

## Gender and Analysis of Common Agroforestry Practices in Akwa Ibom State, Nigeria

<sup>1</sup>C.L. Aboh and <sup>2</sup>I.A. Akpabio

<sup>1</sup>Department of Agricultural Economics and Extension, University of Calabar, Calabar, Cross River State, Nigeria

<sup>2</sup>Department of Agricultural Economics and Extension, University of Uyo, P.M.B 1017, Uyo, Akwa Ibom State, Nigeria

**Abstract:** The study determined gender perceptions of the dominant Agroforestry Practices (AFPs) in Akwa Ibom State of Nigeria. Data derived from 125 randomly selected male and female respondent's revealed Taungya system as the major male AFP while improved fallows were revealed as the dominant female AFP. Other responses were quite similar, although a major perceptual difference was observed in the responses of different gender groupings with regard to the utilization of Taungya AFP. Recommendations have been proffered to aid in the entrenchment of AFPs in the farming system of the study area. This includes the necessity to diversify introduced agroforestry innovations to include AFPs like snail and beekeeping and others alike.

**Key words:** Akwa Ibom, agroforestry, gender, Taungya, Nigeria

### INTRODUCTION

Agroforestry is an aspect of farm forestry that encourages a deliberate integration of woody perennials with agricultural crops and/or animals on the same land management unit, with the aim of enhancing soil fertility and increasing farmers' income through the use of economic trees (Akinbile *et al.*, 2007). The act of combining trees, crops and/or animals is as old as humanity itself, according to the Holy Bible (Genesis 2:5-10) and it has been practiced since the middle ages in Europe, Africa, Asia and tropical America (Udofia, 2001). Recently, the World Agroforestry Centre (formerly ICRAF) defined agroforestry as a dynamic, ecologically based natural resources management system that through the integration of trees on farmland in the agricultural landscape, diversifies and sustains production, for increased social, economic and environmental benefits for land users at all levels (ICRAF, 2000).

Agroforestry is widely regarded as an important approach to lessening the problems of environmental deterioration and is increasingly being seen as an alternative paradigm to rural development (Foley and Barnard, 1984; Leakey, 2001). It addresses many of the global challenges (deforestation, unsustainable cropping practices and rising hunger, poverty and malnutrition)

which have also been highlighted by the Millennium Development Goals (MDGs) (Nair, 1993; Garrity, 2004). The issue of environmental degradation is quite critical in Akwa Ibom State of Nigeria, where more than 80% population depends on forest products for survival, according to the Nigeria Conservation Foundation (NCF, 2000). The Forestry Monitoring Evaluation and Co-ordinating Unit, has also reported an imbalance in the demand and supply of forest products and a projected deficit of fuelwood, pole and saw wood over a 10 years period of up to 2010 (FORMECU, 1999). The formal practice of agroforestry is not as entrenched in Akwa Ibom State, in comparison to areas like Ogun, Edo, Delta and neighbouring Cross River States, however, Egwali (2000) and Ekpo (2004) reported that agroforestry practices are compatible in the study area, while King (1998) provided experimental evidence to that effect.

Sanchez (1995) reported that agroforestry is widely recognized as a branch of agricultural science that is rapidly becoming a science in its own right and that many research studies have been conducted in this area of study. Although, most research studies have been conducted from the biophysical perspectives, Mercer and Miller (1998) however, revealed that socio-economic aspects are now gaining attention. This is more so against the background of Stoian and Donovan's (2007).

observation that agroforestry could contribute to 2 of the MDGs-Eradication of extreme poverty and hunger (MDG 1) and promotion of gender equality and women empowerment (MDG 3). Against this back-ground, it became pertinent to ascertain the level of preparedness of Akwa Ibom State and its citizenry to utilize agroforestry to meet the challenges of rural development. A first step in this direction is to identify common (prevalent) agroforestry practices carried out in the study area.

