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Economic Impact Assessment of African Timber And Plywood Company in Sapele, Delta State, Nigeria

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ABSTRACT: The Impact of African Timber and Plywood (AT & P) industry on Sapele community is an important issue that warrants empirical investigation. Specifically, the study was designed to assess the positive and negative impact of AT & P on Sapele community. A sample of 90 respondents comprising of 30 AT & P company staff and 60 numbers of Sapele community, was composed using simple random sampling techniques. Primary data were collected from the respondents with the aid of structured questionnaire and interview schedule in May 2009. A combination of descriptive statistics (such as means, standard deviation, percentage, table, graph); and inferential statistics (probit regression model) were used to analyse the collected data. The result of the study showed that AT & P industry made positive impact on Sapele community through creation of job opportunities (77.78%) and award of scholarship to indigenes (55.56%), the study revealed that the negative impact created by AT & P industry included deforestation (66.67%) and generation of wastes (61.11%). The result of the probit model showed that AT & P industry created significant impact on Sapele community through the provision of social amenities and wood supply. The average log likelihood value of 0.48 indicated that the mean degree of impact created by AT & P was 48%. It was therefore recommended among others that more forest related industries should be sited in other parts of Delta State Nigeria for the purpose of development.

Keyword: Economic Impact assessment, Timber and plywood, Sapele Community, Nigeria.

Introduction

Timber trade in southern Nigeria is highly commercial with over 500 sawmills. Sapele, a coastal town in Delta State, is the biggest wood production industry in Nigeria. (Southern Forest Productions Association, 2005). AT & P is built on the knowledge of forestry trees. The company deals with plantation forestry maintenance, harvesting, processing and utilization. It has different sections: ply board mill section and dimension mill section. The sawmill section deals with conversion of woods which is known as the primary conversion, the plymills section deals with the pilling of wood. While the dimension mill is a recovery mill for recycling non standard size lumber into finished products like doors, furniture components, cross arm for PHCN, Veneers for the production of plywood blocks, sailing stripes etc.

The demand for wood as a raw material and the supply of wood to those who need it today has exceeded the production capacity of the forest (Akachukwu, 2001).

African Timber and Plywood (AT & P) company was established in Sapele with the objective of creating jobs or employment opportunities, provision of corporate social responsibilities and other

community development services such as provision of scholarship to students from their area of operation. Before now, no empirical study has been conducted to investigate the socio-economic impact of AT & P on the host community. Conducting such study will enable us assess the impact of AT & P on Sapele community since its establishment.

On the other hand, the presence of AT & P in Sapele has contributed to the depletion of timber resources in the area. Population explosion leading to high demand for wood and wood products could result in over exploitation of wood resources in Sapele and environs. This is capable of creating a ripple effect on the ecosystem and micro climate of the area.

Majority of the people in Sapele community depend on the company for their livelihood (some producers, marketers and transporters). African Timbers and Plywood determines the quality and cost of wood product consumed by the people in the community. Despite the significance of the AT & P, there is no study conducted to assess the impact of AT & P on the economic well being of Sapele community before now. The work done by (Ubuh, 2008) only addressed the impact of wood based industries on the physical environment but not the welfare of the people.

Objective of the Study

The objectives of the study are:

(i) to assess the positive and negative impact of AT & P on Sapele community;
(ii) to identify the secondary industries located in Sapele due to the presence of AT & P;
(iii) to ascertain the waste management strategies

Materials and Methods

Description of the Study Area

This research work was carried out at African Timber and Plywood (AT & P) wood industry, Sapele in Sapele Local Government Area of Delta State. Sapele is located at latitude $8^{o}14'$N and longitude $8^{o}45'$E of the equator (Delta State Ministry of Lands & Survey, 2008). Sapele lies in the tropical rain forest zone and it is characterized by rainfall of between April and October with an annual rainfall ranging from 1500mm to 1849.3mm with a temperature range of 32.2^{o}C (Delta State University Meteorological Station, Asaba, 2009).

