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SOCIO-ECONOMIC IMPACT OF THE FAILED AND ABANDONED BRASS LNG CONSTRUCTION PROJECT ON BRASS ISLAND, BAYELSA STATE, NIGERIA.

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Abstract: The topic of this study is the Socio-Economic Impact of the Failed and Abandoned Brass LNG Construction Project on Brass Island and the Host Communities. The purpose of the study was to determine the factors that were responsible for the failure and abandonment of the Brass LNG Project and the socio-economic impact of the failure and abandonment of the project on the host communities. The study employed the quantitative research method, using a structured questionnaire as a data collection instrument. A population of 57 staff (both Junior and Senior) spread across the Brass LNG Project Team, NNPC in Brass Island and Abuja. A sample size of 50 was arrived at using Yamane's mode of sampling size technique. 50 questionnaires were administered, of which 50 were retrieved, translating to a 100% response rate. The data collected was analyzed using the t-test and chi-square statistical tools. Hypotheses I and II were tested, and Decisions were taken. The Study Objectives were achieved. The findings of the study reveal the causes that led to the failure and abandonment of the Brass LNG Project. The study also reveals there were significant socio-economic impacts on the host community as a result of the failure and abandonment of the Brass LNG project. Based on the study findings, the researcher gave some useful and practical recommendations to mitigate future Abandonment of Oil and Gas Projects in Nigeria. The outcome of the study has practical benefits to Project Managers, Project Engineers, Oil and Gas Stakeholders, the Academic Society, Industrial Professionals, Policy Makers, and Organizations saddled with the responsibility of Oil and Gas development in Nigeria.

Keywords: Abandoned, Brass, Construction, Project, Socio-Economic

1.1 Introduction

Project failure is illustrated by a failure to achieve the four success criteria as propounded by Clay Land and Kings and is manifested by the kind of application of proven project management techniques. It does not mean that the project may not have been physically completed, but the question is when was the completion? Is the quality specified standard achieved? Can its potential be maximally realized? Is the client and end-user satisfied? The protracted delay in signing the final investment decision on the Brass LNG Project is robbing the nation of revenue (Ejiofor, 2014). Without the intervention of the Federal Government and the International Oil Companies (IOC), the project may remain a pipe dream. The Brass LNG project located in Brass Island of Bayelsa State is designed to produce Ten Million Metric Tons of LNG per year. The Nigeria National Petroleum Corporation (NNPC) holds

49% equity in the project, while United States Oil Company, ConocoPhillips, French Oil giant, Total and Italian Company ENI holds 17% stake apiece in the Brass LNG project.

However, the NNPC plans to divest 17% of its stake in the project after the final investment decision (FID) of the 17% to be divested. Bayelsa and Rivers State Government are proposed the take five percent each, while the remainder will go to NNPC's strategic investors.

ConocoPhillips is also seeking its Nigeria Assets, including its stake in Brass LNG, and Oando Plc has already completed the funding for the acquisition of some of the assets. However, Oando's acquisition covers only the upstream Assets of ConocoPhillips and does not involve gas-related Assets, including the company's stake in the Brass LNG project. The Brass LNG project suffered neglect and was virtually pushed to the back door, especially after the departure of the pioneer Board of Director Chairman and NNPC Group Managing Director, Dr. Gaius-Obaseki, for reasons many attributed to political considerations. With a pre-FID expenditure of over One Billion Dollars ($1B), a lot of early works have been completed on the site, demonstrating the faith of the shareholders in the Brass LNG project. Comfort was also drawn from the fact that the projected 10 million metric Tonnes of LNG to be produced yearly has been virtually sold.

The delay in signing the FID for the Brass LNG project by the shareholders and business owners significantly contributed to the failure of the project. The International Oil Companies developed a cool feet towards the project because Nigeria elections were around the corner in the country. With the elections coming up in 2015, the IOCs are not yet convinced about the direction of the project. So, in their characteristic nature, they do not like committing to large projects when elections are around the corner. The apparent low level of commitment of officials of the federal government of Nigeria towards the project is also said to have sent a wrong signal and disincentive to the other partners, according to insider sources. The then president of Nigeria and the Minister of Petroleum Resources in the persons of Dr Goodluck Jonathan and Diezanni A. Maducke who are both from the area/state never show any seriousness towards the actualization of the Brass LNG project.

The challenge of the exit of ConocoPhillips was a treat to the Brass LNG projects. ConocoPhillips had a 17% stake in the project and the cascade technology to be used for the Brass LNG Project. Feed Gas supply infrastructure was also a challenge to the Brass LNG project. The unavailability of adequate gas supply infrastructure to feed the project during the operational phase was a serious challenge. The gas supplier companies insisted that they have to invest heavily in gas development and infrastructure if they are to commit to a gas supply agreement for 25 years towards the Brass LNG project. There was also a concern by industry sources and stakeholders that NNPC may not be able to fund its share of the joint venture of cash call for the gas infrastructure for the Brass LNG project. The challenge of the Petroleum Industry Bill (PIB) not being passed and signed into law by both the Senate and the President of Nigeria has hindered the development of gas infrastructure in Nigeria. Also, the harsh fiscal regimes contained in the bill had discouraged the IOCs from investing in gas infrastructure and development in Nigeria. Nigeria is a gas rich Nation with proven and enormous gas reservoirs and resources that need to be developed for both domestic and industrial use in Nigeria. For example, gas resources are needed for power generation, petrochemicals, fertilizer, liquefied petroleum gas (LPG), LNG, etc. The Brass LNG project may have failed and been abandoned as a result of the overpoliticization of the economic decision by the Federal Government and other stakeholders, the unseriousness and delay in taking swift decision on the project in the overall interest of the Nation because of the speed of deciding in today's world. Finally, the Brass LNG project was stalled due to the lack of the final investment decision (FID) which was not taken and signed by both the

Federal Government through the NNPC with other IOCs due to the lack of political and economic will by all stakeholders of the Brass LNG project.

