Biodiversity Conservation and Poverty Alleviation in the Niger Delta Area of Nigeria

Oghenerioborue Mary AGBOGIDI [1(✉)]
Albert Ukaro OFUOKU [2]

Summary

This paper established that biodiversity conservation can aid the alleviation of poverty among the people of the Niger Delta area of Nigeria. The benefits derived from biodiversity were discussed and the ways through which biodiversity can be applied as a tool in the reduction of poverty were emphasized as including bio-regional management approach to biodiversity conservation, ecotourism, community participation in biodiversity management, advocacy of sericulture and drawing from the experiences, knowledge and ideas of conservation bodies all over the world. The paper also maintained that the extension services of government and non–governmental organisations (NGO_S) should not be left out in this process as they are equipped with the teaching, communication and human relationship and rural sociological skills to live up to the tasks in the process of poverty alleviation through biodiversity conservation. Besides, the knowledge and ideas of other professionals including ecologists, conservationists, geographers, zoologists, botanists, taxonomists, and soil scientists should be tapped as biodiversity conservation requires a multi-disciplinary approach.

Key words

biodiversity conservation; poverty alleviation; Niger Delta region; Nigeria

[1] Department of Forestry and Wildlife, Faculty of Agriculture,
Delta State University, Asaba Campus, Nigeria
✉ e-mail: omagbogidi@yahoo.com
[2] Department of Agricultural Economics and Extension, Faculty of Agriculture,
Delta State University, Asaba Campus, Nigeria

Received: June 1, 2006 | Accepted: September 12, 2006

Introduction

Biological diversity or biodiversity encompasses all species of plants, animals, micro organisms, the ecosystems and ecological processes of which they are part (Ikomi, 2005). It covers the variety of all forms of life on earth, which provides the building blocks for our existence and ability to adapt to environmental changes in the future (Olele and Agbogidi, 1999). According to Ogbe (2005), biodiversity refers to the variety and abundance of species, their genetic composition and the ecological system where they live in. Biodiversity is a heritage for the future. It provides stability, health and productivity to a forest ecosystem (Thaman, 2005).

Biodiversity is the key to food security. It is the most important foundation for food security. Food security ultimately depends on the protection of the cultural and natural ecosystems and services, as well as the knowledge and materials needed to provide and process food and drinks, etc. For example, our forests, reefs, rivers, agricultural systems, firewood and knowledge about farming, fishing, food preservation, processing and cooking etc. Food security here depends on three sources: wild harvest, agricultural production and trade. The local foods harvested from our forests provide us with all the proteins, fats, carbohydrates, vitamins, minerals, fibre and water as well as other micro nutrients needed for good health. Most of these plants and animals have many different varieties and breeds. In areas where biodiversity loss is prominent, even though the towns may not actually experience food shortages, the nutritional status of the people who live there is still far from satisfactory. A significant proportion of the dwellers may suffer from malnutrition. Although there may not be death as a result of hunger, there could be high levels of anemia and deficiencies in vitamins a and other trace elements (Thaman, 2005).

Poverty has been variously defined by many researchers. It is the greatest social malaise afflicting mankind (UNEP, 2002). Poverty breeds degradation. It has been identified as a major contributor to environmental degradation in the urban cities of Nigeria in recent times (Thaman, 2005). Poverty is a major challenge confronting many countries including Nigeria. Although many poverty alleviation programs have been put in place by various governments to lessen the poverty burden including monetary and fiscal policy measures, the use of market interventions in low pricing of essential commodities; the sharing of the burden of providing social services with private sectors and public sector effort on strategic development (Agbamu, 2006). These are more or less, short–term measures. In this paper, the conservation principles and practices to alleviate poverty in the Niger Delta region have been emphasized not only as short–term measures but as long term panacea to also aid sustainable development. It is established here that the abundant biological diversity, which if properly harnessed and conserved will improve the living standard and better the life of the people. Although several studies have been carried out on poverty in Nigeria and suggestions on how it can be alleviated principally through the use of macro and micro economic tools, there is paucity of information on the conservation of biodiversity as a tool to reduce poverty in the Niger Delta area of Nigeria.

This review has been undertaken to provide information on how the conservation of the biodiversity of the Niger Delta area can help in the alleviation of the poverty of the inhabitants.

