Integration of Traditional Shipping in the Marine Toll of Indonesia: Determining the Priority and Management Strategy

A Prasetyawan\(^1,2,\ast\), M Zainuri\(^3\), Winarno\(^2\) and D Wijayanto\(^3\)

\(^1\)Coastal Resources Management, Postgraduate Program, Faculty of Fisheries and Marine Sciences, Diponegoro University, Jl. Prof. Sudarto, SH, Tembalang, Semarang, Central Java, Indonesia 50275
\(^2\)Merchant Marine Polytechnic Semarang, Jl. Singosari Raya No. 2A, Wonodri, Semarang, Central Java Indonesia 50242
\(^3\)Faculty of Fisheries and Marine Science, Diponegoro University, Jl. Prof. Soedarto, SH Tembalang, Semarang, Central Java Indonesia 50275

Email: andiprasetyawan117@gmail.com

Abstract. Analysis of the bargaining position of traditional shipping in its integration to the marine toll in Tanjung Emas Port of Semarang should be carried out to evaluate its appropriateness. This research was aimed to identify the internal (strength, weakness) and external (opportunity, threat) factors concerning the integration of traditional shipping into the marine toll, as well as to determine the priority of supporting aspects of improvements. The research was carried out through interviews with some experts. Data analysis was carried out using SWOT and AHP. The research identified 12 internal and 12 external factors related to the integration of traditional shipping business in Tanjung Emas Port of Semarang. SWOT analysis showed that traditional shipping has a strong and opportunistic position with an index position of +0.16; +1.79. AHP analysis showed that policy support is the most important aspect of the integration of traditional shipping into the marine toll, followed by competitiveness and market insurance. According to the result, the policy may have a larger implication on the factors affecting the strength and opportunity of traditional shipping in its integration to the marine toll.

1. Introduction
The traditional shipping business is the business run by the society using traditional vessels. However, the existence of the traditional shipping business is threatened by the modern shipping industry as well as other transportation modes such as trains and trucks. Although currently, the traditional shipping industry is not popular, its activity remains. Traditional shipping-related activities also play an important role to support the community’s economy. Several services including port operation, manning and other added-value services are required in the traditional shipping business [1].
Traditional shipping in Indonesia has various values instead of its economic, including recreational and socio-cultural value as an identity of the archipelagic country. More than 60% of Indonesia’s territory is sea [2]. Moreover, the mainlands also have great rivers [3] where traditional ships operate [4]. Therefore, its existence can’t be neglected.

Since 2015, the Indonesian government has declared the marine toll program to strengthen the interconnectivity of islands and expedite the distribution and exchange of goods among islands [5]. The main objective of the marine toll program is to improve the interconnectivity of lands through water [6]. Integration of traditional shipping business into the marine toll program is somehow important to optimize the logistic distribution process.

However, Indonesia’s logistic performance index is currently lower than in surrounding countries such as Malaysia, Thailand, Singapore, and Vietnam [7]. Poor implementation of technology is a crucial factor affecting performance [8]. Therefore, improvements are needed especially to optimize the logistic shipping service as well as to support the marine toll program.

Integration of traditional shipping business into the marine toll program is expected to support logistic transportation. In the context of marine toll, shipping activities are done regularly and in the scheduled manner[6]. Therefore, traditional shipping activities need to synchronize with the marine toll activities.

The traditional shipping business is currently marginalized due to the advancement of technology and the expansion of ships with modern technology [9]. Generally, the traditional shipping business is not well managed and the shipping activity is not well scheduled. Thus, it has low competitive power compared to newer ship builds.

Tanjung Emas Port of Semarang has the role of feeder port in the marine toll. Therefore, it connects the local (traditional) port and the national hub ports. According to Arisusanty et al. [5], feeder port should fulfill several criteria, such as connectivity to intermodal transportation, demographic, return load potential, and harbor capacity.

