Evaluation and development strategy of PPI Beba (Fish Landing Port) in Takalar District, Indonesia

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Abstract. A fishing port is a place comprising land and sea, with certain boundaries as a place for government and fishery businesses activities. One of the fishing ports in South Sulawesi is the Fish Landing Port (PPI) Beba, which is a type D fishing port in North Galesong, Takalar Regency. This study aims to test the function of the PPI Beba facility and suggest a development strategy. The method used in this research is the survey method (interview) and literature study (review), with analysis methods, including: descriptive analysis (evaluation of facility utilization) and SWOT analysis (formulation of PPI Beba development strategies). The results showed that, overall, the facilities in PPI Beba have not been used optimally, with the current average utilization value of 35.93%, including a land use rate of 34.5%, wharf of 32.2%, fish landing port of 22.5%, and parking area of 54.52%. Strategies to increase the use of facilities at PPI Beba include: a) optimization of storage space, processing, and distribution of catches; b) increasing fish production through increasing the number of fishing vessels; c) increasing maintenance of basic and supporting facilities; d) increasing human resources through training and empowering catch and collector fishermen; e) develop cooperation with the fish processing industry.
Key Words: capture, facilities, fish, infrastructure.

Introduction. Fishing ports are an important means of improving fishery infrastructure, for the capture fisheries system in particular (Huntington et al 2015). The existence of a fishing port will encourage more orderly and targeted capture fisheries activities, not only limited to providing facilities for landing, processing and distribution activities of catches, but also providing optimal service to fishermen (Yang et al 2014; Benny et al 2014; Septaria 2015). The existence of a fishing port facilitates the government (policymakers) to collect, arrange, and supervise data and activity, henceforth educate with ease to minimize conflicts between fishermen and fishing activities that are not environmentally friendly. Fishermen conflict is one of the classic problems that often arises. The potential for conflict between fishermen often appears, especially in using coastal and marine resources (Daris et al 2019, 2020). One of the conflict resolution strategies is to increase supervision.

Beba Fish Landing Port (PPI Beba) is a type D or class 4 fishing port. In addition to functioning as a berth of fishing boats/ships for landing catches, it is also a place to load ship supplies and a base for production, processing, marketing of fish and fostering fishermen, and also directed at developing industrialization, and developing area-based fisheries centers (Danial et al 2018). PPI Beba is one of the fish landing ports in South Sulawesi, with great economic potential to be developed, especially in coastal and marine resources. It is placed in North Galesong, Takalar Regency, with a strategic position because it is close to Gowa Regency and Makassar City.

PPI Beba is a fishery center in the North Galeson region, where people and fishermen mix in the fishing system of the capture fisheries industry. To support the system that occurs the good function of the port infrastructure is essential. The aim of this paper is to test the functions of existing facilities at PPI Beba and to plan a development strategy.

Material and Method

Study location. This research was conducted for 3 months, from June to August 2019. The research started with preparation, data collection, data analysis, and the reporting and discussion of research results. This research was conducted at PPI Beba, North Galesong District, Takalar Regency, South Sulawesi Province, Indonesia.

Types and sources of data. The data used are quantitative and qualitative data, both primary and secondary. According to Yusuf & Daris (2018), primary data is directly retrieved from the field/object of research, both in the form of measurements, observations, and interviews. Meanwhile, secondary data has been collected by data collection agencies and published to the service user community (Nasution 2003). More details on the types and sources of data needed in this activity can be seen in Table 1.

Table 1

Types and sources of data

No	*Type of data*	*Data source*
	Primary data	
1	Port pool facilities	*In situ*
2	Means of pier	*In situ*
3	Fishery port land	*In situ*
4	Parking area	*In situ*
5	Fish auction building	*In situ*
	Secondary data	
1	Status and brief history of the area	Department of Maritime Affairs and Fisheries of Takalar
2	Livelihood	Central Bureau of Statistics
3	Regional development plan	Development Planning Agency at Sub-National Level

Data collection and analysis. The data collection methods used in this study are survey methods and literature study methods. The survey method is an investigation to obtain facts based on existing symptoms and seek factual information, whether about the institution, social situation, economy, or politics of a group or region (Sofian & Singarimbun 1995). The literature study method is a data collection technique by conducting a review of various books, literature, notes, and various reports related to the problem/case being studied (Nazir 2004).