Causes and impact of poverty

About two – thirds of the Nigerian people are poor, despite living in a country with vast biodiversity (National Planning Commission, 2004). In 1980, an estimated 27 percent of Nigerians lived in poverty and by 1999, about 70 percent of the population had income of less than US $I a day – and the proportion has risen since then (World Bank, 2001).

Poverty has many causes, all of which reinforce one another. This is because they have arranged themselves in a "feature" wheel. One source of poverty is the overexploitation of natural resources, which has resulted in the destabilisation and depletion of the biodiversity. The extraction of our resources was not controlled and is still not controlled. This led to mismanagement and many of our resources have gone into extinction while others are facing extinction. Drought and famine, which though are products of natural disaster that have been aided by man's over-exploitation of biodiversity, are other causes. Inadequate or lack of income is also regarded as a cause of poverty. Many rural families depend on biodiversity for income. This they have overexploited and destroyed leaving very little or nothing to exploit for income to take care of their food, clothing and shelter needs. Lack of savings: The incomes derived from their exploitation of the forests were not efficiently managed and have been exhausted. Most of these people never saved for the future thinking that the resources will continue to flow without an insight into the impending catastrophe. In the words of Ihimodu (1996), poverty may emanate from lack of adequate savings or inability to invest the available income productively to generate increases in physical assets that will lead to economic growth.

Lack of technical knowledge is another cause of poverty. Most of the citizens that are poor today are deficient in technical knowledge and this makes them to find

Table 1.
Poverty incidence by geographical regions in Nigeria

Region	Extremely poor (%)	Moderately poor (%)	Non-poor (%)	Type of environmental problem
North - East	58	27	14	Desertification
North - West	58	24	16	Desertification
North - Central	48	28	25	Desertification
South - East	38	32	30	Soil erosion
South - West	37	34	26	Soil erosion and desertification
South - South	38	34	26	Oil pollution

Source: FOS (1999)

themselves in low paying, strenuous menial jobs, which are biodiversity exploitation related. There can also be the problem of attitude of the environmental law enforcers. They keep blind eyes to illegalities that take place in forests. These illegalities rub on poverty incidences. Official corruption has written death warrants for many forests for a bribe, some dishonest officials have been known to give short-term concessions to companies that plunder the timber with no regard for conservation at the expense of forest communities.

Large companies have bought up huge tracts of fertile land and used mechanized equipment to harvest cash crops. This trend threw a lot of farm hands out of work. This made thousands of people to move to the cities. This was because after the Second World War, these large companies used chain, saws and bulldozers to clear forests on a large scale. Other rural dwellers were also forced to move to the rain forests. Depletion of biodiversity in the Niger Delta is not the inevitable result of increasing population and poverty. It is often the result of management, crime, greedy commerce and corrupt government. In 1995, African forests accounted for about 15% of the world total (520 million hectares) (FAO, 1997). About 50% of the region's potential forest cover had been lost. Net deforestation continues at a high rate particularly in the tropical areas. Poverty incidence by geographical regions in Nigeria as illustrated by Federal Office of Statistics is shown in Table 1. Changes in forestland cover in tropical Africa are presented in Figure 1.

The Niger Delta area and its biodiversity

Although the Niger Delta is biologically the least known ecosystem in Niger (Ogbe, 2005), it has Africa's largest mangrove forest (Olomukoro, 2005). Olomukoro (2005) reported that the Niger Delta has the most extensive fresh water swamp forest in West and Central Africa and most of Nigeria's remaining primary forests. The Niger Delta covers an area of 70,000km^2 in the central part of Southern Eastern Nigeria. The Niger Delta includes States like Delta, Bayelsa, Rivers, Cross–River, Akwa-Ibom, Edo, and Ondo. The area lies within latitude 60^{0}N and 60^{0}21N and longitude 30^{0}4'E and 90^{0}E. It consists of a number of characteristic ecological zones comprising sandy coastal ridge barrier saline mangroves, fresh water, swamp forests and seasonal rainforest (Ogbe, 2005; Olomukoro, 2005). The Niger Delta region is rich in biodiversity as it is interwoven with rivers, mangrove forests and abundance of aquatic and wildlife, hence Ogbe (2005) reported that the Niger Delta is a hot spot for biodiversity. Figure 2 shows the diagram of the Niger Delta area of Nigeria.

