Journal of Agriculture and Food Sciences
Volume 8 Number 2, April, 2010 pp . 67-77

ISSN 1597 - 1057

AGROFORESTRY POTENTIAL FOR COMBATING FOREST AND ENVIRONMENTAL DEGRADATION: REFLECTIONS ON SOUTHEASTERN NIGERIA

E.C. Eboh[1] and **A. I. Achike**[2]
[1]African Institute for Applied Economics
168 Park Avenue, GRA Enugu
[2]Department of Agricultural Economics
University of Nigeria, Nsukka

ABSTRACT
Growing deforestation and environmental degradation in parts of Southeastern Nigeria have shifted attention to agricultural production systems that are environmentally sustainable, socially acceptable and economically appropriate. Agroforestry is one major sustainable farming system that has been the centre of theoretical and empirical attention, over the recent years. This paper examines the potential of agroforestry system to promote sustainable land use and ameliorate risks from deforestation, forest degradation and environmental damage. The paper is divided into sections. Section one is the introduction and background of the analysis. Section two reviews the various agroforestry systems and practices that hold potential for promoting sustainable land use and alleviating environmental risks. Section three expounds these potentials which cut across the social, economic, ecological, religious and cultural aspects of rural life. Section four highlights and discusses the imperatives for realizing agroforestry potential in the sustainable development of natural resources in rural Southeastern Nigeria. Section five contains the conclusion and policy agenda for action in order to enhance forest conservation and environmental sustainability.
Key Words: *Agro forestry, Environmental damage, Sustainability, Conservation*

INTRODUCTION
The technical potential of agroforestry to address critical development and environmental challenges is today widely recognized. As a multiple output land use system capable of bringing about soil improvement, land conservation and ecosystem integrity, agroforestry promises to yield results of considerable social, economic and ecological significance in developing areas. Secondly, agro-forestry creates a web of resilient land use practices that mitigate and adapt to climate change, halt land degradation and conserve on-farm biodiversity. In many countries, research efforts and development interventions are increasingly being targeted to tap agro forestry potentials. For instance world Agro-forestry centre (2009) analyses agro-forestry as a tool for improving livelihood in Tanzania and tackling emerging local and global challenges. The numerous agro-forestry programmes under the 'Vi Tree Foundation programmes' operating in Sweden, Kenya, Uganda, Tanzania and Rwanda since 1983 are still contributing to enhancement of rural livelihood and are evidences of the potentials of agro-forestry. In Nigeria generally and southeastern Nigeria in particular, the agroforestry content of research and development efforts remains largely muted, sparsely recorded and regretablly inadequate.

This paper therefore seeks to sensitize the research and development community on the need to increase emphasis on agroforestry for sustainable development. Section I is the introduction and background information on the state of the environment in Southeastern Nigeria. Section II outlines and discusses agroforestry attributes and practices with potential for promoting sustainable land use and alleviating environmental risks. Section III provides historical and anecdotal as well as empirical evidence of the agroforestry situation in Southeastern Nigeria. Section IV describes the need and possibilities for research and policy interventions in realizing the potential of agroforestry. Section V is the conclusion.

Land, Forest and Environmental Degradation in Southeastern Nigeria: Facts and Figures

Increased population pressure on natural resources, deforestation, land degradation and growing scarcity of tree products constitute the prime environmental risks throughout parts of Southeastern Nigeria. The critical nature of the environmental sustainability problem stems from the fact that forests and land productive base constitute the main economic resources of local communities which depend on them to support their livelihoods. Besides their social, economic and cultural significance in local communities, forest and tree sources provide a wide range of environmental/ecological benefits, including biodiversity, protection from soil erosion, preserving important watersheds, providing wildlife habitats, water retention capacity and shade for dwellings.