1.2 Statement of the Problem

Nigeria, which used to supply about 10 percent of the global LNG demand, is currently supplying only seven percent because other countries have developed their gas resources so has to increase their global share of the LNG market and the failure of the Federal Government/NNPC and other stakeholders to strengthen the country position in the global LNG market by signing the FID for the Brass LNG project to commence construction and production phases of the project. And the development and expansion of other gas infrastructures and LNG projects in Nigeria (e.g, Nigeria LNG LTD Bonny Island).

The failure and abandonment of Brass LNG project due to delay in signing the FID, has caused the Nation to loss huge financial resources I n terms of direct foreign investment and revenue. The project had also a negative socio-economic impact on the host communities in Bayelsa State, South-South, Nigeria. The Brass LNG project which was initiated by FG/NNPC, which was to come on stream about 15 years after, is robbing the country of over 25 billion dollars ($25B) as estimated annual revenue from both the sales of LNG, LPG, Condensates, Royalties, taxes, etc. The failure of this project has cause the nation about 18000 jobs at both the construction and operational phases of the project. Therefore, this will have an effect on employment among the youths in the Niger Delta area of Nigeria thereby leading to youth rustiness and criminality. Unless an urgent step is taken, Nigeria stands the chance of losing its influential position in the global LNG supply chain business. All hands must be on deck by the Federal Government, IOCs, and other stakeholders to bring back the Brass LNG project to life at the shortest possible time by identifying the reasons the project failed and was abandoned.

1.3 Objectives of the Study

The main objective is to examine Socio-Economic Impact of the Failed and Abandoned Brass LNG Construction Project on Brass Island, Bayelsa State, Nigeria. The following under listed are the objective for the study.

i. To determine the causes for the failure and abandonment of the Brass LNG project in the study Area.

ii. To determine the socio-economic impact of the Failed and Abandoned Brass LNG Project on the Host Community.

iii. To assess the mitigation measures towards the project's abandonment

1.4 Hypothesis of the Study

i. There are no significant differences in the opinion between the senior and junior staffs on the root and remote causes of the failure and abandonment of Brass LNG project.

ii. There is no significant socio-economic impact on the host communities as a result of the failed and abandoned Brass LNG project.

iii. There is not significant mitigation measures towards the project's abandonment

Review of Related Literature

2.1 Conceptual Review

A project is a complex non routine, one-time effort limited by time, budget resources, and performance specification designed to customer needs. The major characteristics of a project are; it has a clear objectives, defined start and end dates, it has unique deliverables and performance requirement and it has specific resources, time, cost and constraints. A project can also be defined as a sequence of task 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. The concept of project management is conception or the initial state, planning, execution, performance monitoring and the closure or the concluding stage (PMBOK, 2020). The key concept of a 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, (Knowledgehut, 2023).

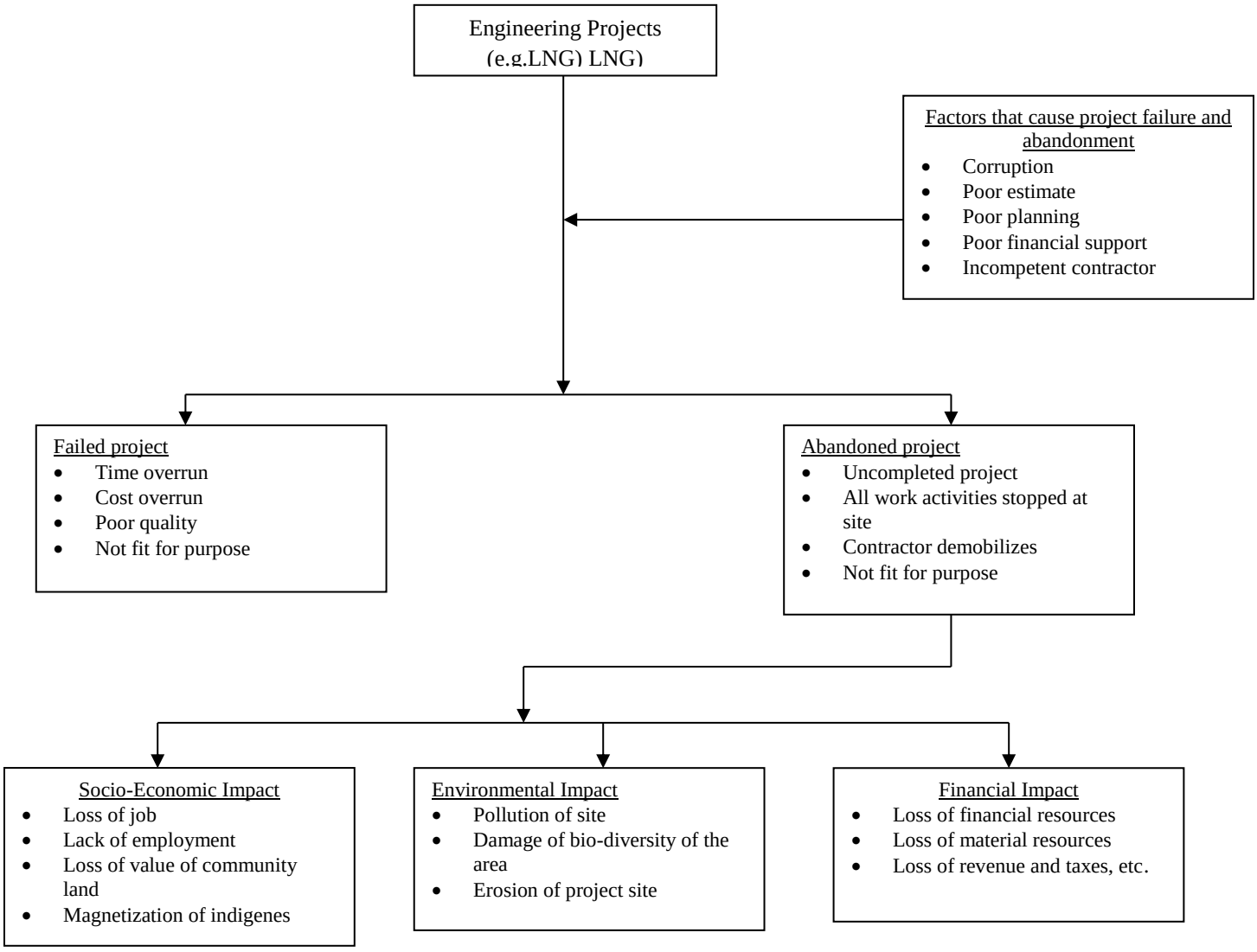
A project is considered a failure when it has not delivered what was required in line with expectation? Therefore, in order to succeed, a project must deliver to cost, to quality and on time, and it must deliver the benefits presented in the business case. An abandoned project is an uncompleted project 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. Abandoned Engineering projects can be described as the project that has started at an earlier data, but which the construction work for one reason or the other has stopped and such are not limited to process plant alone, road, industries, structure, bridges, factories, dams, electric and communication projects and so on. 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 failure and abandonment engineering projects are incorrect estimates, lack of available skilled personnel, inadequate planning, poor risk management and control, miss-understanding of the work requirement, poor quality control by regulatory Agencies, corruption and communication gap among the personnel.