The region is situated in a difficult terrain. It is endowed with forest and game conservation areas; National Parks, Wildlife sanctuary (Edo State), Taylo Creek (Rivers State), Stubbs Creek forest Reserves (Akwa–Ibom State) etc. These areas contained a wide range of biodiversity but today, the forest genetic resources of this region are greatly threatened both in diversity and in richness mainly by human activities without knowing that any influence, which diminishes the richness and diversity of our environment, diminishes the fullness and perhaps the span of our lives. The biological diversity of the

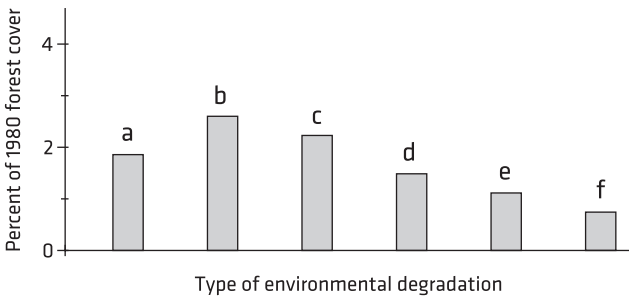

Figure 1.
Changes in forestland cover in tropical Africa (Source: Salim and Ullsten, 1999, (a) Deforestation to non – wooden land cover (b) Deforestation to other wooded land (c) Fragmentation (d) Degradation (loss of density) closed to open forest (e) Conversion to long fallow, shifting agriculture (f) Conversion to plantation, - Amelioration (increase of density) from open to closed forest)

Niger Delta contains the most extensive and complex lowland forest, aquatic ecosystem in West Africa and it is of regional and global importance (IUCN, 1992). The importance of the delta as a habitat for a great variety of coastal and estuarine fauna and flora, which lack any marine or coastal protected area is well known. The full significance of the Delta's biodiversity remains unknown because new ecological zones and species continue to be uncovered and major groups such as higher plants and birds, remain unstudied in large areas. Ogbe (2005) reported that the delta has more fresh water fish species than any other coastal system in West Africa. Biodiversity holds great promise in Niger Delta and the rest of Nigeria for improving the quality of life of the communities there. What is needed is that its management should be tailored to receive adequate support as well as sufficient funds to make region–wide participation attractive. Species threatened by the decline of forests and other natural habitats are shown in Figure 3.

Biodiversity is critical to the maintenance of a healthy environment. It provides direct benefits such as food, medicine and energy. Some drugs cannot be manufactured synthetically (Ikomi, 2005). For example, of the cardiac stimulants, digitoxin can only be obtained from dried *Digitalis* spp (Ikomi, 2005). Fishes, reptiles, mammals, shell fish etc are food organisms harvested from wetland, forests and marine ecosystems of the Niger Delta, and used to meet the food needs of man. Biodiversity caters for our life support system to the recycling of essential elements including carbon, oxygen, nitrogen etc. In addition, it helps to mitigate pollution protect watersheds and combats soil erosion. It acts as a buffer against excessive variations in weather and climate, thus protecting man from catastrophic events beyond human control.

Biodiversity also provides immense economic values in the area of ecotourism and sustainable livelihood of local communities and for conservation of natural environments which was recognised internationally when the United Nations declared 2002 as the international year of ecotourism. Ecotourism represents one of the areas where the link between economic development and conservation of natural areas is potentially clear and direct. Ecotourism could help generate benefits to local communities such as employment and minerals revenues. It could also provide for infrastructure such as roads and electricity or provide proceeds for community projects such as school construction and health clinics (Ogbe, 2005). Biodiversity attracts hikers, animal watchers and photographers alike. Genetic resources diversity represents the resource base from which most of the present agricultural crops and domesticated animals have been bred by generations of Nigerians. Biodiversity allows for