In Southeastern Nigeria, contemporary concern over forest degradation, outright conversion of forests to agricultural uses and deteriorating land quality for crop production can be better appreciated against the backdrop of the swelling volume of statistics regarding these trends. The region has population densities which rank among the highest in rural Africa and the soils are poor, susceptible to heavy leaching, readily erodible and greatly impoverished (Lageman, 1977; Okafor, 1991; Eboh *et. al.*, 2005; Ukpaka, 2007). More than 50 percent of the estimated 30 million tonnes of annual loss of soil in Nigeria through erosion comes from the region (Obiefuna and Emebiri, 1990. Also, it is estimated that about 70 per cent of the region's total land area of 78,612 square kilometers is affected by different forms and degrees of erosion, ranging from mild sheet wash to deep gullies (Ofomata, 1981). This was reiterated by a Lagos-based Centre for Environmental Resources and Sustainable Ecosystems (CE-RASE) when it noted in 2006 that more than 70 percent of all land in southeastern Nigeria is vulnerable to erosion due to land degradation giving rise to more than 1000 severe erosion sites in the zone. Federal, state and local governments often intervene in dramatic cases, such as when a road is cut. Population-led agricultural intensification has meant shortened fallow periods (from 10-15 years to less than 3 years), increased crop density and intensity as well as devegetation of bush lands and other unsustainable farming practices (Eboh, 1993; Achike, 1999). While soil erosion strips away nutrient-rich top soil, leaving the land less fertile and productive as well as structurally or physically destabilized and weakened, the reduction in fallow periods without adequate fertility-compensating measures and practices leads to progressive decline in land quality and productive potential.

So, while soil erosion is widely recognized as the more ominous environmental feature of the region, other forms of soil degradation including deterioration of physical, chemical and biological properties of soil are also heavily emphasized. Some of the more severe erosion sites are located in Amucha, Okwudor and Onicha-mbaise in Imo State; Alor, Agulu, Nanka and Oraukwu in Anambra State, Udi and Awgu in Enugu State, Abiriba, Bende, Isu-Ikwuato and Ndiegoro in Abia State; Brass, Sagbama and Okrika in Rivers State; Utaiwa, Nungudoe, Ekopri and Ahaha in Cross River State and Ikot Adem Itam, Ibeno and Gbotime in Akwa Ibom State (Asiabaka, 1991, Ukpaka, 2007). In fact, some estimates put the number of gullies in both Imo and Anambra States at over three thousand. And past works on the relations between erosion and productivity have confirmed and strengthened the view that loss of crop production through lowering of yields brought about by soil erosion is substantial (Young, 1989). It is also widely recognized that soil structure is of higher grade and more stable with lower detachability and higher infiltration capacity, under forest than under reduced-fallow cultivation cycle.

Seen from a wider perspective, the problem of forest degradation, soil erosion and land deterioration is socio-economic as well as environmental and technical. Trees and tree resources which are the first and primary victims of forest degradation constitute critical sources of food, fuel, medicines, fodder, building materials and cash income for farmers and rural people. In fact, a major justification for the recent upsurge in concern for tree growing by rural people is the potential contribution of trees to rural welfare. Such contributions include satisfaction of subsistence needs (for instance, food, fuel, building materials), substitution for purchased farm inputs (such as live fencing, animal fodder, green manure), opportunities to supplement cash income through sale of raw or processed tree products and social uses – such as amenity plantings, shade, privacy boundary markers (Scherr, 1995; Gregersen, *et. al.*, 1989). Besides, trees often serve as stores of value for household savings (Chambers & Leach, 1989). Deforestation which means the disturbance, conversion or wasteful destruction of forest lands leads to the progressive loss of these benefits and so a general decline in rural welfare – a trend that runs counter to the goals of sustainable development.

Faced with the challenges of deforestation and environmental degradation, efforts were intensified world-wide to search for appropriate land-use approaches that would be socially responsive/acceptable, ensure the sustainability of the production base and meet the need for production of multiple outputs. These efforts culminated in new forestry concepts such as agroforestry, social forestry, community forestry and farm forestry. The emergence of these new concepts draws largely from scientific evidence in a cross section of disciplines. For example, ecologists produced convincing evidence of positive influence of forests and trees on the stability of ecosystems; while studies carried out by anthropologist and social scientists showed the importance of mixed systems in traditional cultures. Both sets of findings lead to greater interest in the introduction of more woody perennials into managed land-use systems and the need to build upon farmer practices when developing new approaches (Nair, 1993).

Agroforestry Attributes and Practices with Potential for Promoting Sustainable Land Use and Alleviating Ecological/Environmental Risks

According to International Centre for Research in Agroforestry (ICRAF), agroforestry is a collective term for land-use systems and technologies where woody perennials (trees, shrubs, palms and bamboos, etc.) are deliberately used on the same land-management unit as agricultural crops and/or animals, in some form of spatial arrangement of temporal sequence. So, for a land-use approach to qualify as an agroforestry activity, two distinct characteristics must be evident - the deliberate growing of woody perennials on the same unit of land as agricultural crops and/or animals, either in some of spatial mixture or sequence; then, significant ecological and economic interactions (positive and/or negative) between the woody and non woody components (Lundgren & Raintree, 1982; Nair, 1993).

