

# Challenges in Attaining Sustainable Development Goals in Port Klang: Port Management Perspective

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**Abstract**— Sustainable development goals (SDGs) revolve around three broad elements: cost reduction, productivity enhancement and environmental protection. Seaport industry is inextricably linked to enormous competitions; requiring unceasing improvements to be able to achieve competitive advantages by addressing the relevant sustainable development goals. Dynamic capabilities theory is incorporated in this study to substantiate the relationship between sustainable development goals and sustainable competitive advantages. In addition, dynamic capabilities theory provides a guideline for port management in ascertaining efforts needed to stay relevant in the ever demanding seaport business. Nonetheless, in the process of attaining sustainable development goals, challenges are faced by port management. This study incorporates a qualitative approach, focusing in port Klang due to the high volume of cargo handled and being the national economic barometer. Interviews were conducted whereby the respondents were managerial personnel in their respective departments. The findings indicate that the challenges in attaining sustainable development goals comprise of technological constraints, financing issues, human capital barriers and supplier associated problems. Addressing these stumbling blocks proves advantageous for port Klang whereby the attainable sustainable development goals is a catapulting factor for ports to achieve sustained competitive advantages in the future. Associating this research to SDGs is a noble attempt at aligning future business strategies to the right SDGs in the port industry which will benefit Malaysia's prospect in competing and creating niche benefits for the country.

**Keywords**— Sustainable Development Goals; Port Management; Dynamic Capabilities; Port Klang; Resource Based View.

## 1.0 Introduction

Seaports are essential infrastructures in facilitating economic growth of any given country. Moreover, seaports are the basic requirements for sea cargo movements through vessels to berth in order to conduct import and export activities which contribute to the growth and supporting businesses. [1] Seaports in Malaysia can be classified into 3 categories which are private, federal and state ports. [2]

Port Klang is the largest port in Malaysia, which has handled more than half of the container trade within the country. It is located at the state of Selangor, and acts as the main gateway for cargo movement of the country. [3] The area is separated into two terminals, known as Westport and Northport. Each terminal has its own functional facilities to support the daily operations requirements. Westport focuses on services like on-dock depots, bunkering and warehousing, while Northport focuses more on container and conventional cargo movements. [4]

In recent times, Malaysia is experiencing severe environmental issues including severe air, sound and water pollution [5]. Rapid increases in energy consumption have caused the reduction of primary non-renewable resources and increase in pollution levels [6]. Ports are considered major sources of pollution in any country. In Malaysia, seaports are often close to populated urban areas which mean exposing millions of people to additional pollution. [7] In recent years, there has been an increase in the number of environmental issues caused by port operations and developments. Such pollution is normally caused by inefficient equipment, vehicles used in the ports including trucks, traditional methods of cargo handling

including older generation equipment, tugboats and others to just name a few.

All these equipment and operations are contributing to a massive increase in sulphur dioxides (SO<sub>2</sub>), particulate matter (PM), nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), volatile organic compounds (VOCs), sulfur oxides (SO<sub>x</sub>), and hydrocarbons (HC). This air pollution adversely affects human health, especially people associated to the port industry and surroundings. [8]

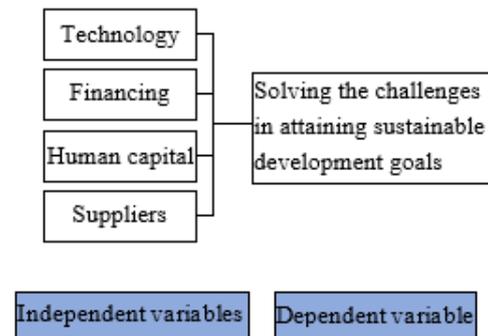
Malaysian ports are considered inefficient when compared to competitors such as the port of Singapore in terms of the productivity due to outdated infrastructures. Comparatively, port of Singapore is currently the second biggest container port in the world next to Shanghai, handling up to 33.67 million twenty-foot equivalent units (TEUs) in year 2017, more than the combined volume of Malaysia's biggest ports (Northport and Westport) which only handled 12.06 million TEUs of cargo. [9]

Failure to address social and environmental demands may damage a seaport's business. [10] Customers of seaports such as the shipping lines are exerting pressure to the ports as they have altered business strategies to protect their own public image. On another note, pressure from insurers is mounting as they refuse to cover liabilities arising because a port management fails in addressing environmental concerns. [10] In addition, there is also pressure from seafarers such as strikes, boycotts for the reason of health concerns arising from such pollutant environment harms. Further pressure from governments and policy makers due to increased public awareness highlights the concerns and need to address the current situation.

