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RESEARCH ARTICLE

Assessment of the Environmental Impact of the Abandoned Brass Lng Project on Brass Island, Bayelsa State, Nigeria

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ABSTRACT

This study is on Assessment of the Environment Impact of the Abandoned Brass LNG Project on Brass Island. The aim of the study is to identify and assess the potential negative environmental impact of the abandoned Brass LNG project on the host communities and Brass Island, and to make useful suggestions to mitigate and control the environmental impact and prevent the future abandonment of oil and gas projects in Nigeria. The study objectives were achieved. The study employed the quantitative research method approach, using a Likert scale structured questionnaire as a data instrument collection. The data collected was analyzed using the Relative Importance Index (RII) tool. The study finding shows the most significant Environmental impact on the host communities and Brass Island by the Abandoned Brass LNG project, is the Exposure to health challenges and Air borne diseases that is a threat on the Brass Island. (R = 0.940). and the most significant factor responsible for the abandonment of Brass LNG project, is the Delay in signing the Final investment Decision by the project Stakeholders and Owners (RII = 0.892). the continuous abandonment of Brass LNG project is costing the Federal Government the loss of annual revenue of about Ten billion dollars ($10B US dollars). Based on the study findings, the Researcher made some useful suggestions to mitigate and control the Environment impact of the Abandoned Brass LNG project and the elimination of future oil/gas project abandonment such as the Strick enforcement of the EIA Act by Government Agencies, the carrying out of detailed project risk Assessment and Management by only competent persons and the application of NLNG Business model in future Gas/LNG projects. This study will be of benefits to the following, project professionals and managers, industry stakeholders and Entrepreneurs, the Academic society and Research Institutions.

Keywords: *Environmental Impact; Abadoned Brass Lng Project; Brass Island; Bayelsa State*

Introduction

The Brass Liquefied National Gas (Brass LNG) construction project is one of the many ventures, whose groundbreaking ceremony was done in May, 2007 by President Olusegun Obasanjo and was intended to harness Nigeria's abundant Nigeria gas reserves in the Niger Delta region of Nigeria. With projection for increase in global demand for natural gas, the Brass LNG project and similar projects, promise significant revenue for the government and huge profits for the corporate promoters. The estimated annual revenue from the Brass LNG project is about Ten Billion dollars ($10B) (Thisday, 2017). The host communities of the Brass LNG project also hope the project will bring significant developments to the area that have borne negative social economic and environment impact of over fifty years of oil and gas exploration and exploitation.

The Brass LNG project was estimated to cost Twenty Billion dollars ($20 billion) and was expected to create during the constructional and operational phases of the project, thousands of new jobs for Nigerians and Expatriates, spur domestic gas demand for industrial use, industrialization, generate electricity for both local use and export to other African countries, create an opportunity to diversify the revenue base of the Federal government from the sales of gas (estimated annual revenue of Ten billion dollars, $10B), strengthen the economic base of Nigeria, thereby turning the country into a dominant geoeconomic player in Africa in the export of LNG product to foreign markets (Chike, 2024).

Despite the enormous benefits the Brass LNG project will bring to the federal government, its citizens, and Nigerian at large, the Brass LNG construction project was started and later abandoned by the Federal Government (FG) and other Stakeholders due to some critical factors. The Brass LNG Project will be said to have failed. This study seeks to identify some of the factors that contributed to the Abandonment of the Brass LNG project and the negative Environment impact to the host communities and Brass Island.

Petroleum infrastructures are not entirely new to the coastal communities in the Brass Island Area of Bayelsa state. The area is site of a major crude oil storage and export terminal, the Brass LNG Project should accommodate the development desires of the communities and effort must be made to address the potential environmental social problems associated with the project of this magnitude. Part of this can be achieved with government and Project developers complying with the Environment Impact Regulatory Laws/ EIA Act 1992 (Saction, 2014). Nigeria enacted the Environmental Impact Assessment Act of 1992 to address the potential negative environmental and social impacts of industrial activities (such as Brass LNG Project) and developmental projects in Nigeria.

Statement of the Problem

The twenty billion dollars ($20B) Brass LNG project in Brass Island, Bayelsa State was expected to create thousands of new jobs for Nigerians, spur domestic gas demand, generate electricity for domestic and industrial uses, create an opportunity to diversify the revenue of the federal government (Estimated annual revenue from Brass LNG project is $10 billion dollars). The Brass LNG project when operational, will strengthen Nigeria economic base and become a dominant geoeconomic player in Africa with respect to the export of LNG products to foreign market.