Also, against the prevalent gender division of labour for crops and tasks in agricultural production in the study area (Lahai *et al.*, 2000; Akpabio, 2005) it became necessary to disaggregate the responses of male and female respondents, with respect to the issue at hand. Against this background, the specific objectives of the study included: to identify the socio-economic characteristics of agroforestry practitioners in the study area and to ascertain the commonly utilized agroforestry practices in the study area.

**MATERIALS AND METHODS**

The sample frame for the study comprised all the small scale farmers involved in the agroforestry project of the Forestry Directorate of the Akwa Ibom State Ministry of Environment. All the 5 Local Government Areas (LGAs) specifically targeted for the Agroforestry project (Oruk-Anam, Urue-offong-Oruko, Itu, Ikot Abasi and Esit Eket) were purposefully selected for the study. A simple random sampling procedure was also utilized to select 25 farmers from each of the LGAs under consideration. This gave a total number of 125 respondents that were sampled for the study.

Interviews and a set of pre-tested structured questionnaires were used to collect information from respondents. Collated data were analysed with the aid of descriptive statistical tools.

In order to identify commonly utilized (prevalent) Agroforestry Practices (AFPs) in the study area, 15 AFPs were drawn up through focus group discussions and a literature search. Respondents were requested to indicate their extent of involvement in each identified AFP in their agricultural operations. This was done with the aid of a 3-point Likert continuum of “Not at all”, “less common” and “very common”. These were assigned respective scores of “1”, “2” and “3”. Total and mean attitudinal scores were thereafter computed for each AFP, after which a mean cut-off score of 2.0 (1+2+3/3) was utilized to demarcate between a Commonly Practiced AFP (CP =  $x \geq 2.0$ ) and a Non-Commonly Practiced AFP (NCP =  $x < 2.0$ ).

**RESULTS AND DISCUSSION**

**Common agroforestry practices:** Table 1 shows on a general basis that only seven of the fifteen identified AFPs were commonly observed in the study area. These were: Improved fallows (rank 1;  $\bar{x}$  = 2.63), home gardens (rank 2;  $\bar{x}$  = 2.54), multipurpose trees on crop land (rank 3;  $\bar{x}$  = 2.05), home gardens (rank 6;  $\bar{x}$  = 2.04) and fuelwood production (rank 7;  $\bar{x}$  = 2.02). Improved fallows are modern forms of shifting cultivation. They are rotational fallow systems which utilize fast-growing leguminous trees with high biomass, as fallow species, in rotation with annual crops, rather than allowing the natural vegetation to return, as is the practice in shifting cultivation. The

