

4M Study to Support Indonesia's Maritime Tourism Development

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ABSTRACT: Indonesia as an archipelagic state with given abundant natural resources need a sustainable development in many aspects to strengthen its position in international community. Current Government vision in archipelago thinking aims at the development of maritime sector including maritime tourism and connectivity to get better equality regional development. Each region has its special potential assets and needs good concept of development design based on the regional development agenda. Smart, Merchant, and Festive are the types of conceptual design development for passenger terminal, while booster marina and enhancer marina has its role to make the development of maritime tourism locally connected internationally recognized.

1 INTRODUCTION

Indonesia, as an archipelagic state with abundant natural resources, needs sustainable development in many aspects to strengthen its position in the international community. Focusing on the maritime sector, there is a lot of hidden potential in Indonesian waters and the surrounding area. Thus, recently, the government has established Indonesia's Global Maritime Fulcrum (IGMF) as guidance for developing all aspects of the maritime sector.

The visions of IGMF are to rebuild Indonesian maritime culture; maritime resource management; maritime infrastructure and connectivity, including maritime tourism; maritime diplomacy; and the maritime defence force (Setkab, 2014). Furthermore, the designated areas for maritime tourism, maritime resources, and the development of other maritime industries are also stated in the National Medium-Term Development Plan (RPJMN) 2015-2019. The implementation of maritime tourism development is under the command of the Ministry of Tourism

(MOT) in collaboration with another relevant stakeholder. For maritime tourism, the MOT aims to develop a marina to fulfil the standards of berthing and facilities for foreign yachts and cruises while still maintaining the improvement of maritime nature tourism, so that tourists can also snorkel, dive, and enjoy traditional cultural attractions performed by coastal communities (MOT, 2015). Currently, some marinas are privately well-established in Indonesia, and there are just a few effective passenger terminals for welcoming international cruises. Essentially, there is a need for an effective passenger terminal not only to welcome international cruises but also to serve domestic transportation in terms of connectivity.

The biggest issue of Indonesia's economic development is disparities between each regional area. All this time, the development is highly focused on Jawa Island which lies the capital city of Indonesia. Another region, especially eastern region has an abundant natural resources and potential selling point if the concept of development is properly planned and implied. The most relevant development

in Indonesia is maritime field as mentioned above, thus the aim of this paper is to find an applicable conceptual design model for marina and passenger terminal development for maritime tourism in Indonesia using Man-Machine-Media-Management (4M) factor analysis, including the consideration of its added value and priority selection to get the best result.

2 INDONESIA MARITIME TOURISM

2.1 Government Support

Based on RPJM 2015-2019, the Indonesian Government established tourism as a priority development sector that needs to be supported by another sector, mainly the infrastructure and transportation sector, to accelerate the achievement of tourism targets in 2019 (Bappenas, 2014). With the establishment of tourism as a priority development sector, tourism under the MOT received an increase in budget allocation and an easing of regulations. In the National Coordination Meeting (Rakornas) that was held in Jakarta, the Minister of the MOT identified ten priority destinations that need to be accelerated in terms of development and promotion. These destinations are Danau Toba (lake), Tanjung Kelayang (beach and island hopping), Tanjung Lesung (beach), Kepulauan Seribu (beach and island hopping), Borobudur (heritage temple), Bromo – Tengger – Semeru (mountain hiking), Mandalika (beach and island hopping), Labuan Bajo (beach, sailing, diving, and gateway to Komodo Island), Wakatobi (beach, sailing, diving, snorkelling, and island hopping), and Morotai (beach, diving, snorkelling, and island hopping) (MOT, 2016). Eight out of the ten priority destinations are for maritime tourism, which indicates the government's seriousness about the usage of maritime tourism as a tool to support economic growth.

Table 1. List of Designated EEPs Referred to in the Regulation

No.	Entrance & Exit Port Name	Location (Province)
1.	Port of Sabang	Aceh
2.	Port of Belawan	North Sumatra
3.	Port of Teluk Bayur	West Sumatra
4.	Nongsa Point Marina	Riau Islands
5.	Bandar Bintang Telani Marina	Riau Islands
6.	Port of Tanjung Pandan	Bangka Belitung
7.	Sunda Kelapa Marina	Jakarta
8.	Port of Benoa	Bali
9.	Port of Tenau	East Nusa Tenggara
10.	Port of Kumai	Central Kalimantan
11.	Port of Tarakan	North Kalimantan
12.	Port of Nunukan	East Kalimantan
13.	Port of Bitung	North Sulawesi
14.	Port of Ambon	Maluku
15.	Port of Saumlaki	West Maluku
16.	Port of Tual	South East Maluku
17.	Port of Sorong	West Papua
18.	Port of Biak	Papua

