Impacts of Oil Foreign Direct Investment on Environment and Poverty Level in Niger Delta Oil Producing Region: A Structural Equation Modeling Approach

Salami Dada Kareem
Department of Economics, Faculty of Social Sciences,
Lagos State University, Nigeria.
Email: daskareem@gmail.com

David Mautin Oke
Department of Economics, Faculty of Social Sciences,
Lagos State University, Nigeria.
Email: okdam76@yahoo.com; david.oke@lasu.edu.ng

Daskareem Vera Enoho
Department of Economics, Faculty of Social Sciences,
Lagos State University, Nigeria.
Email: daskareem@gmail.com

Oladipo Kolapo Sakiru
Department of Human Resource Development,
Unversiti Putra, Malaysia.
Email: honkolapo@gmail.com

Babajide David Adesina
Department of Banking and Finance,
Yaba College Technology, Nigeria
Email: darebabajide@gmail.com

ABSTRACT: This study examines impacts of oil foreign direct investment on the environment and welfare of people of Niger delta oil producing communities, using structural equation models. Overall, it was found that oil foreign direct investment has consistent impact on the environment than the well-being of the community, which results in high levels of poverty. The implication is that there is environmental diseconomies and widespread of poverty in the area. Thus, there is need for fostering sustainable partnership between the oil foreign direct investors and the host communities by suitable consideration of the issues of mitigation of environmental problems that will reduce the poverty level of the people. The environmental and socioeconomic system should be developed to maintain an intensity of biodiversity that will give assurance to the buoyancy of the ecosystems on which human consumption and production depend.

1. Introduction

The economic performance of any country is a result of the relationship between the advancement of economic, institutional and technological forces that align with economic development (Naubahar, 2006).Terrence and Kevin (2005) argue that the dealings and the formation of innovative establishments are potential within an evolutionary structural perspective of economic growth. The developing countries and transition economies have directed more effort towards quality Foreign Direct Investment (FDI) from the developed nations, predominantly what they consider as priority- the FDI that brings tangible benefits, especially contributing new technologies and organizational practices. Many developing countries and transition economies are in the same situation

with the regards to FDI and Transnational corporate operations in an effort to incorporate them into their development strategies (UNCTAD, 2005).

The oil sector affects the Nigerian culture and structure and it is the basis of the economy. The production capacity in the sector is based on the joint venture. Shell Company is the leading producer in the joint venture arrangement which produces about 50%. There is often fluctuation in Nigeria's GDP when there is a sudden increase of oil production. This has led to increase in oil output and resulted to severe damage on the environment.

There is also often disparaging environmental transformation emanating from oil business and industrialization; oil spill and gas flares have destroyed the natural resource base, which portend threat to sustaining independent indigenous livelihood. In most parts of Delta region States for instance, the hitherto very fertile lands are no longer productive. The peasants have lost the fertility of their lands to oil exploration (Victor, 2010). In addendum, the people of the area remains infuriated by massive oil based environmental degradation. It is a regime of massive oil spillage occurrences and gas flares which have devastated the land and water that have led to soil fertility loss, farming decline, forest loss, fisheries and bio-diversity depletion.

Oil dependence has an ambiguous relationship with poverty alleviation, and this is related to the boom-bust cycles accompanying dependence on the resource. Countries dependent on agricultural commodities tend to experience low poverty level, minerals in general are linked to high levels of poverty, and oil dependence in particular is correlated with low life expectancy and high malnutrition rates. It is true that most forms of primary commodity dependence are associated with poverty, not all commodities are equally culpable (Fafchamps and Quisumbing, 2002).

One of the most important social consequences of the resource curse is that oil-exporting countries have unusually high poverty rates, poor health care, high rates of child mortality, and poor educational performance given their revenues – outcomes that contradict the beliefs about what should happen within oil-exporting countries (Bassam, 2008). The question that comes to the mind of many is how can the oil companies making billions of dollars yearly from the exploitation activities do without taking care of the host communities and the environment. In addition, how can natural resources being used up in a manner that appears wasteful and thereby foreclose options for development in the future and increase the poverty level in the society.

Interestingly, however awareness level of environmental problem has grown tremendously in the mind of people in recent years. One question that must be asked in this regard is what is the relationship between an increase in the exploitation activities of the oil companies and its impact on the environment and poverty level of the people in the Niger Delta region? Therefore, the main objective of this study is to examine the impacts of oil foreign direct investment on environment and poverty level in the Niger Delta oil producing region. The structural equation modeling (SEM) approach is being used because of the multi-dimension of the impact of FDI on the environment and the level of poverty of the people in the Niger Delta. To uphold the environment and improve the poverty level, the stock of renewable resources should be maintained and the economy should save over and above the depreciation rate of both man-made and natural resource capital (Catarina et al., 2010).

The paper is organized as follows. Section two reviews the existing literature on the value of the environment and externalities theories. The third section presents the sample research design and model specification. The fourth section presents estimation and results and the final section provides the conclusion.

2. Literature Review

The valuation of the environment suggests that welfare of the future generation should not be less than the welfare of the current generation. Furthermore, the stock of renewable resource should be maintained and the economy should save over and above the depreciation rate of both man –made and natural capital resources (Weitzman and Lofgren 1997; Elif –Akbostanci and Ipek, 2009; Catarina et al., 2010). The serious degradation and pollution of the ecosystem suggest the need for valuing the environment and pursuance of policies that would help to ameliorate the current adverse environmental condition.