Agroforestry systems are commonly classified using criteria that correspond to the systems structure, function (output, socioeconomic nature or ecological, that is environmental) and spread; with these bases of classification being neither independent nor mutually exclusive but interrelated (Young, 1989; Nair, 1985). So, while the structural and functional bases often relate to the biological nature of the woody components, the social-economic and ecological conditions concern the organization of the system according to prevailing resource/input and ecological conditions (Nair, 1993). Based on a mix of criteria, therefore, the major agroforestry practices that have been identified to include: improved tree/woody fallow, taungya, alley cropping (hedgerow intercropping), multilayer (or multistorey) tree gardens, trees on croplands, plantation crop combinations, home gardens, trees in soil conservation and reclamation structures, windbreaks shelter belts and live hedges, trees on rangelands or pastures, plantation crops with pastures and animals, fodder (or protein) banks, home gardens involving animals multipurpose woody hedgerows, apiculture with trees, aquaforestry multipurpose woodlots, boundary planting and contour planting (Young, 1989; Nair, 1991; Current, Lutz and Scherr, 1995). Sustainable land use is that which achieves production combined with conservation not only of soil but of the whole range of resources on which production depends – the objective being the continuation of production over a long period. Young (1989) expressed sustainable land use as a pseudo-equation:

Sustainability = Productivity + Conservation of Resources

By implication therefore, unsustainable land use denotes practices that derail land productivity (the capacity of land to support the growth of useful plants, including crops, trees and pastures, on a sustained or continuous basis) and soil fertility (the capacity of soil to support the growth of plants, on a sustained basis, under given conditions of climate and other relevant properties of land).

Agroforestry Practices for Soil Fertility Maintenance

Even though many management practices exist for the maintenance of soil fertility (for example, traditional practices including crop rotation, intercropping, organic manuring using farmyard manure, compost or mulch, green manuring, fallowing, return of crop residues and modern practices such as fertilizer and minimum tillage), it is now widely recognized that agroforestry holds considerable potential as a major land-management alternative for maintaining soil fertility and productivity. This recognition derives from accumulating scientific evidence that trees and other vegetation provide beneficial effects in terms of maintenance or increase of soil organic matter, nitrogen fixation and nutrient uptake possibilities, nutrient retrieval and cycling (enhanced nutrient-use efficiency) and maintenance/improvement of soil physical properties such as soil structure, porosity and moisture retention and modification of extremes of soil temperature through shading and ground-surface litter-cover. Moreover, they positively affect soil chemical properties by reduction of acidity and reduction of salinity and sodicity (Nair, 1993). Agroforestry practices with the most potential in relation to soil fertility have been identified by Young (1989) to include improved tree fallow, trees on cropland, home gardens, hedgerow intercropping, trees on erosion-control structures, plantation crop combinations, trees on rangelands or pastures, woodlots with multipurpose management and windbreaks/shelter belts.

Agro forestry for Soil Erosion Control

One of the major advantages of agroforestry in terms of improving or sustaining soil productivity is through its effect on soil conservation (or specifically soil erosion control). The use of trees and shrubs for soil erosion control on farmlands includes both direct use for reducing erosion and their supplementary use for stabilizing physical structures that are created for erosion control (Lundgren & Nair, 1985). Nair (1993) describes the direct use as involving the use of trees/shrubs for increasing soil cover, providing live or dead barriers (such as hedgerows) and enhancing soil's resistance to erosion through maintenance or build-up of organic matter and desirable physical properties. The supplementary use relates to use of trees/shrubs to stabilize physical (earth) structures such as buns, risers or embankments.

