

**IMPACT OF BARGES ON TANKERS DISCHARGE OPERATIONS IN IJEGUN – EGBA AREA OF LAGOS STATE.**

**EMORWODIA, SAMUEL OGHENETEGA**  
**Institute of Maritime Studies,**  
**University of Lagos**  
**Otega2420@gmail.com**

**ABSTRACT**

*The study aims to find out if barges have an impact on tankers discharge operational efficiency in Ijegan – Egba Area. The research population for this study is comprised of Staff members of tank farm operators in Ijegan-Egba Area of Lagos state (the organizations). Primary sources of data collection were used for the study. Responses from the questionnaire administered were presented, analyzed and interpreted by the use of percentages and tables. Based on the findings, the study affirms that the presence or absence of barge integration does not wield a significant influence on the efficiency and productivity of tanker discharge operations. The research demonstrated that there is no substantial disparity in operational delays, ease of operation, accuracy of documentation, and overall time efficiency between scenarios with and without barges integrated into the tanker discharge process. Similarly, the study determined that the safety and environmental aspects of tanker discharge operations in the study area remain largely unaffected by the presence or absence of barge integration. The established safety measures and environmental considerations in the Ijegan-Egba Area appear to be consistent, irrespective of whether barges are incorporated into the process. Moreover, the economic considerations and cost implications of tanker discharge operations in the study area remain stable, regardless of barge integration. The economic performance and associated costs appear to be maintained at similar levels. Lastly, the study concludes that the environment is not significantly impacted by the presence or absence of barge integration in tanker discharge operations.*

**Keywords:** *tankers, discharge, operational efficiency, Ijegan – Egba .*

**Introduction**

The efficient and safe discharge of cargo from tankers at the jetty is essential for smooth maritime operations and maintaining the global supply chain. However, the presence of barges near the jetty during tanker discharge operations can introduce various challenges and potential impacts on these operations. Barges are commonly used in marine logistics to support cargo handling processes, provide additional storage capacity, and facilitate the transportation of goods between tankers and the shore. While barges offer flexibility and versatility, their close proximity to the jetty during tanker discharge operations raises concerns regarding safety, operational efficiency, cargo handling constraints, environmental implications, and cost considerations.

Safety is of paramount importance in maritime operations and it is the first thing to consider in undertaking any maritime related activity. The presence of barges near the jetty during tanker discharge operations can increase the risk of accidents, collisions, and interference with mooring lines. These safety risks can endanger personnel, cause damage to equipment, and disrupt the smooth flow of operations.

Operational efficiency is crucial for optimizing turnaround times and meeting the demands of the global supply chain. However, the interaction between tankers and barges at the jetty can result in restricted maneuverability, increased waiting times, and potential bottlenecks. These factors can lead to delays, decreased productivity, and increased costs.

The presence of barges near the jetty during tanker discharge operations can also introduce cargo handling constraints. These constraints may include limitations on loading equipment, space availability, and storage capacity, which can pose challenges for transferring cargo from tankers to the shore tanks, as well as for storing and managing goods at the jetty.

Environmental implications are another concern when considering the impact of barges on tanker discharge operations at the jetty. The risk of spills, contamination, or disruption to marine ecosystems can have significant consequences. Understanding and mitigating these environmental impacts are crucial for sustainable maritime operations.

Furthermore, the incorporation of barges into tanker discharge operations at the jetty can have cost implications. Additional expenses related to barge rental, maintenance, and personnel must be considered to assess the cost-effectiveness of using barges in conjunction with the jetty facilities.

Given these considerations, there is a need for a comprehensive study to investigate the impact of barges on tanker discharge operations at the jetty. The study aims to analyze safety risks, evaluate operational constraints, assess cargo handling efficiency, address environmental concerns, and analyze cost considerations. The findings will contribute to enhancing safety protocols, optimizing operational practices, and guiding decision-making processes for stakeholders involved in maritime trade, including port authorities, shipping companies, and logistics providers.

