DEMOGRAPHIC AND SOCIO-ECONOMIC ATTRIBUTES AFFECTING FOREST ECOSYSTEM EXPLOITATION AND MANAGEMENT IN THE RURAL COMMUNITIES OF CROSS RIVER STATE, NIGERIA.

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Abstract

This study examined the demographic and socio-economic attributes affecting forest resource exploitation and management in the rural communities of Cross River State. Data were collected through questionnaire survey and participatory research methods. These data were analyzed using descriptive statistics, regression analysis and one way analysis of variance (ANOVA). The result of the analysis shows that exploitation and management of forest resources in the rainforest significantly affected positively and negatively by demographic and economic factors. Regression analysis indicated a low positive relationship between demographic factors such as active age of the population household and number of literate population with the quantity of the forest products harvested. The findings also show that increased household size and low level of literate population greatly influenced the quantity of forest products gathered. In addition, the study revealed a significant difference in the income of rural people from the different occupations and that forest-based activities were adjudged to have attracted more income to the people. Based on these findings, a number of mitigating measures were suggested for adoption such as access to higher education, capacity building of forest people, alternative income generation opportunities, reduction of household sizes and female participation in forest management.

Key words: Demographic Attributes, Socio-Economic Attributes, Forest Ecosystem, Exploitation and Management.

1. Introduction

Forest is a valuable environmental and economic resource for supporting natural systems and human welfare. The high degree of biological diversity within the tropical rainforest is reflected not only in genetic resources but also in the array of established and potential products and commodities they contain. Scholars such as Etukudo (2000), Anyonge (2004) and Coffer, Sheil, Kaimorwitz and Kishi (2006), have agreed that forest plants and animals of the humid tropics contain genetic materials and chemical compounds which are widely used, including developing pharmaceutical and other products. In support of this, Ajake (2008) observed that, human population in the, rainforest regions have not been able to take advantage of its wealth of raw materials and invest in processing thus undermining opportunities for employment and income generation. In most countries of the world, forests are designated according to their function such as productive, protective and socio-economic functions (FAO,2007). The special characteristics of the forest have provided opportunities for livelihood sustenance among the rural people.

Unfortunately, the increased demand for forest resources and the technology adopted by man for extraction has caused severe degradation of forest resources (Jimoh, 2001). The rate of forest destruction has accelerated significantly since the turn of the century. This is most critical in the tropics where over 2.5 billion people depend on the natural forest resources for variety of services (Park, 1992, Tijani, 2007). The world has just under 4 billion hectares of forest, covering about 20 percent of the world's land area. Deforestation has continued at an alarming rate of about 13million hectares a year. However, the net forest loss remains 7.3 million hectares per year or 20,000 hectare per day.

Estimated forest losses in Africa (FAO, 2003) and Nigeria (Okonkwo, Umar and Nwafor , 2002) were observed to be higher than those of Latin America and the Caribbean. For instance, between 1990 and 2000, the continent, lost about 5.2millionha of the forest, accounting for about 52 percent of the global reduction of forest cover (FAO, 20001). Also, FAO (2007) reported a net loss of about 4 million hectares for the period 2000-2005.

Forest loss in Nigeria is put at an average of 400,000ha per annum, while afforestation has only 32,000ha annually. The cumulative effect of these is that the country has lost 50 million ha of forest in less than 100years (Nwoboshi, 1987). However, in Cross River State, Bisong (2007) revealed that the rate of annual loss of forest in Ikom forestry charge is about 5.68km2, Akamkpa forestry charge (5.777km^2) and 4,441km2 for Oban charge. Recent estimates of forest clearance however show that between 2000-2005, about 20,000ha of reserved areas in Cross River State are converted to agricultural plantation (Ajake, 2008). The increasing loss of forest ecosystem, especially in Cross River State is affecting the socio-economic livelihood of the indigenous population. The changing condition of the forest ecosystem in Cross River State is a matter of serious concern to government and non-governmental organizations. As people that depend largely on the forest, continuous forest resource depletion and environmental degradation will ultimately result in scarcity of forest products for food, energy use, medicine, building materials, loss of income and environmental deterioration. This in turn will affect the welfare and socio-economic livelihood of the rural people.