Furthermore, goods and services exchanged are measured in terms of their market price and value assessment. Most of the goods and services like clean air and water resources are not generally

valued. The deficiency in markets for environmental services are the most important instances of the market failure. The degradation and over exploitation are always caused by lack of economic valuation of environmental goods (Kalpana et al., 2007; John, 2008). However, environmental economic valuation and its services are the main central basis of environmental economics.

Rudolf (2002) emphasizes that allocation of limited resources in the face of unlimited wants, that is, the scarcity of resources is relevant to the environment's valuation. The fundamental approach of valuation of the environment is the adaptation of the goods and services the natural environment makes available. The valuation of the environment is the practice of committing monetary values on environmental goods and service, many of which have no easy practical market prices (Salamiet al., 2012). Environmental goods and services comprise scenic views, biodiversity, coral reefs, and mountain landscapes. It also comprises indirect processes, such as water supply and watersheds, erosion control and forest ecosystem conservation, and sustenance of genetic material. In order to value these goods and services, valuation techniques have been developed (Clive and Arild, 2006).

However, in a situation of private ownership, natural or environmental resources could be acquired and protections against trespass can be in the context of a regime of liability rules which can certainly resolve conflicts over resource use. This really is not Coase's thesis in "Social Cost." His exposition in the hypothetical world without transaction costs was developed to especially illustrate the paradox intrinsic in the theory of perfect competition. Perfect competition requires perfect information. Perfect information removes transaction costs and the absence of this information gives rise to transaction costs. Coase transaction costs arise only in market exchange and represent the value of the resources which are consumed while undertaking a market exchange. It is exchanged for economists consider advantage in the transaction costs to determine the value of the resources consumed while institutional change, including adjustments to government policy along with the cost of making and safeguarding ownership claims (Glenn, 2007).

Judith-Dean et al. (2009) emphasized the approach within the framework of dealing with environmental parameters such as resource abundance along with the market failure. The best valuation within the common-property resource stock is dependent upon the particular property-right structure governing its use (Eric-Neumayer, 2001; Akkemik and Goksal, 2012). The transaction cost is incurred in each and every point in which the goods in the process pass through one owner to a new utilizing free market exchange. Firms can avoid these transaction costs by creating an enduring relationship between the owners of the factors of production engaged in successive stages of the production process (Glenn, 2007).

The resource externalities associated with a firm's social cost have private costs along with extraction costs, and factor into the firm's optimization problem. Market prices which include the marginal user cost of the resource are one element of the full extraction cost. Similarly, the cost of a user is explicitly considered as a cost when property rights are not assigned but the emphasis is given to social evaluation of productivity growth (Acemoglu, 2003). The externalities of environmental destruction and degradation provide further facts to those who doubt the relevance of conventional economics for long-term policies of sustainable growth and expansion. Environmental economist therefore seeks to incorporate into their value system the scarce environmental goods and services. This is with the intention of the environment to be perceived and can be treated as an economic commodity (Jacobs, 1994).

The modern extractive industry and its environmental effects had conventional attention of several researchers in the past. Some of the issues include the implications of keeping up development in an economy, the main sources of environmental diseconomies arising from oil industry activities and their environmental impacts. The main oil companies operating in the Niger Delta have expressed a commitment to sound environmental practice in the area in which they work. On the contrary their practices are known to be the worst anywhere in the world, hurting the environment and livelihoods of the Niger Delta on a monumental scale (Onosode, 2003; Orubu, 2002).This explained the designation of poverty and associated theories that are deeply rooted in strongly held political values, elevated by encompassing social, political and economic institutions which have a stake in the matter. The World Bank (2000) defines poverty as ''the economic condition in which people lack sufficient income to obtain certain minimal levels of health services, food, housing, clothing and education generally recognized as necessary to ensure an adequate standard of living ''The abilities of the people of Niger Delta to acquire assets (including both material and social assets) and the activities needed for just

means of living are not achievable. Liu (2013) argues that the livelihood is sustainable when it can cope with and can recover from stresses and shocks, as well as maintain or enhance its abilities and resources .While noting the undermining of the natural resource base, the orthodox view in much discussion of the sustainability argues that poverty and environmental degradation are linked within the downward and mutually enforcing cycle.

The World Commission on Environment and Development noted that poverty is the most important foundation of global environmental problems (Brundtland Commission, 1987). Therefore, it is ineffectual to deal with environmental problems without bigger perspective of the standards underlying world poverty and worldwide inequality. The links between poverty and environment were also seen as being self-enforcing. The Commission also noted that many parts of the world are caught within the vicious unpredictable manner, poor people are forced to overuse environmental resources to survive from day to day, and their impoverishment of their environment further impoverishes them, making their survival ever more difficult and uncertain (Stonich, 1992). The study puts forward and illustrates an alternative, environmentally entitlements approach to understanding poverty-environment linkages. Adapted from Kapp (1950) work, it predicts the accomplishment of undesirable cost of growth of the economy on the environment. The approach shifts the emphasis from questions of resource available to those of access, control and management. The social cost which is defined as all direct and indirect burdens impose on the third parties or the general public by the participant in economic activities is the central point in Kapp's analysis. He explicitly mentions all costs emanating from productive processes that are passed on to the outsiders through water and air, land degradation which harm health, reduces agricultural yield, accelerates corrosion of materials, endangers aquatic life forms, flora and fauna, and creates problems in the preparation of drinking water.