### **Statement of the Problem**

The transportation of crude oil and petroleum products is a critical aspect of the global energy industry. Tankers have traditionally been the primary means of transporting large quantities of oil from offshore drilling platforms to onshore storage facilities. However, in recent years, barges have emerged as a viable alternative for the transfer of oil to shore tanks. Barges offer several advantages, including increased flexibility, cost-effectiveness, and reduced environmental impact. Despite these benefits, there is a need to investigate the potential impact of barges on tankers' discharge operations to shore tanks. The problem addressed in this study is to assess the impact of barges on tankers discharge operations in Ijegun – Egba Area.

### **Objectives of the Study**

The study is to empirically assess the relationship that exists among barges and tankers discharge operations in Ijegun – Egba Area. This broad objective is broken down into the following specific objectives; namely to:

- I. Examine the impact of barges on tankers discharge operational efficiency in Ijegun – Egba Area.
- II. Evaluate the safety and environmental implications of incorporating barges in tankers discharge operations in Ijegun-Egba.

### **Research Methodology**

Survey research design is adopted. The research population for this study is comprised of:

1. Staff members of tank farm operators in Ijegun-Egba Area of Lagos state (the organizations) which includes;
  - a. Wosbab Energy Solutions
  - b. Emadeb Energy Services Ltd
  - c. Mao Petroleum Ltd
  - d. Menj Oil Ltd
  - e. OceanPride Energy Services Ltd

- f. A.A. Rano Nigeria Ltd
  - g. AIPEC Oil and Gas Ltd
  - h. First Royal Oil Ltd
  - i. RainOil Ltd
  - j. Chipet International Ltd
  - k. Shell Plux
  - l. First Deep Water Oil
  - m. Stallionaire Ltd
2. Government regulatory agencies in Ijegin-Egba Area [Department of Petroleum Resources (DPR) and Petroleum Products Pricing Regulatory Agency (PPPRA)]
  3. Tanker Crew members and Cargo surveyors handling operations in Ijegin-Egba Area

Simple random sampling technique were used in selecting samples used in this study because this gives equal opportunity to every item in the population. The sample for this study is will be made up of thirty percent (30%) of the population in order to ensure representativeness of the population. Sampling is the method by which fractions of population (samples) are studied. Sampling also refers to the procedure for drawing samples from a population. Sampling theory suggests that methods of estimating sample size in a particular situation depend on:

- The properties of the population.
- The kind of study.
- The resources, time and labour available and the cost to be incurred.

The sample for this study is will be made up of thirty percent (30%) of the population in order to ensure representativeness of the population.

A sample of thirty percent (30%) was randomly selected from:

4. Tank farm operators
5. Tanker Crew members and Cargo surveyors handling operations in Ijegin-Egba Area
6. Government regulatory agencies (DPR and/or PPPRA) representatives in Ijegin-EgbaArea.

The random sampling technique was used for selection of sample because it gives every item in the population an equal opportunity of been selected.

In order to collect as much relevant material on this study as possible, a number of methods of data collection will be used. However, for good understanding of this study both primary and secondary sources of data wereused. The major instrument for the collection of the primary source of data here is the questionnaires. At some point personal interview was used to solicit additional information for clarity where need.The personal interviews involve an oral conversation with the officers of Tank farm operators in Ijegin-Egba Area and government regulatory agencies in Ijegin-

Egba Area.

Responses from questionnaires were presented in tables and subjected to mathematical and statistical analysis where percentage comparison and t-tests method were used.

Chi-square is denoted  $X^2$ . It can be defined as a statistical tool that is used to test the significance difference between observed frequency and expected frequency of bivariate observation. It is also used for comparison of frequencies distribution.