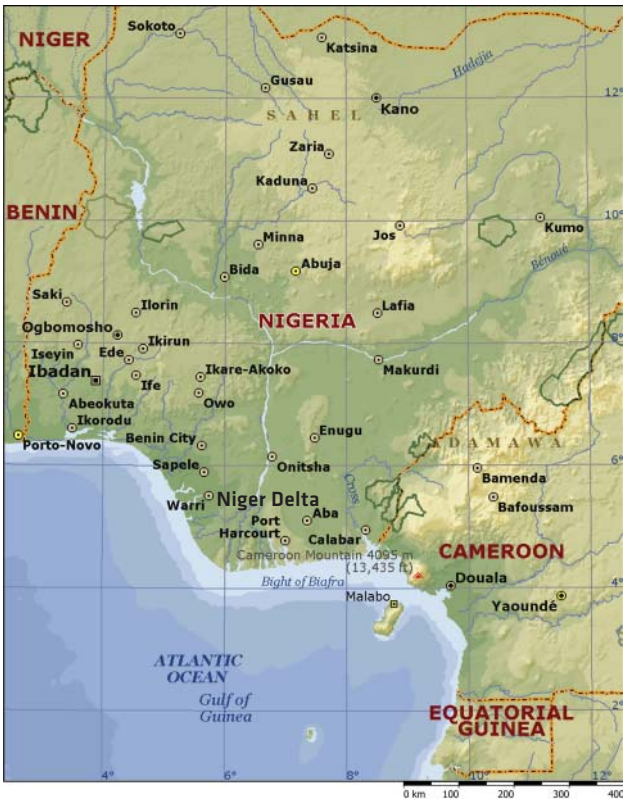

Figure 2.
Niger Delta area of Nigeria

the establishment of forest reserves, natural parks, game reserves, (including wildlife parks, bird sanctuaries and strict nature reserves), special ecosystems and habitats e.g. sacred groves, steams and lakes or other sites that are reserved by local communities for their spiritual, recreational and other socio – economic values.

Ecologically, biodiversity helps to stabilise the flow of water thus, preventing excessive flooding and drying out, enhancement of gaseous exchange, manufacture of food, waste disposal, nitrogen fixation, and pest control. Much of these economic and nutritional benefits of these biodiversities are largely unexploited due to how little they are exploited.

Potentials for profitable exploitation of biodiversity in the Niger Delta to alleviate poverty

There are a number of ways in which biodiversity conservation can serve as a tool for poverty alleviation in the Niger Delta area specifically and in the country as a whole. There is the bioregional management approach to biodiversity conservation. This approach sees the task as a long-term on-going assignment involving the use of afforestation, nursery development, landscape care and

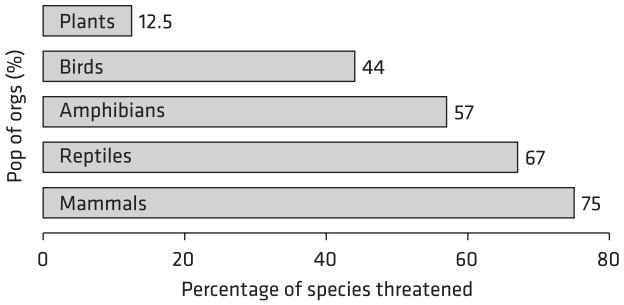

Figure 3.
Species threatened by the decline of forests and other natural habitats (Source: Salim and Ullsten, 1999)

other activities to achieve its goal. All these activities can provide significant employment opportunities for the poor of the region. To get the best of the approach however, requires coordinating government agencies, community leaders, business and private groups within the region so that biodiversity concerns are included in the regional planning processes.

Ecotourism is another vital way biodiversity could serve as a tool for poverty reduction in the Niger Delta zone. Ecotourism is a sub- section of the tourism industry catering for tourists who wish to visit natural areas to observe wildlife, natural landscapes and traditional cultures. Ecotourism is environmentally responsible trade and visitation to relatively undisturbed natural areas, in order to enjoy and appreciate nature (and accompanying cultural features – both past and present) that promotes conservation, and provides for beneficially active socio – economic involvement of local people (IUCN, 2002). The economic benefits of tourism and ecotourism in the country cannot be underscored. There is a general demand in Nigeria and the Niger Delta in particular for tourism and ecotourism development. Delta state and the Niger Delta in general with their diversity of cultures and ecosystems no doubt provide ample opportunities for ecotourism. The Government, NGO_S and private sector should be called upon to support the sustainability of ecotourism by developing ecotourism strategies as components of public policies, and introduction of sound environmental practices including waste reduction. International investors and donor participants should also integrate planning for ecotourism into programmes related to conservation.