Governments, citizens and scientists are increasingly concerned about the role of socio-economic factors in global environmental change. Evidence is clear from studies that increase in human population and the excessive exploitation of resources for income generation have greatly altered the natural forest ecosystem (Turner, 1995). Several studies (Burges, 1992; Rudel, 1994; Blaike and Brookfield, 1987) have established a strong relationship between population changes and land resources degradation. But, in Kenya a study by Tiffen, Mortimore and Gichuki (1994) demonstrated the impacts of five fold increase in population between 1930 and 1990 on land resources affirmed that increased labour availability in locality, when combined with other factors such as market opportunities, technological knowledge and appropriate institutions have led to sustainable utilization of resources.

Although multidirectional results are reported for several factors which are causing deforestation, but Gibson, McKean and Ostrom (1998) posit that a contradictory finding is the dearth of forestry information at the national, regional and local levels, and lack of time series data, desperate and measurement employed in studies of deforestation has made complex the directional relationship between demographic changes and forest exploitation and management. Most analysis on forest exploitation lack linkages to the local level, despite a growing awareness among scholars and practitioners that the actions of local people greatly determine the success or failure of natural resource management programmes.

The role of local people in the rainforest communities in Cross River State is crucial. Most importantly, it is becoming increasingly clear that indigenous people in the forest ecosystem are both a filter and can ignore processes of sustainable forest utilization. Their practices are stemmed out of the attempts to confront the challenges of increasing household population sizes, coupled with low educational attainments which have not presented any alternative for sustainable livelihood. The pressure on natural forest ecosystem still persist since pragmatic efforts by Government, Non-governmental Organizations and scholars have not brought to focus the increasing household population, low level of education and the conditions of women who depend on the resources of the forest for sustenance.

Although a few studies in the area are focusing on the management of the rainforest based on the knowledge systems of the people, with the intention of stabilizing the socio- economic and other benefits, and to reduce the consequences of forest depletion, but consideration has not been given to their changing demographic patterns, educational level and economic characteristics that affect the use and management of forest resources. Research such as this can offer insight into many aspects of rural area and examine the demographic educational and economic characterization of the decision making processes of forest users, and their linkages with the exploitation and management of resources in the rainforest of Cross River State.

2. The Study Area

Cross River State is situated in the South Eastern part of Nigeria, between longitudes $7^0$40'' and $9^0$50'' east and latitudes $4^0$40'' and $7^0$00'' North and covers and covers an area of approximately 23,074.43km^2.

The state shares boundary with Cameroon republic to the East, Abia, Ebonyi and Akwa Ibom States to the West, Benue State to the, North and Atlantic Ocean coastline to the South (Fig. I). The study area lies within the tropical rainforest ecological zone of Nigeria, which is climatically disposed to support forest growth. The mean monthly temperature is between 24.2°C to 27.4°C, while the average annual rainfall ranges between 2000mm to 3500mm. The soils are generally ferrasols which are derived from ancient metamorphic rocks of basement complex and sedimentary structures. In 2006, the population was 2,888,966, with overall population density placed at 93 per sq.km and growth rate of 2.5 percent (National Population Commission, 2006).

3. Materials and Methods

The study used both the primary and secondary sources of data to determine the effect of demographic, educational and economic characteristics of rural people, who are involved in forest utilization for their livelihood in the rainforest of Cross River State. The household questionnaire was used for the generation of primary data. This was supplemented by the Participatory Rural Appraisal methods. The choice of the questionnaire and PRA methods was due to the comprehensiveness and the potential of the methods to suggest specific measurable indicators and collect first hand information (Narayan, 1999; Igbokwe and Enwere, 2001). The questionnaire was administered to 1,457 households heads across eighteen sampled villages that were purposely selected due to their land use status in relation to accessibility to the forest ecosystem. The secondary data were sourced from literature, survey maps, population bulletins and forestry project reports of Cross River State.