Table 1: Common agroforestry practices in Akwa Ibom State, Nigeria

| Agroforestry practices   | Extent of practice |      |         |               |      |         |               |      |         |
|--|--------------------|------|---------|---------------|------|---------|---------------|------|---------|
|  | Male n = 50        |      |         | Female n = 75 |      |         | Total n = 125 |      |         |
|  | Mean               | Rank | Remarks | Mean          | Rank | Remarks | Mean          | Rank | Remarks |
| <b>Agrisilvicultural practices (Trees/food crops/shrubs)</b>     |                    |      |         |               |      |         |               |      |         |
| Improved fallow  | 2.56               | 3    | CP      | 2.69          | 1    | CP      | 2.63          | 1    | CP      |
| Taungya  | 2.74               | 1    | CP      | 1.52          | 12   | NCP     | 2.13          | 4    | CP      |
| Alley cropping   | 2.10               | 5    | CP      | 1.99 (2.0)    | 6    | CP      | 2.05          | 5    | CP      |
| Multipurpose trees on crop land                                  | 2.64               | 2    | CP      | 2.39          | 3    | CP      | 2.52          | 3    | CP      |
| Home gardens (multistory trees/crops)                            | 2.08               | 6    | CP      | 2.0           | 5    | CP      | 2.04          | 6    | CP      |
| Shelter belts/windbreaks   | 1.96 (2.0)         | 7    | CP      | 1.92          | 7    | NCP     | 1.94          | 8    | NCP     |
| Fuel wood production   | 1.94               | 8    | NCP     | 2.09          | 4    | CP      | 2.02          | 7    | CP      |
| <b>Silvopastoral practices (Trees+pasture and/or animals)</b>    |                    |      |         |               |      |         |               |      |         |
| Trees on farmland (scattered or patterned)                       | 1.38               | 12   | NCP     | 1.11          | 15   | NCP     | 1.25          | 15   | NCP     |
| Protein banks  | 1.26               | 14   | NCP     | 1.61          | 10   | NCP     | 1.44          | 13   | NCP     |
| Plantation crops with pasture and animals                        | 1.60               | 10   | NCP     | 1.55          | 11   | NCP     | 1.58          | 10   | NCP     |
| <b>Agrosilvopastoral practices (Trees+crops+pasture/animals)</b> |                    |      |         |               |      |         |               |      |         |
| Home gardens (trees/crops/animals)                               | 2.50               | 4    | CP      | 2.57          | 2    | CP      | 2.54          | 2    | CP      |
| Multipurpose woody hedgerows                                     | 1.50               | 11   | NCP     | 1.52          | 12   | NCP     | 1.51          | 11   | NCP     |
| Apiculture with trees  | 1.28               | 13   | NCP     | 1.71          | 8    | NCP     | 1.50          | 12   | NCP     |
| Aqua forestry  | 1.68               | 9    | NCP     | 1.49          | 14   | NCP     | 1.59          | 9    | NCP     |
| Multipurpose woodlots  | 1.20               | 15   | NCP     | 1.65          | 9    | NCP     | 1.43          | 14   | NCP     |

Source: Field survey, 2007

practice may be observed on both individual and communal plots. This practice allows faster regeneration of fallow land areas. The leguminous trees may have been identified and left undestroyed during seasonal land preparation activities or may be planted on the land. Dominant leguminous trees in improved fallows include: *Gliricidia sepium* (Mexican Lilac), *Acacia auriculiformis* and *Leucaena leucocephala*, among many others.

Multipurpose trees provide several products and services, including fodder, fruits, fence poles, boundary sticks, medicine, shade, fuelwood, soil conservation etc (Etukudo, 2000). All these attributes may not be present in any particular tree crop, but any tree which provides more than 2 of these products or services may be regarded as multipurpose in nature. Common multipurpose trees in the study area include the leguminous trees earlier mentioned above. Others may include: *Chrysophyllum albidum* (African star apple), *Gmelina arborea* (Gmelina), *Dacryodes edulis* (African pear tree), *Anacardium occidentale* (Cashew) and *Citrus sp.* (Orange) among very many others.

Home gardens are utilized to conserve indigenous plant species like *Dactyladenia barteri* (local name "Ukang") and *Anthonata macrophylla* (native name "Nya"), Common livestock raised in home gardens include local fowls, goat and sheep, which use their droppings to fertilize the soil, while tree mulches help to conserve the soil. Mathias-Mundy *et al.* (1992) quoted relevant literature which view home gardens as promising and sustainable land use strategies. Compound farms are the most prevalent home gardens in the study area.

Table 1 also shows that six of the seven identified agrisilvicultural systems were common AFPs in the study area. Incidentally, the prevalent agrosilvopastoral practice (home gardens involving livestock) ranked very high (2nd) on the hierarchy of common AFPs. This finding is consistent with local literature, Egwali (2000) and King (1998) revealed that agrisilvicultural and agrosilvopastoral practices are common in the study area, while Adedire (2005) asserted that agrisilvicultural practices are prevalent in the humid lowland, which is the characteristic physical feature of the study area.

The low ranking status accorded apiculture and aqua forestry systems, in the study area must be redressed. These are potentially viable economic activities which could be introduced to interested farmers who should then be encouraged to practice such activities.