Organisation of specific groups notably women and young people (youths) within local communities for sustainable development and conservation of biodiversity is another viable approach of biodiversity conservation with strong orientation to poverty reduction (Campbell, 1996; Hunt et al., 1996; Orji, 2005). Poverty is a multi–dimensional problem that requires multidisciplinary approach and solutions. Protection strategies should be put in place where local people especially women and young people should be selected as target groups and their participation in protection studies should be ensured. Similarly, the contribution of local authorities to these protection studies should be encouraged. It has been reported that over 99% of forest diversity is in non- timber species. The exploitation of these species including mushrooms, chew sticks, snails, herbal collections etc, act as sources of income to the rural populace thereby reducing their suffering (Udo, 2002; Agbogidi and Okonta, 2003). Poverty reduction activities in the Niger Delta should use the principle of mass participation. The forester could establish a close partnership with the local people and take into serious and full consideration, their opinions and emotions so that the community will have a sense of belonging (Shuncheng, 1998). Inhabitants should have access to forest reserves, wildlife sanctuaries and national park to obtain non timber forest produce. Availability of extension services could boost their involvement in the collection of NTFPs. Ekeke and Nwonuala (1999) reported that the bare areas created in the mangroves by oil workers can be successfully revegetated with adapted indigenous tree and shrub species. Education of rural communities on the natural roles and importance of biodiversity can increase their awareness and open avenues for better utilisation of forest resources (Idumah, 2001). Development of integrated forestry and food production to boost local employment; forest products and income so as to reduce poverty among the rural dwellers is another way of poverty reduction. In the same vein, strengthening of the local people's capacity to adopt sound and sustainable agro forestry practices with a view to improving production at minimal costs through improved soil nutrients is necessary. Community participation in forestry activities could be used as a strategy for poverty alleviation (Idumah et al., 2003). For many people, forests are vital source of food, medicine, raw materials and income, of which rural community has made sustainable use (Tewari and Tiwari, 1997; Chijioke, 2003; Ikojo et al., 2003).

Saving biodiversity means taking steps to protect genes species, habitats and ecosystems (Adekunle, 2005). The best way to maintain species is to maintain their habitats (FAO, 1995). Conservation of biodiversity could involve the following: prevention of degradation of key natural ecosystem, as well as their effective management and protection (Agbogidi et al., 2005b), maintenance of diversity on lands and water that have already been disturbed (Foskett and Foskett, 2004), and restoration of loss species to their former habitats and preservation of species else where in gene banks, zoos, botanic gardens and other off–sites facilities (Ola–Adams, 1996).

Biodiversity conservation must take place at individual household level, village / community level, local government level, state, national level and global / international level. Effective conservation efforts have to begin in the fields, farms, forests, watersheds, grasslands, savannas, coastal zones and settlements where people live and work. Approaches to rural poverty alleviation in the Niger Delta region should be multi-dimensional involving economic, ecological and social factors to satisfy the expectations of the inhabitants (Crispin, 1994). Government could sponsor afforestation | reforestation projects for early canopy cover and litter accumulation to enhance cover recovery. Afforestation practices should also be advocated, encouraged and supported by private investors and NGOs (Keyojo et al., 2002).

Advocacy of sericulture: Sericulture is a vocation, which involves the production of mulberry leaves for feeding silkworms with the sole aim of producing cocoons from which silk is obtained (Jayeola and Adedutan, 2002). Jayeola and Adedutan (2002) posited that a hectare of mulberry generates remunerative employment to 12 to 20 persons throughout the year.

There should be increased interest in enhancing the production of tree products particularly the non-timber forest products (NTFPs) through domestication of indigenous tree species to increase farmer's income, their food and nutritional security (Agbogidi et al., 2005b; Oregbome, 2005). The NTFPs have been identified as the most formidable way of meeting the aims of development, conservation and poverty reduction (Belcher and Kusters, 2005). There is also the need to overcome negative association between economic development and environmental quality (Udo, 2002; Udo, 2003). Fabiyi and Oyagade (2003) advocated the use of wood residues while Nwaigbo (2003) noted that the development of short rotation coppice (SRC) crops in the Niger Delta area.

Experiences, knowledge and ideas could also be drawn from bodies involved in conservation such as World Conservation Union formerly International Union for the Conservation of Nature and Natural Resources (IUCN), United Nations Environment Programme (UNEP), Food and Agriculture Organisation (FAO) and World Meteorological Organisation (WMO) and more recently, the World Conservation Strategy (WCS).