It is instructive to argue that environmental costs are frequently externalized for lack of clearly defined property rights. This is because most environmental resources share the traits of public goods and some suffer uncontrolled and excessive exploitation for coming under common property right. Insecure land tenure is bound to discourage long term investments, therefore is biased in technology choice in favour of short-run output maximization over sustainable economic system. Therefore, well-defined property right is a dimension towards enforcing appropriate environmental behaviour. These problems arise essentially because of scarcity of all resources in the economic system (Richard and Krugman, 2004).

Externalities occur when economic unit's activities, such as those of firms or consumers, impinge on the consumption or production of another component and where the benefits of costs that builds up to components do not usually go into the gain or loss estimation. In other words, these effects are noticed, they are left un-priced; hence the bearers are normally uncompensated in the private market environment. If externalities are priced and bearers are compensated, then they are said to be internalized (Collin, 2007). Baumol and Oates (1988) point out that market failure is a very broad issue that occurs in many areas of economics. They favour the approach taken by Costanza et al. (1997) that defined externalities as not in terms of what they are but what they do, thus they contravene the optimum allocation of resources conditions in the economy. The key characteristic of a private externality is that the agents involved should be required to be fully appropriated by the external effect. Thomas et al. (2006) note that, public externality arises when a natural resource is used without payment and its use by one agent does not reduce the quantity obtainable to others. The quality of the natural resource may be affected, however, owing to the use- as-you-please principle. Air and water pollution are examples of this kind of externality.

There is need to plug back some of the benefits accruing to these firms and companies to the community who are impoverished, as a result of their operational defects. The absence of this kind of incentive would lead to the confrontation between Nigeria government, oil companies and host communities. The role of oil companies may be extensive in less developed countries (LDCs) and transitional economies where free market regulating mechanisms are not yet fully formed or effectively practiced. Oil companies have a unique opportunity in attending to social responsibility issues, as in the Niger Delta, especially where potential host countries lack the legal framework, societal infrastructure and experience of a market economy.

3. The Study Location

The Niger Delta Region which occupies an area of 75,000 sq. km is located in the Southern part of Nigeria. It stretches to Nigeria-boundary in the East of Cameroon; bounded by Ogun and Ondo; West is by Kogi, Enugu, Ebonyi, Anambra, and in the north bounded by Ekiti state and in the South generally bounded by the Atlantic Ocean. It is the world's largest third mangrove forest in Africa and most expansive unsullied water swamps in Western and Central Africa and is Nigeria's major concentration of high biodiversity. The population of the Niger Delta is over 30 million people, who live in about 13,400 long settled aboriginal communities made up of Ijaw, Isoko, Itsekiri, Ishan, Ilaje, Ibibio, Anang, Efik, Ekpeye, Ikwerre, Edo, Ogoni, Ogba Engine and Ukwani nationalities. Over 75% of these settlements lie along the coastal region of Nigeria (Okaba, 2005). Figure 1 shows the Niger Delta Map by local government.

Figure 1. Niger Delta Map
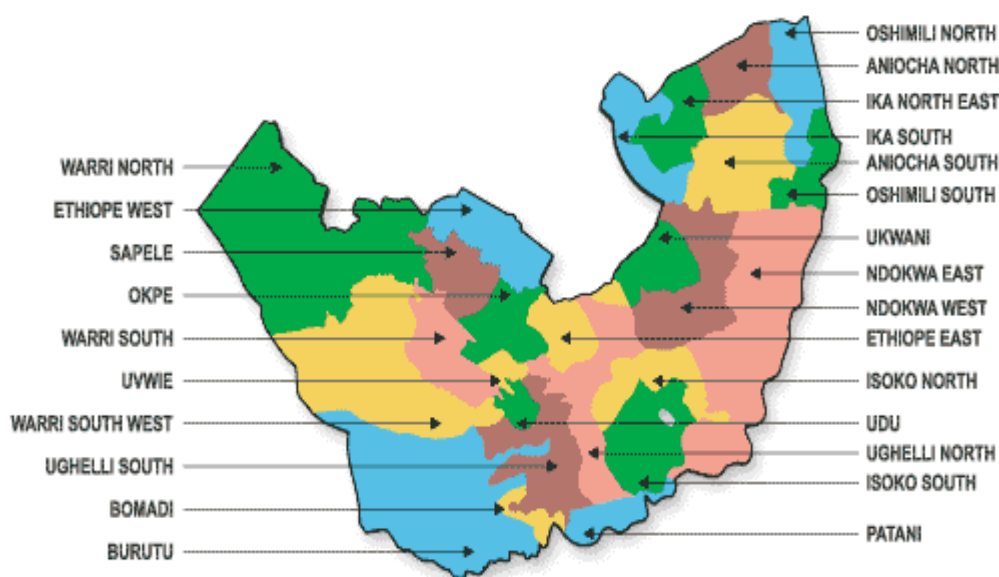
The Nigeria's total land mass formed the Delta sediment deposition, on the Floor plain make up 7.5%. It has the largest drainage basin, also the largest wetland basin in Africa. Also, the Niger delta environment has island forests, freshwater swamps and lowland rainforests. Island mangrove and freshwater swamp, they are the ecological zone. It has an uppermost concentration of the biodiversity and well endowed ecosystem and there is plentiful vegetation, cultivatable topography that can uphold a wide assorted crops and agriculture tree, also more water inhabitant species than any ecosystem in Africa (Wackernagel et al., 2004)

Its difficult terrain and abnormal weather conditions are positively counterbalance by her rich natural resources and their associated domestic and industrial potentials for sustainable development. The Niger Delta is not only strategic because it is the epicenter of the West African economic resource base but also because it is lavishly endowed with enormous water resources. Approximately, 21 major rivers connect the region to the luminous Atlantic oceans which is an aquatic highway that opens coastal Nigeria to all the continents of the world. There are clear indications that huge underground lakes of fresh water bound in this area, suggesting that a prosperous water-based export economy can be sustained (Okaba, 2005).

