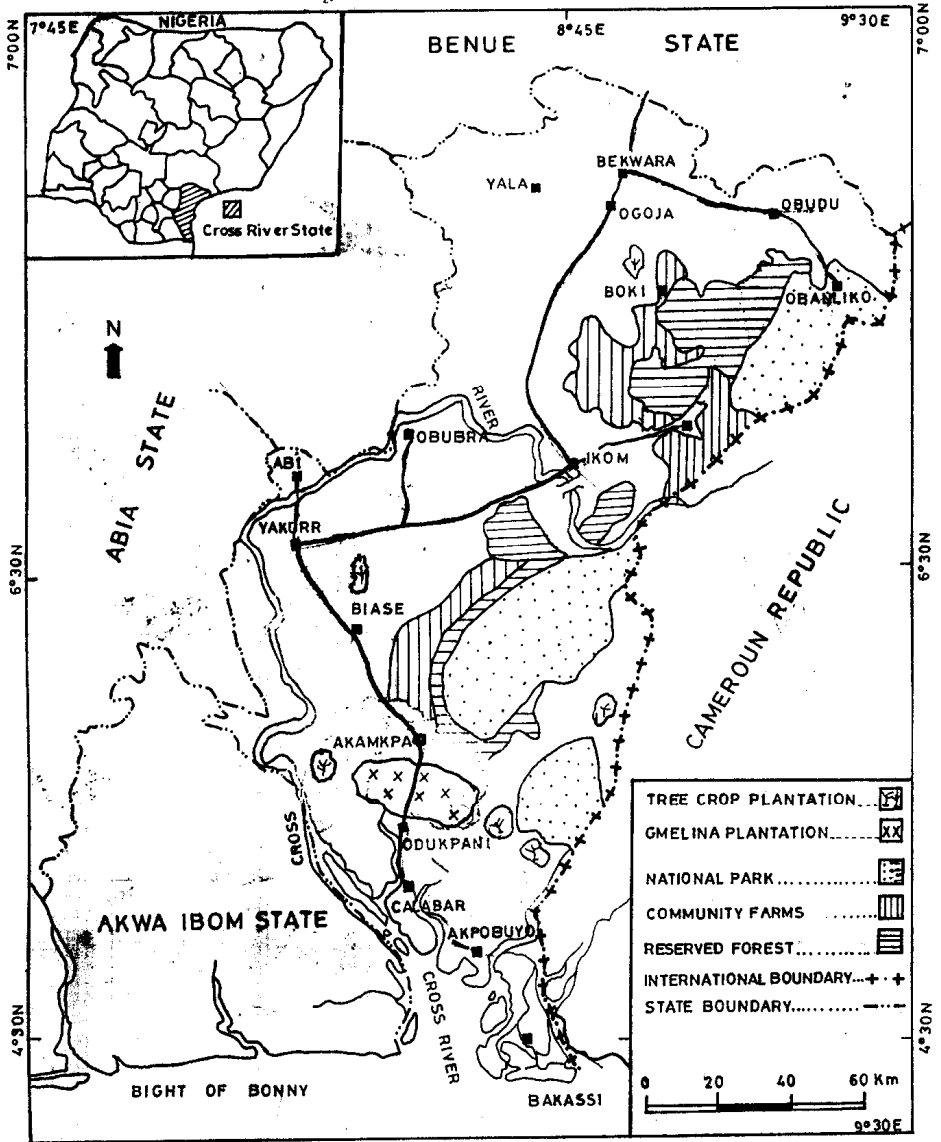


Fig. 2 : CROSS RIVER STATE : PRESENT FORESTS.