Referring to the current condition of the shipping business, especially regarding its competitive power, the traditional shipping business needs further improvements. Therefore, a certain strategy is needed to optimally improve traditional shipping capacity. Therefore, assessment of internal and external factors related to the integration of traditional shipping to the marine toll is important to understand its bargaining position.

The integration of traditional shipping business into marine toll needs the support of various aspects. Unfortunately, some aspects could become obstacles in the integration and therefore need to be resolved. However, the aspects could have various impacts and importance. Thus, an assessment of the importance of the aspects is needed to determine the priority of the problem-solving.

This research was aimed to identify the strengths, weaknesses, opportunities, and threats, to evaluate the current strategic position, and to determine the priority of traditional shipping development to traditional shipping business in Tanjung Emas Port of Semarang.

2. Methods
The research design was a survey that was carried out through a qualitative approach. The research was aimed to describe the position of the traditional shipping business in Tanjung Emas Port of Semarang in the marine toll framework as well as to formulate the strategy of its development. Important aspects of traditional shipping business development were assessed for its priority to gain optimum strategy. On the other side, the assessment of strengths, weaknesses, opportunities, and threats to traditional shipping was carried out. The assessment results were then compared to formulate the actual strategy.

Assessment on the priority of traditional shipping management included several aspects into consideration, such as policy support, infrastructure and facilities, human resources capacity, company management, competitiveness, market insurance, business incentives, and business performance.
Assessment on the strategic position of traditional shipping in Tanjung Emas Port of Semarang to the marine toll was done by investigating the internal and external factors.

Data collection was carried out through in-depth interviews with the stakeholders of traditional shipping, including harbor officers, ship owners/managers, and academics. The instrument used for the interview was a questionnaire. As many as 24 respondents from various backgrounds were involved in the interview.

Data analysis was carried out using AHP and SWOT. AHP was used to carry out a pairwise comparison between management aspects which lead to the conclusion of the priority/rank of each aspect to be resolved. AHP was carried out using the Expert Choice software. SWOT on the other side was used to identify which of the internal factors acted as strengths or weaknesses and which of the external factors acted as opportunities or threats. The determination was done through the cumulative judgment of the respondents’ responses/opinions. The current position of traditional shipping management was obtained by accumulating strengths and weaknesses impacts as well as opportunities and threats impacts. Therefore, internal and external factors indices were obtained. The cumulative indices should be between -5 to +5.

3. Result and Discussion

3.1. Result

Identification and assessment of internal and external factors related to traditional shipping business showed variations on the expert’s opinions. According to the result analysis, the internal and external factors related to the traditional shipping business in Tanjung Emas Port of Semarang were identified as shown in Table 1 and Table 2.

Table 1. Internal factors condition of traditional shipping business in Tanjung Emas Port of Semarang.

| No. | Internal Factors                                                                 | Impact Index | Category |
|-----|----------------------------------------------------------------------------------|--------------|----------|
| A.  | **Strengths**                                                                    |              |          |
| 1.  | Traditional ships in Tanjung Emas Port of Semarang are appropriate to support the marine toll activity. | 1.71         | Low      |
| 2.  | Traditional shipping manning in Tanjung Emas Port of Semarang consisted of professional human resources. | 2.75         | Fair     |
| 3.  | The management of Tanjung Emas Port of Semarang is supportive for traditional shipping activity. | 0.17         | Very low |
| 4.  | Traditional shipping activity in Tanjung Emas Port of Semarang has good performance. | 2.33         | Fair     |
| 5.  | The service cost of traditional shipping in Tanjung Emas Port of Semarang is competitive. | 0.88         | Very low |
| 6.  | A low service charge of port services in Tanjung Emas Port of Semarang.           | 0.96         | Very low |
| 7.  | The capital needed for the traditional shipping business is low.                  | 0.58         | Very low |
| 8.  | Tanjung Emas Port of Semarang has appropriate infrastructures supporting the traditional shipping business. | 0.21         | Very low |
| 9.  | There are various sizes of traditional shipping vessels available in Tanjung Emas Port of Semarang. | 2.92         | Fair     |
| 10. | Traditional shipping business in Tanjung Emas Port of Semarang has diverse destination routes. | 0.58         | Very low |