Other factors are project cost, inability of clients to engage contractors or designers capability to do the work, failure on the part of contractors to obtain vital inputs such as materials, manpower and machines, inconsistent government policies, lack of accountability, poor project monitoring and supervision, application of poor project management techniques non availability of utilities or infrastructural facilities, wrong location of project site, etc. (Olapade and Anthony, 2019). The above reasons invariably lead to waste of resources in the form of capital, material, human power, promotion of illegal activities, adverse effect on community, aesthetics and so on. Hence, there is the need for Engineering and construction firm should inculcate operational strategic, personnel, technology, marketing and environmental strategic in order to cushion the effects of financial predicament associated with project failures and abandonment.

Project failures and abandonment is not restricted to developing countries like Nigeria, Ghana only. Abandonment is a well-known concept in Engineering and construction projects around the world. The social-economic effects of abandoned projects is overwhelming when considering the huge amount of money and resources on the part of the client has invested in the project. There are two types of impacts an abandoned project has on a community. Such as socio-economic and environment impacts. The socio-economic impacts of an abandoned project are loss of jobs, lack of employment for the locals, loss of value of the area, marginalization of the local's population or indigenes, transfer of cost between private and public sectors etc. While the environment impact involves visual impact landscapes, modification, erosion, loss of biodiversity and pollution. The concept of a liquefaction natural gas process plant is to gather both associated and non-associated gas, which is then treated and process into LNG using the liquefaction technology either the APCI or the Cascade process. For export to both foreign and sales to local buyers.

The Brass LNG project is designed to gather, treat both Associated and non-associated gas, then process these gases using the cascade technology process into LNG for the export market through ship from Brass Island in Bayelsa. The purpose of the plant or project was to general foreign exchange in US dollars for Nigeria, create jobs for Nigerians and add value to our enormous gas resources. Engineering projects don't just fail and

abandoned, but there are factors or reasons contributing to the failure and abandonment of these projects. These failures and abandonment generally come with some consequences result to financial loss to the project owner, contractor. There is also the socio-economic and environmental aspect of project failure and abandonment to the host communities and project sites.



Source: Akpan, 2024

Fig. 2.1: Conceptual Framework

2.2 Theoretical Framework

All abandoned projects are failed projects. But not all failed projects are abandoned projects (Nwachukwu, 2016). Over the past few years, project implementations are progressively becoming complex and huge in size, as a result many incidences of project failure and abandonment are on the increase. Some pundits posit that one of the principal factors responsible for this failure is lack of project management skills and its practice in Nigeria. Using the Brass LNG project in Bayelsa State, Nigeria as a case study. This research study examines the role of project managers in engineering infrastructure development in Nigeria. The extent to which these projects have succeeded or failed or abandoned will be explored.

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 he understands the role of a project manager in project management. and so, who is a good project manager?

A project manager is the consultant charged with the responsibly to make things work on a project site (for engineering), type of project not withstanding 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 site. 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 get familiar with the need of decision-making process.

What is Project Management?

Project management is the art of managing all the aspects of a project from inception to closure using a scientific and structured methodology, (Abonyi, 2020). Project management is the application of knowledge, skill, tools and techniques so as to meet the project requirements (Nwachukwu, 2019).

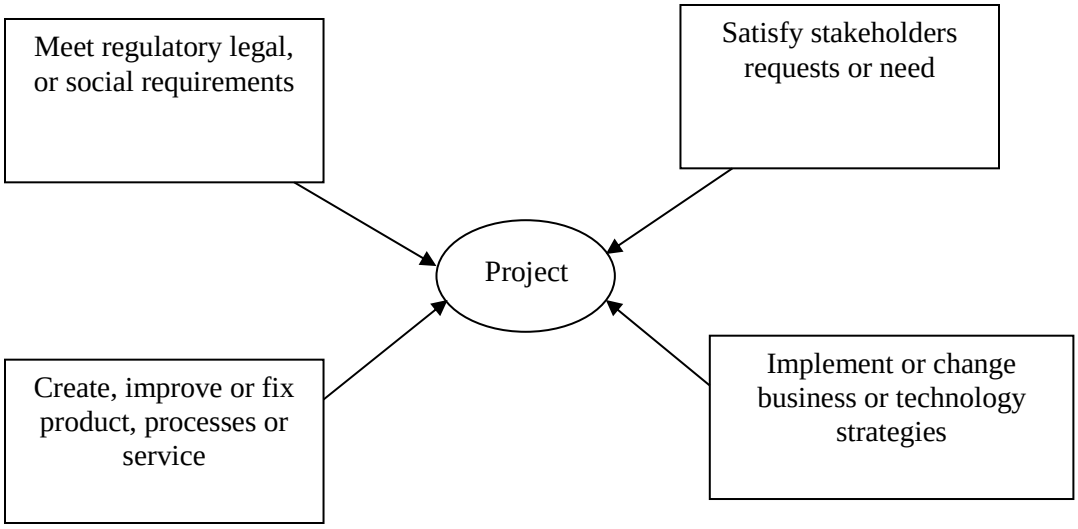
Project Management Life Cycle

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

Phase 1: Project Initiation

Which involves the following?