Data were collected through direct interviews with respondents and documentation. The number of respondents was 25 people, comprising: PPI Beba management, transportation drivers, skippers, couriers/porters, traders, transportation service providers, ship owners, and crew members. Interviews were conducted face to face by filling out a questionnaire/list of questions. The success of obtaining data and information depends on the situation in which the interview is conducted and the ability of the interviewer (Danial et al 2011). The Likert scale from 1 to 4 was employed in the answers. The answer value was measured from very poor to very good.

Data analysis methods used in this study include the analysis of facility utilization rate evaluation and the SWOT analysis.

Evaluation of the utilization level of the facilities of PPI Beba. The use of existing facilities can be determined by a utilization analysis. The analysis of the utilization of fishery port facilities is based on the Decree of the Director-General of Fisheries (1981) in Sinaga et al (2013), and includes the following:

1. The port: the required pier length is calculated by the formula:

$$L = [(l+s) \times n \times a \times h]/(u \times d)$$

Where: L - length of the pier (m); l - average ship width (m); s - distance between ships (m); n - the average number of ships using the dock per day (units); a - ship average weight (tonnes); h - time duration at the dock (hours); u - average production (tonnes); d - average fishing trip duration (hours).

2. The fishery port land (area): the land used for the port is 2-4 times the total area of the existing facilities. The results of the calculation were compared with the capacity to determine if expansion should be recommended.

3. Fish Auction Place (TPI): the formula used to determine the area of a fish auction place refers to Murdiyanto (2004):

$$S = (N \times P)/(a \times R)$$

Where: S - the area of the auction building (m^2); N - amount of production per day (ton); P - the capacity factor of space to production (tonnes m^{-2}); a - the ratio between the auction hall and the auction building; R - frequency of auctions per day.

4. Parking area: the required parking area is calculated using the following formula:

$$L = (P \times R) / (N \times D)$$

Where: P/N - average production amount per day in 1 year (tonnes); D - carrying capacity per vehicle (ton); R - current parking area (m^2); L - required parking area (m^2).

The analysis of the level of utilization of the fishery port facilities was conducted by comparing the use of the facilities with the capacity of the facilities:

Utilization rate = (utilization of facilities/capacity of facilities)x100

The decision-making criteria are the following: when the percentage of utilization exceeds 100%, the utilization rate of the facility exceeds the optimal conditions; when the percentage of utilization is 100%, the level of facility utilization reaches optimal conditions; when the percentage of utilization is less than 100%, the level of facility utilization is not optimal.

SWOT analysis. The SWOT analysis is a strategic planning method used to test the strengths, weaknesses, opportunities, and threats in a study or analysis (Rangkuti 1998). The stages of the SWOT analysis in this study include: identification of internal and external factors; analysis of internal and external strategic factors (IFAS-EFAS); internal-external matrix analysis (IE); space matrix analysis; SWOT matrix analysis.

1. The identification of internal and external factors: according to Yusuf et al (2020), the identification of internal and external factors should get an overview of internal factors (strengths and weaknesses) and external factors (opportunities and threats) related to the study. It is further stated that the identification of internal and external factors is carried out using a survey approach (interview), literature study (systematic review), or brainstorming with experts or users.

2. Analysis of internal and external strategy factors (IFAS-EFAS): according to Yusuf et al (2020), the analysis of internal and external strategic factors is carried out to determine the factors of strength, weakness, opportunity, and threat in formulating strategic policies. It is further stated that part of this analysis is to create an internal factor analysis summary (IFAS) and external factor analysis summary (EFAS) matrix. Factor scoring is carried out after the internal and external factors are known (Suherman 2010).