In term of easing regulations, the MOT proposed the simplification of the immigration and port clearance regulation to boost the number of foreign

yachts entering Indonesian waters. The regulation is set in Presidential Regulation of the Republic of Indonesia, number 105, year 2015, on Foreign Yacht Visits to Indonesia. Under this regulation, inspections of port formalities, customs, immigration, and quarantine as well as cruising permit documents can be directly handled at 18 designated Entry and Exit Ports (EEP) (Pres, 2015). The list of EEPs is shown in table 1. The number of EEPs has a high probability of increasing by considering the development of yacht visits, the readiness of facilities and the supporting infrastructure for service provision, and the development of the region.

Based on the list of EEPs shown above, ten EEPs are located in Indonesia's Eastern Region (IER), but only eight are located in Indonesia's Western Region (IWR). An interesting fact is that three well-established marinas are located in IWR. Thus, the development of marinas in IER is potentially beneficial.

2.2 Regional Development Agenda

The main focus of the regional development agenda is to overcome the disparities in economic growth across regions, especially between IWR and IER. Currently, IWR contributes 80% of the national GDP. To improve equality, the government has set a specific agenda to boost the development of IER, which consists of Papua, Maluku, Nusa Tenggara, Sulawesi, and Kalimantan, while maintaining economic growth momentum in IWR, which consists of Jawa-Bali and Sumatra. The theme of development in each region is stated in the RPJMN 2015-2019, and because of budget limitations, the development of maritime regions, especially that of coastal areas, has become a priority. In the future, the government promises to accelerate national economic development specifically for maritime resources (Bappenas, 2014).

Table 2. The Themes of Regional Development

Region	Theme of Development
Papua	Agricultural product industry, livestock industry, <i>maritime-based industry through maritime tourism</i> , energy storages for IER.
Maluku	<i>Maritime-based industry through fishery</i> , processing industry.
Nusa Tenggara	<i>Maritime-based industry as the ecological tourism gateway</i> , fishery, livestock industry, commodity-based industry.
Sulawesi	Logistics-based industry as Indonesia and IER's gateway, agricultural product industry, commodity-based industry, <i>maritime-based industry through maritime tourism and fishery</i> .
Kalimantan	Forestry, energy storage, commodity-based industry, mining industry.
Jawa-Bali	Agricultural product industry, national industrial and service industry, gateway to world's best tourism destination, <i>maritime-based industry through maritime tourism and shipyards</i> .
Sumatra	Indonesia's gateway to international trading, national energy storage, commodity-based industry.



Figure 1. Regional Map of Indonesia

Based on the theme of development in each region in table 2, it is clearly stated that five of the seven regions and almost all of IER are designated to develop maritime-based industries, especially tourism, fisheries, infrastructure, and shipyards. This data is proof that the current government is taking serious efforts to develop the maritime sector, but, as stated before, because of budget limitations, the priority regions and the concept of development in the maritime industry must be set appropriately. This study focuses on identifying the type of marina and passenger terminal that can be developed in each region, with specific conceptual designs for maritime tourism and connectivity, in order to obtain the best result to improve equity across the regions.

2.3 Marina Development

Marinas are still a promising alternative for the maritime tourism sector, since just a few marinas have been established on Indonesia's approximately 54,716 km coastline. There are at least six well-established marinas, of which three are included on the EEP list, and several new marina projects are in the process of planning and construction. Since the establishment of the RPJMN 2015-2019, the IGME, and the MOT strategic plan to boost the maritime tourism sector, marina construction has become a favourable project in several regions. The MOT itself has a target to build 100 marinas with a total of 5,000 yacht visits by 2019.

The urgency of marina development is necessary because the MOT has an annual international event to attract foreign yachters to come to Indonesian waters called Sail Indonesia. Hundreds of yachters participate in this event, filling Indonesian waters with yachts (Sail Indonesia, 2015). Unfortunately, if there is no event, there are few yacht visits. If marinas are established, foreign yachters will be able visit Indonesia outside of the Sail Indonesia event. The construction of marinas requires a sustainable development program so it can be one of the important tools to achieve the target plan.