- Why the project?
- Identify project objectives or need
- Can the project be done?
- Carryout a feasibility study
- Should we do the project?
- Justification



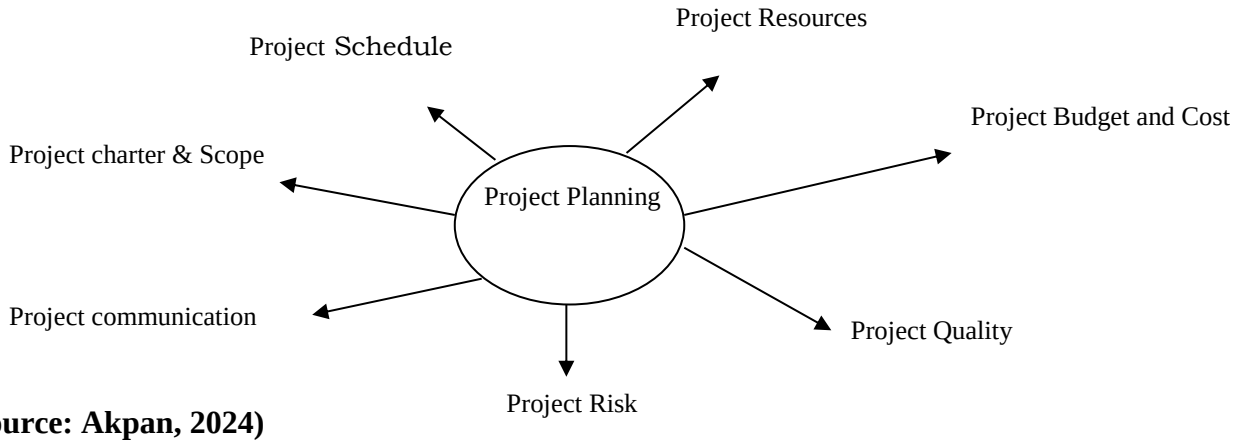
(Source: Akpan, 2024)

Fig. 2.2: Project Initiation Concept

Phase 2: **Project Planning**

These involve the following activities.

- Detailed solution developed
- Plan steps required to meet the project objectives
- Identify all work to be done
- Identify project scope
- Draw a project plan outlining activities, tasks, dependencies and time frame



(Source: Akpan, 2024)

Fig. 2.3: Project Planning Stages

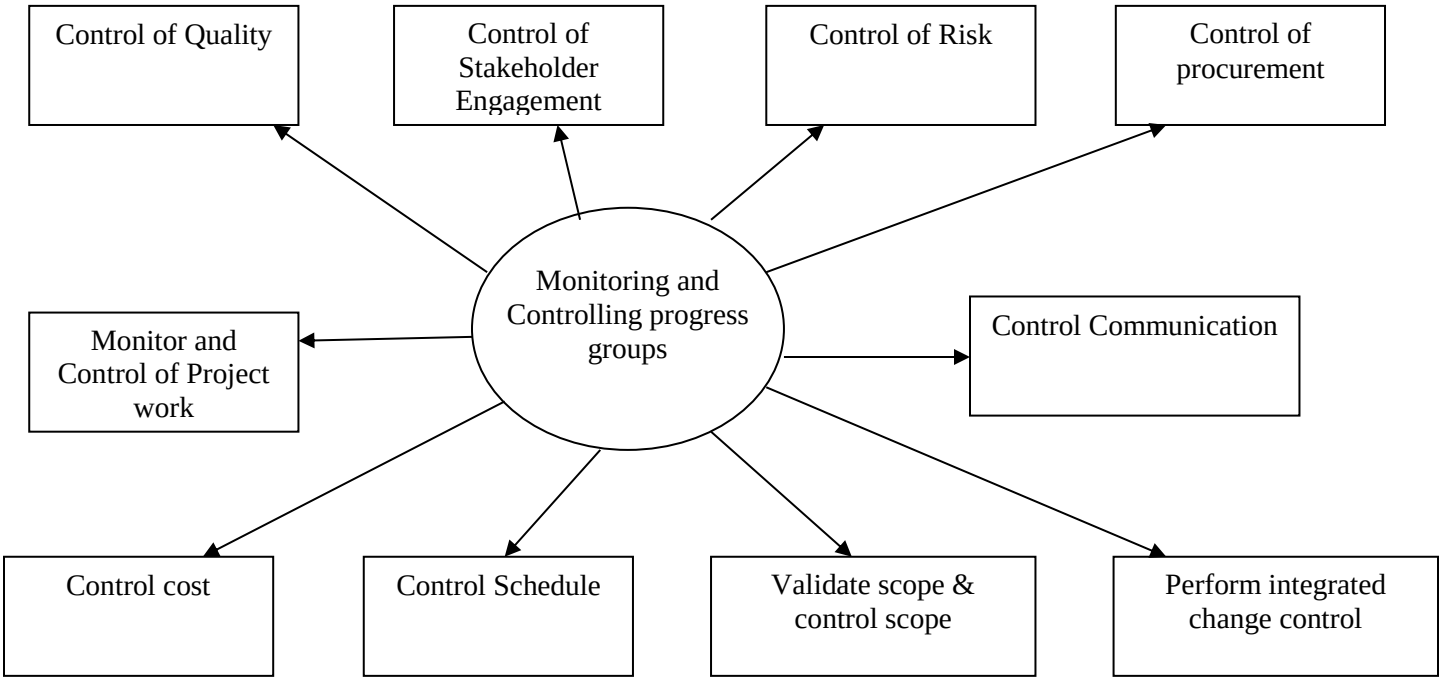
Phase 3: Project Execution or implementation

This involves the following activities/task.