3. Internal-external matrix analysis (IE): according to Rangkuti (2015), the internal-external matrix can identify a relevant strategy based on 9 IE matrix cells. The 9 cells can be broadly grouped into 3 main strategies, namely: growth strategy, which is a strategy designed for growth alone (cells 1, 2, and 5) or for diversification (cells 7 and 8); stability strategy, which is carried out without changing the direction of the

predetermined strategy (cell 4); and the retrenchment strategy, which consists of reducing the work done (cells 3, 6 and 9). This is presented in Figure 1.

1 GROWTH Concentration through vertical integration	2 GROWTH Concentration through horizontal integration	3 RETRENCHMENT Turn around
4 STABILITY Cautious	5 GROWTH Stability	6 RETRENCHMENT Divestment
7 GROWTH Concentric diversification	8 GROWTH Conglomerate diversification	9 RETRENCHMENT Bankruptcy or liquidation

Figure 1. Internal-external matrix analysis (Rangkuti 2005).

4. Space matrix analysis: The matrix space or the matrix of strategic positions and evaluation of actions, shows the most appropriate strategy to be implemented. It includes aggressive, conservative, defensive, or competitive strategy (David 2006). According to Rangkuti (2015), the space matrix is used to determine the position and direction of further development. The data used is the difference between the total score of internal factors (strengths-weaknesses) and the difference between the total score of external factors (opportunity-threat). The matrix space is detailed as follows:
- Quadrant I represents a lucrative position, where the company has high strength and opportunities. The policy strategy that can be implemented is an offensive (aggressive) approach.
- Quadrant II shows the position where the company faces various threats, but still has several strengths. The policy strategy that can be implemented is competitive.
- Quadrant III shows a position that is not profitable for the company, where some threats are faced amidst many weaknesses.
- Quadrant IV shows a position where there are many opportunities, but there are various weaknesses. The policy strategy that can be implemented is conservative.

5. SWOT matrix analysis: according to Rangkuti (1998), the SWOT matrix analysis can show indications of various factors systematically to plan policy strategies. This analysis is based on the logic that maximizes the strengths and opportunities, but minimizes weaknesses and threats. The strategic decision-making process is always related to the development of mission, goals, and policies. Thus, strategic planning must analyze strategic policy factors (strengths, weaknesses, opportunities, and threats) as a situation analysis in existing conditions. Below, a summary of the strategy formulation matrix compiled by the SWOT matrix is presented (Table 2).

Table 2

SWOT matrix analysis diagram

Internal	*External*	
	Opportunities	*Threats*
Strengths	Strategy Create strategies that uses strengths to take advantage of opportunities	Strategy Create strategies that uses strength to overcome threats
Weaknesses	Strategy Create strategies that minimize weaknesses to take advantage of opportunities	Strategy Create strategies that minimize weaknesses to avoid threats

Results and Discussion. Takalar regency is on the west coast of the Makassar Canal with an area of 566.51 km^2 comprising 9 sub-districts and 100 areas. Administratively, Takalar Regency has district borders in the east (with Gowa and Jeneponto Regencies), north (with Gowa Regency), west (with Makassar Canal), and south (Flores Sea). PPI Beba is in Tamasaju Village, North Galesong District, Takalar Regency, 19 km from Makassar City and 26 km from the capital city of Takalar Regency. Inaugurated in 2014, PPI Beba follows the Regent of Takalar Regulation Number 67 of 2014 concerning the Establishment of the Technical Implementation Unit of the Maritime Affairs and Fisheries Service of Takalar Regency and a description of its duties and functions. One function of PPI Beba is as a place for implementing the arrangements for the departure, arrival, and existence of fishing boats, including administrative services for fishermen. Another function is as a place for fish auction or capture fisheries trading system, where fishermen as producers, traders (intermediaries) and buyers (consumers) meet and make transactions. There is a flow of goods, money, and information.

