



Influencing factors of oil and gas production and sustainability in Niger delta, Nigeria

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General Note

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ABSTRACT

In Nigeria, oil and gas operations are majorly carried out in the Niger Delta region. Recently, the region was confirmed and declared dangerous due to the high occurrence of insecurity that is evidenced by kidnappings, vandalism, killings, and criminalities, among others. The communities in the Niger Delta region sadistically opposed the operations of oil and gas after an allegation of continuing abandonment of the region despite the level of destruction that is caused as a result of oil and gas operations. The sadistic opposition was achieved with armed militants disrupting the activities of multinational oil companies. As a result of this, the production, exploration, and supply of oil and gas energy had been negatively affected, and it became essential to assess the contributions of Multinational companies to the sustainability development of the Niger Delta region. The study employed a survey and purposive sampling technique to elicit information through a questionnaire instrument from 579 respondents. Descriptive statistics (Table and percentages) and Relative importance analysis were employed. The descriptive analysis found that even though the projects embarked upon by the multinational companies as a result of corporate social responsibilities in the Niger Delta region are operational, they are not durable and functional; hence they are not acceptable by the Niger Deltans. Finally, the availability of

capacity development programs, the impact of programs on quality of life, and the fact that projects that are in operations are periodically maintained are the influencing factors of oil and gas production and sustainability in Niger Delta, Nigeria.

Keywords: Sustainability, Oil and Gas, CSR

1. INTRODUCTION

Nigeria is known to be a mono-economy because the major source of income is embedded in the exploration of oil and gas. Oil and gas are manufactured from the natural endowment of hydrocarbon. The hydrocarbon was discovered in Nigeria in the early 70s (Kadafa, 2012), and since then, there seems to be shifted attention from other non-oil sectors that should boost the economy to the oil sector. The past Nigerian government was so carried away by shifting all policies around oil. Even though there was an economic boom shortly after the discovery of hydrocarbon, but the tenacity of technical know-how, consciousness for the sustainability of the region, and other crucial factors were not properly taken into consideration (Adeniran and Ben, 2018).

In Nigeria, the down-stream oil production had gained attention until recently that there was diversification by oil and gas companies to gas production. There was so much satisfaction in the local market regarding gas reserve as it does not affect the commitments to peripheral networks. Nevertheless, various challenges were hindering the effective exploration of oil and gas in Nigeria. These challenges were not market-oriented in nature, and they were not technological in nature. But they were known to deeply affect the economy of Nigeria because the exploration of oil and gas could not be carried out smoothly more so that the economy seems to be monolithic in nature.

The oil and gas companies are multinational companies and have a mandate for providing corporate social responsibilities. Regrettably, their CSRs could no longer be the main assurance that will enable them to operate in the Niger Delta region despite the increasing demand for oil and gas in the local and international markets (Vidal, 2011). The companies were known to also contribute meaningfully to the development of rural communities that is outside the jurisdiction where they explore hydrocarbons. This is needed to make their presence known in the entire region. The CSRs were essential because of the long neglect, and denials among others (Ebegbulem, Ekpe, and Adejumo, 2013). To meet the required demand by increasing the level of exploration, there is a need for a friendly environment. To achieve this, the companies embarked on fulfilling some developmental programs in rural areas.

The major areas of focus were:

- Infrastructural development;
- Economic development;
- Human empowerment; and
- Maternity and health-related services

When assessing the performance of the companies that were involved in the exploration and production of oil and gas in the Niger Delta, most especially from the residents' perspective (Niger Deltans) in meeting the highlighted obligations, It was revealed that the companies do not have a pass mark. As a result of this negligence or poor performance, militancy activities in which embedded criminals became the only language for Niger Deltans to communicate as it is seen as the only way-out. The militancy activities include kidnapping, hostage-taking, killings, and vandalism of oil and gas facilities, among others. Conversely, the demand for oil and gas continually increases.

There was no choice other than for oil prices to increase. It, therefore, became essential to evaluate the factors that could influence the sustainable production of oil and gas in Nigeria with emphasis on the Niger Delta region. It was identified that technological factors may not be a factor that threatened the exploration and production of oil and gas to ensure optimum supply and meeting the demand. In this regard, the technological factor will be left aside.

Among the crucial success factors recorded in the exploration of oil and gas is corporate social responsibility (CSR). Nonetheless, CSR could be influenced by some crucial factors that are connected with oil and gas exploration in the Niger Delta. This was rooted in the fact that Nigeria is known to be a high populated nation and listed among the developing nations, and the fact that the rural areas are mostly neglected or not inclusive in the developmental process.