Despite the benefits mentioned above, the Brass LNG project would have brought to Nigeria if it was completed, but the Brass LNG project is now stalled and abandoned due to the delay of not signing the Final Investment Decision (FID) as well as the unnecessary bickering and lack of political will to pursue the project to completion and operational state by Project Owners.

The abandonment of the brass LNG project is causing the Federal Government and IOC loss of annual revenues and expected jobs for Nigerians. The abandoned Brass LNG project has created a negative environmental impact on the host communities and Brass Island.

This study seeks to identify, examine and assess the Environmental Impact on the host communities/Brass Island as a result of the Brass LNG project abandonment. Also seek to identify the factors responsible for the abandonment and make useful suggestions to mitigate future abandonment of Oil/Gas projects with a view to reduce or eliminate the environmental impact associated with abandonment of projects to the environment.

Objectives of Study

The aim of this study is to identify assess and evaluate the potential negative Environmental impact of the abandoned Brass LNG Project on the host communities and Brass Island. And to make useful suggestions to mitigate, reduced or eliminate environmental impact and prevent the abandonment of oil/gas projects in Nigeria. The following underlisted are the objectives of the study.

i. To identify and assess the environmental impact of the Abandoned Brass LNG project on Brass Island.
ii. To identify the factors that were responsible for the abandonment of Brass LNG Project.

Review of Related Literature

Conceptual Review

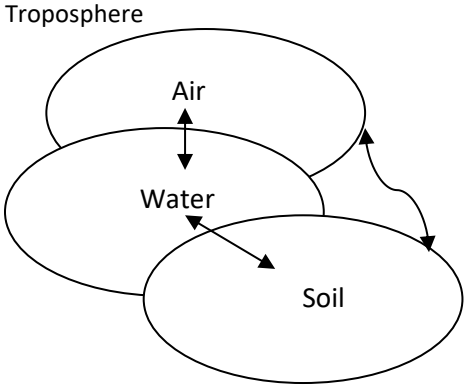
The Environment

The Environment is defined as that whole outer physical and biological system in which man and other organism live – is a whole, albert a complicated one with many interacting components. The wise management of that environment depends upon an understanding of these components, of its rock, minerals and water, of its present and potential vegetation, of its animal life and potential for livestock husbandry and its climate. It demands positive and realistic planning that balances human needs against the potential environment has for meeting them (UNEP, 2012).

Environmental Systems

The planet Earth, also called the geosphere, consist of air and water vapor, the essential components of the troposphere (the lowest atmosphere layer), water, the essential component of the hydrosphere, and land or soil, the essential component of the lithosphere. The biosphere is a global ecosystem composed of living organism (Biota) and the non-living (abiotic) factors from which they derive energy and nutrients. The physical systems that make up the biosphere are closely interacting system – see the diagram fig. 1 below.

Troposphere



Hydrosphere Lithosphere
Fig. 1: Physical system that make up the biosphere
Source: Narayanan (2015)

Living communities and nonliving environment are inseparable, interrelated and constantly interact with each other in exchange of matter .and energy such a combined system is called an ecosystem. That must include at least an autotrophy (primary producer), a decomposer (consumer) water, a source and sink of energy, and all chemical elements require by the autotrophy and the decomposers. Ecosystems may be further subdivided into smaller biotic units called communities. There exists a tremendous diversity of life in each ecological system (Biodiversity). Different species are organized at many levels through their interrelationship into complex biological communities (Santra, 2018).

Environmental Pollution

Close links exist between the environment cycles. Change in any of these cycles influences the other cycles as well. Each biosphere unit can contaminate the environment and get contaminated by it. contaminants disappeared in the atmosphere are eventually transferred back to the ocean or earth. The atmosphere is thus, regarded as a potential vehicle for contamination of the hydrosphere and the Earth's surface (soil). Deforestation, the burning of fossil fuels and the increased use of synthetic fertilizers and industrial and other anthropogenic activities have the major causes for the disturbance of natural cycles in the biosphere. Environment Pollution is defined as the addition of any substance or form of energy (e.g. heat, sound) to the environment at a rate then at which the environment can't accommodate. It by absorbing, dispersing or breaking it down and that would harm human, flora and founa or aboitic system (Narayanan, 2016). Physical, chemical and biological factors that disturb the balance of the environment may be termed as pollution and the factors or substances which cause the deterioration, the pollutants. They may be in the form of solid particles, liquid droplets gases or in combination thereof.