Analysis of the utilization of the facilities in PPI Beba. The analysis results of the utilization of PPI Beba facilities are focused on the analysis of the main facilities, namely; port, port area, fish auction place, and parking area.

The port. PPI Beba has a pier length of 68.3 m. The calculation results show that the length of the pier that is used in the PPI is 21.99 m, thus the utilization rate of the pier is 32.2%. This value shows that the utilization of the jetty is relatively inadequate. There is still potential to be developed.

Fishery port area. PPI Beba has a land area of 12200 m^2. Based on the calculation results, the land used has 4209 m^2, with a land utilization rate of 34.5%. Based on these results, the land in the PPI Beba area is still included in using facilities below optimal capacities.

Fish auction place (TPI). PPI Beba has a fish auction area of 600 m^2. From the calculation results, the current utilization rate of the fish auction place is 135 m^2 (22.5%). Thus, the level of TPI utilization is not optimal. This condition occurs due to the lack of fish auction activities carried out at PPI Beba, where fishermen generally still use the beach around the PPI area as a place for fish landing and auction. Information obtained from respondents stated that the auction on the beach is relatively easy and free, fishermen not needing any more effort in moving fish to the TPI area. On the other hand, the cost (retribution) is also a reason.

Parking area. The parking area at PPI Beba is 418 m^2. Based on the results, the current level of utilization is 227.89 m^2 or 54.52%. This shows that over 50% of the parking lot is being used, but it can be optimized.

The direction of the development strategy for the management of PPI Beba. The results of the identification of internal and external factors revealed 15 factors, including 5 strength factors, 4 weakness factors, 3 opportunities factors, and 3 threat factors. More details are about the internal factors are presented in Table 3, and about external factors in Table 4.

The results of the evaluation of the internal strategic factors revealed a value of 3.11, including the strength factor 1.38 and the weakness factor 1.73. Based on these values, it is known that the position of internal factors in the development strategy of PPI Beba is strong (3.11>2.5). Wheelen et al (2018) state that if the total weighted score of IFE (internal factor evaluation) is higher than 2.5, then it is categorized as strong, and if it is lower than 2.5, it is categorized as weak.

Table 3

Internal strategic factor analysis matrix

No	*Factor*	*Point*	*Rating*	*Score*
	Strength			
1	Adequate port facilities	0.14	4	0.56
2	Strategic FLP location	0.12	3	0.36
3	Experienced human resources in fisheries	0.08	2	0.16
4	Easy permit licensing service	0.08	2	0.16
5	Relatively easy location access	0.07	2	0.14
	Weakness			
1	The absence of a breakwater (coast protection)	0.14	4	0.56
2	The number of human resources is relatively limited	0.13	3	0.39
3	Unmaintained environmental cleanliness	0.09	2	0.18
4	Lack of Standard Operation Procedure in the Fish Landing Port	0.15	4	0.60
	Total	1		3.11

Table 4

External strategic factor analysis matrix

No	*Information*	*Point*	*Rating*	*Score*
	Opportunities			
1	Potential fisheries market share	0.24	4	0.96
2	Stable fish prices with rising tendency	0.21	3	0.63
3	The increasing number of fish demand	0.19	3	0.57
	Threats			
1	Increasing distance to the fishing grounds	0.16	2	0.32
2	Erratic weather factor	0.13	2	0.26
3	Lack of fishermen ability in handling fishery products from auction landing to distribution	0.07	1	0.07
	Total	1		2.81

The results of the evaluation of external strategic factors obtained a value of 2.81 including an opportunity factor of 2.16 and a threat factor of 0.65. Based on these values, the position of external factors in the PPI Beba development strategy is classified as strong (2.81>2.5). According to Wheelen et al (2018), if the total EFE (external factor evaluation) weighting score is higher than 2.5, it is classified as strong, and if it is lower than 2.5, it is classified as weak. However, when compared to the evaluation of internal factors, the value of the evaluation of external factors is lower.