Analysis of data was based on the frequency values obtained from the questionnaire. This enables the study to obtain the mean scores, percentages and graphic illustrations. In the interpretation, the higher the mean score indicates the greater the impact or effect of that variable on forest exploitation and management. The multiple regression statistics was used to determine the effect of demographic factors on the total quantity of forest products harvested across the study communities. The general form of the equation is as follows:-

$y = B_0 + b_1x_1 + b_2x_2 + b_3x_3 \ldots b_nx_n + e.$ …….(equation 1)
y = Total quantity of forest products harvested
x_1 = Active of the population
x_2= Household population size
x_3= Number of literate population
$b_1\, b_2\, b_3$ = slopes of the independent variables
B_0 = y intercept
e= the stochastic error

The b-values in the analysis are the impact multipliers, which explain the magnitude of the effect of a unit change in the quantity of forest products harvested in the area. Thereafter, one-way analysis of variance was used to isolate the variable, which yielded more income to the rural population vis-a-vis affecting forest exploitation and management in the study area.

4. Results and Discussion

The analysis of data was based on the demographic and socio-economic attributes affecting forest exploitation and management. The demographic attributes that featured prominently were household size, age structure and sex distribution. Educational status was the only social indicator, while occupation, quantity of forest product harvested and income status were the main economic issues considered by the respondents as having influenced forest resources exploitation and management in the study area.

4.1 Demographic Characteristics Affecting Forest Use and Management

The household survey carried out in the sampled villages collected population data on the number of households per settlement and the number of persons per household. These data were used to determine the actual population size of the study settlements. From Table I, the result shows that estimated mean population of the sampled settlement is 2,397.22, while the mean household number is 161.4 and the mean household size is 14. The household size varies according to the study settlements. For instance, Okuni, Akparabong, Ajassor, Agbokim and Iko Ekoerem have higher number of persons per household than the other settlements. This implies that as the household population increases, it accelerates the dependence and the use of forest resources. The Participatory Rural appraisal study through interviews with key informants and group discussion revealed that household heads determine the activity structure of the entire household.

Therefore, the economy of the rural area is highly dependent on the household. The responses of household heads toward the use of forest resources have considerably increased the activities of rural population within the forest communities. Detailed survey across the communities through informal discussion with key informants shows that some households are between 28 to 42 persons while others are between 8 to 14 persons. There was no household with a population size of less than eight persons. Tendencies to increase the population of households were observed among farmers and forest products collectors who claim that their activities require many hands to ensure higher output. The study identified five main age structures. Table 2 indicates that the population within the age brackets of 18-25 years was 11.05%, 26-35 is 24.91%, 36-45 is 31.30%, 46-60 (24.23%), and 61 and above was 8.51%.

The age distribution of the population reveals a young and expansive population who are in control of their households and the resources of the forest. Interestingly, the findings have shown that most people within the age brackets of 18-25 and 26-35years are expected to contribute significantly to farm labour and forest related activities instead of constituting a burden to other age structures. These two groups constitute about 35.96% of the entire population sampled (Table 2). The increasing number of people attaining position as household heads is an indication of expanding productive age structure of the rural population. The implication of this trend is that there is increasing demand for forest resources and acquisition of more farmlands from the Virgin forests. This scenario contributes significantly to forest resources degradation in the study area. The study through transect walk with key informants across forest and farmlands observed that most people within these age brackets are found unconsciously managing the forest resources by regulating their harvesting and integrating tree species into farmlands as a means of reducing constant pressure on the forest ecosystem in their communities. The sex of individuals in any location has impact on the forest in that area (Ogar, 2001). From Table 3 the result shows that 69.94% of the household heads sampled were males, while 30.06% were females.

Both males and females are involved in farming and extraction of forest products. The high population of the males implies that there may be need to expand- farmlands, increase hunting activities, timber exploitation and other related forest based activities associated with them. These activities accelerate forest degradation in the Study area. The female population was observed as a dynamic group involved in the collection of non-timber forest products such as Afang (*Gnetum Africanum*), Bush mango seeds *(Irvingia Gabonensis),* Alligator pepper *(Aframonum meleguleta),* Monkey kola *(Carapa procera);* Hot leaf/seed *(Piper guineensis),* Editan (Lasiantera africanum). Udara(*Chrysophylum albidum),* Atama (*Hensia crinata),* etc. Male and female population shared activities on farmlands which are easily noticed especially in the maintenance and management of forest trees on farmlands. Ajake's (1998) investigation on the role of women in forest resources management shows that women make rules and regulations for forest use and management. They enforce community forest laws, and are the first to show signals about the degrading conditions of the forest.

