Distribution of Agroforestry Species in the Southeast Nigeria

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Abstract

This study investigated indigenous agroforestry species combinations and location pattern in Southeast Nigeria. Primary data were obtained by means of interview schedule from 400 farmers drawn by multistage random sampling technique from the zone. Data obtained were analyzed with descriptive statistical tools. General observation was also made on local agroforestry patterns. The study identified twenty-five (25) tree and shrub species as common woody components of agroforestry practice in the zone. It was also revealed that more species were located in homegardens than in farm fields. The ratio of species located in homegardens to that in farm fields was 7:4. Fruit and vegetable yielding trees and shrubs were found in homegardens while timber, stakes, fuel and economic trees were located in farm fields. Other identified species were located in both compounds and farmer's fields mostly for boundary maintenance. Root and tuber crops were the dorminant arable crop components of the local agroforestry practice, for instance yam (71.5%), cocoyam (69.5%) and cassava (56.5%). Other important components included leafy vegetables (68.5%) and cowpea (58.5%). Rice production is least associated with the practice (4.5%) in the zone. It was recommended that extension intervention in the zone should emphasize introduction of cereals and legumes in their local agroforestry practice.

Keywords: Indigenous, Agroforestry, Combinations, Farmers, Southeast Nigeria, Species

1. Introduction

Although agroforestry is an age-old approach to land use and an old practice in many African and Asian countries, it has been defined in modern times as a dynamic, ecologically based natural resources management system that through the integration of trees in farmland and range land, diversifies and sustains production for increased social, economic and environmental benefits for land users at all levels (ICRAF, 1997). The ruling objective for agroforestry, therefore, is to increase the human-ecological carrying capacity of rural areas, with the priority of improving food production systems. It has the potential to provide rural households with food, fodder, fuelwood and other products. At the same time, agroforestry can help ensure the sustained productivity of the natural resource base by enhancing soil fertility, controlling erosion and improving the micro-climate of crop land and grazing lands.

Nwokeabia (2002) observed that because of values associated with certain tree species, farmers have always left them standing while preparing the sites for arable agriculture. Some of these trees and shrubs provide a multiple of edible products, medicines, protective and soil improvement functions, fodder and wood for rural and household implements, food processing raw materials and export products. In a study on indigenous agroforestry practices among farmers in Southeast Nigeria, Umeh (2008) stated that various forms of agroforestry practices exist in the zone. These include homestead garden, trees on crop land, improved fallow, multistory crop combinations and sylvopasture. A positive relationship was identified to exist between indigenous-based agroforestry practices and income of farmers in Southeast Nigeria (Umeh, 2009). In a related study in Philipines, Brown (2003) observed that a farmer's adoption of agroforestry technology depends on the following criteria: food (supplying immediate household needs), income (providing cash to service other needs), future (providing savings for long-term needs), building (providing wood materials for construction of new houses) and erosion (activities that minimize soil loss).

Agroforestry design strives to maximize positive interactions between trees and other elements (crops and animals) and minimize negative interactions. This is achieved through appropriate species selection, spacing, and

management practices (Elevitch and Wilkinson, 2000). Careful advanced planning is, therefore, important to maximize benefits of agro forestry practices. For a better understanding of agroforestry design in Southeast Nigeria and the potentials for optimal realization of benefits of the system it is imperative to investigate the agroforestry species and patterns of combination among farmers in the zone.

The main objective of this study is to investigate agroforestry species and pattern of location among farmers in Southeast Nigeria.

2. Methodology

The area of study is South east zone of Nigeria. Southeast Nigeria is made up of five states, namely: Anambra, Abia, Ebonyi, Enugu and Imo States.

The people are mainly of Igbo tribe of Nigeria. The traditional economic activities of the people of the area is farming, which is often complemented with other non-farm activities. A multistage random sampling technique was adopted for the study. In the first stage, three states, Ebonyi, Enugu, and Imo were randomly selected from the five states. Then four local government areas from each of the three states were randomly drawn to give a total of twelve local government areas. Three communities were further drawn randomly from each of the selected Local Government Areas. Finally, twelve farmers were drawn by means of systematic sampling from each of the communities to give a total of four hundred and thirty respondents. However, only four hundred (400) well-completed and returned copies of interview schedule were used for analysis. Trained enumerators were used to administer the interview schedule on the farmers. The obtained data for the study were subjected to simple statistical tools such as percentages and frequency distribution. General observation was made on local agroforestry patterns.

3. Results

The data were analyzed to identify tree and shrub species common in agroforestry systems in the area of study based on location. Arable crop components of local agroforestry practices were also determined in the study.

<Table 1>

Table 1 presents some of the identified tree and shrub species found grown in combination with arable crops in the area of study.