Environmental degradation is due to contaminants and pollutant arising out of transfer processes (dispersion) of matter and energy. Air pollutants are often grouped on categories for ease in classification, some of the categories are particulate matter, sulfur compound, volatile organic chemical, nitrogen compounds, oxygen compounds, halogen compounds, Agro chemical, radioactive compounds, and odors. Every pollutant has a source, and the receptor is anything that is affected by the pollution (air, water, soil, vegetation, animal and human life). For example, eutrophication, the ecological stagnation of water bodies occurs when organic wastes, carrying nutrients, are discharge into water sources. This would disturb the ecological control mechanism prevailing in the water bodies and leads to damage to aquatic life. Defection of the disturbed balance between the living organisms and the environment requires efficient ways of measuring the substances effecting the environment.

Global Environmental Problems

Environmental problems are always interrelated – often solution to one problem actually creates another problem. For example, when people are sick and dying from disease, it is natural to want to improve, human health when health is improved and mortality is reduced, a population explosion may result to feed this growing population, natural habitats are often converted into farmland. In turn, the destruction of natural habitats eliminates the native wild species of plants, predatory animals and parasites. The major environment problem can be divided into the following categories.

i. **Over-population:** It causes human suffering directing and amplifies all other environmental problems.
ii. **Pollution**: It makes vital resources less useful and reduces the quality of life.
iii. **Global Changes:** This resources from human activities and may permanently outer the Earth in unpredictable ways.
iv. **War:** This may be caused by or may cause all other environmental problems – modern (chemical/biological warfare threaten the survival of the human species).

Project

A project is a complex non-routine one time effort limited by time, budget, resources and performance, specifications, designed to customer needs and satisfaction. The major characteristics of a project are it has a clear objective, defined start and end dates, it has unique deliverables and performance requirements, and it has specific resources, time, cost and constraints. A project can also be defined as a sequence of tasks that must be completed to obtain a certain outcome. According to the Project Management Institute (PMI), the term project refers to any temporary endeavor with a definite beginning and end. Depending on its complexity, it can be managed by a single person or hundreds of individuals.

The concept of Project Management is conception or the initial state, planning, execution, performance, monitoring and the closure or the concluding state (PMBOK, 2010). The key concept of the project is project scope and plan. A project scope defines the specific goals and objectives of the project. It outlines what work will be done, by whom and within what time frame. While project plan is the document that outlines the project scope, timeline, budget, resources and risk. (Knowledge Hut, 2023). A project that is Abandoned is considered to be a failed project when it has not delivered what was required in line with expectation. Therefore, in order to succeed, a project must deliver

to cost, to quality and on time and it must deliver the benefits presented in the business case. An abandoned project is an uncompleted project in a time frame of a contract. Hence there is urgent need to look inward and examine critical factors militating against the project completion and occupation in accordance with its conception.

Abandon Engineering projects can be described as the project that has started at an earlier date, but which construction work for one reason or the other has stopped and such are not limited to process plant along, road, industries, structures, bridges, factories, dams, electric and communication projects and so on. Research studies have shown that a good number of Engineering projects initiated with good intentions are abandoned at different stages of the design and construction phases. Some reasons advanced for the abandonment of Engineering projects are poor and inadequate planning, lack of enough financial capacity, incorrect cost estimates, unavailability of adequate skilled manpower and personnel for the job, poor risk management and mitigations, poor understanding of the scope and work requirements, poor quality control and documentation, inadequate supervision of project by Government Agencies, corruption and communication gap among personnel, stakeholders and project promoters. Other factors include contractor lack of capacity to do the job, poor location of project, inadequate site infrastructure to support the project, poor project management techniques in job execution, inconsistent Government policies, lack of accountability, communities' issues and interference, etc. (Olapede and Anthony, 2019).

Abandoned Brass LNG project

Abandoned Engineering Project, such as the Brass LNG project usually comes with environment impact and challenges to both the host communities and site location. Some of the Environmental challenges or impact imposes by Abandoned project are environmental pollution of land, water and air, poor disposal of solid and liquid waste, defacing of the beauty of the environment, loss of fertile Agricultural land and resources, degradation of the environment, Change of the ecosystem and the biodiversity of the location, threat to wild life and animals in the location, etc.

The concept of the Brass LNG project is the gathering of the associated and non-associated natural gases from the Niger Delta region of Nigeria, and process the natural gas into Liquefied Natural gas at about – 160^{o} using the cascade process technology which is owned by one of the technical partners, Conoco Phillips. The design intention of Brass LNG project was to process Nigeria abundant gas resources for export thereby generating revenues in dollar to the Federal Government and Nigeria, creating employment opportunities to the youths and Nigerian, reducing the flaring and wastage of out gas resources, etc. But the Abandonment of the Brass LNG project have created Environmental Impact and challenges to both the host communities and the Brass Island, which is the location of the project.