Consequently, to sustain the demand for oil and gas, improving and developing the rural communities that housed the oil and gas is essential and should be prioritized. This is essential to have a peaceful relationship between the companies and the environment in which major oil and gas activities (particularly the exploration) take place. On this note, this study paper x-rayed the

crucial achievable factors of CSRs that influence the oil and gas exploration in Nigeria, such that has a huge implication in the prices of oil and gas in the global market.

In a nutshell, the price of energy is usually influenced by the availability of oil and gas, and it has an index on the sustenance of oil and gas. To curb the high instability in the prices of energy, there is a need to secure the social and physical operating environment, particularly the Niger Delta region that which is the basis that enhanced the massive production of oil and gas. One of the approaches to curbing the level of militancy in the region is through the introduction of Corporate Social Responsibilities (CSR)

It is pertinent to note that there is a high level of hopelessness, hunger, abject poverty, and neglect in the Niger Delta region despite the abundant natural resources in the region that the enriching corrupts individuals and the Nigerian government. To make the government responsive and placing the region on high priority, a militant group (known as Niger Delta militant) was formed, and they are known to carry arms.

Therefore, the study aimed to reveal the influencing factors of oil and gas production and sustainability in Niger Delta, Nigeria. This is an approach to moderately stabilize the price of energy that is predisposed by market forces. The specific objectives are to:

1. Examine the level of projects embarked upon by the multinational companies as a result of corporate social responsibilities in the Niger Delta region; and
2. Examine the influencing factors of oil and gas production and sustainability in Niger Delta, Nigeria.

Queer Ladder Theory

Queer ladder theory was developed by Lyman (2007) and Mallory (2007). For this study, the queer ladder theory will be adopted. The primary assumptions of queer ladder theory are: Organized crime is a means to an end, and it is an instrumental behavior. It is a tool for socioeconomic advancement. It is a means of building power and accumulating wealth (Mallory, 2007).

It is also assumed that organized or structured crime flourishes when government power and sanction is poor; this is evident with the high level of public corruption in the system, such that legitimate source of livelihood is minimal (Nwoye, 2000; Lyman, 2007). The circumstance is an incentive for the frustrated dwellers to indulge in high crime which gives room for pipeline vandalization and criminal market of crude.

