



## Investigating Implementation of Green Port Initiative at Johor Port Berhad

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### ABSTRACT

Environmental sustainability in the port industry is a growing concern among port authorities, policy makers, port users, and local communities. Hence, port operations are continuously subject to challenges as a result of unpredictable environmental changes and ever evolving business dynamics. In order to address this issue, the sustainable development and green port concept have emerged as a requirement and the solution. In an attempt to minimize the environmental impacts for sustainable operations in the long run, Johor Port Authority (JPA), a responsible party that monitors the port operation in Johor has introduced Green Port Initiative (2014-2020) to recognize the importance of port sustainability as a key driver in the port development and its sustainability in the future. One of the ports which participated in this initiative was Johor Port Berhad (JPB) which is located in Pasir Gudang, Johor, a southern state of Peninsular Malaysia. The initiatives which started in 2014 is worth an investigation in terms of performance and involvement of the JPB staff. The study has adopted qualitative research method using the group focus interviews to collect the data and to extract the theme and issues. The findings revealed that there is direct positive association between degree of awareness and implementation effectiveness among the respondents. This indicates that there is insufficient communication in creating awareness among JPB staff resulting at lower level of commitment, hence there is an immediate need for relevant training programs in realizing green concept objectives. It is envisaged that these preliminary findings will enable JPA to design more appropriate mechanisms in the organization to not only effectively implement Green Port policy framework but also to ensure that the relevant performance matrices are developed to monitor, track and report its implementation success.

**Key words:** Supply Chain Management, Logistics management, Green Port initiatives, Sustainable operation.

### 1. INTRODUCTION

The recent years have seen a growing interest in the environmental impact of port operations and development due to pressing global issues such as climate change and energy consumption. The port industry is facing increasing challenges since it is subject to closer scrutiny in terms of environmental regulatory compliance. Hence, a sustainable port operation is inevitable to long term sustainability of the port industry. An ability of the port operations to design and implement business strategies which meets not only current but also future needs of the port and its stakeholders without creating harm to human and nature [1] while keeping an optimal balance between business performance and minimal impact to environment [2] explains a sustainable port operation.

However, to what extent a port operation can protect human and the nature remain an unanswered question given changing business requirements as well as international trade dynamics. This has made a call to all port operators and port authorities to look into ways and means of transforming existing port operations into green concept operations with an aim of achieving sustainable development. [3] concluded that literature has consolidated the green concept of a port operation into three main aspects: i. environmental protection, ii. energy conservation and iii. ecology care. In an attempt to minimize the environmental impacts and pursue sustainable operations in the long run, several legislations regarding the port operation have been introduced in a very timely manner at both national and international levels. For example, Green Port Policy was introduced by Lembaga Pelabuhan Johor (LPJ) in 2010. This Policy, incorporated environmental issues into the port core strategies for port development and operations to be both environmentally friendly and commercially profitable. The implementation of this policy clearly indicates recognition of port sustainability development as a key driver in the port development in the future.

The implementation of Green Port Policy which is supported by a set of specific initiatives was introduced to facilitate the port operators' activities to achieve Green port status by 2020.

These initiatives involve participation from management team and support staff from JPB.

These initiatives are expected to have direct impact on cost effectiveness, in securing new markets and alliances, in achieving competitive advantages over neighboring ports and also to pursue global green logistics developments. Hence, it is important to understand the achievement of the Green Port initiatives implemented by JPB which can be adopted as a role model for other port operations in Malaysia. In this respect, the involvement of JPB staff will be of main focus in this study, and therefore, the study aims to investigate their involvement in the implementation of Green Port initiatives.

## 2. BACKGROUND OF RESEARCH

The Green Port initiatives have been identified as one of the Key Performance Indicators (KPI) for creating a safe and healthy work environment in the port under the Johor Port Authority's Strategic Plan 2013 - 2020. The initiatives will guide the business decisions, development, and operations towards achieving a sustainable port development and operation. The Green Port initiatives suggest some proactive approaches and simple solutions where impacts on the local community and the environment can be better managed. The initiatives are focusing at 3 main elements, which is environment, community engagement and promoting sustainability.