Sampling Procedure/Sample Size

Simple random sampling design was used in composing the sample for this study. The sample size was 90 (respondents). This was made up of thirty workers of African Timber and Plywood Industry and sixty members of Sapele Community of data collection.

Method of Data Collection

Structured questionnaire and interview schedule were adopted as instruments for data collection and were presented in English and in some cases questions were asked in their native languages; and answers given were filled into the questionnaires in order to communicate with those persons that can neither read nor write. Hence, primary data were used for the study. Secondary data used were obtained from published materials.

Data Analysis Techniques

Data collected was analysed using frequency distribution, percentages and probit model. The logit model is stated in the implicit form as IMP = F (X_1, X_2, X_3, X_4, X_5).

Probit Model Specification

Application of qualitative choice model (probit model) in explaining socio-economic phenomenon is not new. In such models, the probability of an event (e.g. impact) occurring, is a function of a set of non-stochastic explanatory variables and a vector of unknown parameter. In this case, the dependent variable (impact) is measured on binary scale (i.e. probability of 0 (zero) and 1 (one). The probit model was used by previous authors such as Rahn and Huffman (1984); and Nagatus and Pankh, (1999). The probit model is specified as:

$$Pi = C/(1 + e^{-zi})$$

Where Pi is the probability that an impact was created or not by AT & P company, given the information embodied in index Zi, and C is a constant. Index Zi, though unobserved was investigated as being predicted by the following regression model:

$$Zi = \beta_0 + B_1 X_1 + \beta_2 X_2 + \ldots + \beta_k X_k$$

Where X_1 to X_k are the variables through which AT & P Company created impact.

Table 1: Description of Symbols of variables in the model.

Variables	Description	Measurement
Pi	Probability that an impact was created or not	1 if yes, 0 otherwise
X_1		1 if yes, 0 otherwise
X_2		
X_3	Provision of Social amenities	1 if yes, 0 otherwise
X_4	Provision o buy product	1 if yes, 0 otherwise
X_5	Wood	Supply

Results and Discussion

Socio-economic Characteristics of Respondent

The socio-economic characteristics of respondents considered in this study include: gender, age, educational background, marital status, family size and occupational characteristics of respondent in African Timber and Plywood company, Sapele and its environ. This is shown in the table below:

The socio-economic characteristics of respondents are presented in the table 1.0. Majority (61.11%) of the respondents are males. This shows that more males than females participated in the survey. This result could be due to the fact that males are more and better informed about the contribution of a project to community-economic development of a community such as Sapele than women.

Majority (40%) of the respondents falls within the age group of 41 – 45 years. This age group comprises of the active youth or productive age. This group also has information on community development and shows more concern about their community development.

Furthermore, the result of the study shows that majority (61.11%) of the respondents acquired educational level ranging from secondary to HND. This shows that most of the respondents were educated and could contribute to development debates.

Table 2: Socio-economic Characteristics of Respondents.

Variables	Frequency	Percentages
Gender		
Male	55	61.11
Female	35	38.89
Total	90	100.00
Age (years)		
Below 30	6	6.67
31 – 40	18	20.00
41 – 45	36	40.00
46 and above	30	33.33
Total	90	100.00
Educational Background		
No formal education	-	-
Primary education	5	5.56
Secondary education	25	27.78
OND/NCE	20	22.22
HND/B.Sc.	30	33.33
M.Sc./above	10	11.11
Total	90	100.00
Marital Status		
Single	20	22.22
Married	60	55.67
Divorced	10	11.11
Total	90	100.00
Family Size		
Below 5	10	11.11
5 – 10	75	83.33
11 and above	5	5.56
Total	90	100.00
Years of Experience		
1 – 5 years	10	11.11
6 – 10	22	24.44
11 – 15	25	27.78
16 – 20	18	20.00
20 and above	15	16.67
Total	90	100.00

Majority of the respondents (66.67% were married, while others were either single (22.22%) and divorced (11.11%). These results show that most of the respondents were family people who are already settled for a living in Sapele community, such people are well-informed about the impact of African Timber and Plywood Industry on Sapele community.