Mathematically, it can be denoted as:

$$X^2 = \sum(O_j - E_j)^2 / E$$

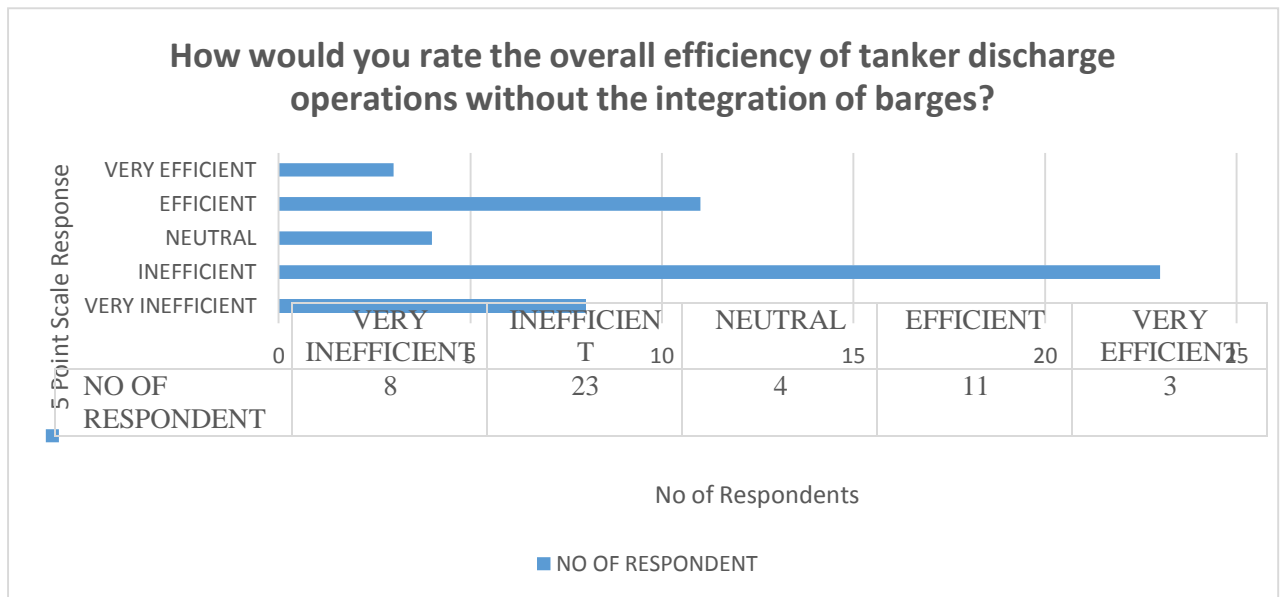
Where:  $X^2$  = Chi-square

$\Sigma$  = Summation of all quantities  
 $O_j$  = Observed frequency

$E_j$  = Expected frequency

**Presentation and Analysis of Data**

**FIGURE 1:** How would you rate the overall efficiency of tanker discharge operations without the integration of barges?