Furthermore, the result of the household survey shows that 40.15% of the study population had no formal education, while 34.45 percent were First School Leaving Certificate (FSLC) holders, 13.86 percent obtained secondary school education, 5.83 percent had Diploma and National Certificate of Education (NCE), 4.32 percent possessed Higher National Diploma (HND) and Bachelor Degrees, while 1.3 percent was post-graduate certificate holders (Table 4). The findings show that a significant number of the study population had no formal education, while only 11.5percent of population received higher education. However, a bulk of the people who claimed to be educated was first school leaving certificate holders (Table 4). The problem of education was more severe in some study communities where the most educated persons hold Senior Secondary School Certificate or Teacher Grade II. The level of education in the study area contributed to the indiscriminate exploitation of forest resources and uncompromising attitudes of the people towards forest resources management. This display of behaviours due to low level of education was adjudged by the study to have resulted to further degradation of the natural forest ecosystem.

The study also observed that a few people who received higher education were also involved in the collection and sale of forest products. It was confirmed that forest product economy has enhanced educational progress in the study area. According to Ajake (2008), education is fundamental to the understanding of the changes in the forest ecosystem and sustainable forest resource management approaches, and influences the adoption of sustainable farming practices that may not be destructive to the forest ecosystem. When farming system practices and forest resource harvesting methods are unsustainable, it will result in deforestation.

Population with higher educational qualification may extract less forest products as most of them have their primary occupation apart from the extraction of forest products. Formal education enhances the understanding of participatory management and integration of forest trees on farmlands as a sustainable way of farming and managing the remaining forest ecosystem in the area. The participatory study through semi-structured interviews with key informants, elders, chiefs and leaders reveals that, education was a critical factor in promoting indigenous initiatives of managing forest resources.

4.2 Economic Characteristics Affecting Forest Use and Management

From the findings of Participatory Rural Appraisal (PRA) study and household survey, the people were involved in several productive activities that influence their livelihood security. From Figure 2, the results show that civil service, farming, collection of forest products, trading and other minor activities such as fishing, mat weaving, artisans etc are the productive (occupation) activities of the rural population. The results reveal that farming and collection of forest products were the main occupation of the people. These attracted 44.68 percent and 34.59 percent respectively. This implies that these two activities constitute about 79.27 percent of the population. While 10.02 percent were civil servant, 6.86 percent were traders and 3.84 percents were involved in other minor occupations.

The study discovered that most respondents from other employments such as civil service, trading and minor activities were also involved in farming and collecting forest products. Farming and forest products extraction remains the major source of food and income for the rural population. Transect walk across the village territories, participant observation and key informant interviews carried out during the study indicate that civil servants, traders, artisans and other people are involved in farming and extraction of forest products as their secondary activities to enhance their livelihood. For instance, it was observed that, the main products of marketing are from the forest. Since majority of the people are farmers and forest product collectors, large areas of the primary forest were used for cultivation and forest products extraction. As a result, there is pressure on the remaining forest, thus resulting in forest resources depletion. It was also observed that farmers allow forest frees on their farmlands and maintain them based on their knowledge systems, thus, reducing continuous pressure on the primary forest.

4.3 Regression Analysis of the Demographic Factors and Quantity of Forest Products harvested in the Area

In this section, the study attempt to quantify the effect of demographic factors (independent variables) on the quantity of forest products harvested (dependent variable) using the multiple regression analysis. The model assumes that a number of factors or variables (explanatory variables) jointly influenced the changes on endogenous (dependent) variables. The data used for this analysis were obtained from the questionnaire survey and field measurement across the eighteen sampled communities (Table 5). The demographic factors or variables (independent variables) under study were active age of the population, household population size and number of literate population, while the quantity of the most preferred forest product harvested (dependent variable) was measured in kilogram. The products includes bush mango (*hvingia gaboneensis*), Afang (*Ginetum africanum),* oil palm (*Elaeis guineansis*), Native pear, (*Dacryodes Edulis),* Hot leaf/seed (*piper guineensis),* Bitter kola (*Garcina kola),* Native kola (*kola accuminata),* chewing stick (*Randia Longiflora),bushmeat*, timber and firewood.