The results of the analysis show that more of these species were located around homes and home gardens than in farm fields. This implies that there is more diversification of tree species around homes than farms in the area. The ratio of tree and shrub species located within home compounds to that located in farms was 7.4. Most common trees and shrubs grown in association with arable crops within homes include *Dacryodes edulis* (75.5%), *Pterocarpus santa linoides* (66.5%), *Vernonia amyigdalina* (74%), *Pterocarpus Soyanxii* (77.5%), Citrus Sinensis (88.5%), *Musa spp* (85.5%), *Chrysophyllum albidum* (70%), *Carica papaya* (86.2%) *Kola spp* (67.5%), *Newbouldia leavis* (89%) *Irvigia gabonensis* (64%), *Treculia afrucana* (46.5%), *Phukenatia conophora* (43.5%) and *Ocimum gratisimum* (47.5%). Species that dominated the farmers fields include *Pentaclethra macrophylla* (59.5%), *Cajanus cajan* (55%), *spondias mombin* (46%), *Brachystegia spp* (49%), *Eleais guinensis* (62.5%), *chlorophora excelsa* (91%), *Monadora myristica* (42.5% and *Garcinia kola* (45.5%). Location pattern of the identified tree and shrub species indicated that fruits and vegetables were found mostly in home gardens, while timber, stakes, fuel and economic trees and shrubs were located in farm fields. The rest of the species identified were located in both compounds and farmers' fields mostly for boundary maintenance

<Table 2>

Table 2 shows responses on perceived arable crop components of agro forestry practice of farmers in the zone.

Analysis of data in the table indicated that yam production was most common arable crop component of agroforestry practice in the study area (71.5%). Cocoyam production is ranked next to yam as the dominant crop combination of agroforestry systems in the area (69.5%). Other major arable crops that form components of the practice include cassava (56.5%), cowpea(58.5%),and leafy vegetables (68.5%). Rice production was identified as the arable crop least associated with agroforestry practice. This result implies that tuber and vegetable crops formed components of agroforestry practices in the study while cereals were less associated with practice in the area. The tuber crops and leafy vegetables are carefully selected for integration with trees in order to optimize the production and positive effects of agroforestry and to minimize negative competitive effects.

4. Conclusion

The practice of integrating wood perennial crops with arable crop production is a common practice among the farmers of Southeast Nigeria. More diverse species of trees and shrubs were found in home gardens where they

provide shade to man and livestock, among other services. Income generating species, such as timber and fuelwood providers were found in association with arable crops in farm fields while food producing woody species, fruits and nuts were identified with home gardens.

5. Recommendation

Based on the findings, it is recommended that interventions through introduction of improved woody species for agroforestry purposes in the zone should recognize the local people's agroforestry needs and patterns of distribution in home gardens and farms.

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Table 1. Percentage Distribution of Some Common Tree and Shrub Species based on Location

Tree/Shrub Spp	Igbo(Local Name)	English	Home		Farm	
			Freq	%	Freq	%
Treculia Africana	Ukwa	Breadfruit	186	46.5	140	35
Irvigia gabonensis	Ugiri/ogbono		256	64	88	22
Pentaclethra macrophylla	Ukpaka	Oil bean tree	80	20	238	59.5
Dacryodes edulis	Ube	Pear	302	75.5	26	11.5
Pterocarpus santalinoides	Uturukpa		266	66.5	62	15.5
Cajanus cajan	Fiofio	Pigeon pea	90	22.5	220	55
Xylopia acthiopica	Uda		92	23	136	34
Monadora myristica	Ehuru		58	14.5	170	42.5
Gongronema latifolium	Utazi		128	32	136	34
Vernonia amygdalina	Onugbu	Bitter leaf	296	74	70	17.5
Phukenatia conophora	Ukpa		174	43.5	122	30.5
Ocinum gratisimum	Nchanwu	Scent leaf	190	47.5	100	25
Spondias mombin	Ichikere		102	25.5	184	46
Brachystegia sp.	Achi		96	24	196	49
Baphia nitida	Abosi	Camwood	132	33	130	32.5
Pterocarpus soyauxii	Ora		310	77.5	36	9
Citrus sinensis	Oroma	Orange	354	88.5	38	9.5
Musa spp.	Unere	Plantain/banana	342	88.5	20	5
Chrysophyllum albidum	Udara	African star apple	280	70	72	18
Carica papaya	Okwuru	Pawpaw	346	86.2	30	7.5
Kola spp	Oji	Kola	270	67.5	98	24.5
Eleais guinensis	Nkwu	Oil palm	120	30	250	62.5
Garcinia kola	Nkwu	Oil palm	120	30	250	62.5
Chlorophora excels	Oji	Iroko	30	7.5	364	91
Newbouldia leavis	Ogirisi		356	89	54	13.5

Table 2. Percentage Distribution on Arable Crop Components of Agro forestry

Arable crops	Frequency	Percentage
Rice	118	4.5
Yam	286	71.5
Cassava	226	56.5
Maize	168	42
Cowpea	234	58.5
Leafy vegetables	274	68.5
Cocoyam	278	69.5
Groundnut	134	33.5
Bambaranut	138	345

Multiple Responses

Source: Field Survey, 2007.