2.4 Revitalization of Passenger Terminal

As Indonesia is an archipelagic state, connectivity between islands is an important task to be accomplished. Until now, the paradigm of continental thinking has been applied to Indonesia's development. Although there are several Port Authorities (PA) in Indonesia, the ports for passenger, cargo, container, and tanker ships are not properly

developed. Thus, a paradigm shift is needed from continental thinking to archipelagic thinking. (Rosyid & Ekowanti, 2016). Special attention must be paid to a passenger terminal, because it would not only be used by domestic transportation but can also be a tool for welcoming foreign cruises. A breakthrough has been made by Indonesia Port Corporation (Pelindo) III, PA, which manages the Jawa-Bali, Nusa Tenggara, and Kalimantan regions, by creating a sub-subsiary that focuses on the development of Pelindo III's unused assets surrounding the port area as a maritime tourism attraction (Pelindo, 2014).

The breakthrough was marked by the revitalization of the existing passenger terminal port of Tanjung Perak, located in Surabaya, East Java, and called Gapura Surya Nusantara (GSN). Before the revitalization, the condition of GSN matched the common image of other passenger terminals in Indonesia: dirty, hot, harmful, and uncomfortable. The PA then rebranded and launched a port-based maritime tourism attraction called Surabaya North Quay (SNQ). This event and the new face of GSN created a new image of a passenger terminal port as clean, safe, comfortable, and eco-friendly. The SNQ also become an attractive spot for both domestic and foreign tourists, with events located inside the GSN building. The first floor and half of the second floor are for passenger ship facilities, and the other half of the second floor is mostly for a handicraft bazaar and serves as a place for performances and art exhibitions if an SNQ event is held. The third floor consists of indoor and outdoor space to welcome foreign cruise tourists. The purpose of SNQ events is not only to optimize the assets of Pelindo III but also to function as a new maritime tourism attraction in Surabaya and as an instrument to promote or teach maritime education, provide a new alternative meeting point, and provide a Meetings-Incentives-Conferences-Exhibitions (MICE) place.

3 MAN-MACHINE-MEDIA-MANAGEMENT (4M) FACTOR ANALYSIS FOR REGIONAL DEVELOPMENT

3.1 Overview

4M factor analysis is a multifaceted approach that is widely used in the investigation of accidents, with an emphasis on human error. Discovered by the United States National Transportation Safety Board (NTSB), many researchers have used 4M factor analysis and have modified it into new analysis models. 4M4E (Takeshi et al., 2003), the IM model (Furusho, 2002), and the 4M overturned pyramid (MOP) model (Mutmainnah & Furusho, 2014) are examples of the development of 4M factor analysis. Most of the developed models are still used to analyse accidents, including studies that utilize the MOP model to analyse the characteristics of accidents that happened in five major ports of Japan (Sulistiyono et al., 2016a). The MOP model, developed by Mutmainnah & Furusho (2014), is a three-dimensional model configured as a three-sided inverted pyramid. This inverted pyramid is an unstable geometry and is vulnerable to failure, representing maritime transportation's susceptibility to error. The four

corners represent the 4M factors, with the man factor always located at the bottom of the pyramid. The model has two analyses, namely, corner analysis and line relation analysis that can describe each corner of the 4M factors and the corner-corner relationships.

The 4M factors are not just Man-Machine-Media-Management; they have broad meanings and specific definitions. The usage of 4M factors can be expanded to analyse the improvement case. The authors have already utilized the MOP model for the analysis of maritime tourism improvement. The application is in choosing which EEP should be the priority for improvement. The EEPs selected as high priority ports to be improved as marinas are the Port of Sabang, the Port of Benoa, the Port of Tenau, the Port of Sorong, and the Port of Biak (Sulistiyono et al., 2016b). As stated in point 2.2, because of the limited budget, the goal of this analysis is to recommend which EEP should be improved first. The reason to choose EEPs as the base location for marina improvement is because the EEPs already have the advantages of entry and exit ports for foreign yachts and the Sail Indonesia event that pass through these EEPs. If the EEP is improved to become a marina, it is expected to attract more yachters to Indonesian waters. Three of the five high-priority EEPs are located in IER, and, thus, the result of this analysis is in accordance with the Indonesian government's vision to develop IER.

3.2 Definition of 4M Factors

4M factor analysis uses a specific definition for each factor. The definition of each 4M factor is defined in the MOP model (Mutmainnah & Furusho, 2014), but some modifications must be applied in order to utilize this model in terms of improvements (Sulistiyono et al., 2016b). In the case of analysing the conceptual design of maritime tourism development, the definitions and examples must be redefined to obtain the best result.