**Analysis of perceptual gender differences:** On a disaggregated basis, male respondents were generally

involved in seven AFPs, while the female were involved in only 6 AFPs. The three major AFPs involved in by the men in the study area are: Taungya (rank 1;  $\bar{x}$  = 2.74), multipurpose trees on crop land (rank 2;  $\bar{x}$  = 2.64) and improved fallows (rank 3;  $\bar{x}$  = 2.56). The three major female AFPs were: Improved fallows (rank 1;  $\bar{x}$  = 2.63), home gardens combining trees, crops and animals (rank 2;  $\bar{x}$  = 2.57) and multipurpose trees on cropland (rank 3;  $\bar{x}$  = 2.39).

A major perceptual mean difference was observed with regard to Taungya AFP (item 2). Male respondents ranked Taungya as the most common AFP, while the female disagreed with the notion, by consigning the item to a distant 12th place ranking. Enquiries on this trend revealed that portions of land that are utilised for Taungya practice by the Forestry Directorate, are located in relatively remote and inaccessible terrains, which are characterized by relatively virgin (undisturbed) vegetation. The women complained about this fact and also about the economically prohibitive cost of clearing such land portions for crop production. The women were also quite scared of the envisaged difficulty that may be encountered in attempts to evacuate harvested farm produce from such remote places, even to nearby markets. On the other hand, the men are quite thrilled by the prospects offered by a relatively easy access to large portions of rich arable land for large scale crop production. The male also possess adequate physical energy to develop apportioned land areas for cultivation purposes. It may also be observed that population pressure on land is low in communities bordering Taungya locations and hence female farmers have adequate access to individual/communal land plots for their crop production activities and therefore, do not need to beg nor seek for land from other sources. Table 2 also shows that both gender groupings considered alley cropping as a common AFP. This is because the Forestry Directorate locates its alley crop farms in semi-urban or urban areas of the study area. These areas are well known for heavy population pressure on limited arable land and hence there is a high requirement for any available arable land for crop cultivation.

The minor perceptual difference that was observed between the gender groupings with regard to fuel wood production (item 7) arises because the female folk regard any woody tree growing on a farmland as a potential source of fuelwood and would tend such trees and ensure that they are left undisturbed, in anticipation of its future utilization as fuelwood for household food preparation. On the other hand, the male farmers are more interested in

economic trees like oil palm, rubber, mango etc, which are expected to provide a form of revenue for family socio-economic sustenance.

### CONCLUSION

Seven common agroforestry practices were identified in the study area with improved fallows, home gardens and planting of multipurpose trees; as the three most preferred AFPs. Slight perceptual differences were however observed between the male and female respondents. While the male generally utilised seven AFPs on their farm plots, the female utilized only 6 AFPs. The major male AFP in the study area was revealed as Taungya system, while the females preferred improved fallows. A major perceptual difference was however observed with respect to Taungya AFP, which the male ranked first, while the females gave the AFP a distant 12th place ranking.

It is important to entrench the concept of agroforestry into the farming system of the study area. The following recommendations may help in this regard:

- Sustained education and environmental awareness campaigns to the churches, market places and on the electronic air waves would help to familiarize more people with the importance and necessity to be involved in AFPs.
- Efforts should also be focused on the documentation of indigenous agroforestry and forest conservation practices of the target clientele. These practices could then be improved and disseminated to the people. The compatible nature of such innovations would increase the adoption process of AFPs, faster than the relatively slower rate of adoption of exotic species like *Gliricidia sepium* and others.
- Efforts should also be targeted at broadening the notion of AFPs to encompass the raising of mushroom, snails, bees, medicinal plants and homestead fish ponds. Against this background, relevant literature should be produced by the Forestry Directorate for onward distribution to the citizenry. This procedure would aid adoption of AFPs among the enlightened/educated populace who may not necessarily be involved in agricultural production. Also, in this regard, the introduction of credit facilities to aid adoption of AFPs would be a welcome development.