Depending on crop-residues management and the agroforestry practice, trees and agroforestry practices can reduce erosion to 1 – 10 per cent of its rate on bare soil (Nair, 1993) via their effects on erosion-related factors, in terms of reduced rainfall erosivity, reduced soil erodibility, reduction of run-off and increased ground surface cover. The barrier approach to erosion control is to check run-off and soil removal by means of barriers or structures which may be earth structures (terraces, ditch-and bank structures) grass strips or hedgerows; while the cover approach to erosion control is to check raindrop impact and run-off through maintenance of a soil cover formed or living and dead plant material, including herbaceous plants, crop residues and tree litter and pruning (Young, 1989). Agroforestry can contribute to the barrier approach directly through the use of hedgerows as partly permeable barriers (those which allow some proportion of run-off to pass through) and indirectly, through the role of trees in stabilizing earth structures and making productive use of the land they occupy. Within this framework, agroforestry practices with potential for control of soil erosion have been identified (Young, 1989) as follows: plantation crop combinations, multistory tree garden (including home gardens), hedgerow intercropping (alley cropping) and barrier hedges; trees on erosion-control structures, windbreaks and shelter belts, boundary planting and live fences.

AGROFESTRY FOR SOIL CONSERVATION AND ENVIRONMENTAL SUSTAINABILITY: EVIDENCE FROM FIELD STUDIES IN SOUTHEASTERN NIGERIA

Growing trees in combination with arable crops is a traditional practice among farmers in parts of Southeastern Nigeria. In many rural communities, people have simulated forest conditions especially around their living homes, to obtain the beneficial effects of the forest ecosystem. In clearing the forest for agricultural use, farmers deliberately spared certain trees which were expected to provide a wide range of benefits – products and services, so trees and in fact woody species remain an integral part of the traditional farming system. Forde (1937) is one historical evidence that in this region, farmers grow yams, maize, pumpkins and beans together under a cover of scattered trees.

In Southeastern Nigeria, the traditional home gardens exemplify many agroforestry characteristics, that is, the intimate combination or mix of diversified arable crops and multipurpose trees fulfils most of the basic needs of the local population while the multistoried configuration and high species diversity help reduce the environmental deterioration. Most home gardens belonging to farmers in the region are known to be agrosilvopastoral systems consisting of herbaceous crops, woody perennials and animals, while some are agricilvicultural systems consisting mainly of the first two components, (Lageman, 1977; Okafor & Fernandes, 1987; Eboh & Agu, 1994). Culture, traditional economic as well as ecological considerations are principal driving forces behind the local people's continued use of home garden agroforestry system (Soemarwoto, 1987). A positive correlation has even been found to exist between population pressure on land (land shortage) and the intensity of tree cultivation in home gardens (or the whole system of home gardening). Specifically, it was found that the proportion of land under compound agroforestry system as well as the density of both tree and arable crops within the compound systems increased as the population pressure on land increases (Lagemann, 1977; Okafor, 1991; Eboh & Agu, 1994).

A diagnostic study of the traditional agroforestry systems in Eastern Nigeria (Eboh & Agu, 1994) identified the most common agroforestry practices that constitute the different agroforestry system as follows:

- improved tree fallow (woody species planted and left to grow during the fallow phase of the cultivation cycle);
- taungya (combined stands of woody and arable species during early stages of establishment of plantations, especially palm plantations, fruit orchards and government tree-growing projects);
- multilayer tree gardens like home gardens (trees scattered haphazardly or according to some spatial arrangement);
- woody species on farm boundaries, field/plot demarcations and live fences;
- multipurpose trees on croplands (especially on outer farms);

- trees on erosion-control structures (banks, bunds, terraces) and trees land-stretch along gullies;
- trees around farmlands/fields or around living areas (windbreak sand shelter belts and live hedges).

The study also found that agroforestry was practiced firstly to obtain multiple output from a given land unit (Socioeconomic rationale) and secondly to conserve/protect the soil from degradation and loss of productive potential (ecological rationale). In most of the surveyed areas, trees/shrubs and arable crops were spatially mixed, a finding that is understandable considering that majority of the standing/growing trees were in fact retained from previous cultivation or from preceding fallow vegetation or forest ecosystem. Boundary planting of trees/shrubs and live fences were among the few cases of spatial-ordered arrangements. Woody species used for such boundary demarcation include: "Ogirisi" *Newbouldia laevis*, "abosi" *Baphia nitida*, "echichi" *Erythrina senegalense,* "ahaba", *Acioa bateri*, "nturukpa" *Pterocarpus santilinoides*. The commonest woody species on homestead farms were found to include: "nkwu" *Elaeis guineensis*, "mangoro" *Mangifera indica* "oroma" *Citrus sp*., "ube" *Dacryodes edulis*, "oji" *Cola sp*., "onugbu" *Vernonia amygdalina*, "ogbu" *Ficus sp.*, "ichikere" *Spondias mumbium*, "ogirisi" *Newbouldia laevis*, "echichiri" *Rothmania whitfieldii*. On the outer farms, the common woody species were found to include: "nkwu" *Elaeis guineensis*, "ukwa" *Treculia africana*, "mangoro" *Mangifera indica*, "ogbonno" *Irvingia gabonensis*. "ugba" *Pentaclethra macrophylla*, "ichikere" *Spondias mumbium*, "echichiri" *Rothmannia whitfieldii*, "icheku" *Dalium guineense* and "ahaba" *Acioa barteri*.