Conceptual Framework

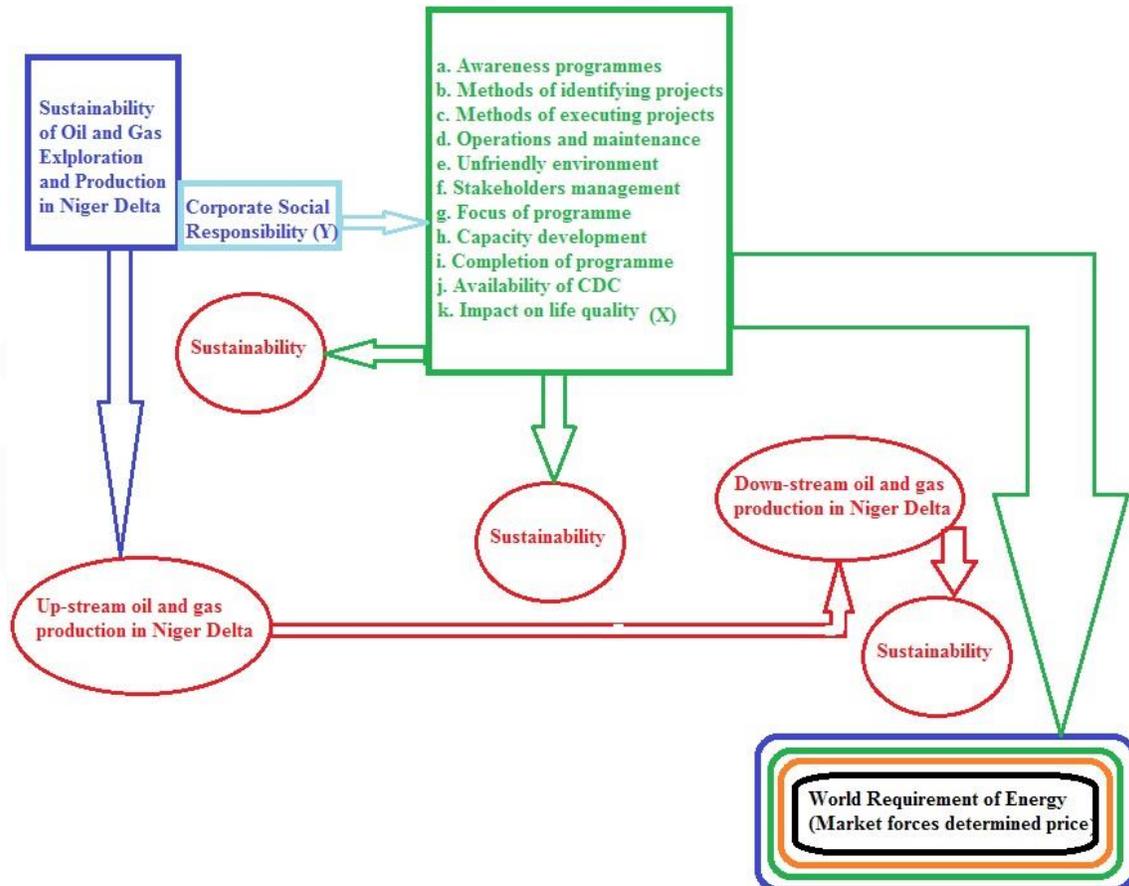


Figure 1. Conceptual framework of the study: Adapted from Emma, Ike, and Ray (2010)

2. METHODOLOGY

This study covers the Niger Delta region of Nigeria. Niger Delta region is known for the highest deposit of hydrocarbon in Nigeria, therefore oil and gas exploration and production majorly take place in the region. The region comprises of nine states which are; Abia State, Akwa Ibom State, Bayelsa State, Cross River State, Delta State, Edo State, Imo State, Ondo State, and Rivers State. Nevertheless, Akwa Ibom State, Bayelsa State, Cross River State, Delta State, Edo State, and Rivers State, are known to be the major Niger Delta region, but this is debatable.

The majority of the oil and gas exploration and production, and the connected militancy took place in Bayelsa State, Delta State, and Rivers State. The militancy activities are oil bunkering, kidnappings, environmental issues, human rights abuse among others. It also results in communal conflict, and all these have negative implications on the region such that the region was sometimes declared as a dangerous zone in the world. The target population of the study was beneficiaries of corporate social responsibilities in Bayelsa State, Delta State, and Rivers State. The respondents were household heads, community representatives, women, and youths that benefited from the developmental interventions that were provided by the oil and gas companies. The companies that are involved in oil and gas exploration and production in the Niger Delta region are The Shell Petroleum Development Company (SPDC), Nigerian Agip Oil Company (NAOC), and Total Exploration and Production (TEPNG).

According to Zikmund (2003); Adeniran, Stephens, and Akinsehiwa (2020), the various error allowances were determined and the suitable one was chosen based on the discretion of the researcher. The chosen error allowance of 0.04 was employed to establish the sample size as shown in the equation below:

The formulae for achieving sample size $n = \frac{Z^2}{4E^2}$

where; n = Sample size; Z = Z score for the confidence interval (2.05); E = Error allowance (0.04). When inserted into the formula, Sample Size was 656.6406, and approximately 657. It is therefore crucial that the questionnaire distribution will target six hundred and fifty-seven respondents who were household heads, community representatives, women, and youths that benefited from the developmental interventions that were provided by the oil and gas companies. Primary data were collected through a convenience sampling technique and over a period of 21 days (7 days in each state) by a self-constructed questionnaire from August 1, 2020 to August 21, 2020. Data were collected simultaneously in all study areas with the help of research assistants.

The analysis was achieved with SPSS version 21. Regarding the recommendations of the sample size for factor analysis, Adeniran, Stephens, and Akinsehinwa (2020); Comrey and Lee (1992) provide the following guidance concerning the determination of sample size adequacy: such that *the sample size of hundred is poor; a sample size of two hundred is fair; a sample size of three hundred is good; a sample size of five hundred is very good, and sample size of one thousand or more is excellent*. In this study, the sample size of six hundred and fifty-seven (657) is adequate for factor analysis and reporting as rooted in earlier studies. Relative Importance Analysis was employed for the analysis. Data collection was done through the help of research assistants.

According to Johnson and LeBreton (2004), relative importance index is a type of importance analysis that aids in finding the contribution of a particular variable that enhances the prediction of a criterion variable both by itself and in combination with other predictors variables.

Relative Importance Analysis can be calculated with the formula below $RIA = \frac{\sum W}{A * N}$

where, W is the weight given to each statement by the respondents and ranges from 1 to 3; A is the Higher response integer (3), and N is the total number of respondents.