- Putting project plan into work or action
- It is important to maintain control and communication
- Progress is continuously monitored; appropriate adjustments are made and recorded
- People carry out the task, and progress reported though regular team meetings
- The project maintains control compare progress to plan

Phase 4: Project Monitory and Control

The activities carried out in this phase of project management cycle are shown in the figure below.



(Source: Akpan, 2024)

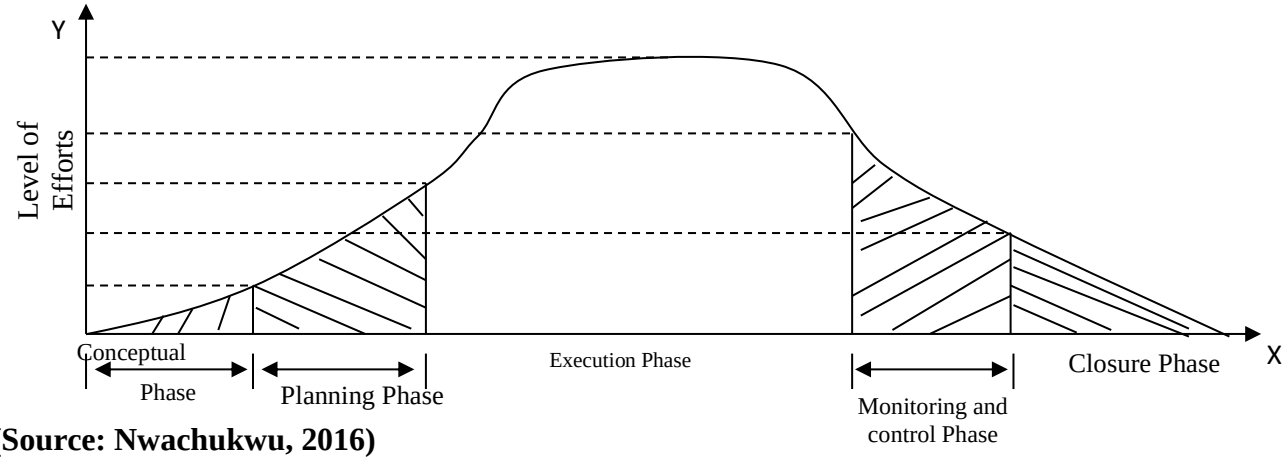
Fig. 2.4: Project monitoring and Control Activities

Phase 5: Project Closure

The activities in this project phase involve the following.

- Final deliverables are released
- Project documentation
- Terminating supplier's contract
- Releasing project resources
- Communicating the closure of the project to all stakeholders
- Review of lessons learnt
- Examine what went well and what didn't
- The wisdom of experience is transferred back to the project organization which will help in the future.

Graphical representation of project life cycle and management



(Source: Nwachukwu, 2016)

Fig. 2.5: Project Life Cycle Phases

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.

Project Risk Management

Risk is unavoidable in any project. Every Engineering project is associated with one form of risk or the other. Every project risk must be assessed and effectively, managed and reduce to a level that is tolerable to the organization. The amount of risk which is judged to be tolerable and justifiable is the "Risk Appetite" (Akhator, 2018). Project Risk Management refers to activities for minimizing project risks, and thereby ensuring that a project is completed within time and budget, as well as fulfilling its goals.

The five essential steps of the Risk Management process are as follows.

- Identify the risk
- Analyze the risk
- Evaluate or rank the risk
- Treat the risk
- Monitor and review the risk

The objectives of project risk management are to increase the probability and impact of the positive events and decrease the probability and impact of the negative events. Project risk management includes utilizing the outputs from the risk management evaluation to carryout risk management planning to successful executive the project.

The following are some of the risk associated with any project. These includes

- Financial risk
- Strategic risk
- Performance risk
- External factor risk
- Health and safety risk

Failed and abandoned Engineering projects, goes along with socio-economic impacts to the community and project sites. Socio-economic impacts are typically defined as impact to a community, self-definition, culture and customs, language and demographic characteristics, and related change to it's economic base, main industries, employment patterns, and infrastructure. Socio-economic (also known as social economics) is the social science that studies how economic activity affects and is shaped by social processes. In general, it analysis how modern societies progress, stagnate, or regress because of their local or regional economics, or the global economics. Economic and social impact analysis entails estimating how a community might change given an increase or decrease in a specific economic activity. There are five socio-economic factors in socio-economic analysis: Education, Employment, Income, Food insecurity and Housing insecurity

The characteristic of Project Abandonment

When projects are abandoned, it does not mean that continuation is collapsed. Abandonment is the temporary suspension of work on site during the execution phase. If the idea to execute is suspended at the conception or planning phases, it may not mean abandonment. Conception is planning phases is best described as "initiation"

when even though it involves huge financial plan can be stopped or suspended because of any foreseen reason that may eventually lead to abandonment during execution phase or implementation process.
Abandonment is characterized by the following.

- There may be need to change the design especially when the abandonment gap is too wide leading to outdated or old fashion design.
- The period of abandonment may lead to a change in taste of a client or change of client. This occurs most when there is a change of client either by sales, lease or death.
- The aim or objective of the project may change. The precious aim may to build a particular structure but later change to a different structure.
- The initial project cost and time must change. The gap created by the abandonment will be affected by inflation (changes in the prices of material and services), rate of exchange of local currency, and interest rate.
- The project team may change including the contractors and other site workers.
- There may be need for re-appraisal to ascertain if the project is still feasible or viable.