It was found that over 90 percent of the total number of farm-fields investigated were carrying varied mixtures and species of trees/shrubs and arable crops. Of these farm-fields (both homestead and outlying), the average proportion of total land area estimated to be under mixture of trees/shrubs and arable crops was about 41 percent, meaning that out of every ten (10) equal portions of the average farm field in the surveyed area, about four (4) portions were carrying a mixture of trees/shrubs and arable crops; with most of the remaining portions under arable crops only and only a relatively smaller proportion under trees/shrubs only.

In a study (Agu & Eboh, 1996), it was reported that farmers in parts of Southeastern Nigeria have been found not only to be practicing agroforestry but do so in integration with earth structures/physical barriers for the control of soil erosion. Some of the integrative practices identified on farmers' fields include:

- planting of woody species (tree, shrubs) on or beside plot-encircling earth banks;
- locating trees and shrubs near mounds;
- combining trees and shrubs with contour banks;
- combining trees with terraces;
- combining trees with ridges or beds;

- locating trees and shrubs along drainage channels;
- boundary planting of trees and shrubs along earth banks;
  pruning/litter fall to provide soil with organic matter.

THE NEED FOR FURTHER RESEARCH AND POLICY INTERVENTIONS

The conjunction of a large and growing problem of soil degradation and productivity decline, a high apparent potential of agroforestry to address soil conservation and other developmental needs, with a scarcity of research evidence and policy interventions points clearly and strongly to the need for action by researchers and policy makers. Traditional agroforestry systems, including the Southeastern Nigeria example, evolved under site-specific conditions. However, they have been insufficiently researched; as such their potentials remain vastly under-exploited. Worse still, available information is mostly experiential and anecdotal, rather than experimental and evaluative, perhaps for lack of appropriate methodologies for evaluating the various types of agroforestry systems (Nair, 1993). While it is accepted that agroforestry systems need to be evaluated on the basis of their productivity, sustainability and adoptability, the precise criteria for such evaluations have not been fully developed.

Ideally, scientific research in agroforestry should fall into three levels: what, why and how (Huxley, *et al.,* 1989). WHAT research is directed at questions of "what happens" – what tree species are appropriate to plant, in what number and arrangement and with what management practices? Diagnostic or baseline studies of socio-economic, physical production and ecological processes are important here. WHY research seeks to answer questions regarding why the components of agroforestry systems perform in a certain way. HOW research is concerned with the fundamental processes operating within the systems. Beyond these levels of purely scientific research are user-response and evaluation studies. User response studies ascertain the reaction to proposed agroforestry systems while evaluation seeks to test the overall desirability of the proposed systems, on environmental, economic and social grounds – *ex ante* or ex post

Regarding policy interventions, the goal should centre on measures: to alleviate the constraints and weaknesses of traditional agroforestry systems, enhance the benefits and strengths of the systems and promote the technical, managerial and financial capacity of rural people to adopt more efficient and sustainable agroforestry technologies. Interventions that are based on species or practices already familiar to farmers have greatest likelihood of bringing about incremental adaptive change. Since rural people are eager to see clear immediate/short-term rewards for adopting new agroforestry species or practices/technologies, emphasis is needed on those species that meet the local people's requirements for food, fuel, fodder, construction material and cash income. After all, sustainability does not imply the incorporation of longer-term concerns at the expense of the basic short-term needs of the local people. So, policy support is required to promote local people's access to markets, resources and incentives.

CONCLUSION

The technical potential of agroforestry to address a range of development and environmental challenges is now widely recognized. In spite of the upsurge in interest, initiatives and efforts to create a supportive policy environment and implement necessary policy changes for agroforestry development, agroforestry content of Nigeria's environmental and land use development policies and programmers remains inadequate and muted. The paper therefore calls for stronger political will to incorporate more agroforestry concerns into the country's environmental and developmental processes.