The aquatic ecological problems of the Niger Delta region should be improved to alleviate the rural poverty level of the inhabitants. Fishing is the main stay of economic activities of most inhabitants of the region apart from farming. Effort should be made to improve the aquatic life of the people. Aquacultural and pisicultural environment should be developed. The tourist potential of the mangrove swamp forest should be fully exploited for maximum revenue generation since the aquatic and wildlife resources typically represents the region. Government and allied oil and gas prospecting companies in the area should fully integrate the host communities in their poverty reduction programs. These may include building and rehabilitation of schools, primary health care services, community water supply, adult literacy classes, food security and nutrition, family planning, reconstruction and rehabilitation of roads, provision and maintenance of electricity to the rural populace, free and basic community education, skill acquisition centre and vocational training institutes to empower the youths of the area employment, provision and creation of jobs for rural inhabitants which will reduce tension, unemployment and other social vices in the Niger Delta area. The provision of these could improve the living standard of the rural populace in the area.

Improvement of human capabilities through training by extension workers is another way poverty can be reduced in the Niger Delta area. Agbamu (2006) posited that agricultural and rural extension workers can help to promote agricultural and vocational knowledge among rural dwellers in a bid to equip them with capabilities, which can enhance their production activities. He further stated that higher productivity in agriculture is attainable by using more knowledge in the production process.

Conclusion

Biodiversity embraces all species of macro and micro flora and fauna and the ecological systems and processes of which they are a part. It is very crucial to the existence of mankind especially when it has the potentials to solve the problem of poverty in the life of man. The Niger Delta area, which has Africa's largest and the world's third largest mangrove forest also houses the most extensive freshwater swamp forest in West and Central Africa, and most of Nigeria's remaining primary forests. This region is rich in biodiversity as a result of the presence of rivers, mangrove and freshwater forests and the abundance of aquatic and wildlife. The profitable exploitation of biodiversity in the Niger Delta has potentials for alleviating poverty among the people of the Niger Delta through biodiversity approach to biodiversity conservation, ecotourism, community, participation, advocacy of sericulture and borrowing of knowledge, experiences and ideas from conservation bodies. Other poverty reduction programs that can be generated through biodiversity conservation include the following: tree nursery development, mushroom production, snailery, microlivestock programs (grass-cutter farm, rabbit production, guinea fowl production), fish production in forest estates, and integration of livestock (poultry, piggery,

goat / sheep) and integration of food crops. The extension services of government and non–governmental organisations (NGO_S) should not be left out in this process. They are equipped with the teaching, communication and human relationship and rural sociological skills to live up to the tasks in the process of poverty alleviation through biodiversity conservation. Poverty will be alleviated meaningfully if these professionals are involved in the project. Besides, the knowledge and ideas of other professionals including ecologists, conservationists, geographers, zoologists, botanists, taxonomists, and soil scientists should be tapped as biodiversity conservation requires a multi-disciplinary approach.

References

Adekunle V.A.J. 2005. Trends in forest reservation and biodiversity conservation. In: Okoko Adekunle V.A J. and Adeduntan S.A. (eds.). Environmental sustainability and conservation in Nigeria. Jubee – Niyi Publishers, Akure. Pp 82 – 90.

Agbamu J.U. 2006. Poverty reduction strategies for agricultural and rural development in Nigeria. In: Adedoyin S.F. (ed.). Proceedings of the 10th Annual National Conference of the Agricultural Extension Society of Nigeria (AESON) held in Badeggi, Niger State, between 14th and 17th June, 2005. Pp 28 – 35.

Agbogidi O.M. and Okonta B.C. 2003. Role of women in community forestry and environmental conservation. In: Akindele S.O. and Popoola L. (eds.). Proceedings of the 29th Annual Conference of FAN held in Calabar, Cross River State, between 6th and 11th October, 2003. Pp 159-165.

Agbogidi O.M., Okonta B.C. and Dolor D.E. 2005. Participation of rural women in sustainable forest management and development. In: Okoko E., Adekunle V. and Adeduntan S. (eds.). Environmental sustainability and conservation in Nigeria. Jubee-Niyi Publishers, Akure. Pp 264-270.

Aigbokhan B.E. 1997. Poverty alleviation in Nigeria: some micro economic issues in poverty in Nigeria. The Nigerian Economic Society 181-210

Belcher B. and Kusters K. 2005. How to make money from forest products. Id 21Natural Resources Highlights Forestry 4:2.