2.3 Empirical Review

The International Journal of Scientific and Engineering Research, Vol. II, 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 used the structured questionnaires, interviews and site observation for the 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 socio-economic effect include social vises and untidy environment.
Another empirical review as carried out on a study done by Nnamdi Nweze (Author) on the topic; Failure of Public Infrastructure Projects in Nigeria; causes, Effect and solution. The study was done in 2016 and in Nigeria. The independent and dependent variables was considered. The data collection and analysis used by the Researcher was by content analysis and indebt reviews of textbook, academic journals, conference proceeding and relevant websites. The study findings were, poor project management and inefficient resource allocation, lack of financial capacity and delay in payment, bureaucracy, corruption and inaccurate cost-estimate, lack of experience, knowledge and technical competence, poor design, frequent communication and leadership, as factors responsible for project failures.
A third empirical review was done on a study topic "An Analysis of Factor Causing Failure and Abandonment of Construction Project in Kaduna State, Nigeria" by Terlemun Adagba, Hassan Shamsudden, Joshua Onduanemole (the Authors). This study was carried in 2023 and in Kaduna. The independent and dependent variables was considered. Data collection and analysis by the Researcher was done by the used of structure questionnaire and descriptive statistics using MS-Excel 2016. The findings of the study are corruption as a factor, change in government administration, government policies, and politics.
A study topic on "Abandonment of Building Project in Nigeria; A review of Causes and Solution" by Olapade Olaluse and Anthony Otunola (as Authors). The study was done in 2012 and in Nigeria. And the study dependent and independent variables was considered. The study data collection and analysis by the Researcher were done by the use of questionnaires, interviews, field visit and data was analyzed by sample statistical tools and tabular

format. The study findings were constructive projects are complex and requires professional team to procure and deliver, adequate planning, feasibility, viability, studies and effective monitoring for financial outlay for construction projects to be put in place, provision of infrastructural facilities before, during and after the completion of housing projects.

A review was done on a study which was title "Infrastructure Development and Abandonment in Nigeria" which was written by Mercy Ogunnuse, Huda Salman and Richard Laing (Authors). The study was done in 2021 and in Nigeria. The independent and dependent variables were considered. The study methodology and analysis Researchers was by quantitative approach (questionnaire), used of simple statistical tools and tabular format. The study findings are poor funding change in government, political influence, and inefficient procurement process. These were the factors responsible to project abandonment in Nigeria by the Researchers.

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

3. **Methodology**

A survey research design was adopted for the study. a structure questionnaires design with a five point Likert scale and personal Interview was use to collect data for the study. This is due to the nature of the study whereby the opinion and views of the people are sampled. The research study was carried out at both Brass LNG project site, Field Offices and NNPC Corporate Office, Abuja. An inclusion criterion of staffs within the senior and junior cadre of Brass LNG project team and NNPC staffs who consented to participate in the study were considered, through which a target population of 57 was arrived. Both casual and temporary workers were excluded from the study.

A sample size for this research was computed using Yamane (1967). Formula as illustrated below based on assumed 95% confidence level which p = 0.5.

$$n = \frac{N}{\left(1 + N(e)^2\right)} \qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \qquad (1)$$

Where,

n = The sample size

N = The population size

e = The level of precision

To determine, n;

Substituting the variable in the equation (1) above

$$n = \frac{N}{\left(1 + N(e)^2\right)}$$

Given;

N = 57

e = 0.05

:. $n = \frac{57}{1+57(0.05)^2}$

n = 50

:. n = Sample size = 50 workers

(27 Senior and 23 Junior staffs of Brass LNG LTD/NNPC)

The data was analyzed using the statistical tool of t-test and chi square test (δ) to carry out the analysis and the results was presented in line with the research study objectives. The justification for the use of t-test and chi test is that t-test hypothesis testing is about the difference between means of two groups where there sample size are small. Essentially, that t-test is used to determine whether the two mean ($\bar{x}_1$ *and* $\bar{x}_2$) are significant different at a chosen level of significant. Similar, the chi test is used to check of the any significant relationship between the observed and expected outcome of an events.

4 Data Presentation and Analysis

4.1 Data Presentation

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

For this study, a total of 50 questionnaires were validated and analyzed.

Table 4.1: Demographic Distribution of the Respondents

Demographic Information	Frequency (N)	Percentage (%)
GENDER		
Male	27	54
Female	23	46
AGE		
25 – 30	5	10
31 – 35	13	26
36 – 40	15	30
41 – 45	7	14
45 and above	10	20
EDUCATIONAL QUALIFICATION		
OND	5	10
HND	10	20
BSc/BENG/B.Tech	15	30
MSc/M.Tech/MBA	15	30
Ph. D/DBA	5	10

WORKING EXPERIENCE		
Less than a year	0	0
1 – 5 yrs	6	12
6 – 10 yrs	14	28
11 – 15 yrs	15	30
16 – 20 yrs	7	14
21 – 25 yrs	5	10
25 – 30	3	6

MARITAL STATUS		
Married	45	90
Singles	5	10
Divorced	0	0

CATEGORY OF WORKERS		
Senior staffs	27	54
Junior staffs	23	46

GEOGRAPHIC LOCATION		
Southern Nigeria	0	0

Source: (Akpan, 2024)

The table 4.1 above gives a picture of features of the nature of the demographic of the respondents for the research or study carried out.

Workers were divided into two groups for the study.

1. Senior Staffs
2. Junior Staffs

50 questionnaires were administered to both categories of workers.

Therefore, total number of workers = 50

Number of senior staffs responded = 27

Number of junior staffs responded = 23.