### REFERENCES

- Adedire, M.O., 2005. The role of agroforestry in enhancing food security through organic fertilizers. In; Organic Agriculture for Sustainable Food Security, Pub. Proc. 1st National Conf. Organic Agriculture. Olasantan, F.O., I.O.O. Aiyelagbe, V.T.O. Olowe and B.B. Philips (Eds.). Held at the University of Agriculture, Abeokuta, pp: 83-86.
- Akinbile, L.A., K.K. Salimonu and O.T. Yekini, 2007. "Farmer participation in agroforestry practices in Ondo State, Nigeria. Res. J. Applied Sci., 2: 229-232.
- Akpabio, I.A., 2005. Human agriculture. Social Themes in Agri. Dev. Abaam Pub., Uyo, pp: 106-122.
- Etukudo, I., 2000. Forests-Our Divine Treasure. Dorand Publishers, Uyo, pp: 117-116.
- Egwali, Q., 2000. Level of agroforestry practices in Akwa Ibom State. Unpublished M. Sc. Thesis. Department of Forestry and Wildlife Management, University of Uyo, Nigeria, pp: 84.
- Ekpo, A.C., 2004. Agroforestry practices in Nigeria-Implications for Akwa Ibom State. Paper presented at refresher course for staff of the Ministry of Agriculture, Uyo, Akwa Ibom State, pp: 12.
- Foley, G. and G. Barnard, 1984. Farm and Community Forestry. Energy Information Programme: Earthscan and IIED, London, pp: 30-61.
- Forestry Monitoring Evaluation and Co-ordination Unit (FORMECU), 1999. Forestry Resources Study Nigeria-Akwa Ibom State Revised Management Plan. Beak, Geomatics Int. Geomatics Nigeria, pp: 116.
- Garrity, D., 2004. World agroforestry and the achievements of the Millennium Development Goals, *Agrofor. Sys.*, 61: 5-17.
- International Centre for Research in Agroforestry (ICRAF), 2000. Paths to prosperity through agroforestry: ICRAF's corporate strategy 2001-2010. ICRAF, Nairobi, Kenya, pp: 43.
- King, E.J., 1998. Influence of agroforestry trees on the growth and yield of selected crops in Uyo, Akwa Ibom State. Unpublished Ph.D Thesis. Department of Forestry and Wildlife, Rivers State University of Technology, Port Harcourt, Nigeria.
- Lahai, B.A.N., P. Goldey and G.E. Jones, 2000. The gender of extension agents and farmers' access to and participation in Agricultural Extension in Nigeria. *J. Agric. Edu. Extension*, 6: 223-233.
- Leakey, R.R.B., 2001. Win: Win land use strategies for Africa: 1. Building on experiences with agroforestry in Asia and Latin America. *Int. For. Rev.*, 3: 1-10.

- Mathias-Mundy, E., O. Mucheria, G. Mckiernan and P. Mundy, 1992. Indigenous Technical Knowledge of private tree management-A bibliographic report. Studies in Technology and Social Change. No. 22, Ames, I.A.: Technology and Social Change Programme, Iowa State University.
- Mercer, D.F. and R.P. Miller, 1998. Socio-economic research in agroforestry: Progress, Prospects, priorities. *Agrofor. Syst.*, 57: 177-186
- Nair, P.K.R., 1989. Agroforestry defined, *Agroforestry Systems In: The Tropics*. Kluwer Academic Publishers/TCRAF, Kenya, pp: 13.
- Nigeria Conservation Foundation (NCF), 2000. Documentation of Environmental Degradation in 15 Communities in Akwa Ibom State. UNDP, Lagos, pp: 45.
- Sanchez, P.A., 1995. Science in agroforestry. *Agrofor. Syst.*, 30: 5-55
- Udofia, S.I., 2001. The role of agroforestry practices in checking environmental degradation. In: *Forestry and Sustainable Development*. Proc. 1st workshop of the Forestry Association of Nigeria, Akwa Ibom State Branch, Udo, E.S. (Ed.). 10-11th April. FAN/UNDP/AKSMOE/Dept. of Forestry and Wildlife, University of Uyo, pp: 122-133.