Descriptive statistics were employed to examine the sustainability of oil and gas exploration and production in the Niger Delta which is captured by the level of projects embarked upon by the multinational companies as a result of corporate social responsibilities. Also, relative importance analysis was employed to examine the factors influencing sustainability challenges in the Niger Delta. The variables are Awareness programs, Methods of identifying projects, Methods of project execution, Operations, and maintenance, Unfriendly environment, Stakeholders management, Focus of program, Capacity development, Completion of the program, Availability of the CDC, and Impact on quality of life. It is pertinent to note that the CSR was defined based on Project Acceptability, Project Functionality, Project Operability, and Project Durability.

3. RESULTS AND DISCUSSIONS

The targeted participants in the investigation were approved to voluntarily take part in the exercise. In furtherance to that, the aim of the study was made comprehensible to them. An intensive and joint effort was ensured to realize confidentiality, secrecy, and anonymity of information given by the respondents; also they were assured that all information elicited from them was used solely for this study. Research assistants were educated regarding the etiquette in research to ensure absolute compliance with research ethics during the process of conducting the study.

From the sample size calculated to about six hundred and fifty-seven (657) which equals the total copies of questionnaires administered by the researcher targeted at the respondents in the three states. Five hundred and seventy-nine (579) which is about 88 percent copies of the questionnaire were valid and returned for data analysis and reporting. The remaining (78) copies of the questionnaire were not used in the data analysis because of different invalidity issues. Hence, all the valid questionnaires returned were processed for data analysis, and the response rate was shown in Table 1.

Table 1: A response rate of respondents

Questionnaire	Frequency	Percentage
Administered	657	
Returned	579	88.13
Not Returned	78	11.87

Field Survey (2020)

Fadare and Adeniran (2018) posit that a response rate of fifty (50) percent copies of questionnaire returned is adequate for data analysis and reporting; a response rate of sixty (60) percent copies of questionnaire returned is good for data analysis and reporting and response of seventy (70) percent or more copies of questionnaire returned is excellent for data analysis and reporting. Hence, the response rate of about eighty-eight (88) percent copies of the questionnaire returned for this study is excellent for data analysis and reporting.

Descriptive statistics were employed to examine the sustainability of oil and gas exploration and production in the Niger Delta which is captured by the level of projects embarked upon by the multinational companies as a result of corporate social responsibilities. Also, relative importance analysis was employed to examine the factors affecting sustainability challenges in the Niger Delta. The variables are Awareness programs, Methods of identifying projects, Methods of project execution, Operations, and maintenance, Unfriendly environment, Stakeholders management, Focus of program, Capacity development, Completion of the program, Availability of the CDC, and Impact on quality of life. It is pertinent to note that the CSR was defined based on Project Acceptability, Project Functionality, Project Operability, and Project Durability.

Level of projects embarked upon by the multinational companies in the Niger Delta region

The level of projects embarked upon by the multinational companies as a result of corporate social responsibilities in the Niger Delta region was defined based on Project Acceptability, Project Functionality, Project Operability, and Project Durability. Tables 2a and 2b depict the respondents' perception of Corporate Social Responsibilities (CSR) based on project acceptability, project functionality, project operability, and project durability of the two-point scales Yes and No. From the respondents' responses, it was revealed that three hundred and sixty-three (363) respondents representing 62.69 percent acknowledged that the project embarked upon as a result of corporate social responsibilities in the Niger Delta region is not acceptable. Two hundred and ninety-six (296) respondents representing 51.12 percent acknowledged that the project embarked upon as a result of corporate social responsibilities in the Niger Delta region is not functional. Two hundred and ninety-seven (297) respondents representing 51.29 percent acknowledged that the project embarked upon as a result of corporate social responsibilities in the Niger Delta region is operational.

Table 2a. Respondents' perception of the Corporate Social Responsibilities

Indices for corporate social responsibilities	Yes	No
Project acceptability of corporate social responsibilities	216 (37.31)	363 (62.69)
Project functionality of corporate social responsibilities	283 (48.88)	296 (51.12)
Project operability of corporate social responsibilities	297 (51.29)	282 (48.71)
Project durability of corporate social responsibilities	136 (23.49)	443 (76.51)

Source: Authors' fieldwork (2020)

Finally, four hundred and forty-three (443) respondents representing 76.51 percent acknowledged that the project embarked upon as a result of corporate social responsibilities in the Niger Delta region is not durable. These descriptions imply that even though the projects embarked upon by the multinational companies as a result of corporate social responsibilities in the Niger Delta region are operational, they are not durable and functional; hence they are not acceptable by the Niger Deltans.