The Niger Delta is a unique constellation of ecological area including sandy coastal ridge barriers, brackish saline mangrove, freshwater, permanent and seasonal swamp and low lands. It is traversed by a large number of rivers, streams, rivulets and canals, as over 60% of the region is crisis-crossed with creeks and dotted islands while the remainder is a lowland rainforest.

The Niger Delta is well endowed with abundance of mineral resources especially crude oil and natural gas. In oil export, Nigeria's domestic revenue average of 69% in 2008 and real GDP growth had a large positive link with oil export revenues, implying that oil export revenue volatility was immediately reflected in the economic growth in Nigeria, just as in other African countries that

depend largely on single commodities for foreign exchange earnings. The foreign direct investments into oil exploitation include activities like exploration, production refining, transportation and marketing of crude-oil products which have been prosperous over the years. Most of the industries are based principally in the Niger Delta region, which have caused the major colossus of environmental degradation in the region.

3.1 Sampling and Data Collection

Data used in this study was collected from households in two communities of the Delta region, Nigeria, over the period of September 2010 to February 2011. The two communities are Burutu and Ogulagha, where oil companies' activities are prominent. The total population of the household in the two communities is four thousand, five hundred (4500). The target respondents were the heads of the households. Where possible, information about the household's income and asset holdings was obtained directly from the household's head, defined as the member in charge of the household's economic and financial dealings.

In determining the sample size needed to be a representative of the population, this study adopted the formula given by Krejcie and Morgan (1970) as:

$$S = \frac{X^2 NP (1 - P)}{d^2 (N - 1) + X^2 P (1 - P)}$$

S = required sample size.
X^2 = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841).
N = the population size.
P = the population proportion (assumed to be .50 since this would provide the maximum sample size).
d = the degree of accuracy expressed as a proportion (.05).

Additionally, setting an appropriate confidence level can be used to determine any sample sizes. The most often used level of confidence is 95% considering the danger of Type I error when making a critical decision. Thus, a significant level of .05 levels or 95% confidence level is used in this study (see Krejcie, and Morgan, 1970). In all, 354 samples of households were determined through the sample size formula of Krejcie and Morgan (1970). The questionnaire targeted the households' head. There was a complete response which could be attributed to the direct involvement of the researchers in the administration of the questionnaires. The structural equation modeling was used to investigate and predict the causal attribution that explains the relationships under investigation.

In the sampling procedure the study adopted the social cognitive theory and effects related theory in foreign direct investment and environmental economics in explaining the factors contributing to the welfare of the people and their environment. The main objective of this study is to examine the impact of oil foreign direct investment on environmental degradation and poverty level in the Niger Delta oil producing region. Tabachinick and Fidell (2007) argue that, survey research is suitable in the investigative assessment of psychological constructs where data can be used to review and explain the population understudy of an issue. Therefore, a sample of respondents from the population was selected and a standardized questionnaire was administered.

Also, selection of communities for the research was based on where there are high levels of oil production activities of the oil companies. These were purposively selected communities and the survey applied a semi-structured questionnaires guide to give a high-quality measurement of the differences between various oil exploration impacts on the environment, environmental stress, well-being of households and communities as whole.

The questionnaire was therefore designed to generate data about the level of awareness of the people as regards air pollution, oil spillages and land degradation as environmental problems. The extent of stress from environmental factors in the communities, environmental impact on the people and communities, general awareness of environmental consequences and the perception of the people on operation of oil companies in the communities are also addressed. The questionnaire consists of structured and semi-structured statements. Some of the questions are continuous in nature, while others are in scaled form and on five and ten likert scale.

The questionnaire was divided into six sections: i) the demography of the respondent, ii) the environmental impacts of the oil companies on the community; iii) the general awareness of environmental consequences, iv) the impact of crude oil exploitation on the people and community
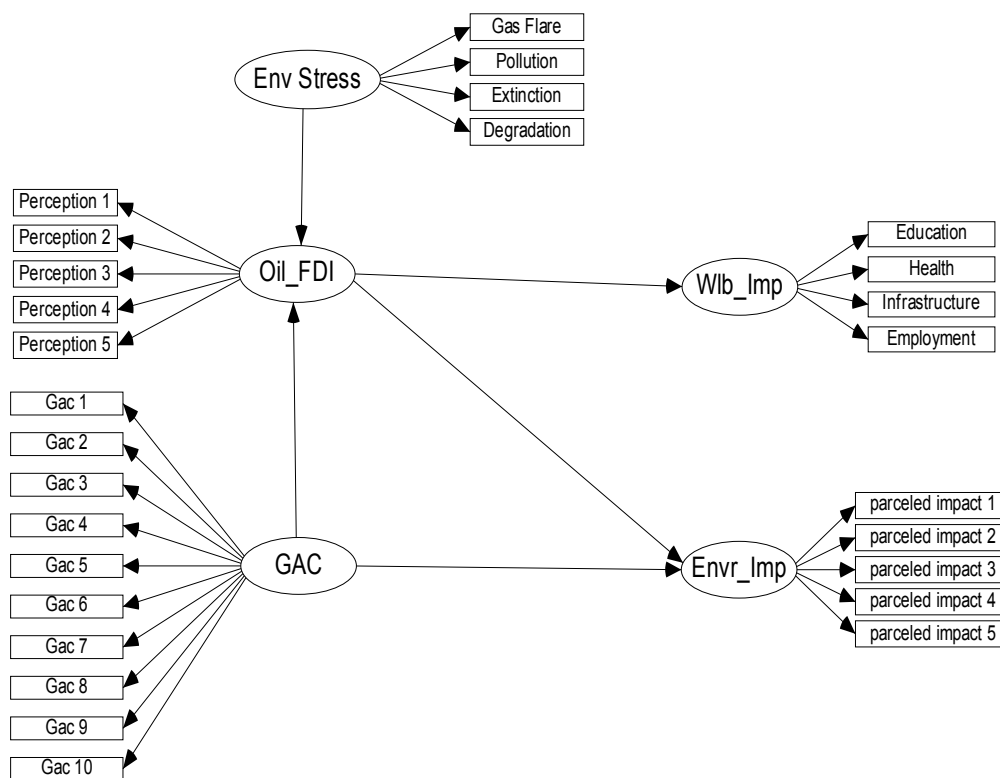
well-being, v) the extent of stress from environmental factors in the communities, and finally the perception of the people on operation of oil companies in the communities