**Strength index** 1.31
B. Weaknesses

1. Raw materials for traditional shipbuilding are currently limited. 2.21 Fair
2. The facilities supporting traditional shipping business in Tanjung Emas Port of Semarang is inappropriate. 0.08 Very low

Weakness index 1.15

Internal factor index 0.16

| No. | External Factors                                                                 | Impact Index | Category |
|-----|----------------------------------------------------------------------------------|--------------|----------|
| A.  | **Opportunities**                                                                 |              |          |
| 1.  | A new paradigm that marine/water transportation as the means to connect lands.    | 3.38         | High     |
| 2.  | Tanjung Emas Port of Semarang acts as a feeder port that connects main (hub) ports and traditional ports. | 3.83         | High     |
| 3.  | Traditional shipping business license is easy to get.                            | 0.71         | Very low |
| 4.  | Traditional shipping is involved in regional logistic distribution.              | 1.67         | Low      |
| 5.  | Low tax for traditional shipping business.                                       | 0.79         | Very low |
| 6.  | Traditional shipping in Tanjung Emas Port of Semarang is integrated into another transportation modal. | 2.38         | Fair     |
| 7.  | Traditional shipping activities in Tanjung Emas Port of Semarang has diverse functions/utilizations. | 1.08         | Low      |
|     | **Opportunity index**                                                            | 1.98         |          |
| B.  | **Threats**                                                                      |              |          |
| 1.  | Traditional shipping has weak business competition watch.                        | 0.54         | Very low |
| 2.  | There is no incentive from the government to support the growth of the traditional shipping industry. | 0.04         | Very low |
| 3.  | Access to sources of business loans is difficult.                                | 0.13         | Very low |
| 4.  | Shipbuilding components for traditional shipping are insufficient.              | 0.04         | Very low |
| 5.  | Traditional shipping activity is not integrated into the other shipping activities. | 0.21         | Very low |
|     | **Threat index**                                                                 | 0.19         |          |

According to the result, the traditional shipping business in Tanjung Emas Port of Semarang had more strengths than weaknesses, but they also had more threats than opportunities. However, based on the data obtained the impact is generally low. Assessment results showed that strength factors had very low to fair impact as well as weakness factors. Opportunity factors had a very low to high impact, while all threat factors had a very low impact. Based on the calculation of internal and external factors impacts,
the SWOT position of traditional shipping management in Tanjung Emas Port of Semarang was obtained in the coordinate +0.16; +1.79. Therefore, the traditional shipping business in Tanjung Emas Port of Semarang is strong and has an opportunity to be integrated into marine toll activities. Figure 1 shows the current position of the traditional shipping business in Tanjung Emas Port of Semarang in the marine toll program.

Figure 1. Current position of traditional shipping business in Tanjung Emas Port of Semarang in marine toll policy.

Referring to the position, an aggressive strategy should be implemented in the integration of traditional shipping into the marine toll program. The strengths should be utilized to achieve the opportunity. However, since the strength and opportunity indices were low, the condition of internal and external factors should be taken into concern.

Determination of management priority was carried out using AHP analysis. Priority was defined by the index obtained from the analysis. Based on the obtained data, the analysis resulted from an inconsistency level of 0.02, indicating high consistency of the experts’ opinion regarding the management priority. Figure 2 shows the priority indices of each management aspect of the integration of traditional shipping business in Tanjung Emas Port of Semarang into marine toll.

Figure 2. Priority of traditional shipping development

According to the analysis result as presented in Figure 2, only three out of seven aspects obtained high concern. Policy support was the most important aspect in the integration of traditional shipping into the marine toll program, followed by competitiveness and market insurance aspects. Compared to the other
aspects, these aspects had a significantly higher index. However, the index obtained by policy support aspect made a significant distance to competitiveness as the second priority, indicating its crucial role in the successful integration of traditional shipping into marine toll program.