The data set on the quantity of forest products harvested (dependent variable (y) and the demographic factors (independent variables x_1, x_2 and x_3) (Table 5) were analysed using the multiple regression analysis. The regression model defined by the equation:

$Y=590\ 1465.8 + 0.20x_1 + 0.34x_2 + 0.39x_3$ ……(equation 2)

Details of the regression results are shown in Table 6. From the results, a low positive relationship is evident between quantity of forest products harvested by the people and the demographic factors under consideration as shown by multiple R of 0.455 and multiple regression square (R^2) of 0.207. The co-efficient of determination (R^2) suggest that the demographic factors of active age of the population household (x_1) population size (x_2) and number of literate population (x_3) jointly explain 20.7 percent of the variance in the quantity of forest products harvested (y) in the area. This analysis reveals that apart from the demographic factors, other variables this study did not capture also determine of the quantity of forest product harvested in the area.

Furthermore, the multiple regression analysis shows that an F-ratio of 1.216 was produced for the joint contribution of the three parameters to the quantity produced, which was not significant at 0.05level. This indicate that when the demographic factors are taken together, they do not significantly influence the quantity of the products harvested. The relative contribution of each of demographic variable was shown in the regression (equation 2 and Table 6). The result shows that the parameters as indicated by the beta-coefficients (regression weights) and the t-values when taken are not significant in their influence on the quantity produced. However, furthermore analysis indicated that the household population size(x_2) made the highest contribution to the quantity produced. This is followed by number of literate population (x_3) and active age of the population (x_1) in that order (Table 6 and equation 2). This result implies that the number people in a household and the low level of education of the people are the main demographic factors that significantly influenced the quantity of forest products harvested in the rainforest communities of Cross River State, Nigeria.

The participatory appraisal analysis indicated that the higher the number of people in a household, the more quantity of forest product harvested. Low level of education implies that rural people are not engaged in other productive activities outside forest based activities. In addition, when level of education is too low as it is the study area (Table 4), it may result to unsustainable harvesting practices. A few literate people who are found in the area rather owned forest based industries in order to increase the quantity of products harvested. The study further observed that, as the quantity of forest products harvested in the area increases there is more pressure on the primary forest vis-à-vis degradation of resources and unsustainable management practices.

4.4 Analysis of Rural income from Forest Communities

The rural people are increasingly seeking for productive activities that yield higher income. The questionnaire data were collected according to the five main occupations such as civil service, farming, forest product collection, trading and other minor activities such as carpentry, blacksmith (Fig.2) etc. In order to determine which occupation yielded more income to the rural population, annual income data from the five main occupations were used. The data were analyzed using one-way analysis of variance. The analysis of variance used the F-test which is the ratio of two or more variance (ratio between means variance to within means variance). The estimated F-ratio is compared with theoretical value in the F-table at specified degrees of freedom and level of significance. The results are presented in Table 7.

From the result the mean income from forest products collection was higher with N1,309,383.00 per annum. This was followed by farming with N678,825.8 per annum. The high income from forest products collection was attributed to the numerous activities of the people in the forest to generate income. It was discovered that most products from forest are for cash sale, while produce from farmlands are mostly used as food. The study observed that significant number of forest dwellers is mainly involved in forest activities for the purpose of generating income which is used to enhance their livelihood. Mean income from trading activities is N91,184.79 per annum. Apart from trading with a few manufactured goods, most rural people are found buying and selling forest products at household level or open markets. The annual income of a few civil servants which the survey covered could not be determined, but the mean estimate is N74,549.33. This result implies that forest people are highly dependent on the forest ecosystem income and farming than other productive activities in the study area. Therefore forest products gathering determine the rural economy of forest dwellers. Income from forest products are used for farm expansion, education of children and relatives, as well as socio-cultural demands of the people. The standard deviation for income distribution across the sampled villages indicated a high level of disparity of (652,716.16 and 18.862.88). This means that while some have a minimum income as low as N50,450.06 per annum in some communities, others are very high (N1,309,383).