Theoretical Framework

All Abandoned projects are failed projects. But not all failed projects are abandoned projects (Nwachukwu, 2016).

Over the past few years, project implementation are progressively becoming complex and huge in size, as a result of many incidences of project Abandonment and failures are on the increase. Some pundits posit that one of the principal factors responsible for this abandonment and failures is the lack of project management skill and practices in Nigeria. The Brass LNG project is a practical example of a project abandonment and failure. For any Engineering project to be successful, project management is very critical to project success. Since resources are limited in nature and using opportunity cost to deploy resources it behaves on project managers to manage these resources optimally. A good project manager should be able to manage the four project success criteria (time, cost, quality and customer satisfaction (Akhator, 2017).

To examine the axiom that all abandoned projects are failed projects, but not all failed projects are abandoned projects can only be situated when we understand the role of a project manager in project management.

A project manager is the consultant charged with the responsibility to make things work on a project site (gor engineering project), type of project notwithstanding, from conception to operational stages. His role therefore arises from the need for a technical expert to take charge, take control of events on the project sites. Someone who both understands the intricacies of coordinating, controlling and directing the effort and activities of the professional

team and the physical problems of engineering and construction and familiar with the need of decision-making process.

Project Management

Project management is the art of managing all aspect of a project from inception to closure using a scientific and structure methodology (Abonyi, 2020).

Project management is the application of knowledge, skill, tools, and techniques so as to meet the project requirements (Nwachukwu, 2019).

Project Management Cycle

There are five phases in any project management cycle which are listed below.

Phase 1: Project Initiation

This consist of the following.

i. Why the project
ii. Identify project objectives/needs.
iii. Can the project be done?
iv. Carryout feasibility and viability studies
v. Should we do the project?
vi. Justification for the project
vii. Regulatory or legal requirement concerning the project.

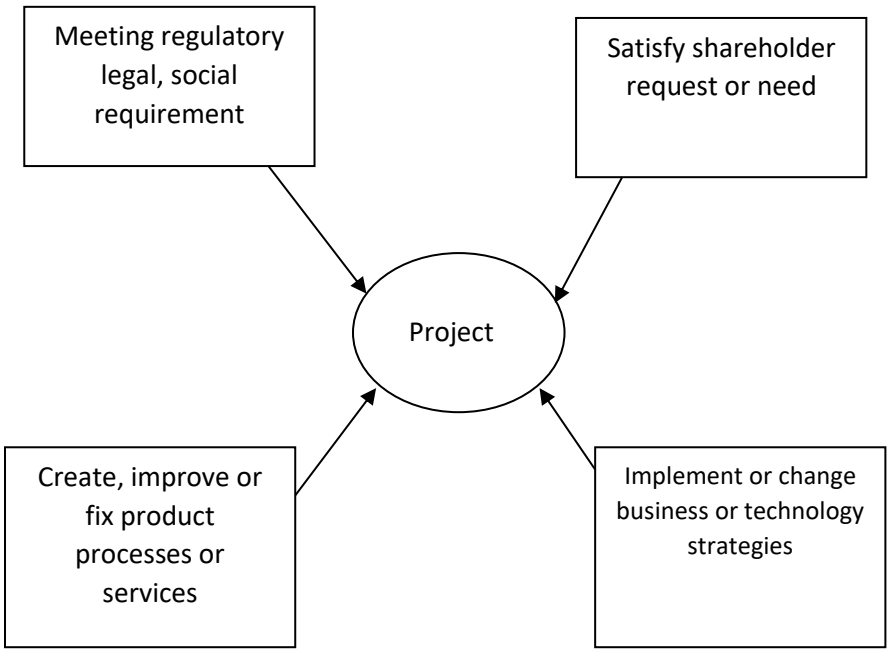


Fig 2: Project Initiation Concept
Source: (Akpan, 2024)

Phase 2: Project Planning

This involves the following activities.

i. Detailed solution developed.
ii. Plan steps required to meet the project objectives.
iii. Identify all work to be done.
iv. Identify project scope.
v. Draw a project plan, outlining activities, tasks, dependencies and time frame.
vi. Considering project quality

vii. Ensure accurate, detailed and up to date documentation.