3.2. Structural Analysis

Structural equation modeling (SEM) offers the analytical power suitable for integrated model in research since it can simultaneously examine the influence of several variables on other variables in the entire scheme of the model. Also, implicit presumptionsof unidirectional constructs are made explicit, with the result that theoretical meaningful models can be derived and compared with the existing models (Kline, etal. 2001). Hence, the role of variables in predicting behavioral intentions was deduced from SEM analyses through the calculation of the confirmatory nod.

The responses from the questionnaires were coded and analysed using SPSS 19 and Further analysis of SEM was performed using Analysis of Moment Structure v16 (AMOS SOFTWARE). Kline (1998) suggests that a sample size that exceeds 200 cases can be considered adequate of estimation in SEM. Nevertheless, this study embraces several predictors. The variables used are: Perception of the people on operation of oil companies in the communities (Oil_FDI), Impact on environment (Envr_Imp), Impact of crude oil exploitation on peoples' well-being (Wlb_Imp), Extent of stress from Environmental problem in the communities (Stress) and General Awareness of Environmental Consequences (GAC).

Figure 2. Path Diagram of Hypothetical 1Model

Note:

Env_ Stress, represents Extent of stress from Environmental problem in the
        communities
Oil_FDI, represents Perception of the people on operation of oil companies in the communities
Envr_Imp, represents Impact on environment
GAC,   represents General Awareness of Environmental Consequences
Wlb_Imp, represents Impact of crude oil exploitation on peoples' well-being

3.3 Descriptive statistics and Reliability test.

The sample of 354 heads of households from Burutu and Ogulagha of Niger Delta Region participated in the study. Table 1 shows the basic demography and socio-economic status of the respondents.

Table 1. Basic demography and socio-economic status of the respondents

Titles	Frequencies	Percentages
Sex		
Male	219	61.9
Female	118	33.3
The respondent's age group		
Middle age	67	18.9
Old age	210	59.3
Elderly	77	21,8
Residential status of the respondent		
Indigene	298	84.2
Settler	56	15.8
Marital status		
Married	285	80.5
Widow/Widower	53	15.0
Separated	6	1.7
The educational qualification obtained		
Primary Leaving Certificate	272	76.8
Secondary / Diploma	46	13.0
Degree / Higher Diploma	36	10.2
Employment in the Oil companies		
Employee	48	13.6
Non-employee	306	86.4
Occupation of Household Head		
Farmer	221	62.4
Trader	97	27.4
Civil servant	20	5.6
Others	16	4.6

For the reliability test: The average summated mean scores and all the constructs under study representing standard deviations are presented in table 2

Table 2. The reliability alpha value and Descriptive statistics of the constructs under study (N=354)

	Means	Standard deviation	Alpha value
Oil_FDI	3.67	0.58	0.72
Env_Stress	2.18	0.27	0.67
Envr_Imp	3.24	0.65	0.74
GAC	2.16	0.97	0.78
Wlb_Imp	3.34	1.14	0.82

Note:

Oil_FDI — Extent of stress from Environmental problem in the communities answerable with a 5-point scale range from 1= strongly disagree to 5 = strongly agree

Env_Stress — Perception of the people on operation of oil companies in the communities accountable on a 5-point scale ranging from 1= strongly disagree to 5 = strongly agree

Envr_Imp Impact on environment accountable on a 5-point scale ranging from 1= strongly disagree to 5 = strongly agree

GAC General Awareness of Environmental Consequences accountable on a 5-point scale range from 1= strongly disagree to 5 = strongly agree

Wlb_ImpImpact of crude oil exploitation on peoples' well-being answerable on a 5-point scale ranging from 1= strongly disagree to 5 = strongly agree

N — Sample Size

The possible range of the average mean score of Env_ Stress, Oil_FDI, Envr_Imp, GAC and Wlb_Imp is between 1 and 5

The result expressed a positive oil FDI effect on environment and poverty in the host communities. Out of a maximum score of 5, the Oil_FDI and Env_ Stress, mean scores of the respondents were 3.67 and 2.18 respectively. The GAC and Wlb_Imp are above the average mean score reported for the peoples' well-being. Along a 5- point scale, the mean ofWlb_Imp score was 3.34. To further assess the reliability of the collected data, the Cronbach's alpha reliability test was performed on the foregoing constructs. The test rendered alpha values between 0.67and 0.82. These computed figures well exceeded the threshold of 0.70 for exploratory research.