*SOURCE: FIELD REPORT (JULY, 2023)*

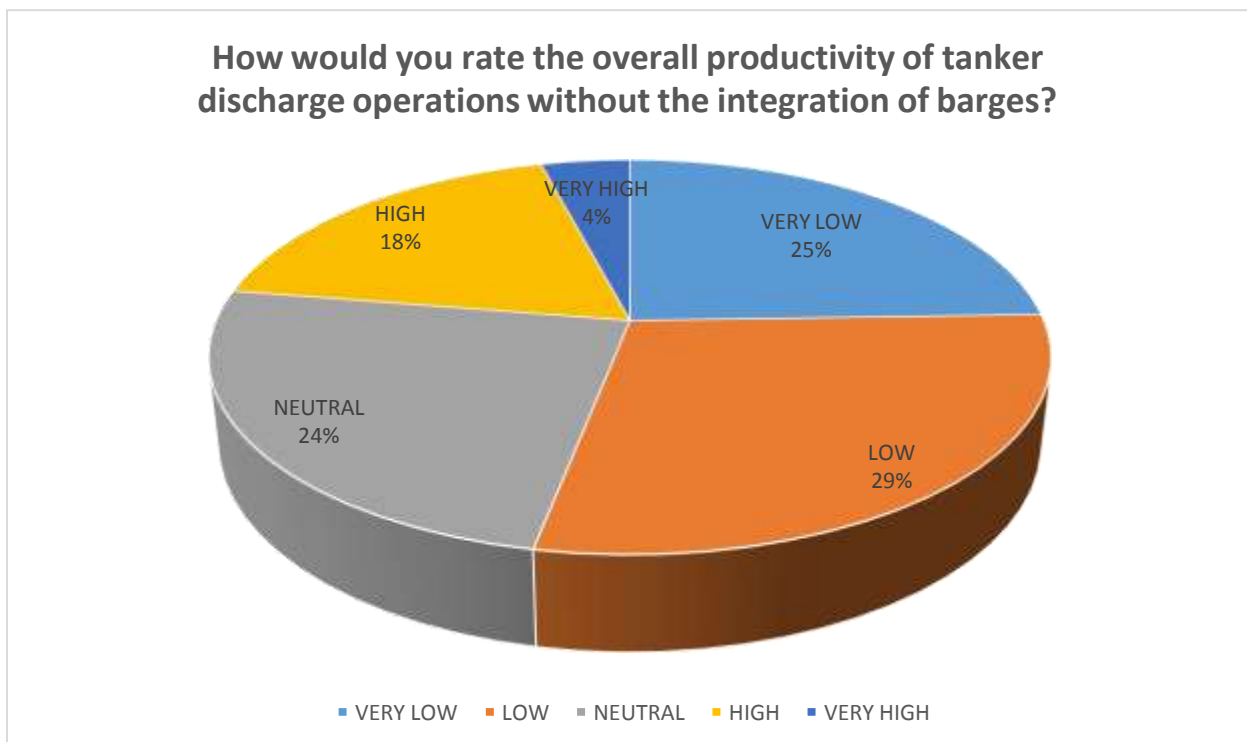
This figure presents the responses from a survey or study conducted to gather opinions on the overall efficiency of tanker discharge operations when barges are not integrated. The table displays the distribution of responses based on the level of efficiency perceived by the respondents. The responses are categorized into different levels of efficiency, and the number of respondents and corresponding percentages for each category are provided.

Very Inefficient, this category indicates that the respondents consider the tanker discharge operations to be highly inefficient. Inefficient. Respondents in this category find the operations to be inefficient but not to the extreme level of "Very Inefficient." Neutral. This category represents respondents who have a neutral opinion about the efficiency of the operations, neither considering them efficient nor inefficient. Efficient. Respondents in this category perceive the operations as efficient, indicating that they believe the operations are well-organized and effective. Very Efficient: This category suggests that the respondents find the tanker discharge operations to be highly efficient.

The total number of respondents is 49, as indicated at the bottom of the table. This total corresponds to the sum of respondents across all efficiency categories.

In summary, this table provides a snapshot of the opinions and perceptions of respondents regarding the efficiency of tanker discharge operations without the integration of barges. It quantifies these perceptions into different efficiency categories and provides insight into how respondents view the current state of operations.

**FIGURE 2:** How would you rate the overall productivity of tanker discharge operations without the integration of barges?



*SOURCE: FIELD REPORT (JULY, 2023)*

This figure presents responses from a survey or study that assessed the overall productivity of tanker discharge operations when barges are not integrated. The table displays the distribution of

responses based on different levels of perceived productivity. The responses are categorized into different productivity levels, and the number of respondents and corresponding percentages for each category are provided.

The total number of respondents is 49. The responses are divided into different categories based on perceived productivity levels. Very Low: 12 respondents (24.5%) This indicates that 12 out of the 49 respondents (approximately 24.5%) perceive the productivity of tanker discharge operations without the integration of barges to be very low. This suggests that these respondents believe that the operations are not productive at all.

Low: 14 respondents (29%). Nearly one-third of the respondents (14 out of 49, or approximately 29%) rate the productivity as low. This suggests that a significant portion of respondents view the operations as having limited productivity without the involvement of barges.