Table 3. The Definition and an Example of Each 4M

4M Factors	Definition (Example)
Man	All elements that affect people's preparedness for an improvement (knowledge, education, skills, abilities, welfare, experience, sense of belonging, alertness, etc.).
Machine	All elements, including technology, that help people to complete their tasks (information and communication technology, equipment, design, infrastructure, construction, etc.).
Media	All environmental factors that affect the system and/or people (geographical location, climatic/weather conditions, economic conditions, social politics, culture, etc.).
Management	All elements that can control the system and/or people (communication among stakeholders/government, regulatory activities, procedures, rules, maintenance, etc.).

3.3 Implementation of 4M Factors in Maritime Tourism Development

4M factor analysis is implemented in a problem-solving approach (fact-problem-solution) in order to

optimize maritime tourism development. Indonesia has abundant natural resources and a strategic geographical location supporting maritime tourism, and these assets are included in the Media factor. The problem is mainly the development discrepancy between IWR and IER, which spread to a lack of connectivity caused by undeveloped infrastructure, which is included in the Machine factor, to a lack of equality in human resources, which is included in the Man factor, and, lastly, to a lack of support from government or relevant stakeholders, which is included in the Management factor. The solution is obtained from the improvement of all of the 4M factors in each region. Because IWR's development has been successful, the accomplishments of IWR in all aspects of development can serve as benchmarks for IER's development.

3.3.1 Man Factor

Within the Man factor, human resources are the most important aspects that must be developed because successful development depends on the quality of people's education, knowledge, skills, and welfare. The Human Development Index (HMI) in IER is lower than that in IWR, which is caused by the difficulty of accessing formal education. However, education is the most important way to shape attitudes for welcoming tourists and to establish a creative and attractive event so that the region will be more comfortable and tourist friendly. As in the research of Paker & Vural (2016), most tourists take the attitudes of staff or local communities as important points in choosing a tourism destination because service is critical to tourism.

The development of an educational centre, science and technology park, or museum can be a solution to overcome this situation and still improve the formal education sector. Establishing a community centre also can have a strong impact because local wisdom is a unique selling point and each region has its special local wisdom that can be explored.

3.3.2 Machine Factor

The lack of connectivity must be overcome first in order to achieve equality across Indonesia's regions. In addition to developing infrastructure, the revitalization of existing infrastructure can be a favourable way to change people's perceptions. For example, the revitalization of the passenger terminal building in the GSN case successfully changed people's perceptions of port image and attracted both domestic and foreign tourists (Sulistiyono & Furusho, 2016). The most important aspect of a maritime tourism attraction is its accessibility. Most tourists travel to tourism spots by air or road, so the development of this infrastructure can provide the greatest impact while still maintaining the improvement of sea-based transportation. The development of one-stop education-entertainment-tourism leisure can be one of solutions to boost the development of maritime tourism. Access to information and communication technology must also be improved.

3.3.3 Media Factor

Abundant natural resources will not be a good asset if people cannot maintain them well. Recent tourism attractions are prioritizing the environment. As the research of Nuzula et al. (2016) stated, environmental factors are associated with the sustainability of tourism convenience, especially for coastal tourism. The economic and social situations of Indonesian citizens vary and influence Indonesia's character. The utilization of social media to promote and influence is likely possible. Thus, using social or online media to promote maritime tourism or maritime culture may be very effective.

3.3.4 Management Factor

For the Management factor, the presence of government as a policy maker can have a direct impact in the field. One example is a positive response from foreign yachters regarding the simplification of entering Indonesian waters. Another example is the construction of a marina in Korea that was initiated by the government; through specific research, the government found that citizens were willing to pay some money in order to support the project (Lee & Yoo, 2016). Acts to nurture communities in each region can also be performed by relevant stakeholders in order to improve welfare, tourism spots, and sustainability.