In order to address these problems, efforts in attaining sustainable development goals (SDGs) is definitely inevitable. However, in the process of attaining SDGs, seaports will face substantial challenges such as technology constraints, financing constraints, human capital issues and suppliers related problems. [11]

## 1.1 Conceptual framework

**Figure 1.** Conceptual framework developed for research



## 2. Literature review

### 2.1 Dependent variable: Solving the challenges in attaining SDGs

Sustainable development goals (SDGs) basically have 3 broad objectives which include reducing operation costs, enhancing productivity and encouraging environmental protection. SDGs are a collection of 17 global goals set by United Nations. [12] The 17 goals are interconnected, whereby all have targets to achieve. The SDGs accommodate a broad range of social and economic development issues. [13] In regards to this study, there are 7 out of 17 SDGs that have been identified as highly related to the research, which are goals number 6, 7, 8, 9, 13, 14, 15.

### 2.2 Independent variable

#### 2.2.1 Technology

Technology is often a product of science and engineering. [14] Innovative technologies and the development of sustainable seaports operations are inevitable investments that allow a port's capabilities to be enhanced. These investments are crucial to the evolution of green implementation in Malaysian seaports operations. Green implementation will affect the efficiency of port operations and enhance the productivity of ports. [15]

While docked at port, vessels require power to maintain lights, heating or cooling, and other vessel functions. In Malaysian seaport, this power is provided by running the vessel's diesel-fueled auxiliary engines, which is not environmental friendly. Shore power has been introduced by several environmental friendly ports, for instance the Port of Los Angeles and the Port of Long Beach to reduce the ship emission [12]. In order for Malaysian seaports to be more sustainable in term of business competitiveness and environment protection, shore power is definitely a crucial investment. However, huge investment is needed and it involves huge financial uncertainties.

[16] Furthermore, after the adoption of shore power, not all the vessels that arrive to the port have the ability to utilize such technology since the connectors and cables are not internationally standardised.

In terms of technology, it is also considerably a viable solution for ports in moving towards sustainable development by introducing solar energy in operation processes. The constant supply of sunlight, low maintenance cost, environmentally friendly factors have made solar one of the best options for future energy power generation. [17] Malaysia is located at the equatorial region with a solar radiation of approximately 400 to 600 MJ/m<sup>2</sup> within a month. [18] Hence, Malaysia has enormous potential in creating large quantities of solar power. Unfortunately, in Malaysia, solar energy is still at its infancy stage of development because of the high solar electricity tariff rate and expensive acquisition cost of photovoltaic (PV) cells. [19]

### 2.2.2 *Financing*

Financing refers to all financial resources provided to carry out specific activities or projects. [20] Financial institutions such as banks are in the business of financing as they provide capital to other businesses, consumers and investors in achieving their objectives. Financing is vital in any economic system, since it allows companies to purchase products out of their immediate reach. In order for a port to pursue their goals in attaining sustainable development, getting financial support is inevitable, either through internal or external means.

From financial institutions' and investors' perspectives in providing financing services, they normally assess the revenue projections and major risks of a business. If this risk-return analysis is not adequately performed, it will directly impact the sum, timing, cost and availability of financing. In reality, for Malaysian ports to obtain certain grants from financial institutions, investments not only need to be proven reliable, they have to be scalable to achieve returns expected.

The lack of collateral assets and poor credit standings among businesses is deterring Malaysian ports from obtaining the necessary credit facilities. [21] Financial institutions consider innovative technologies investment not a promising investment due to the fact that such technology is highly sophisticated and lack of talent from a Malaysian context in handling such complexity. Lenders are more likely to impose more stringent

lending and investment criterias, making the cost of financing higher than government financing schemes.