Table 2b. Respondents' perception of the Corporate Social Responsibilities

Indices	Project Acceptability		Project Functionality		Project Operability		Project Durability	
	Yes	No	Yes	No	Yes	No	Yes	No
Corporate Social Responsibilities (Y)	216	363	283	296	297	282	136	443
Percentage	37.31	62.69	48.88	51.12	51.29	48.71	23.49	76.51

Source: Authors' fieldwork (2020)

Factors affecting sustainability of oil and gas production in the Niger Delta

On a three-point scale, Relative Importance Analysis was used to achieve the Relative Importance Index and to identify the influencing factors of oil and gas exploration, production and sustainability in the Niger Delta. The variables captured were Awareness programs, Methods of identifying projects, Methods of project execution, Operations and maintenance, Unfriendly environment, Stakeholders management, Focus of program, Capacity development, Completion of the program, Availability of the CDC, and Impact on quality of life.

From the analysis, as shown in Table 3, it was revealed that the availability of capacity development programs, the impact of programs on quality of life, and the fact that projects that are in operations are periodically maintained are the major influencing factors of oil and gas production and sustainability in Niger Delta, Nigeria.

Table 3. Respondents' perception of the factors affecting the sustainability of oil and gas production in the Niger Delta

Indices	Agree	Not Sure	Disagree	ΣW	RIA	RII
There are community sensitization and awareness programs	345	68	166	1337	0.770	8
There are established methods of identifying projects	231	19	329	1060	0.610	10
There are established methods of executing projects	177	13	409	966	0.556	11
The projects are in operations and are periodically maintained	435	23	121	1472	0.847	3
The environment is unfriendly for the companies	399	41	139	1418	0.816	4
There are established policies for stakeholders management	389	46	144	1403	0.808	6
The programs have a focus	395	43	141	1412	0.813	5
Capacity development programs are conducted	367	57	155	1370	0.789	7
Programs embarked upon are usually completed	341	70	168	1331	0.766	9
Capacity development programs are available	463	9	107	1514	0.872	1
The programs have a better impact on the quality of life	459	11	109	1508	0.868	2

Source: Authors' Fieldwork (2020)

The study found that even though the projects embarked upon by the multinational companies as a result of corporate social responsibilities in the Niger Delta region are operational, they are not durable and functional; hence they are not acceptable by the Niger Deltans. Also, the availability of capacity development programs, the impact of programs on quality of life, and the fact that

projects that are in operations are periodically maintained are the influencing factors of oil and gas production and sustainability in Niger Delta, Nigeria.

4. CONCLUSION AND RECOMMENDATIONS

In Nigeria, Oil and Gas operations are majorly carried out in the Niger Delta region. Recently, the region was confirmed and declared dangerous due to the high occurrence of insecurity that is evidenced by kidnappings, vandalism, killings, and criminalities, among others. The communities in the Niger Delta region sadistically opposed the operations of oil and gas after an allegation of continuing abandonment of the region despite the level of destruction that is caused as a result of oil and gas operations. The sadistic opposition was achieved with armed militants disrupting the activities of multinational oil companies. As a result of this, the production, exploration, and supply of oil and gas energy had been negatively affected, and it became essential to assess the contributions of Multinational companies to the sustainability development of the Niger Delta region.

The study employed a survey and purposive sampling technique to elicit information through a questionnaire instrument from 579 respondents. Descriptive statistics (Table and percentages), and Relative importance analysis were employed. The descriptive analysis found that even though the projects embarked upon by the multinational companies as a result of corporate social responsibilities in the Niger Delta region are operational, they are not durable and functional; hence they are not acceptable by the Niger Deltans. Finally, the availability of capacity development programs, the impact of programs on quality of life, and the fact that projects that are in operations are periodically maintained are the influencing factors of oil and gas production and sustainability in Niger Delta, Nigeria.

For there to be sustainable oil and gas exploration and production in the Niger Delta region, projects embarked upon by the multinational companies as a result of corporate social responsibilities should not only be operational, but they must also be durable, functional, and acceptable by the Niger Deltans. Also, capacity development programs should be available, periodical, and must be targeted at improving the quality of life.

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Conflict of Interest

The authors declare no conflicts of interests any matter related to this paper.

Data and materials availability

All related data have been presented in this paper.

Peer-review

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