The normality of data deductions from the survey was examined and Skewness and kurtosis values and their individual items were explored. There was no serious skewness or kurtosis problem that required transformation of data. All the data have absolute values of the original skewness less than 0.7 for theoretical variables. Also, absolute value of the original kurtosis was less than 0.6 for theoretical variables (Kline, 1998). In fulfilment of normality assumption a data set is considered normal if the values of skewness fall within the range of +2 to -2 while kurtosis values do not exceed the range of +7 to -7 (Tabachinick and Fidell 2007). Given the above threshold for justifying the normality of data, it could be said that all observed data for items considered under this study are normal.

4. Estimation and Results

The overall performance of the proposed model shows the degree to which the present data fit proposed model by various fit indexes. Confirmatory Factor Analysis of the individual construct was used to test the construct validity of the instrument. Specifically, to test the convergent validity, it also entails the assessment of model fit for each instrument. An instrument is believed to have satisfied convergent validity only when the values of the instrument's individual factor loadings and the Average Variance Extracted (AVE) satisfy some benchmarks. Accordingly, AVE that is greater than 0.5 indicates high convergent validity in defining the threshold for factor loading (Hair et al, 2003).

The models fit construct validity assessment of perception of well-being impact of the Oil FDI Instrument. This instrument originally comprises eighteen items. However, upon justifying the existence of one underlying dimension in the construct, the items were parceled into five indicators. All factor loadings are greater than 0.5. The instrument's AVE of Wib_Imp, Oil_FDI, Env_Imp, GAC, and Stress are computed to assess construct validity. This instrument has high convergent validity because the factor loadings for each indicator > 0.5. The AVE is 0.96, 0.84, 0.78, 0.93 and 0.71 > 0.5 respectively. Besides, an assessment based on construct validity of AVE, model fit is also important to evidence the existence of construct validity. Generally, four fit indices are used. The indices generated along with the output including the p-value, RAMSEA, GFI and NFI, all meet the expected range to justify the existence of construct validity. In sum, the measures indicated that the proposed model fitted well with the present data set.

4.1 Measurement Model

The measurement model, construct is collectively assessed for the establishment of discriminant validity and model fit. This is besides examinations of diagnostics such as multivariate normality. Discriminant validity between any two latent constructs is established when the values of their individual AVE is greater than the squared correlation between them (AVE > R^2).The individual AVE are greater that the squared correlation. All the model fit indices generated along with the output including the p-value, CFI, RAMSEA, GFI and NFI, meet their expected range to justify the validity of the measurement model.

Figure 3. Correlations among Latent Constructs (variables)
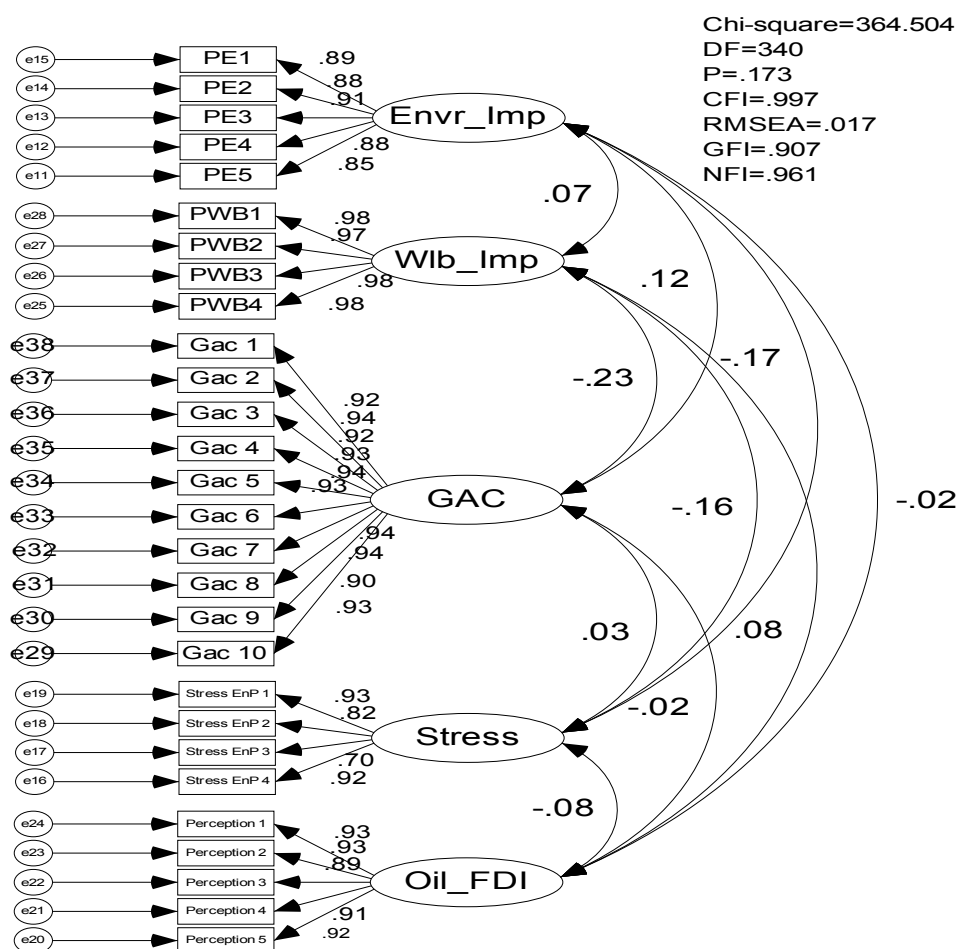
The results of correlation among latent constructs variables in Figure 3 is depicted in the table 3 for more clarity.