### 2.2.3 *Human Capital*

Human capital refers to the skills and knowledge possessed by an individual or population that will be able to create value to an organization or country. [22] Human capital is the center of sustainable development in balancing the vigor of nature with the productive life of social wellbeing. [23] Investment in human resources is acknowledged as an effective way in achieving sustainable development as it allows other resources to be allocated efficiently. Therefore, it is essential in maintaining or developing human capital before addressing sustainable development goals. [24]

Seaport is an enormous working environment that needs substantial human capital to support daily operations whereby labor represents the skills, knowledge and the effort flow contributing to the productivity of activities that are conducted at the seaports. Malaysian seaports are facing severe lack of human capital in achieving sustainable development goals. Although Malaysian seaports have appropriate infrastructure and facilities, a substantial deficiency of human capital in terms of qualifications and competitive strength compared to other developed countries have affected port strategies. [25] In addition, inadequate skilled staff has hindered the efforts of Malaysian ports in providing services maximizing green implementation to customers and operationalize the port.

A survey done in Malaysia displayed that a total of 69% of Malaysian companies agreed that they lack talent in achieving their business strategies. [26] The absence of skilled workers relate to the failure in research and development areas and technical know-how of implementing ideas and addressing productivity issues. [27]

### 2.2.4 *Supplier*

Supplier is defined as a person or organization that provides something needed such as a products, raw materials or services. [28] In seaports, substantial numbers of suppliers are involved including but not confined to equipment, facilities, fuel and other suppliers. Selecting the right suppliers and building long terms relationships with suppliers is crucial for the ports in attaining sustainable development success.

Unfortunately, collaboration between Malaysian seaports and the suppliers are still poor. Poor collaboration with suppliers is considered as an external challenge for the organization to

implement the green strategy. [29] Lack of resources, strategic vision, low willingness, information sharing between ports and suppliers are deterring the implementation of green practices in seaport area. [30] Lack of information flow will cause disruptions to the business strategy and affect competitive strengths of ports. On the other hand, most of the Malaysian suppliers are lacking of the environmental awareness and it is becoming a barrier for organizations to implement the green supply chain management (GSCM) practices. In addition, most of the Malaysian suppliers are still remain at the primeval stage which are lack of planning for the investment to redesign their supply model to be more environmental friendly. [31]

Switching to low sulfur fuels such as liquefied natural gas is one of the easiest measures to reduce ship pollution. The sulphur content of Heavy Fuel Oil (up to 35,000ppm) is almost 35 times of low sulfur alternatives such as Marine Gas Oil (MGO). [32] Even though that there are few Malaysian based suppliers producing low sulphur fuel, the majority of low sulphur fuel is imported from developed countries such as US and Singapore. [33] Hence, ports lose their bargaining power over those suppliers as the supply is limited. This situation is a factor deterring ports from supplying more low sulphur fuel through bunkering services due to higher cost of product.

### 2.3 Resource based view

Resource Based View (RBV) analyzes and identifies resources owned by an organization and ways the resources contribute to the competitive advantage of an organization. [34] RBV theory emphasizes on attaining competitive advantages by acquiring resources which are valuable, rare, non-substitutable and imperfectly imitable. [35]

Eventually, competitive advantages will be eliminated gradually due to technology obsolescence and other factors. There is no guarantee that competitive advantages will sustain forever if continuous improvements are ignored. As RBV theory is not able to explain 'sustainable' competitive advantage, dynamic capabilities theory (DCT) was introduced by David Teece and Gary Pisano in the year of 1994. In fact, DCT is developed based on resource based view and it is not solely a new theory. Dynamic capabilities theory emphasizes on the abilities to generate rapid reaction and flexibilities to the ever changing business world. [35] In other words, DCT further discusses two issues that were being ignored in the RBV theory. The first issue is a firm's ability in understanding the changes in the business environment while the second is a firm's ability in

generating a proper strategic management tool based on globalization effects. [36]

Due to globalization, seaports are exposed to a highly competitive business environment. Ports need to be aware of current and future trends in order to remain competitive [1]. For Westport and Northport to develop sustainable competitive advantages, it is imperative they benchmark to current trends in order to create first mover advantages. From a dynamic capabilities theory perspective, it exemplifies that internal and external components of the organization have a significance influence in attaining sustainable competitive advantages.

### 3. Methodology

This study was conducted using a qualitative method in determining the significance between each of the independent variable (technology, financing, human capital, suppliers) and dependent variable (challenges in attaining sustainable development goals). In this research, an in depth interview was conducted with the relevant seaport management team in obtaining valuable information regarding the possible challenges in achieving sustainable development goals.