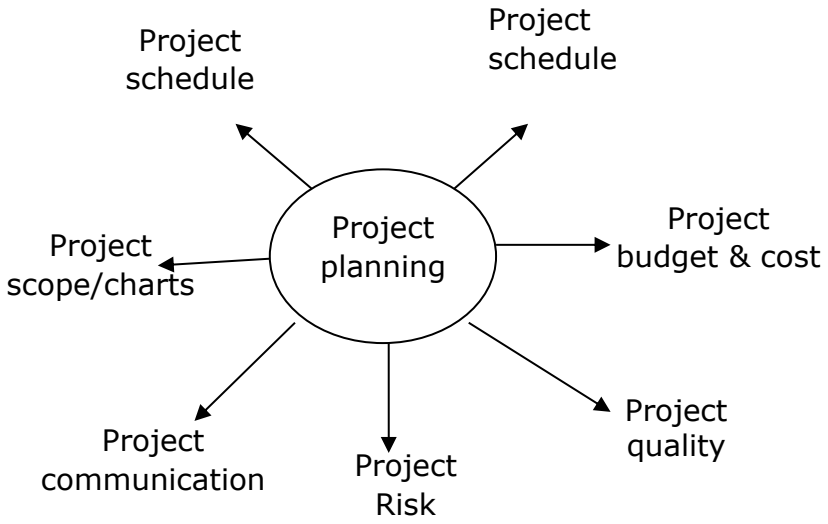


Fig. 3: Project Planning Stages Source (Akpan, 2024)

Phase 3: Project Execution or implementation

This phase involves the following.

i. Putting project plan into work.
ii. Using the right and competent contractor.
iii. It is important to maintain control and communication.
iv. Progress is continuously monitored; appropriate adjustments are made and recorded.
v. People carryout assigned task and progress reported through regular team meetings.
vi. The project maintains control, compare progress with plan.
vii. Effective coordination and supervision of project team members and task accessory

Phase 4: Project Monitor and Control
The activities carried out in this phase of project management are shown in the figure below.

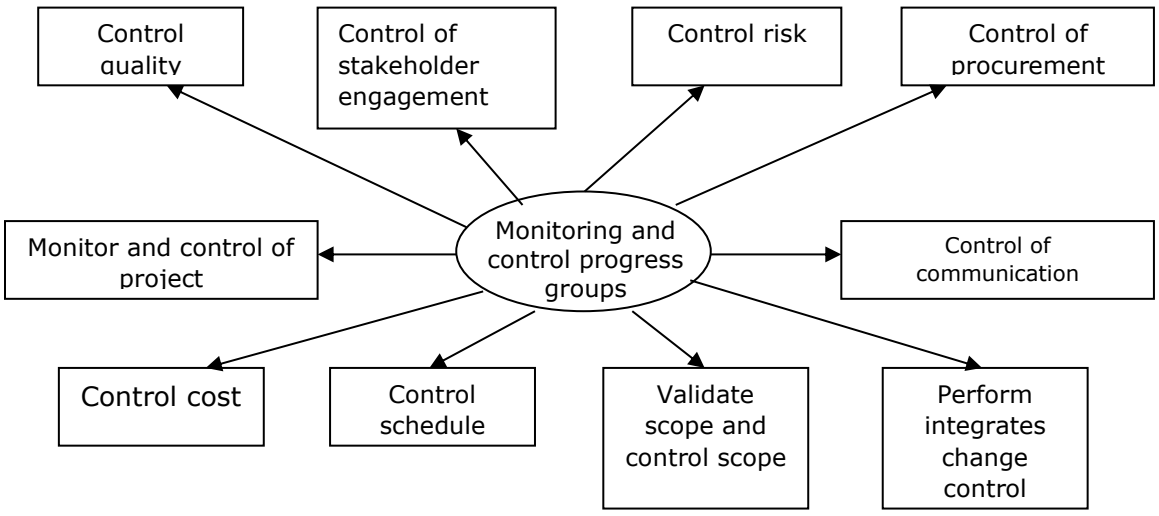


Fig. 4: Project monitoring and Control Activities
Source: (Akpan, 2024)

Phase 5: Project Closure

The activities in project closure phase involves the following;

i. Final deliverable is released.
ii. Project documentation handed over to client/Project Owner
iii. Termination of supplier's contract.
iv. Releasing project resources.
v. Communicating the closure of the project to all stakeholders
vi. Review of lessons learnt.
vii. Examine what went well and what didn't.
viii. De-mobilization of project team and contractors.
ix. Commissioning and start-up activities carryout.
x. The lesson learn and wisdom of experience is transferred back to the project organization which will help in the future.