Based on the scope of Green Port initiatives implemented at JPB, the researcher decides to focus specifically on the breakbulk operation which most of the Green Port initiatives are applicable at this operation.

## 3. PROBLEM STATEMENT

Various researchers [4-6] have investigated green supply chain management in the last decade. This is more prominent in the port operations as it is a main driver of global trade. However, to what extent or intensity the port operations are seen as "green" or sustainable remain an unending debate in the literature. As posited by [7], such concerns has made green port operations vital to a sustainable development of port industry since it is found to adversely affect environment. Hence, the "green port concept" has attracted attention from various part of the world and has become an inevitable prime focus among not only scholars but also practitioners.

Although Green Port concept has been introduced for decades in Western developing countries, it has only recently been brought to the Malaysian community since the past three years. Therefore, majority of Malaysians are still unfamiliar with the concept of Green Port and its benefits towards our daily life and environment. Lembaga Pelabuhan Johor (LPJ) which is the authority that governs the operation of ports in

Johor has introduced Green Port initiatives under the implementation of Green Port Policy (2014-2020) which is aimed at promoting safe and healthy and sustainable operation of all ports in Johor. This implementation is specifically focusing on the marine activities such as ballast water management, fuel quality used by the ship, energy, electrical and fuel savings, and environmental initiatives.

These initiatives which started in 2014 are warranted for investigation in particular to assess the involvement of JPB staff and the obstacles faced by the team during the implementation which then will allow this research to propose several recommendations to JPB and LPJ for improved benefits realization of these initiative within the port operations.

## 4. THE IMPORTANCE OF SUSTAINABLE PORT

According to [7], sustainable port operations refer to the 'business strategies and activities that meet the current and future needs of the port and its stakeholders while protecting and sustaining human and natural resources. For this study, the researchers will use [2] & [4] more comprehensive definition of a sustainable port which is 'a port with an optimal balance between performance of business, utilizing the available capacity, limited use of space, minimal negative influence on the environment and a relation between port and hinterland [3], [8] & [9]. Research in sustainable port operations, according to [9], was driven by the rising environmental legislations. But according to [10], the need for research in this area was driven by the new role of ports within the framework of the sustainable supply chain, the changing expectations of shippers in terms of customer service and costs, and the challenging sustainable logistics initiatives.

## 5. PORT ENVIRONMENTAL ISSUES

In terms of the environmental impact of port operations, most studies have concluded that the major types of impact on the environment are on the water and air quality. [11] revealed the impact of shipping routes changed to the reductions in health effects to the local community, such as asthma, other respiratory diseases, cardiovascular disease, lung cancer and premature mortality [12].

In another research, [13] assessed the environmental impacts generated by routine shipping operations at the Port of Rotterdam and concluded that a water pollution comes from ballast water, fuel oil residue and waste disposal of ship operations, as well as cargo residue, would form a contaminated sludge on the seafloor that requires a dredging of which this activity will cause a disruptive impact on marine ecosystems. The above studies led to a better understanding of environmental issues in ports but did not directly cover any

port strategy or any appropriate strategy holistically can be used to address these environmental issues as a result of the port operation. There is also a gap in the literature to integrate economic and social aspects with environmental concerns to address the port's sustainable growth and development which is one of the objectives in this research.

### 6. BENEFIT OF GREEN PORT

In handling the legalization pressure on this issue, the adoption of a low-carbon and environment-friendly development strategy has become an inevitable trend and necessity for future ports. [14], conclude that the implementation of the Green Port Concept covers six key areas in ports, and environmental sustainability goals will benefit the port shown in Table 1.