The analysis of variance of the influence of occupation on income level of the people produced F-ratio of 47.60. This is greater than the tab F-ratio of 2.52 at 0.05 level of significance. From this result, it was established that there is statistically significant difference in the income of rural population from different occupations in the study area. This implies that, occupation with higher mean income level provided more opportunities to the people for income generation. The study further observed differences in mean income of the rural population from various occupations (Table 8). Income distribution across communities is uneven. Some villages depend solely their daily, weekly, monthly and annually income, but trading and minor productive activities. This disparity also reflects economy of the rural household in the study area.

The study observed that some households have no definite income generating occupation, but are involved in several activities within their environment for their livelihood security. Finally, the analysis shows that farming is increasingly becoming important determinant of the people's income. The PRA study reveals that the introduction of forest species into rural farming systems has increase income from farmlands and reduces pressure from the virgin forest in the study area.

CONCLUSION

The study investigated the demographic and socio-economic characteristics affecting forest resources exploitation and management in the rainforest communities of Cross River State. The analysis reveals interesting picture of the effect of demographic factors and economic parameters on forest utilization and management. It was discovered that demographic and socio-economic attributes such as household size, age structure, sex distribution, educational status, occupation and income status influenced forest use and management. The regression analysis shows that the increased in household size and low level of literate population greatly determine the quantity of forest products gathered. Also, the result indicated significant difference in the income of rural population from different occupation. Forest occupation was observed to have attracted more income to the people than other productive activities. The increased in quantity of forest products harvested and income generated from forest activities has imposed great damage to the remaining forest ecosystem in the study area. In order to stem the tide of this pressure created by demographic and economic factors influences in the management of the primary forest, the study suggest mitigation measures such as access to higher education, capacity building of forest people, alternative income generation opportunities, reduction in household population and female participation in forest management must be put in place to ensure sustainable forest exploitation and management in Cross River State.

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Table I: Estimated Population and Household Sizes

Study communities	* Estimated population	**No of Households	Average Household size
Iwuru Central	1,877	157	12
Iko Ekperem	2,328	146	16
Ibogo	1,031	129	8
Idoma	1,287	92	14
Orumenkpang	1,067	89	12
Abo Ebam	1,275	85	15
Agbokim	1,683	106	16
Ajassor	2,467	154	16
Okuni	6,153	362	17
Odonget	1,611	134	12
lyametet	4,601	288	16
Bendi 1	1,128	81	14
Busi	1,240	89	14
Okorshie	1,275	106	12
Bayatong	705	70	10
Agoi Ekpo	3,100	221	14
Ibami	2,600	186	14
Total	42,260	2,906	250
Mean	2379.22	161.14	14

Source: Author Field survey, 2010, *National Population Commission, 2006

Table 2: Age Structure of the Study Population

Study communities	18-25(%) yrs	26-35(%)yrs	36-45(%) yrs	46-60(%)yrs	61 and above
Iwuru Central (%)	8(10.31)	20(25.32)	30(37.97)	16(20.25)	5(6.33)
Iko Ekperem (%)	3(4.11)	21 (28.77)	28 (38.36)	20(27.39)	1(1.37)
Ibogo(%)	5(7.69)	21(32.77)	22(33.85)	16(24.61)	1(1.54)
Idoma (%)	6(13.04)	12(26.09)	15(32.61)	10(21.74)	3(6.52)
Orumenkpang (%)	6(13.33)	15(33.33)	10(2.22)	12(26.67)	2(4.44)
Abo Ebam (%)	6(9.30)	10(23.25)	14(32.56)	13(30.23)	2(4.65)
Agbokim (%)	3(5.66)	11(20.75)	18(33.96)	14(26.41)	7(13.21)
Ajassor(%)	4(7.79)	19(24.67)	26(33.96)	16(20.78)	10(12.99)
Okuni(%)	30(16.57)	37(20.44)	48(26.52)	39(20.99)	27(14.92)
Akparabong (%)	18(8.74)	41(19.90)	50(24.27)	68(33.01)	29(14.08)
Odonget (%)	5(7.46)	16(23.88)	26(38.80)	18(26.86)	1(1.49)
Iyametet (%)	28(19.44)	37(25.69)	42(29.17)	25(17.36)	12(8.33)
Bendi 1(%)	5(12.19)	14(34.15)	11(26.83)	9(21.95)	2(4.88)
Busi (%)	7(15.55)	10(22.22)	16(35.55)	8(17.78)	4(8.89)
Okorshie (%)	3(3.66)	14(26.41)	18(33.96)	16(30.19)	2(3.77)
Bayatong (%)	6(17.14)	7(20)	11(31.43)	6(17.14)	5(14.28)
Agoi Ekpo (%)	14(4.30)	24(21.62)	39(35.13)	26(23.42)	2(2.15)
Ibami (%)	4(4.30)	24(36.56)	32(34.41)	21(22.58)	2(2.15)
Total	**161(11.05)**	**363(24.91)**	**456(31.30)**	**353(24.23)**	**124(8.51)**