Campbell J.Y., Chattapadhyay R.N. and Das C. 1996. Income generation through community forestry. In: Victor M. (ed.). Proceedings of an International Seminar, Banagkok, Thailand, 18th- 20th October, 1995, RECOFTC, Banagkok.

Chijioke E.O. 2003. Community forestry and poverty alleviation: a real possibility in the Niger Delta area. In: Akindele S.O. and Popoola,L. (eds.). Proceedings of the 29th Annual Conference of the Forestry Association of Nigeria held in Calabar, Cross River State, 6th – 11th October, 2003. Pp 9-14.

Crispin T. 1994. The importance of biodiversity information: needs and options, Riddles Ltd, U. K.

Dugan P. 1993.Wetlands in danger. Mitchell Beazley Publishers, London.

Ekeke B.A. and Nwonvala A.I. 1999. Reforestation of bare degraded mangrove areas in the Niger Delta. Delta Agriculturist 6: 75 – 88.

Fabiyi J.S. and Oyagade A.O. 2003. Utilisation of wood residues as means of reducing poverty among rural community. In: Akindele S.O. and Popoola L. (eds.). Proceedings of the 29th Annual Conference of FAN held in Calabar, Cross River State, between 6th – 11th October, 2003.Pp 64 – 71.

FAO 1995. Conservation of genetic resources in tropical rainforest management: principles and concepts. FAO Forestry Paper, 107. 105p.

FAO 1997. State of the world's forests. 1997. Rome: FAO.

Federal Office of Statistics (FOS) 1999. Poverty and agricultural sector in Nigeria.

Foskett N. and Foskett R. 2004. Conservation. NTC Publishing, USA.

Hunt S.M., Jackson W.J. and Shresthra K.B. 1996. Income generation through community forestry in Nepal. In: Victor M. (ed.). Income generation through community forestry. Proceedings of an International Seminar Bangkok, Thailand, 18th – 20th October, 1995, RECOFTC, Bangkok.

Idumah F.O. 2001. Forestry sub – sector and poverty alleviation in Nigeria. In: Popoola L., Abu J.E. and Oni P.I. (eds.). Proceedings of the 27th Annual Conference of the Forestry Association of Nigeria (FAN) held in Abuja, FCT, from 17th – 21st September, 2001 Pp 319 – 327.

Idumah F.O, Akinyemi O.D.and Yakubu F.B. 2003. Community forestry: a strategy for rural development and poverty reduction. In: Akindele S.O. and Popoola L. (eds.). Proceedings of the 29th Annual Conference of FAN held on Calabar, Cross River State, between 6th – 11th October, 2003. Pp 30 – 38.

Ihimodu C.E. 1996. Poverty and sustainable development in Africa. A paper presented at the capacity building course at the United Nations Institute for Development and Economic Planning (IDEP). Dakar, Senegal.

Ikojo H.A., Udofia S.I. and Azeez A. 2003. Community forestry approach to poverty alleviation in rural areas. In: Akindele S.O. and Popoola L. (eds.). Proceedings of the 29th Annual Conference of the Forestry Association of Nigeria held in Calabar, Cross River State, 6th – 11th October, 2003. Pp 1- 8.

Ikomi R.B. 2005. Biodiversity: a building block for sustainable environmental stability. A paper presented at the Delta State maiden council meeting on Environment with all stakeholders held at Nelrose Hotel, Delta State, Nigeria between 28th and 29th September, 2005.12p

IUCN 1992. Coastal and marine, biodiversity report for UNEP: Identification establishment and management of specially protected areas in the WACAF region, Gland, Switzerland

Janzen D.H. 1991. How to save tropical biodiversity. American Entomologist 37: 159-163.

Jayeola V. and Adedutan S.A. 2002. Sericulture in Odo State: a means of alleviating rural poverty. In: Abu J. E., Oni P.1 and Popoola L. (eds.). Proceedings of the 28th Annual Conference of the Forestry Association of Nigeria (FAN) held in Akure, Ondo State, from 4th – 8th November, 2002. Pp 202 – 207.