Case study was the chosen research design for this study. Westport and Northport were chosen as the target groups for the reason that these 2 ports recorded the highest throughput in cargo movements in Malaysia. The respondents involved an operation manager and an administrative manager in order to enhance the data reliability. Purposive sampling technique was used in this research.

### 4. Results and findings

The interview responses and information from literature review strongly co-relate and justify the relationship between independent variables and the dependent variable of this research. As such, technology, financing, human capital and supplier are said to be strongly influencing sustainable development in the selected Malaysian ports.

As for technology, respondents from both ports are aligned with literature reviews whereby it is agreed that huge investments remain the largest constraint in introducing smart technology within the ports. Additionally, external factors such as space constraint and soil settlement are deterring the utilization of solar energy in ports. Furthermore, unstandardized electrical converter is also considered a barrier for ports. According to literature review, soil settlement is not a challenge in port Klang. On the contrary, respondents mentioned soil settlement as a huge challenge for

port Klang to overcome in order to utilize electrified equipment in port areas.

As for financing, respondents strongly agreed that lack of financial support from government and financial institutions are major barriers for ports in enhancing competitiveness. It is difficult to gain financial support from external parties due to the fact that the ports are lack of collateral and poor credit standing and these factors cause more stringent lending criteria from external parties.

It is undeniable that external financial support is extremely crucial in enhancing a port's ability in achieving green port status. If port Klang is not able to acquire sufficient financing from external parties, the competitive gap with competitors (PSA terminal) will widen. Respondents from Westport claim that by solving financing issues, other challenges could be addressed rather straightforwardly.

Not forgetting both Northport and Westport are lacking talent expertise. According to the interview answers, both port respondents agreed that top management and employees lack expertise and operational methods in achieving the desired SDGs. According to the respondents, not the entire top management lack capabilities, only certain departments' lack qualities, strategies, knowledge and skills required. There are a few reasons such a predicament: lack of training programs, lack of collaboration from employees, cultural differences, and information constraint. These factors deter the ports in enhancing services by aligning to the SDG goals and also unable developing business strategies suitable for the future [37].

In addition, suppliers who are considered external factors further provide a challenge to ports. Both interview answers and information from literature review concur with this statement. In terms of local suppliers, they lack environmental awareness and planning for investment in redesigning the supply model to be more environmental friendly in operations. This places ports in a difficult situation when acquiring advanced technology. As for foreign suppliers, the issue involves high bargaining power of suppliers, lack of spare part substitutes and difficulty of ports in acquiring after sales service. Other than that, the limited supply of electricity from TNB remains a challenge for ports in utilizing that equipment. According to previous researchers, lack of information flow between ports and suppliers is a barrier for seaports in communicating current trend and issues. However, interview answers from respondents do not indicate that the lack of

information as another barrier in attaining SDGs as information is constantly shared between the relevant parties.

## 5. Conclusion

Sustainable development in seaports is inextricably linked with cost improvements, productivity enhancements and at the same time expands a port's reputation. Green implementation is an extremely crucial factor in achieving the above mentioned. Introduction of advanced technology is the most effective way in enhancing efficiency and minimizing wastage. According to the research, there are several factors that deter a port from attaining sustainable development goals. Plausible steps in addressing these challenges include strategic alliances, investment by stages, negotiations with government and financial institutions in obtaining funds, enhancing job training and improving supplier relationship management. However, financing issues remain the main challenge for port management. By addressing the financial thorn, it becomes smoother in addressing technology, human capital and supplier problems. Being agile and responsive to the changing business world is considered as a crucial asset for ports in attaining sustainable development goals whereby the above mentioned factors would be a virtue in attaining competitive advantages for ports. This research is a noble attempt at linking the right SGD's to the port industry by focusing in Port Klang and exploiting the aforementioned challenges to further spur the port industry in Malaysia. By doing so, competitiveness will be enhanced and the country will gain vital dynamic capabilities which could be transferred to other industries in the country. Future researches could further look into other federal ports in Malaysia and the challenges faced in attaining SDGs which will provide a more holistic approach for the authorities in developing policies in achieving sustainable development in the maritime industry.

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