Source: Author Field survey, 2010

Table 3: Sex Distribution in the Study Area

Study communities	Males	Females	Total
Iwuru Central	53(67.22%)	26(32.91%)	79(100%)
Iko Ekperem	52(71.23%)	21(28.77%)	73((100%)
Ibogo	59(76.92%)	15(23.08%)	65(100%)
Idoma	35(76.09%)	11(32.91%)	46(100%)
Orumenkpang	31(68.89%)	14(31.11%)	45(100%)
Abo Ebam	27(62.79%)	16(37.21%)	43(100%)
Agbokim	29(54.72%)	24(45.28%)	53(100%)
Ajassor	47(67.40%)	30(38.76%)	77(100%)
Okuni	122(67.46%)	59(32.26%)	181(100%)
Akparabong	142(68.93%)	64(31.08%)	206(100%)
Odonget	55(82.09%)	12(31.91%)	67(100%)
Iyametet	102(70.83%)	42(29.17%)	144(100%)
Bendi 1	30(73.17%)	11(26.83%)	41(100%)
Busi	28(62.22%)	17(37.78%)	54(100%)
Okorshie	40(75.47%)	13(24.52%)	53(100%)
Bayatong	29(82.85%)	6(17.14%)	35(100%)
Agoi Ekpo	85(76.56%)	26(23.42%)	111(100%)
Ibami	62(66.67%)	31(33.33%)	93(100%)
Total	1019(69.9%)	428(30.06%)	1457(100%)

Source: Author Field survey, 2010

Table 4: Educational Level of the study population

Sampled communities	No. of formal education	FSLC	GCE/SSCE	ND/NCE	HND/B.Sc.	Others
Iwuru Central (%)	24(30.38%)	38(78.1%)	9(11.39%)	6(7.59%)	2(2.53%)	0(0%)
Iko Ekperem (%)	36(30.38%)	28(33.36%)	8(10.96%)	1(1.37%)	0(0%)	0(0%)
Ibogo(%)	30(46.15%)	28(43.08%)	4(6.15%)	2(3.08%)	1(1.54%)	0(0%)
Idoma (%)	20(48.48%)	14(30.45%)	10(21.74%)	2(4.35%)	0(0%)	1(2.22%)
Orumenkpang (%)	15(33.33%)	16(35.55%)	9(20%)	3(6.67%)	1(2.22%)	0(0%)
Abo Ebam (%)	14(32.56%)	16(37.21%)	8(18.6%)	4(9.30%)	1(2.32%)	1(1.88%)
Agbokim (%)	20(37.7%)	14(26.41%)	8(15.09%)	8(15.09%)	2(3.77%)	1(1.3%)
Ajassor(%)	26(33.77%)	20(25.97%)	12(16.88%)	10(12.99%)_	7(9.09%)	6(3.31%)
Okuni(%)	52(28.73%)	70(38.67%)	30(16.57%)	12(6.63%)	11(6.08%)	8(3.88%)
Akparabong (%)	71(34.4%)	66(32.04%)	16(7.77%)	17(8.25%)	28(13.59%)	0(0%)
Odonget (%)	30(44.78%)	32(32.83%)	10(14.92%)	4(5.97%)	1(1.49%)	0(0%)
Iyametet (%)	82(56.94%)	48(33.33%)	12(8.33%)	2(1.38%)	0(0%)	0(0%)
Bendi 1(%)	21(51.22%)	16(39.02%)	4(9.76%)	0(0%)	0(0%)	0(0%)
Busi (%)	18(40.00%)	22(48.89%)	3(6.67%)	2(4.44%)	0(0%)	0(0%)
Okorshie (%)	20(37.73%)	22(41.51%)_	8(15.09%)	1(1.89%)	2(3.77%)	0(0%)
Bayatong (%)	5(42,86%)	14(40%)	6(17.14%)	0(0%)	0(0%)	0(0%)
Agoi Ekpo (%)	61(54.93%)	22(19.82%)	20(18.02%)	3(2.70%)	3(2.70%)	2(1.80%)
Ibami (%)	30(32.26%)	26(29.96%)	26(29.96%)	24(25.81%)	8(8.6%)	4(4.30%)
Total %	583(40.15%)	502(34.45%)	202(13.36%)	85(5.83%)	63(4.32%)	20(1.37%)