The workers were made to indicate in a questionnaire to the extent to which they agreed that the stated factors that influence the reasons for the failure and abandonment of Brass LNG project in Bayelsa State, Nigeria.

4.2 Data Analysis

Likert type scale was used to extract the data or information.

Strongly Agree (SA) = 4 points

Agree (A) = 3 points

Disagree (D) = 2 points

Strongly Disagreed (SD) = 1 point

No opinion (NP) = 0 point

Table 4.2: Responses from both senior and junior staffs of Brass LNG project team/NNPC

S/N	Factors contributing to failure and Abandonment Brass LNG Project	Strongly Agreed (4)	Agreed (3)	Disagreed (2)	Strongly Disagreed (1)	No Opinion (0)
1.	Federal government undertaking and handling multiple LNG/gas projects at the same time without enough financial and human resources in place, is seen as the root cause of the failure and abandonment of Brass LNG project.	14(9)	5(4)	4(5)	3(2)	1(3)
2.	The delay in signing the final investment decision (FID) for Brass LNG project by FG and other IOCs, stakeholders for the project.	13(10)	10(5)	2(4)	1(3)	1(2)
3.	The lack of commitment, decision, and unseriousness by federal government and other stakeholders of Brass LNG project	12(9)	8(7)	3(5)	3(1)	1(1)
4.	The non-availability of gas supply infrastructure in place to provide feedstock or gas to the Brass LNG plant.	11(12)	8(5)	4(2)	2(2)	2(2)
5.	The withdrawal from the Brass LNG project by one of it's technical partner and stakeholder which is ConocoPhillips	9(8)	7(6)	5(4)	4(3)	2(2)

Source: (Akpan, 2024)

NOTE: The figure in the table above (not in parenthesis) represents the responses of the senior staff, while the figures in parenthesis represent the responses of the junior staffs of Brass LNG project Team/NNPC staffs. In order to convert the ordinal scale to interval scale a weighting was given to each point in the scale.

Strongly Agreed (SA) = 4 points
Agreed (A) = 3 points
Disagreed (D) = 2 points
Strongly Disagreed (SD) = 1 point
No opinion (NO) = 0 point

4.3 Test of Hypothesis

Hypothesis I

To test the hypothesis that the opinion of the Senior and Junior staffs of Brass LNG Project Team/NNPC are not significant different on the root cause factor responsible for the failure and abandonment of Brass LNG project. The t-test statistics can be used to test the hypothesis I, which states that there is not significant difference between the opinion of the senior and junior staffs to the root cause of the failure and abandonment of Brass LNG project. Computing the mean and standard deviation for the variables X_1 and X_2.

X_1 = Senior staffs
X_2 = Junior staffs

i. **The mean for senior staffs**

Table 4.3: The mean for senior staff

Responses	**X**	**F**	**Fx**
Strongly Agreed	4	14	56
Agreed	3	5	15
Disagreed	2	4	8
Strongly Disagreed	1	3	3
No Opinion	0	1	0
Total		**27**	**82**

Source: (Akpan, 2024)

Mean = $\overline{X}_1 = \frac{Fx}{N} = \frac{82}{27} = 3.037$

ii. The mean for Junior Staffs

Table 4.4: The mean for Junior Staffs

Responses	**X**	**F**	**Fx**
Strongly Agreed	4	9	36
Agreed	3	4	12
Disagreed	2	5	10
Strongly Disagreed	1	2	2
No Opinion	0	3	0
Total		**23**	**60**

Source: (Akpan, 2024)

Mean = $\overline{X}_2 = \frac{Fx}{N} = \frac{60}{23} = 2.61$

iii. To determine the standard deviation for Senior staff **($X_1 = 3.04$)**

Table 4.5: Standard deviation for Senior staffs

X	F	$x - \overline{X}_1 = X_1$	Fx_1	$F(X_1)^2$
4	14	0.9	13.44	12.9024
3	5	-0.04	-0.2	0.008
2	4	-1.04	-4.16	4.3264
1	3	-2.04	-6.12	12.4848
0	1	-3.04	-3.04	9.2416
N = 27		$\sum fx^2$		38.9632

Source: (Akpan, 2024)

Variance, S^2 is given as = $\frac{f(x_1)^2}{N-1}$

By substitution, S^2 = $\frac{38.9622}{27-1}$

$$= \frac{38.9622}{26}$$

$S^2 = 1.4986$

Standard Deviation is given as;

$$S^2 = \sqrt{S_1^2}$$

$= \sqrt{1.4986}$

$S_1 = 1.224$

Therefore, Standard deviation for Senior staffs is given as;

$S_1 = 1.224$

iv. **To determine the standard deviation for the Junior Staffs** $\left(\bar{x}_2 = 2.61\right)$

Table 4.6: Standard deviation for Junior Staffs

X	F	$x - \overline{X}_1 = X_1$	Fx_1	$F(X_1)^2$
4	9	1.39	12.51	17.3889
3	4	0.39	1.56	0.6084
2	5	-0.61	-3.05	1.8605
1	2	-1.61	-3.22	5.1842
0	3	-2.61	-7.83	20.4363
N = 23		$\sum f(x_1)^2$		45.4783

Source: (Akpan, 2023)

Variance, $S^2 = \frac{\sum f(X_1)^2}{N-1}$

By substitution, $S^2 = \frac{45.4783}{23-1}$

$$= \frac{45.4783}{22}$$

$S^2 = 2.07$

Therefore, standard deviation $S = \sqrt{S_2^2}$

$= \sqrt{2.07}$

$S = 1.438$

Standard deviation for junior staffs, $S_2 = 1.438$

The data for computing the t-test for only the first factor as responded to by the respondents are ready. They are;

$\overline{X}_1 = 3.04$ $\overline{X}_2 = 2.61$

$S_1 = 1.224$ $S_2 = 1.438$

$N_1 = 27$ $N_2 = 23$

Computing the t-test

The t-test formula is given as;

$$t = \frac{\overline{X}_1 - \overline{X}_2}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

By substitution

$$t = \frac{3.04 - 2.61}{\sqrt{\frac{(1.224)^2}{27} + \frac{(1.438)^2}{23}}}$$

$$= \frac{0.43}{0.3813}$$

t = 1.1277

To determine the degree of freedom for t-test statistic is given by $df = n_1 + n_2 - 2$.

n_1 = Number of Senior Staffs

n_2 = Number of Junior Staffs

df = 27 + 23 – 2 = 48

t – Calculated = 1.1277

t – Tabulated at 48 degree of freedom and 5% significance

$$\therefore t_{48(0.05)} = 2.020$$

Decision Rule

Reject H_o and uphold H_1 (Alternative hypothesis) if the t-calculated exceeds the t-tabulated (table), otherwise, do not reject the null hypothesis.