Referring to the result of SWOT and AHP analysis, there seems to be a connection between both results. The result of the AHP analysis strongly emphasized the need for policy support in the integration of traditional shipping business into the marine toll. Fortunately, the result of SWOT analysis showed various components related to traditional shipping business that require policy support. As an implication, the policy-making should consider and be focused to overcome the weaknesses and threats as well as improving the strengths and opportunities.

3.2. Discussion
The main purpose of the marine toll program is to improve the connectivity of lands through the sea (water transportation) [10]. However, as an archipelagic country with nearly 13,466 islands [2], Indonesia needs a large number of ships of various sizes [11]. Therefore, the implementation of the marine toll program should involve various stakeholders. Traditional shipping is one of the sectors involved to support the marine toll program. However, several adjustments need to be carried out to optimally integrate traditional shipping activity into the marine toll program.

Traditional shipping business should be viewed as a maritime transportation services business, especially in the marine toll program. Traditional shipping is an alternative modal for short sea logistic transport [12] which includes various activities such as inland water to short sea transport. Therefore, it could distribute logistics to remote areas.

According to Popa et al. [1], the traditional shipping market consisted of four main components, including the ship trade market, shipbuilding market, scrapping market, and freight market. Each component plays important role in developing a business environment. However, in the integration of traditional shipping into the marine toll program, more components could be involved.

The traditional shipping business has significantly decreased due to various aspects [13], such as modernization of ship technology as well as the massive development of land and air transportation. However, the fact that Indonesia is an archipelago country can’t be neglected. Marine transportation will always have value to society.

Integration of traditional shipping into marine toll emphasis the character of the nation as a maritime country. However, since traditional shipping is a minor shipping business, there are limitations of its capacity to support the program. This is proven by the result of the SWOT analysis. The internal factors showed that although the strengths are dominant, they generally had a low impact. The external factors on the other side had a higher index, but some opportunities also showed low indices.

The result suggested that the main issue which needs to be resolved is the policy related to the integration of traditional shipping into a marine toll. Reconstruction of regulation which support is important to guarantee its legality [14]. Legal regulation is also expected to be a foundation for further actions.

To improve its competitiveness, traditional shipping should improve its service quality. Integration of services and activities needs to be optimized, for example using information technology [8]. However, limitations of build materials, difficulties in accessing capital, and limited availability of ship insurance inhibit the development of traditional shipping [13]. Among the weaknesses of traditional shipping is that it doesn’t have a fixed route and schedule [15]. Therefore, adjustment on the shipping schedules and routes is needed to expedite the logistic distribution.

Considering the geographical condition of Indonesia as an archipelagic country, traditional shipping has great importance and market potentials as an alternative to the logistic carrier. However, uncompetitive service charges and unsupportive regulations could become a barrier to its application [12].

Traditional shipping businesses in Tanjung Emas Port of Semarang need to improve their competitiveness. Improvement of competitiveness should be done by maximizing the opportunities it
currently has [16]. Referring to the result of the research, the opportunities achievement specifically concerning the change of paradigm of marine/water transportation, the position of Tanjung Emas Port of Semarang as feeder port, and the integrated transportation modal need to be maximized.

To optimize its integration into the marine toll, the traditional shipping business needs to adjust its management. Implementation of marine toll shifts some paradigms of shipping principles, such as the logistic system and shipping activities [6]. The new paradigm of the logistic system is to support the trading activities rather than just to support the flow of goods, while the new paradigm of shipping activities is to promote trading activities, therefore the shipping schedule should follow the trade.

Based on the result of the research, integration of traditional shipping in Tanjung Emas Port of Semarang still has a lot of things to work on. Internal and external adjustments should be carried out to support and accelerate integration. To do that, the wide opportunity should be used to overcome the weaknesses and threats as the strategic plan in optimizing the role of the traditional shipping business and emphasizing its existence.