4 CONCEPTUAL DESIGN DEVELOPMENT

4.1 Conceptual Design Seeking

Marina and yacht harbours are well developed in the Mediterranean basin, and they can also develop the European economy. There are two kinds of marina models in the European market. The first is a marina that plays a role in the development of a region. The second is a marina that is simply a product of a spectrum of tourist facilities (Kizielewics & Lukovic, 2013). In Korea, the reconstruction of old ports to become marinas is seen as a favourable choice because the shapes of the existing ports still meet an engineering design standard that can provide the advantages of saving coastline resources and developing the yacht industry rather than leaving the port as is (Zai et al., 2013). The role of the marina as an economic booster and to maximize spatial utilization can be applied as an alternative choice with careful study and implementation. Proper location selection, a marina design that has an ergonomic function for people, and sustainable maintenance could be references for marina development (Achmadi et al., 2016; Bilski, 2015).

In the case of port development, however, the discussion is focused on a passenger terminal. As in the successful example of the Tanjung Perak Port, with the improvement of the GSN passenger terminal, the idea of integrating a passenger terminal with a tourist attraction has a big impact on attracting foreign and domestic tourists. This concept design can be applied to another passenger terminal in IER. The redevelopment of ports has also had a large impact in other major port cities worldwide. For example,

Shimonoseki Port has transformed into one of the important ports in Japan with the addition of the Karato fish market, a famous fish market where tourists can directly taste fishery products, Kaikyokan aquarium, Kaikyo Yume Tower, and other attractive surrounding facilities (Song & Chun, 2005). Another example is Kobe Port, still standing after the Great Hanshin Earthquake, which never fails to satisfy its tourists following the addition of a maritime museum, Kobe Port tower, and shopping facilities in the surrounding area to its MICE facilities. The construction of West-Breakwater in Jeju New Port is also an interesting example because it functions not only as the protector of the port but also as a tourist attraction with its breakwater design and zone classification that make the port a leading sightseeing place (Kim et al., 2005)

4.2 Results

In accordance with the Regional Development Agenda of RPJMN 2015-2019, the utilization of 4M factor analysis, and the literature from successful examples, three types of conceptual design development for a passenger terminal and two types of conceptual design development for a marina are obtained. Table 4 shows the results of the conceptual design development.

Three types of passenger terminal conceptual design development and two types of marina development should be applied in each region of Indonesia. The results will differ from one region to another because of the potential product difference and the government development agenda. Table 5 shows the resulting conceptual design development by region.

Table 4. The Conceptual Design Development Results

Conceptual Design Name	Definition
1. Passenger Terminal	
Smart (S)	Integrated with a maritime-ecological science and technology park and museum.
Merchant (M)	Integrated with a local fishery market and food court.
Festive (F)	Integrated with MICE and a maritime tourism festival.
2. Marina	
Booster (B)	Marina that acts as an area development tool.
Enhancer (E)	Marina as the product of maritime tourism.

Table 5. The Conceptual Design Development by Region

Region	Conceptual Design Development Name				
	Passenger Terminal			Marina	
	S	M	F	B	E
Papua	•			•	
Maluku		•		•	
Nusa Tenggara			•		•
Sulawesi		•		•	
Kalimantan	•			•	
Jawa-Bali			•		•
Sumatra	•			•	

5 DISCUSSION

The conceptual design development for a passenger terminal in Papua, Kalimantan, and Sumatra is a smart passenger terminal because the natural and human resources of these regions must cope with the government development agenda (refer to Table 2), which requires strong human resources. Thus, the development of a smart passenger terminal is expected to attract foreign and domestic tourists as well as the local society so that they can learn about the maritime knowledge in advance. The concept for a marina is a booster marina, because the infrastructure surrounding the coastal area is sufficient if the coastal community can work together to provide the best service to yachters. Then, yachters will be satisfied and will recommend the marina to other yachters, improving the reputation of the marina and, thus, improving economic conditions.

In Maluku and Sulawesi, however, a merchant passenger terminal and a booster marina are recommended. Based on the development agenda, these regions will be developed with fishery products, so the merchant concept can be applied, creating mutual conditions for fishermen and tourists. In Nusa Tenggara and Jawa-Bali region, a festive passenger terminal is suitable for the current condition. Supported by the establishment of GSN passenger terminal in Surabaya, as well as the gateway of tourism in these regions as stated in the development agenda. The marinas that are established there will act as tools to make the surrounding tourism area more interesting.

6 CONCLUSIONS

Based on the 4M factor analysis, there are three types of conceptual design development for passenger terminals and two types of marina development. The conceptual design development will have the best result if the local wisdom of each region is also applied. IER is the priority for maritime tourism development because of its abundant natural resources and need for immediate action to boost equality using strong connectivity. Thus, enacting these improvements can make Indonesia's maritime tourism locally connected and internationally recognized.

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