Graphical Representation of Project Life Cycle and Management

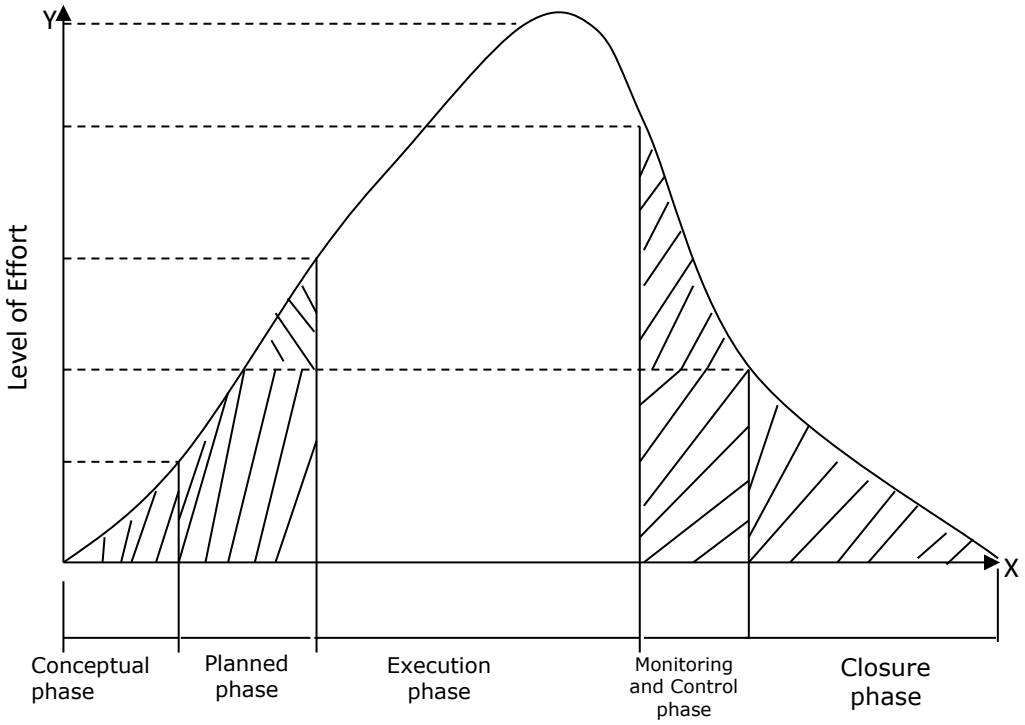


Fig. 5: Project Life Cycle Phases
Source: Nwachukwu (2016)

Y = axis = The level of Efforts made

In the project implementation measured financially in terms of time, cost, quality, material and human resources collectively on any activity, stage and or phases.

X – axis = Explain the life cycle phases and why project life cycle is a straight line against other life cycle concept that is spherical.

Empirical Review

The international journal of scientific and engineering research, vol. 11, which is the author, published a study on the environmental implication of Abandoned Development projects in Port-Harcourt metropolis. The study was published in 2020. The place of the study was Port-Harcourt. The dependent and independent variables were

considered, the researcher use the structured questionnaire interview and site observation for study design and data collection. The used of Bar Charts and tabular representation was used for the data analysis. The findings from the study are insufficient budget allocation; lack of reliable feasibility studies, change of political administration and nepotism are the factors responsible for project failures and abandonment in Port-Harcourt metropolis and the socioeconomic effects include social vises and untidy environment.

Another empirical review was done on a study title "Environmental Effect of Abandoned Building Project in Edo Sate" by the Author, Margret Alminhiefe. The study was done in Edo State, Nigeria and in 2022. The study considered the dependent and independent variables. the study methodology was by descriptive research design, purposive sampling techniques and structured questionnaire. The data analysis used by descriptive statistics. The study findings were the creation of uncontrolled and unsupervised garbage disposal, encouragement of population marginalization, defects of project sites, a reduction on the aesthetics of the neighborhood, etc. The economic effect of an abandoned project includes Low revenue from property tax, wastage of financial and material resources by the owners, loss of economic value for the building area, reduction of employment opportunity among others.

Methodology

A Survey research design was adopted for the study. Data was collected using a structured questionnaire design with a five-point Likert scale. This research work was carried out at the project site and offices of both Brass Island and Yenagoa, Bayelsa State, Southern Nigeria.

the population size is 57 persons drawn from the host communities, Bayelsa State Environmental Agency, Brass LNG project team, and NNPC project team. The Relative Importance Index (RII) is the tool used to analyze the collected data.

Data Presentation

This chapter present the analysis of data derived through the structure questionnaires and the informal interviews administered with the respondents in the study area. The analysis and interpretation were derived from the findings of the study. The data analysis depicts the sample frequency and percentage of the respondents as well as interpretation of the information gathered total (50) questionnaires were administered to the respondents of which all the fifty respondents responded, and which was validated.

From the study, a total of 50 questionnaires were validated and analyzed.