Keyojo O.A., Abu J.E. and Omokhua G. 2002. Rural poverty dynamics in the Niger Delta region of Nigeria: options for sustainable development. In: Abu J .E, Oni P.I and Popoola L. (eds.). Proceedings of the 28th Annual conference of FAN held in Akure, Ondo State from 4th - 8th November, 2002. Pp 376 – 384.

National Planning Commission 2004. National Economic Empowerment and Development Strategy, Abuja. 47p.

Nwaigbo L.C. 2003.Short rotation coppice for community fuelwood and poverty reduction in Nigeria: the suitability of *Gmelina arborea* Roxb. In: Akindele S.O. and Popoola L. (eds.). Proceedings of the 29th Annual Conference of FAN held on Calabar, Cross River State, between 6th and 11th October, 2003. Pp 72 – 81.

Odebiyi J.B. and Ogunjobi M. 2003. Role of non-timber forest products (NTFPs) in alleviating poverty in Odeda Local Government Area of Ogun State, Nigeria. In: Akindele S.O. and Popoola L. (eds.). Proceedings of the 29th Annual Conference of FAN held on Calabar, Cross River State, between 6th and11th October, 2003. Pp 59-63.

Ogbe M.O. 2005. Biological resource conservation: a major tool for poverty reduction in Delta State. A key not address delivered at the Delta State maiden Council meeting on Environment with all stakeholders held at Nelrose Hotel, Delta State, Nigeria between 28th and 29th September, 2005. 16p.

Ola A. 1987. Issues in biodiversity. U.S. Congress Office of Technical Assessment, Washington, D C.

Ola – Adams B.A. 1996. Conservation and management of biodiversity. In: Ola – Adams B.A. and Ojo L.O. (eds.). Biosphere reserves for biodiversity conservation and sustainable development. Anglophone Africa, Proceedings of the Inception meeting and training Workshop, January 1996. 186 – 192pp.

Olele N.F. and Agbogidi O.M. 1999. The diversity and protection of aquatic habitats in Nigeria. In: Omeje S. I. (ed.). Issues in animal science. Raykenendy Scientific Publishers, Enugu. Pp 237 – 257.

Olomukoro J.O. 2005. Environmental pollution and its implication in Nigeria. A paper presented at the Delta State maiden council meeting on Environment with all stakeholders held at Nelrose Hotel, Delta State, Nigeria between 28th and 29th September, 2005. 23p.

Oregbeme A.O. 2005. Propagation and cultivation of economic non – timber forest produce and fruit trees: a possibility for poverty alleviation in rural communities in Edo State. In: Orehervata A.M., Nwokoro S.O, Ajiyi M.T., Adekunle A.T. and Asumgha G.N. (eds.) Proceedings of the 39th Annual Conference of the Nigeria held at the University of Benin, Benin – City, Edo State between 9th and 13th October, 2005. Pp 242 – 245.

Orji E. C. 2005. Involving women in management and conservation of the environments. African Journal of Environmental Studies 1(1&2): 36-44.

Salim E. and Ullsten O. 1999. Our forests: our furture. A report of the world commission on forest and sustainable development. Cambridge University Press, UK.

Shuncheng N, G. 1998. Issues relating to forestry and mitigation of poverty. Chinese Academy of Forestry 6 (1): 1- 8

Spore 1994. Biodiversity: our common heritage. Bi – monthly bulletin of the technical centre for Agricultural and Rural co – operation. No56, P4.

Tewari O.N. and Tiwari D.K. 1997. Sustainable forestry in poverty alleviation of indigenous people in South Asia. Voluntary paper for X1 World Forestry Congress Antalya, Turkey. 13th – 22nd October, 1997.

Thaman R. 2005. Biodiversity is the key to food. Spore Magazine 117:18

World Bank 2001. Nigeria: poverty in the midst of plenty, growth with inclusion. A World Bank Assessment, Washington, D C.

Udo E.S. 2002. Forestry for economic development. In: Popoola L. (ed.). Proceedings of a national workshop organized by FAN CONSULT and Edo Sate chapter of FAN held in Benin-City, Edo State, 5th – 6th September 2002. Pp 52-63

Udo E.S. 2003. The challenges of community forestry in Nigeria. In: Akindele S.O. and Popoola L. (eds.). Proceedings of the 29th Annual Conference of the Forestry Association of Nigeria held in Calabar, Cross River State, 6th – 11th October, 2003. Pp 224-231.

acs71_15