4. Conclusion
Integration of traditional shipping business into marine toll program requires a lot of works to do to improve its bargaining position and optimize its contribution. Twelve internal factors were identified consisted of 10 strengths and 2 weaknesses. While external factors consisted of twelve factors consisted of 7 opportunities and 5 threats. Most of the internal and external factors had a low impact on the integration, only two opportunities including the new paradigm of marine/water transportation and the position of Tanjung Emas Port of Semarang as feeder port have a high impact on the strategic management plan. Overall factors, the traditional shipping business in Tanjung Emas Port of Semarang is currently in a strong – opportunistic position. The development of traditional shipping should be prioritized mainly on policy support, followed by improvement in competitiveness and market insurance.

References
[1] Popa C, Nistor F, Reczey I 2017 The traditional maritime market components and its relations with the global maritime business model variables Sci. Bull. Nav. Acad. 20 108
[2] Simatupang R S, Khomsin 2016 Penentuan batas pengelolaan wilayah laut antara Provinsi Jawa Timur dan Provinsi Bali berdasarkan Undang-Undang Republik Indonesia Nomor 23 tahun 2014 J. Tek. ITS. 5 199
[3] Brontowiyono W, Kasam K, L R, A I 2013 Strategi penurunan pencemaran limbah domestik di Sungai Code DIY J. Sains &Teknologi Lingkung. 5 36
[4] Malisjn J 2013 Kajian pengawakan kapal tonase kurang dari GT 7 pada wilayah perairan pedalaman dalam meningkatkan keselamatan pelayaran, studi kasus: Sampit War. Penelit. Perhub. 25 1
[5] Arisusanty D J, Arkeman Y, Rahardjo S, Soeboer D A 2018 Analisa menentukan kriteria pemilihan pelabuhan pengumpun tollaut menggunakan metode AHP Albacore. 2 57
[6] Manti Y P R, Kusuma L T W N, Ramadhani A N, Majid M S 2019 Indonesia sea toll strategy framework directive: Innovative and participatory decision-making methods towards the world maritime axis Adv. Intell. Syst. Res. 173 394
[7] Worldbank 2020 [dikutip 24 Agustus 2020]. Logistic Performance Index - Global Ranking [Internet] lpi.worldbank.org. hal. 1–5
[8] Kusuma L T W N, Leu J-D, Tseng F-S 2019 Advanced ERP application for marine transportation industry in the South Asia Pacific country; A case study IOP Conf. Ser. Mater. Sci. Eng. 528 012048
[9] Johny M, Jinca M Y, Herman P, Abrar S 2013 Traditional shipping transport safety case study: Phinisi fleet (A study on stability, strength and human resources) Int. Ref. J. Eng. Sci. 2 1
[10] Wahyono E, Tangkilisan Y B, Marihandono D 2016 Development of inter-island shipping as a bridge to Indonesian archipelago J. Marit. Res. 13 29
[11] Baihaqi I, Pribadi S R W, Supomo H 2018 Production aapacity analysis of national shipyard in Indonesia to build sea toll ships Appl. Mech. Mater. 874 174
[12] Brooks M R, Sanchez R J, Wilmsmeier G 2014 Developing short sea shipping in South America: Looking beyond traditional perspectives Ocean Yearb. Online. 28 495
[13] Syafril K A 2018 Pemberdayaan pelayaran rakyat dilihat dari karakteristiknya J. Penelit. Transp. Laut. 20 1
[14] Hartanto 2019 Reconstruction of transport regulatory on marine toll to support sea connectivity based on Pancasila justice Law Dev. J. 1 7
[15] Priatno D H, Samudro 2019 Konsep kapal pengumpan reguler untuk mendukung angkutan laut perintis Wave J. Ilm. Teknol. Marit. 4 12
[16] Malisan J, Jinca M Y 2012 Kajian strategi peningkatan keselamatan pelayaran kapal-kapal tradisional War. Penelit. Perhub. 24 218