REFERENCES

Achike, A.I (1999) Socio-Economic and Environmental linkages of Deforestation and Forest Land Use Change in Rural Farming Communities of Southeastern Nigeria. Technical Report, African Academy of Sciences (AAS), Nairobi.

Agu, J. N. and Eboh, 1996. Traditional Strategies of Integrating Agroforestry, Ethno-Engineering and Organic Manuring Practices for Sustainable Land Use: Diagnostic Case Studies in Eastern Nigeria. Technical Report, African Academy of Sciences, Nairobi.

Asiabaka, C. C. 1991. "Methods of Disseminating Erosion Control Information" in Njoku, J. E. and Ozara, N. A. eds. *Management and Control of Erosion in Agricultural Practices*, Institute of Erosion Research, Federal University of Technology, Owerri, pp. 53-74.

Chamber, R. and Leach, M. 1989. "Trees as Saving and Security for the rural poor", *World Development,* 17, (3), 329-42.

Current, D. Lutz, E. and Scherr, S. J., 1995. "The Costs and Benefits of Agroforestry to Farmers", *The World Bank Research Observer,* Vol. 10, No. 2, 151-180.

Eboh, E. C. 1993. "The Agricultural Symptoms of Population Stress in the Former Anambra State. Implications for Food Production and Environmental Conservation" *Modelling, Measurement and Control.* D., Vol. 37, No. 3, pp. 41-64.

Eboh, E. C. and Agu, J. N. 1994. Diagnosing Traditional Agroforestry Systems in Eastern Nigeria for Needed Research and Policy Interventions, Technical Report, African Academy of Sciences, Nairobi.

Eboh, E.C; Achike, A.I; Oji, K.O, Ujah,O.C; and Amakom,U (2005). Sustainability of Economic growth in Nigeria: The role of Natural Resources. Technical report submitted to DFID.

Forde, D. C. 1937. "Land and Labour in a Cross River Village", *Geographical Journal,* Vol. XC, No. 1.

Gregersen, H., Draper, S. and Elz, D., eds. 1989. *People and trees: the role of social forestry in sustainable development.* Economic Development Institute of the World Bank, Washington, D.C.

Huxley, P. A., Pinney, A. and Gatama, D. 1989. Development of agroforestry research methodology aimed at simplifying the study of potential tree/crop mixtures, Final Report of Tree/Crop Interface Project, ICRAF, Nairobi, 104 pp.

Lagemann, J. 1977. *Traditional African Farming Systems in Eastern Nigeria: An Analysis of Reaction to increasing population pressure,* African Studies, Weltforum Verlag, Munich.

Lundgren, B. and Nair, P. K. R. 1985. “Agroforestry for soil conservation”, El-Swaify, S. A., Moldenhauer, W. C. and Lo, A., eds., *Soil erosion and conservation,* Soil Conservation Society of North America, Ankeny, Iowa, 703-171.

Lundgren, B. and Raintree, J. B., 1982. “Sustained agroforestry”, in Nestel, B., ed., *Agricultural Research for Development: Potentials and Challenges in Asia,* ISNAR, The Hague, 37-49.

Nair, P. K. R., 1985. “Classification of agroforestry system”, *Agroforestry Systems, 5; 301-317.*

Nair, P. K. R. ed., 1989. *Agroforestry System in the Tropics,* Kluwer, Dordrecht.

Nair, P. K. R. 1991. “Sta6 □ □ % ,

Okafor, J. C. and Fernandes, E. C. M., 1987. "The Compound farms of Southeastern Nigeria: A predominant agroforestry home garden system with crops and small livestock", *Agroforestry System,* 5, 153-168.

Scherr, S. J. 1995. "Meeting Household Needs: Farmer Tree-Growing Strategies in Western Kenya" in Amold, J. E. M. and Dewees, P. A., eds., *Tree Management in Farmer Strategies: Responses to Agricultural Intensification,* Oxford University Press, Oxford.

Soemarwoto, O. 1987. "Home gardens: A traditional agroforestry system with a promising future", in Steppler, H. A. and Nair, P. K. R. eds., *Agroforestry: A Decade of Development,* ICRAF, Nairobi, 157-170.

Ukpaka, F (2007). "An Impartial Observer". *In Ukpaka Reports on Anambra State Nigeria.*

Young, A. 1989. *Agroforestry f or Soil Conservation,* C. A. B. International, Oxon.