Table 3. Correlations among Latent Constructs (variables)

|	Envr_lmp	Wlb_Imp	GAC	Stress	Oil_FDI
Envr_lmp	1				
Wlb_Imp	.07	1			
GAC	.12	-.23	1		
Stress	-.17	-.16	.03	1	
Oil_FDI	-.02	.08	-.02	-.16	1

The correlation coefficient among latent variables- Oil_FDI, Envr_lmp, Stress, Wlb_Imp and GAC in the measurement model indicated that multi co-linearity problem is not inherent. Besides it depicts that each of these variables distinctly represents separate constructs. The correlation across latent constructs also explains why the AVE for each of the constructs is greater than the square correlation coefficients. Hence, the fulfillment of discriminant validity arises from the low correlation across latent constructs.

4.2 The Results of structural model

Figure 4 shows the estimated standardized path coefficients of the five constructs under investigation. The structural model introduced as evidence are- communities' perception about the operation of oil producing companies (Oil_ FDI); the General Awareness of Consequence (GAC), which measures environmental risk, and environmental stress measures the extent of stress from

environmental problem in the communities, which have influence on oil foreign direct investment. The Oil-FDI has a consistent impact more on the environment than the well-being of the community thus resulted in high levels of poverty.

Figure 4. Estimated Standardized Path Coefficients of the Constructs
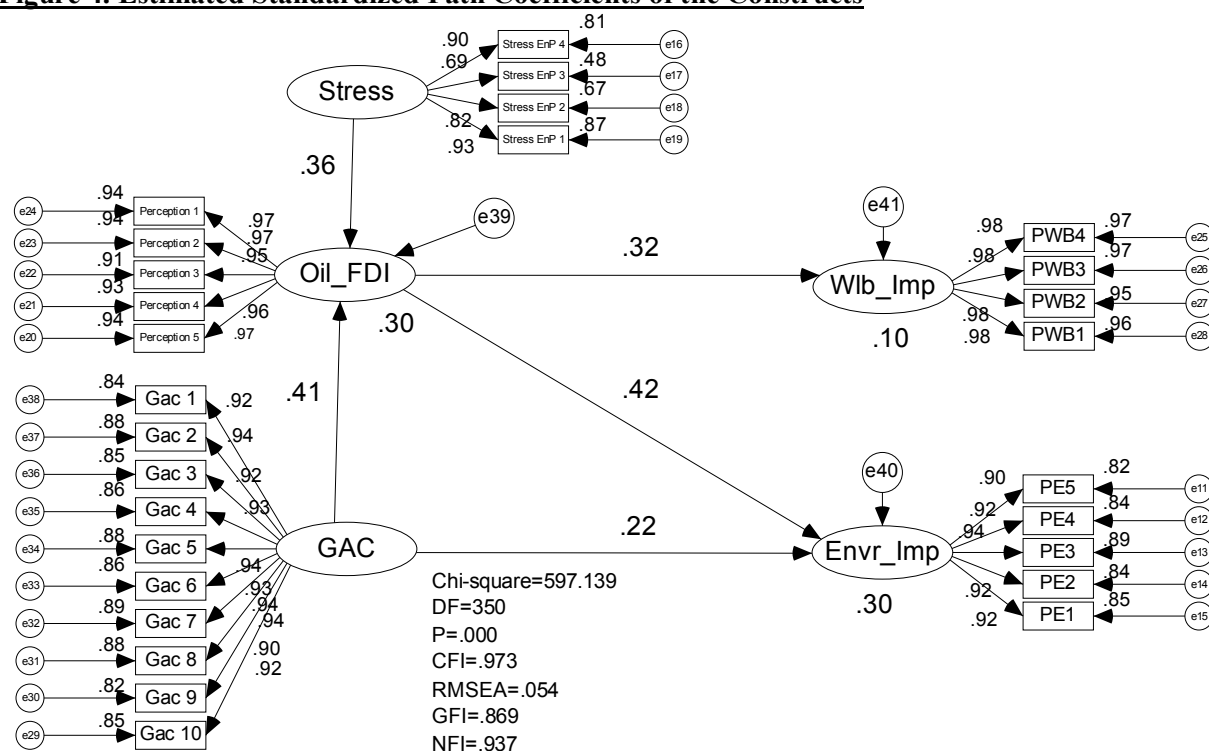
4.3 Discussion

The result in the path diagram model, χ^2 is 597.139 with 350 degrees of freedom. The ρ- value associated with this result is .000. The ρ- value is significant using a type 1 error rate of .05. The value of the root mean square error of approximation (RMSEA), an absolute fit index, is 0.54. This value is below the 0.07 a stringent upper limit guideline (Steiger, 2007). The RMSEA shows how well the model, with unknown but optimally chosen parameter estimates would fit the population covariance matrix (Byrne,1998). It has been regarded as one of the most informative fit indices.

Also, Goodness of fit index (GFI) is 0.869 which reflect good model fit for the model of the sample. Another absolute fit statistic is normed χ^2, which is 1.71. This measure is the chi-square value divided by the degree of freedom (597.139/ 350 = 1.71). Hence, Kline (1998) suggests that χ^2/ d.f., the ratio must be equal to 3 or less as a reasonably desirable alternative indicator of model fit. From the structural model, χ^2/ d.f. ratio yields 1.71 which is less than 2 as suggested by Tabachnick and Fideli, 2007. This further clarifies that the model has a good fit.