Neutral: 12 respondents (24.5%). Another 24.5% of respondents (12 out of 49) have a neutral opinion regarding the productivity of the operations. This indicates that these respondents do not strongly lean towards either low or high productivity.

High: 9 respondents (18%). About 18% of the respondents (9 out of 49) consider the productivity of the operations to be high even without the use of barges. This suggests that there is a subset of respondents who perceive the operations to be productive.

Very High: 2 respondents (4%). A small minority of respondents (2 out of 49, or about 4%) rate the productivity as very high. This suggests that a very small portion of respondents believe the operations are exceptionally productive without the involvement of barges.

The combined percentage of respondents who perceive the productivity as either "Very Low" or "Low" is 53.5%. This indicates that more than half of the respondents find the operations to be lacking in productivity without the integration of barges. About 42.5% of respondents have a more positive view, rating the productivity as either "High" or "Very High."

In conclusion, the table's analysis reveals diverse opinions about the productivity of tanker discharge operations without barge integration. While a significant portion of respondents view the operations as having low productivity, there are also those who perceive the operations to be productive or very productive. This information can serve as a foundation for discussions on potential enhancements or strategies to address the productivity concerns raised by respondents.

## CONCLUSIONS

So far the study has progressed through various levels despite the obstacles faced along the way. The researcher in order to achieve the objectives of the study; did review some literature, many articles, textbooks and journals on the concept of barges, tankers and tankers operations.

## RECOMMENDATIONS

Based on the comprehensive findings from the study on the impact of barges on tanker discharge operations in the Ijebu-Egba Area, a set of detailed and actionable recommendations are proposed:

- I. Operational Efficiency:** To enhance operational efficiency, it is essential to establish a robust data-driven approach. Implement an integrated information management system that captures real-time data on tanker discharge operations. This system should track key performance indicators (KPIs), such as turnaround time, loading and unloading rates, and documentation accuracy. Regularly analyze this data to identify bottlenecks and areas for improvement. Conduct periodic training sessions for personnel involved in tanker discharge operations to upgrade their skills and keep them up-to-date with the latest industry best practices.
- II. Safety and Environmental Considerations:** To maintain and further improve safety and environmental practices, develop a comprehensive safety culture within the organizations involved in tanker discharge operations. This includes conducting regular safety drills, sharing lessons learned from incidents, and encouraging a proactive reporting system for potential hazards. Collaborate with relevant regulatory authorities and industry experts to

establish a standardized safety and environmental guideline framework. Regularly review and update these guidelines to reflect evolving industry standards and technological advancements. Encourage the integration of environmental sustainability measures, such as waste management, recycling, and the use of low-emission equipment.

## **REFERENCES**

- Asika, N. (2008). *Research Methodology in the Behavioural Sciences*. Lagos: Longman Nigeria Limited.
- Burns, N., & Grove, S.K. (2001). *The Practice of Nursing Research: Conduct, Critique, and Utilization* (4th edition). Philadelphia: WB Saunders.
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Sage Publications.  
<https://dexteroffshore.com/types-of-barges/#what>  
<https://micdot.com/types-of-barge/>  
<https://www.pollisum.com/blog/types-of-barges/>
- LoBiondo-Wood, G., & Haber, I. (1998). *Nursing Research: Methods, Critical Appraisal, and Utilization* (4th Edition). St. Louis: CV Mosby.
- OSHA Academy Course 895 Study Guide | Deck Barge Safety | 2017 Geigle Safety Group, Inc.
- Polit, D.F., & Hungler, B.P. (1999). *Nursing Research: Principles and Methods* (6th Edition). Philadelphia.
- Seaman, H.C. (1991). *Research Methods: Principles, Practice, and Theory for Nursing*. Norwalk: Appleton & Lange.
- Uys, H.M., & Bason, A.A. (1991). *Research Methodology in Nursing*. Pretoria: Kagiso.
- Zikmund, W. G., Babin, B. J., Carr, J. C., & Griffin, M. (2019). *Business research methods* (10th ed.). Cengage Learning.