Table 1: Demographic Distribution of the Respondents

Demographic	*Frequency (N)*	*Percentage (%)*
Gender		
Male	30	60
Female	20	40
Age		
25 – 30	4	8
31 – 35	14	28
36 – 40	15	30
41 – 45	9	18
46 and above	8	16
Educational Qualification		
OND	2	4
HND	11	22
BSc/BENG/BTECH	16	32
MSc/M.TECH/MBA	18	36
Ph.D/DBA	3	6
Working Experience		

Less than a year	0	0
1 – 5 years	6	12
6 – 10 years	10	20
11 – 15 years	14	28
16 – 20 years	10	20
21 – 25 years	5	10
26 – 30 years	3	6
31 – 35 years	2	4
Marital Status		
Married	46	92
Single	4	8
Divorced	0	0
Category of Persons		
Staff of Organization	40	80
Community Stakeholder or Reps	10	20
Geographic Location		
Brass Island	100	100

Source: (Akpan, 2024)

The table 1 above provides a picture of the features and nature of the demographic of the respondents for the research study carried out by the researcher. Respondents were divided into two groups for the study.

i. Staff of the concerned Organizations.
ii. Community Reps and Stakeholders.

Fifty (50) questionnaires were administered to both categories of Respondents.

The total number of each category of Respondents is shown below.

1. Number of category 1(Staff of Organization)
2. Number of category 2 (Community Rep)

Total number of category 1 = 40
Total number of category 2 = 10

The Respondents were made to indicate in a questionnaire to the extent to which they agreed or disagreed to the factors that is responsible to the Abandonment of Brass LNG project and the Environment Impact of the Abandoned Brass LNG project on the host communities and Brass Island.

Data Analysis

Likert type scale was used to extract the data or information that is required for analysis and findings.

Strongly Agreed (SA) = 5 points
Agreed (A) = 4 points
Neutral (N) = 3 points
Disagreed (D) = 2 points
Strongly Disagreed (SD) = 1 point

Table 2: A sample of the Responses from the Respondents on the Environmental Impact of the Abandoned Brass LNG Project on Brass Island.

S/N	Environmental impact of the Abandoned Brass LNG project on Brass Island	5	4	3	2	1
		Strongly Agreed (SA)	Agreed (A)	Neutral (N)	Disagreed (D)	Strongly Disagreed (SD)
1	Acidification of soil and water body.	15	20	5	6	4
2	Alteration of local hydrology draining pattern and soil profile.	20	25	2	1	2
3	Environmental pollution of the plant site due to poor Solid and Refuse management and disposal system.	40	5	1	2	2
4	Structural defects and corrosion in civil structures, pipelines and site equipment due to abandonment of project.	30	9	1	6	4
5	Visual Environmental defects and the negative aesthetic defacing the Environment of the plant site/brass Island.	38	9	1	1	1
6	Exposure to health challenges and air borne diseases.	41	6	1	1	1
7	Presence of Environmental and fire hazards on site (e.g oil spills, open drains and channels, combustible materials).	37	10	1	1	1
8	Non-availability of Waste, Refuse recycling/treatment facility on site.	25	20	1	3	1
9	Untreated Effluent and Wastewater discharge into Brass River and environment/surroundings.	40	7	1	1	1
10	Contamination of groundwater, surface water, soil and sediment.	35	10	1	3	1
11	Changes in the local Topography of Brass Island.	32	9	1	2	6
12	Impairment of Air quality around plant site and Brass Island.	38	5	3	2	2
13	Increase in surface water Turbidity.	15	17	5	5	8
14	Loss of Environmental biodiversity of Brass Island.	35	5	1	5	4
15	Loss of community fertile farmland, reduction of access to land and its resources.	40	5	1	3	1
16	Presence of a suitable hideout for potential Criminals, kidnappers and Rapists, etc.	36	10	1	2	1
17	Hideout for wild and dangerous Animals and Reptiles due to overgrown weeds, grasses and poor housekeeping.	34	13	1	1	1

Source: (Akpan, 2024)