Furthermore, for the incremental fit indices, the comparative fit index (CFI) is the most widely used index. In the study CFI has a value of 0.973, which exceeds the CFI guidelines of greater than 0.90. The other incremental fit indices also exceed suggested cutoff values. Normed fit index (NFI) is 0.937 which reflects good model fit. The results are significant and show reasonably good overall model fit and the hypotheses in the relationships are generally supported. The model shows that community perceptions about the operation of oil companies as well as, environmental consequences and risk perception collectively determine environmental impact perception. The direct environmental impact leads to social strain that caused increased in resource scarcity that lead to greater poverty (Gabriel, 2006). The crisis in the Niger Delta is believed to have been triggered by environmental stress.

The constructs estimate coefficient of Oil_FDI impact on the environment (Envr_Imp) and well-being of the people in the communities (Wlb_Imp) are β = 0.42 and β = 0.32 respectively. The perception of people in the communities that environmental stress causes by foreign direct investment

into oil (Oil_FDI) estimate coefficient is $\beta = 0.036$. While the General Awareness of Environmental Consequences (GAC) caused by an increase in foreign direct investment into oil exploitation (OIL_FDI) estimate coefficient is $\beta = 0.41$. The direct effect path estimate coefficient of GAC from environmental impact is $\beta = 0.22$. However, since the path coefficients are standardized values, a higher value for environmental impact relative to that of well-being, implied that the communities perceived more destruction of their environment than the influence on their well-being from oil FDI. In addition, the exploitation of crude oil has not done well with the degree of environmental and economic efficiency with the principle of Pareto optimality benchmark which will ensure efficient allocation of resources in production, and consumption choice that maximize utility.

The model is suitable for interaction and decision making on the environment, and consequences of production in the oil sector. In this context, environment and natural resource degradation, pollution and loss of biodiversity are detrimental because they increase vulnerability, undermine health system, and reduce resilience of the communities. It is useful to think about livelihood sustainability in terms of the normal functioning and longevity of a nested hierarchy of ecological and socioeconomic system. From this perspective environmental and socioeconomic system should evolve so as to maintain a level of biodiversity that will guarantee the resilience of the ecosystems on which human consumption and production depend.

5. Conclusion

The study has investigated the impact of oil foreign direct investment on the environment and poverty level in the Niger Delta oil producing region. We find that FDI has important implications for rising poverty and social crises in the Nigerian oil-rich region. It reveals that the environment appears to be worsening at a faster rate than increase in well-being. This shows that the marginal environmental cost of additional exploitation will rise over time. The people have lost control of some of their traditional natural resources which had led to high level of poverty. Most of the natural resources have been locally unsustainable and this has occurred in a manner and scale that often bypass the poor. The implication of this is that the devastation of the environments resulted in the poverty of the people.

Furthermore, the oil FDI should involve exploitation of crude oil with some degrees of environmental and economic efficiency (ideal of Pareto optimality), which encourages actions that will improve the welfare of at least one individual without worsening the situation of someone else. The Pareto optimality benchmark will ensure efficient allocation of resources in production, and efficient consumption choice that maximize utility. Moreover, it will increase an adaptive capacity and opportunities for improvement of economic, social and economic systems.

Another implication is that environmental degradation poses a potential threat to sustainable development in the Niger Delta. Although, most of the negative environmental consequences of oil industry activities are localized and more intense in the areas of primary activities and some of the effects are trans-boundary implied. The environmental consequences impose economic costs on the people which often lead to poverty and social tension. Unfortunately, there are no explicit provisions made to incorporate the host communities of oil companies in the process of implementing strategies. There is doubt if the oil companies have confidence in their host communities and carry them along for the purpose of cleaning up the environment and educating the local people. If this was done, it would have helped to avoid a number of community level crises.

It is important to acknowledge the local rather than universal experience of poverty and environmental degradation and to provide enabling circumstances for poor people to create their own institutional responses to economic, demographic and environmental changes, instead of macroeconomic responses that may increase both poverty and environmental degradation. It is important to build effective public–private synergies of environmental policy that will connect the evolution of new systems to monitor and address risks in industry. It is also important to create institutions that will utilize the environmental expertise available in the private sector to help gain local trust and effective regulation of industry. It is clear that many rapidly industrializing countries require waste management or new technologies available from foreign investment.

The investment in oil has to be conducted under a form of regulation that accelerates the provision of environmental infrastructure that will achieve this for the sake of local development and environmental protection rather than for the agendas of investors alone. In addition, there is a need for

sustainable livelihoods through locally controlled access on their income. Research on sustainable livelihoods has identified that the locally controlled resource development may imply a movement away from both poverty and environmental degradation as a result of diversifying incomes and economic concerns of local groups. Furthermore, the study submits that national environmental policy capacity and accessibility is a common requirement for implementing environmental policy. However, it is also important to incorporate local resistance to the potentially negative impacts of international environmental agreements.

Therefore, future research may adopt methodology of valuation of the environment to quantify the full costs of environmental degradation, and a need for inferring the optimal penalty to discourage gas flaring and oil spillage to be based on scientific inquiry. This presupposes a detailed and focused research to determine the compliance cost to oil companies such that the penalty for environmental degradation will yield to government revenue and compensation to the poor people of the host communities.

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