**Table 1:** Six Key Areas of Green Port Concept

Areas	Description
Energy Consumption	It is encouraging energy conserving to maximize energy efficiency for a port operation by implementing solar panel system and installation of photovoltaic systems
Sustainable Development	It is aimed to enhance the environmental performance of the port buildings while maximizing long-term economic benefits
Water Quality	Development of water conservation strategy to improve water the quality and preservation of water supply
Waste Management	Development of water conservation strategy to improve the water quality and preservation of water supply
Air Quality	To reduce a gas and air emissions from port operations
Sustainable Business Practices	To give an equal treat to the environment, economics and social concerns in the decision making process

### 7. RESEARCH METHDOLOGY

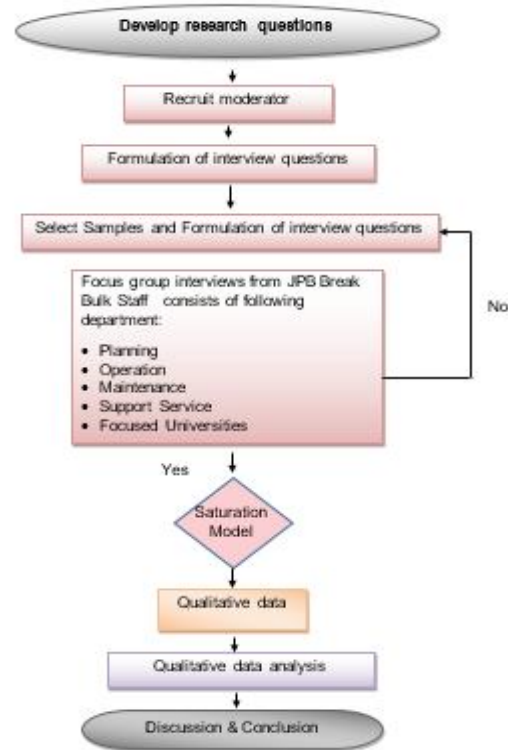
This study adopted a qualitative approach where focus group interviews were employed which was aimed at enhancing confidence in the research findings [15] & [16]. Figure 1 below provides an overview of the research design employed in this research.

The selection of focus group interviews is appropriate since this is exploratory research to understand different views of stakeholders involved in the implementation of Green Port initiatives and therefore, it can be explored and triangulated. Findings from previous research studies show that focus group interview is very effective in gaining insights and exploring the issue to be addressed, especially if there is a limitation in information availability [17]. Six (6) break the

bulk staff was selected from various position levels and functions to enrich the information gathering during the triangulation process. The number of respondents is in line with the recommendation by [18] & [18] who suggest that six to ten respondents are sufficient [20].

### 8. RESULT AND DISCUSSIONS

The environmental issues that occurred at breakbulk operation as a result of port and shipping activities is a major concern for the staff themselves. Some of the environmental issues are very serious and require immediate attention of port management. For instance, oil spillage is happening in daily operations and have become very dangerous towards marine ecosystem because it is very difficult to be cleaned and may last for years in the sea. Despite growing concern on the environmental issues among the staff, the findings revealed that the majority of the respondents are not clear about the implementation of Green port initiative at JPB. There is no clear direction from the management about the strategies to achieve these initiatives, and most of them are not aware of the initiatives that being introduced by the authority (i.e.LPJ). This is evident from following quote during the interview:



**Figure 1:** Research Process Flowchart

*“My opinion is the implementation itself is not clear...”*  
*“Not really. Most of them did not know about Green Port...”*

Respondents opined that these initiatives are only being discussed among the top management of JPB and LPJ hence resulted at lack of awareness among the staff.

*“The information given to the top management is stuck where the staff didn’t receive the news about the implementation. This is why most of the staff not aware of green port implementation.”*

Due to the lack of communication, some of the respondents were assuming that the Green port concept to be something that is similar to Green Logistics concept which was evident in following quote:

*“Emm...As for me Green Port is something similar to Green Logistics which everything will contribute to the clean air and good environment.”*

Based on the answer given by the respondent, researcher found that most of the staff in Break Bulk Division are not aware about the Green Port implementation at Johor Port. From the interview session, it was found that there were no KPI mechanics and measurements to evaluate and monitor the realization of the green port implementation objectives. KPI is one of the measurement that guides an employee about execution, evaluation and control of Green Port initiatives. This infers the lack of urgency and seriousness from the top management about implementation and realization of Green Port status which will turn out to be one of the prominent recommendation of this study.