Decision

There is no reason for rejecting H_o, since the t-calculated (1.1277) is less than t-tabulated which is 2.02 at 48 degree of freedom and 0.05 level of significance. Therefore, I uphold the H_o with the conclusion that there is no significant different between the opinion of Senior and Junior Staffs on the multiple handling of different LNG/Gas projects at the same time is responsible and the root cause of the failure and abandonment of the Brass LNG project in Bayelsa State, Southern Nigeria.

To test for Hypothesis II

Hypothesis II Testing

This is to test using a statistical tool if there is any significant socio-economic impact on the community of the project site as a result of the failed and abandoned Brass LNG project.

Using the chi-square statistical tool and theory.

The formula for chi-square

$$X^2 = \sum\left(\frac{O_i - E_i}{E_i}\right)^2$$

Hypothesis II testing

Let H_{20} = Null hypothesis

H_{21} = Alternative hypothesis

H_{20} (Null), states that there is no significant socio-economic impact on the community at a result of the failed and abandoned Brass LNG project.

H_{21} (Alternative), states there is a significant socio-economic impact on the community/project site as a result of the failed and abandoned Brass LNG project.

Table 4.7: Showing the chi-square statistical tool to test the hypothesis II

Responses from staff	Fo	Fe	$Fo - Fe$	$(Fo - Fe)^2$	$\frac{(Fo-Fe)^2}{Fe}$
Yes	25	16.6	8.4	70.56	4.25
No	20	16.6	3.4	11.56	0.696
NA	5	16.6	-11.6	134.56	8.1
Total	**50**	**50**			**13.046**

Source: (Extra from contingency table, 2014)

Degree of freedom = (r – 1)(c – 1)

= (3 – 1)(2 – 1)

= (2)(1)

= 2

At 0.05% significant level and at calculated degree of freedom of 2. The critical table value = 5.991.

Findings

Since the X^2 calculated value is greater that the critical table value.

i.e., 13.05 is greater than 5.991

X^2 calculated value = 13.05

X^2 tabulated value = 5.991

$X^2_{cal} > X^2_{(tab)} = 13.05 > 5.991$.

Decision

The Null hypothesis (H_{20}) is rejected, and the Alternative hypothesis accepted.

i.e. H_{20} = Rejected

H_{21} = Accepted (based and the outcome of the test statistics)

Conclusion

This means there is a significant socio-economic impact to the host communities as a result of the failed and abandoned Brass LNG project.

4.4 Discussion of Findings

(Based on the outcome of the hypothesis I & II test.

i. **Hypothesis I**

H_o = Null hypothesis

H_1 = Alternative hypothesis

H_o = Accepted

H_1 = Rejected

H_o states there is no significant different in opinion between the senior and junior staffs of Brass LNG project team/NNPC on the root cause factor that led to the failure of Brass LNG project in Brass Island, Bayelsa State, Southern Nigeria.

H_1 States that there is a significant difference in the opinion of Senior and Junior staffs.

ii. **Hypothesis II**

H_{20} = Null hypothesis

H_{21} = Alternative hypothesis

H_{20} = Null hypothesis was rejected and the alternate hypothesis accepted because;

$X^2_{cal} > X^2_{tab}$

I.e. X^2 calculated value is higher than the X^2 tabulated critical value.

Hypothesis II

Hypothesis, H_{21}, which say there is a significant socio-economic impact in the community/project site as a result of the failed and abandoned Brass LNG project.

Conclusion

The root cause for the failure and abandonment of Brass LNG project in Brass Island, Bayelsa State, South-South Nigeria was the simultaneous handling of 3 LNG plants by the Federal Government/NNPC without enough available, adequate human and financial resources in place for these projects by FG/NNPC. Another contributory factors for the failure of the Brass LNG plant, was the lack of seriousness, lack of commitment and prompt decision and action by past and present Federal Government of Nigeria for the actualization of the Brass LNG Project. Due to the failure and abandonment of the Brass LNG Project, Nigeria is losing billions of dollars due to the non-actualization of Brass LNG Project. The completion and operation of Brass LNG project would have been contributing about 10 Billion Dollars annually to the revenue of Federal Government/Nigeria for the sales of LNG and NGL product to both Local and Foreign buyers.

5.3 Recommendations

Considering the result of this study findings, it is appropriate to recommend the following to forestall future occurrence of failure and abandoned oil/gas project in Nigeria.

i. The NLNG business model should be used and adopted for all future LNG/Gas projects in Nigeria by both Federal, State and Stakeholder in the business.

ii. The Federal Government and other stakeholders managing our oil and gas resources, should stop the over politization of huge economic projects like the Brass LNG Project, which posses enormous benefit for Nigeria and Nigerians in terms of revenue generation, employment opportunities and technology transfer etc.

iii. The Federal Government/NNPC should show more seriousness and commitment to all future LNG projects in Nigeria. The Federal Government should be swift in it's decision-making process and avoid delays in signing the Final Investment Decision (FID) for critical LNG project such as the Brass LNG project.

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