Source: Author Field survey, 2010

Table 5: Quantity of Forest Products and Demographic Factors in the Study Area

Sampled communities	Qty of forest products (kg) (y)	Active Age of the population (x_1)	Household population size (x_2)	Number of literate population (x_3)
Iwuru Central	2,576,150.5	66	12	17
Iko Ekperem	2,380,493.5	69	165	9
Ibogo	2,119,617.50	59	8	7
Idoma	1,500,037	37	14	12
Orumenkpang	1,467,427.50	37	12	14
Abo Ebam	1,402,208.50	37	15	13
Agbokim	1,728,303.50	43	16	19
Ajassor	2,516,931.50	61	16	31
Okuni	5,967,538.50	104	17	59
Akparabong	6,717,557	159	18	69
Odonget	2,184,836.50	60	12	15
Iyametet	4,695,968.50	104	16	143
Bendi 1	1,336,989.50	34	14	4
Busi	1,467,427.50	34	14	5
Okorshie	1,728,303.50	38	12	11
Bayatong	1,141,332.50	24	10	6
Agoi Ekpo	3,619,654.50	89	14	28
Ibami	3,032,683.50	77	14	37
Total Average	3,214,192.10	62.8	14	21

Source: Author Field survey, 2010

Table 6: Result of Regression analysis of quantity of Forest Product based on the demographic factors

Variable	**Standardized beta co-efficients**	**f-Ratio**	**Sign level**	**Multiple R**	**R^2**	**Adjusted R^2**	**F-Value**
Active Age of the population	0.202	0.479	0.640				
Household population size	-0.340	-1.133	0.276	0.455	0.207	0.037	1.216
Number of literate Population	0.394	0.895	0.366				

Constant (BO) = 590.1465.8

Table 7: Analysis of Variance of Income of Different Occupations in the area

Source of variation	**Sum of squares**	**Degree of freedom(df)**	**Mean sum of squares**	**F-ratio**	**Tab. F-value**
Between Groups	2.12E +13	4	5.31 E+2		
Within Groups	9.49 E+12	85	1.16E +1	47.60	2.52
Total	3.07 E+13	89			

Significant at 0.05 confidence level

Table 8: Annual Income (N) of the Rural Population from Different Occupations

Occupation	Mean (N)	Std Deviation	Minimum (N)	Maximum (N)	Total (N)
Civil service	74549.33	24635.61	48920.00	134,640	1,341,888
Farming	678,825.8	381,088.33	58240	980,460	10,512,360
Forest product gathering	1309,383.	652,716.16	350,130	2,380,134	22,245,840
Trading	91,184.78	49,209.35	34,860	198,280	1,641,326
Others	50,450.06	18,862.88	28,930	98,132	908,701
Total 4,133,883.5	4,133,883.5	852758.1	812,390	3,625,890	37,619,935

Source: Author Field survey, 2010