Due to absence of proper performance management mechanisms resulting at unavailability of performance data about these initiatives, most of the respondents were unable to share the current status of the initiatives implementation. Nevertheless, most of them agreed that some physical impacts were evident in the port operation probably as a result of the Green Port initiatives implementation. This could be attributed to absence of efficient and effective communication channels about not only the initiatives planned for the program but also time sharing of performance metrics of these initiatives across the organization. In such situations, is it proper to conclude that the feedback mechanisms are also a missing component in the entire program where the organizational citizens are unable to provide their feedback from time to time to improvise the initiatives as well as the performance metrics. In addition, a misconception between Green Port and Green Logistics has added to existing confusion where majority of the respondents perceived it to be similar in nature. This was clearly evident in the following quote:

*“Is that when we have many trees in our port consider as green port? \*laugh\* or all of the workers must ride bicycle to work to keep clean air towards green port?”*

The statements above also show that the respondents were living in the world of assumptions when it comes to Green Port initiatives as well as implementation.

The findings also extracted the information about possible

issues and gaps in the implementation of Green Port initiatives at breakbulk division. This is the focus area for the improvement in execution of the initiatives in the future. There were two issues which was discovered to be an obstacle in Green Port implementation as shown in the quote below:

*“The main barriers are the cost we need to bear for this green port implementation. As we know to compare our port with others international port they are more advance and sophisticated while our machine at port is conventional and old.”*

The implementation of Green port initiative will be very costly to the management. Many of the break bulk equipment are aging and will be costly to be upgraded or to be replaced if needed to meet the objectives of Green Port initiatives. This could be one of the reasons why the initiatives were not seriously implemented. This can be evident from the following quote:

*“For example, we use conventional grab. Near example of advance port is Singapore Port our neighbor. There they already use advance machine like pipeline and some other latest machine to transport their goods...”*

*“The implementation is made by JPA but for each department it is not standardize where the top management did not apply this Green Port implementation in break bulk department...”*

*“To meet the green port requirement we really need to transform. From the point of view of safety, health and the facilities in the port. Maybe as for Singapore they ready to absorb the high cost to implement such an advance technology.”*

During the interview, the researcher noticed that communication channels and processes were not properly implemented and executed to explain to the staff about the Green Port initiatives as a part of long term port operation business strategy. Management also did not provide adequate training to the staff involved in the initiative implementation to ensure that they are fully equipped with sufficient knowledge to implement these initiatives effectively. Port management probably is very selective in the implementation of the initiative since it involves cost. A further investigation also revealed that these initiatives were not made compulsory to the port operator which is perceived as one of the contributing factor to inefficient implementation of the Green Port initiative.

## 9. CONCLUSION

Based on the study, researcher found that there are two barriers in implementing Green Port initiative which are cost concerns and lack of communication channels. Insufficient

information may lead to the misinterpretation of the green port initiatives objectives and therefore lacked in support needed from the staff who directly involved in the implementation. Apart from communication, a proper training, according to Elzarka (2015) is also crucial to prepare the staff in term of knowledge and competencies to perform these initiatives.

Both communication and training are requiring some financial investment which will impact JPB's commitment to achieve Green Port status by 2020. The most important contribution of the Green Port initiative is not only environmental protection and preservation, but also to reduce unnecessary costs in the operation al processes. Therefore, government interference is recommended to support the port operator in terms of financial aid in order to achieve a Green Port status.

The Johor Port Authority (JPA) must play its active role in promoting the Green Port Policy and its implementation. They have to explore about the types of support they could offer to Johor Port and its employees to ensure that Green Port initiatives implemented as planned and that it yields that benefits that was aspired to be achieved at the end of the program.

This study serves as a reference for future research in order to improve and enhanced the green port implementation to achieve the aspiration to become a greener port by 2020

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