Based on the analysis of the internal and external strategic factors, the position in the IE matrix is in cell 2 (Growth). According to Gurel (2017), the 2nd cell is a growth cell, which in concentration conditions is carried out through horizontal integration. In that sense, the PPI Beba development strategy must be carried out horizontally or in other words, optimizing the function of the facility utilization. Then, the analysis results of internal factors (strengths-weaknesses) and external factors (opportunities-threats) showed estimated values in the space matrix (Table 5).

Table 5

Estimated value of the space matrix

Factor	*Value*	*Difference*
Strengths-Weaknesses	1.36-1.73	-0.35
Opportunities-Threats	2.16-0.65	1.51

Note: analysis results for 2019.

The analysis results obtained the estimated value of the space matrix, namely the x-axis (-0.35) and the y-axis (1.51). This shows that the position of the PPI Beba development is in quadrant III (conservative strategy) (Figure 2). This condition is a situation where the PPI Beba development is in a stable condition and can be developed more conservatively.

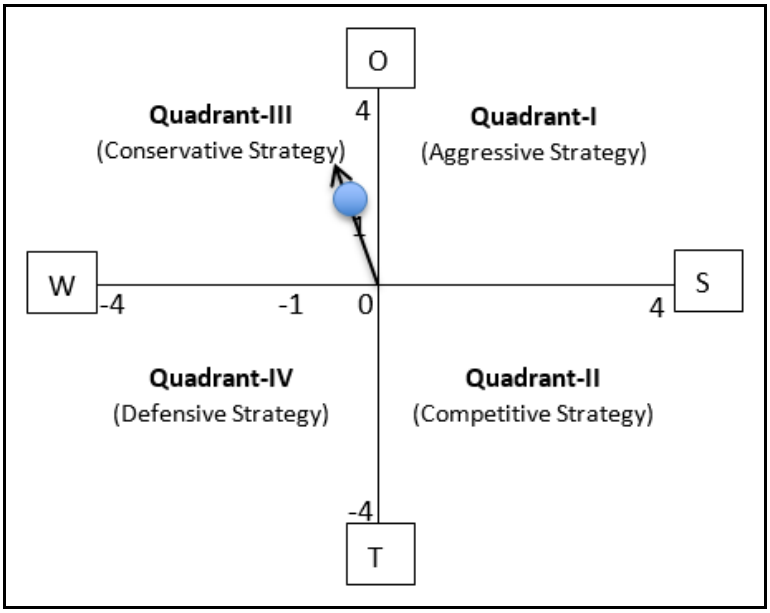

Figure 2. Mapping internal and external factors in a space diagram.

The analysis results of the space matrix indicate that the strategy which should be carried out for the development of PPI Beba is the conservative strategy. The conservative strategy maintains current results, by using the current strength and not taking excessive risks. According to David (2006), the conservative strategies often include market penetration, market development, product development, and business diversification. For this reason, there are several strategies that can be carried out in the development of PPI Beba, including: a) optimization of storage space, processing, and distribution of catches; b) increasing fish production through increasing the number of fishing vessels; c) increasing maintenance of basic and supporting facilities; d) increasing human resources through training and empowering catch and collector fishermen; e) develop cooperation with the fish processing industry.

Conclusions. Based on the results of research conducted regarding the evaluation and development strategy of the Beba fish landing port (PPI) in Takalar Regency, the following conclusions were obtained:

1. Overall, the facilities in PPI Beba are not beeing optimally used, with the current average utilization value of 35.93%, with a land use rate of 34.5%, wharf use of 32.2%, fish landing port use of 22.5%, and parking area use of 54.52%.

2. Strategies to increase the use of facilities at PPI Beba, include; a) optimization of storage space, processing, and distribution of catches, b) increasing fish production through increasing the number of fishing vessels, c) increasing maintenance of basic and supporting facilities, d) increasing human resources through training and empowering catch and collector fishermen, and e) develop cooperation with the fish processing industry.

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