The findings of this study revealed that most of the respondents (83.33%) has large family size. Household with large family would ordinarily expect development impact on their families. When the families are developed, the community will also develop. Households are the building blocks of community development.

It was shown in the study that majority of the respondents (27.78%) has years of working experience that range between 11 – 15 years. Such people are very familiar with the history of African Timber and Plywood Industry and the impact of the company on Sapele community.

Table 3: The impact of African Timber and Plywood on Sapele Community.

Job Opportunity	Frequency	Percentages
Yes	70	77.78
No	20	22.22
Total	90	100.00
Scholarship		
Yes	50	55.56
No	40	44.44
Total	90	100.00
Social amenities		
Yes	30	33.33
No	60	66.67
Total	90	100.00
Wood Supply		
Yes		72.22
No		27.28
Total		100.00
Negative Impact		
Deforestation		
Yes		66.67
No		33.33
Total		100.00
Generation of waste		
Yes		61.11
No		38.89
Total		100.00

Source: Field Survey, May 2009

The Presence of Secondary Allied Industries to AT & P in Sapele

Majority of the respondents (72.22% were of the opinion that African Timber and Plywood Sapele created positive impact on Sapele community by way of attracting secondary allied industries to the area.

Table 4: Secondary Industries located in Sapele.

Variables	Frequency	Percentages
Secondary Industries		
Yes	70	77.78
No	20	22.22
Total	**90**	**100.00**

Source: Field Survey, May 2009

The table above shows that distribution of secondary industries located in Sapele as a result of the presence of African Timber and Plywood in Sapele. The result shows that majority of the respondents (77.78%) agreed that African Timber and Plywood attracted some secondary industries to Sapele within the period of its existence. Such secondary industries that were established in Sapele include paper mills, sawmills, coal processing centres and wood transportation firms. Such secondary industries tend to obtain their raw materials from African Timber and Plywood. The respondents agreed that by way of job creation and economic activities, the secondary industries have indirectly created impact on Sapele community.

Waste Management Strategies of AT & P

Table 5: Distribution of waste and waste management strategies in African Timber and Plywood Sapele

Variables	Frequency	Percentages
Waste		
Yes	80	88.89
No	10	11.11
Total	90	100.00
Waste effects		
Air pollutants	20	22.22
Good waste products	66	66.67
Chemical substance	10	11.11
Total	90	100.00
Waste Management		
Escape air	10	11.11
Dumped river	--	--
Allow to pile up and decay	10	11.11
Recycled for other products	76	77.78
Total	90	100.00
End product		
Run-off	--	--
Solid waste	90	1.00
Effluent	--	--
Emission	--	--
Total	90	100.00

Source: Field Survey, May 2009

The distribution of waste and waste management strategies in African Timber and Plywood Company Sapele is presented in table 4.0 above. The result shows that majority of the respondents (88.89%) supported the view that African Timber and Plywood generates waste as their bye-product. The result of the study shows that the waste generated in the company is in solid form, that is sawdust, wood shavings, barks and condemned wood pieces. Here, African Timber and Plywood waste products can be classified as solid intensive (mainly solid wastes).

Further analysis of data shows that the waste effects generated from African Timber and Plywood (66.67%) can be converted to good uses such as fuel wood, recycled sawdust – wood shavings for the production of steam. This means that the waste generated in African Timber and Plywood produces positive impact. Only very small quantity of the waste can be considered a chemical substance (11.11%) and air pollutant (22.22%). Furthermore, the result of the study shows that African Timber and Plywood Company Sapele had relatively efficient waste management system. Majority of the waste (77.78%) are recycled to produce other products such as steam, ply boards and ceiling boards. Only small quantity of the waste was burnt (11.11%) and others (11.11%) were allowed to pie up and decay.

Statistical test of Impact assessment of African Timber and Plywood Company in Sapele Community

Though, the descriptive statistics (frequency distribution) shows that African Timber and Plywood created positive impact on Sapele Community, there was the need to test statistically the key areas where African Timber and Plywood Company created significant impact in Sapele Community.