Table 3: Environmental Impact Data Analysis using RII Tool/Method

S/N	Environmental impact components of the Abandoned Brass LNG Project Brass Island	5	4	3	2	1	Total	50	250	RII	Rank
		SA	A	N	D	SD		Total No. of Respondent	Max scale		
1	Exposure to Health Issues.	75	80	15	12	4	186	50	250	0.93	3
2	Untreated Effluent discharge.	100	100	6	2	1	209	50	250	0.836	12
3	Acidification of Soil	200	20	3	4	2	229	50	250	0.916	7
4.	Visual Environmental defects.	150	36	3	12	4	205	50	250	0.820	13
5	Presence of Environmental Hazards.	190	36	3	2	1	232	50	250	0.928	4
6	Loss of Community Fertile Land	205	24	3	2	1	235	50	250	0.940	1
7	Environmental Pollution on site.	185	40	3	2	1	231	50	250	0.924	5
8	Presence of Hideout for Criminals	125	80	3	6	1	215	50	250	0.860	10
9	Hideout for dangerous Animals	200	28	3	2	1	234	50	250	0.936	2
10	Change in Topography.	175	40	3	6	1	225	50	250	0.900	9
11	Impairment of Air Quality.	160	36	3	4	6	209	50	250	0.836	12
12	Non-Availability of Waste Treatment	190	20	9	4	2	225	50	250	0.900	9
13	Loss of Environment Biodiversity.	75	68	15	10	8	176	50	250	0.704	14
14	Alteration of Local hydrology.	175	20	3	10	4	212	50	250	0.848	11
15	Contamination of groundwater.	200	20	3	0	1	230	50	250	0.920	6
16.	Structural Defects and Corrosion.	180	40	3	4	1	228	50	250	0.912	8
17	Increase in surface Turbidity.	170	52	3	2	1	228	50	250	0.912	8

Source: (AKPAN, 2024)

Table 4: Showing the factors responsible for the abandonment of Brass LNG project that was assessed and Rank from the highest Relative Important Index (RII) to the least.

S/N	*Factors Responsible for the Abandonment and Brass LNG project*	*RII*	*Ranking*
1	The delay in signing the final investment decision (FID) for the propose Brass LNG project by the promoters (FG and IOCs)	0.892	1
2	The failure to adopt and apply the same NLNG business model towards the handling of the Brass LNG project.	0.876	2
3	The withdrawal of a credible Stakeholder technology owner and technical partner from the Brass LNG project	0.852	3
4	The federal government undertaking multiple LNG/Gas project at the same time without adequate financial capacity and human resource to drive these projects.	0.812	4
5	The non-availability of gas supply infrastructure and development plan to provide adequate feed stock for the Brass LNG project during the start-up and operational phases of the project.	0.792	5
6	The lack of commitment, indecision and unseriousness by the Federal Government, IOCs and other Stakeholders to deliver on the Brass LNG project.	0.720	6

Source: (Akpan, 2024)

From fig. 4 showing the most significant factor that was responsible for the Abandonment of the Brass LNG project in Bayelsa State, Nigeria was the Delay in signing the Final Investment Decision (FID) by the Federal Government and international oil companies driving the project.

Similarly, the least significant factor responsible for the Abandonment of the Brass LNG project was the lack of commitment, indecision and unseriousness on the part of the FG and IOCs to drive the project to its completion.

Conclusion

There were six factors identified, assessed and were responsible for the abandonment of Brass LNG project in Bayelsa State, Nigeria.

From out of the six factors that was responsible for the Abandonment of Brass LNG Project, the most important and significant factor with the highest Relative Importance Index (RII = 0.892) is the Delay by the Federal Government and International oil companies in signing the Final Investment Decision (FID) for the Brass LNG project.

Similarly, there were seventeen Environment impact and challenges that were identified and assessed as a result of the Abandonment of the Brass LNG project on the host communities and Brass Island.

Out of these seventeen Environmental impacts that affected the host communities and Brass Island, the most important and significant that has the highest Relative Important Index (RII = 0.940) is the exposure of Human beings to health challenges and Air borne diseases.

Recommendations

Considering the results of the study findings, it is appropriate to recommend the following to forestall and mitigate future occurrence of abandonment of LNG/Gas projects in Nigeria and to reduce or eliminate the Environmental impact or challenges associated with Abandonment of LNG and Gas projects.

i. The Federal Government and IOCs should always be driven by strong commitment and political will in executing Oil and Gas projects in Nigeria. Ensuring the FID are usually agreed and signed at the shortest possible time. Only projects that will benefit Nigerians and Nigeria with adequate financial resources in place should be promoted or executed by FG and other Stakeholders.
ii. The relevant Government Agencies and Ministry of Environment should always ensure that all Oil and Gas Promoters should strictly abide by the EIA report and EIS for all project to ensure all stated mitigations and control measures for all identified Environmental impact and challenges are in place and carried out. The

failure for any Project Promoter to carry out any of these prescribe Mitigation/Control measures should be sanction accordingly as prescribe by the EIA Act of 1992. The EIA Act of 1992 should be reviewed to include more punitive measure to defaulting Project Promoters.

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