Since opinion of the indigence with respect to the impact assessment to African Timber and Plywood Company on Sapele was elicited using qualitative response model, the appropriate statistical tools that was used for these test was the probit model.

In this model, the responses were measured by binary scale. The result of the probit model is presented below:

Table 6: Covariance matrix computed using second derivatives.

Variable	Coefficient	Standard error	Z statistic	Probability
X_1	0.166760	0.283459	0.588303	0.5563
X_2	0.036467	0.277052	0.131626	0.8953
X_3	0.987263	0.394337	2.503599	0.0123
X_4	0.461052	0.581802	0.792456	0.4281
X_5	0.774140	0.284170	2.724211	0.0064
Avg. log livelihood	0.484324			
Obs. Dep = 0	28			
Obs. With Dep = 1	62	Total obs.	=	90

The probit model revealed that two out of the five variables captured in the model were significant. They are social amenities (X_3) and wood supply (X_5). The model also revealed an average log likelihood of 0.48 (48%). The means that the tendency of African Timber and Plywood Company to create impact on Sapele community was 48%.

The statistical significance of the impact assessment variables is explained below.

Job Opportunity (X_1)

This variable was not significant in the model due to its low coefficient (0.17). The implication of this, is that there is positive relationship between job opportunity and the impact created by African Timber and Plywood on Sapele community. African Timber and Plywood could not create significant impact by way f job opportunities because the parameter coefficient of 0.17 indicates that a unit of job opportunity given by African Timber and Plywood leads to 17% impact creation. This also means that with respect to the entire population of Sapele, only 17% got job opportunities with African Timber and Plywood Company. This findings is in agreement with the early report of (Gaynor, 2003) who asserted that timber industry in National Development through job creation, especially, in the rural area.

Scholarship awarded (X_2)

This variable was not significant in the model due to its low coefficient (0.03). The implication of this is that there is positive relationship between scholarship awarded and the impact created by African Timber and Plywood Company on Sapele community. African Timber and Plywood Company could not create significant impact by way of scholarship awarded because the parameter coefficient of 0.03 indicates that a unit of scholarship awarded by African Timber and Plywood Company lead to 3% impact creation. This means that very few people (insignificant number of people) were awarded scholarship in Sapele community. Award of scholarship has a multiplier effect on the socio-economic development of the society.

Social amenities (X_3)

This variable was significant in the model due to its high coefficient (0.99). There was positive relationship between social amenities and the impact created by African Timber and Plywood Company on Sapele community. African Timber and Plywood created significant impact by way of social amenities because the parameter coefficient of 0.99 indicates that a unit of social amenities provided by African Timber and Plywood Company lead to 99% impact creation. This means that many lives were touched positively by the social amenities provided by African Timber and Plywood Company viz. potable water, electricity, housing, transportation, health centre, technical training schools, recreation facilities and sports development centre.

Wood Supply (X_5)

This variable was significant in the model due to its high coefficient (0.77). The implication of this, is that there is positive relationship between wood supply and the impact created by African Timber and Plywood Company on Sapele community; African Timber and Plywood company created significant impact by way of wood supply because the parameter wood supply by African Timber and Plywood leads to 77% impact creation.

Conclusion

The result obtained from this study showed that African Timber and Plywood Company created some impact in Sapele community by way of job creation. This findings is in agreement with the early report of (Graynor, 2003) who asserted that timber industry is important in national development especially in the rural area. Africa timber and Plywood company also created significant impact by way of providing social amenities like potable water, electricity, housing, health centre, recreation facilities, et. This findings is in agreement with the assertion of (Lipsey, 1980) that social amenities are public goods that can benefit the masses. Another important area where African Timber and Plywood Company created significant impact was in wood supply capacity of the company. Due to wood supply of the company, other secondary industries such as paper mill, charcoal production, lumber marketing businesses were established in and around Sapele. They depended on At & P for the supply of raw materials. This had a multiplier effect of job creation, income generation and sustenance of livelihood. This led to a boost in cash economy of Sapele.

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