



The Urban Coastal Settlement Management Strategy of Bumi Waras Sub-District, Bandar Lampung

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Abstract: Indonesia's extensive coastal areas face significant environmental and social challenges, particularly in densely populated regions like Bumi Waras Sub-district, emphasizing the urgent need for integrated coastal management to ensure sustainable development and improve community living conditions. This study aims to ascertain the future course of urban coastal settlement management measures. The study was conducted in Bandar Lampung's Bumi Waras Sub-District's coastal region, as the second-highest population sub-district in Bandar Lampung City. The samplings were chosen purposively by expert assessments and the community. Direct interviews were used to collect data, while the SWOT method was used to analyze the result. The results of the Internal Factors Analysis Summary matrix score of 3.167 and the External Factors Analysis Summary matrix at 3.153, indicating fairly good growth conditions. The highest priority strategy, 4.028, was the "weaknesses and threats" (WT) parameter, highlighting the need to address limited community participation in planning, implementing, and supervising coastal area management, as well as the lack of private sector involvement. Therefore, the recommended strategy is to enhance human resource capacity through socialization and counseling on urban coastal settlement management. Additionally, efforts should be directed toward optimizing the utilization of existing facilities and infrastructure to reduce environmental damage and promote sustainable coastal area management.

Keywords: development strategy; coastal management; SWOT

1. Introduction

Indonesia possesses significant natural resource potential, with the world's largest archipelago comprising 17,508 islands and a coastline stretching 81,000 km (Dahuri, 2008). However, the country's coastal areas have not been managed optimally, underscoring the need for integrated coastal management (Suning, 2016). Coastal areas are intricately linked to residential zones, as many communities tend to settle near coastlines. According to Egman (2016), coastal settlements reflect spatial dynamics shaped by the coastline's role as a source of livelihood for local communities.

Urban coastal settlements are particularly vulnerable to environmental and social challenges that negatively impact the surrounding ecosystem. The intensive utilization of coastal spaces has exceeded the carrying capacity and sustainability of coastal ecosystems, leading to pollution, overfishing, habitat degradation, and coastal erosion. These issues are especially pronounced in densely populated areas experiencing rapid development. One such area is the Bumi Waras Sub-district. Data from the Central Statistics Agency of Bandar Lampung City (2017) indicates that Bumi Waras Sub-district is the second most densely populated area after Kangkung Sub-district, with a population density of 22,125 people per km².

The coastal region of Bandar Lampung, particularly in Bumi Waras Sub-district, is characterized by highly dense settlements, resulting in various challenges. Among these, poor sanitation has classified the area as a slum due to the low public awareness of cleanliness. Additionally, the spatial arrangement of buildings in the area is inconsistent with the Zoning Plan for Coastal and Small Islands (ZPCSI) of Lampung Province for 2017–2037.

Drainage infrastructure in the area is inadequate, with poor drainage flow preventing runoff from reaching the sea, causing recurrent flooding during heavy rains. Along the coastline, numerous non-permanent toilets discharge waste directly into the sea, further degrading environmental quality. Such practices contribute to groundwater contamination, adversely affecting public health. If these conditions are not addressed, the coastal environment of Bumi Waras could become uninhabitable for local residents. Thus, a comprehensive study on integrated coastal management is essential (Seftalina, 2016). Formulating effective strategies for improved coastal settlement management is imperative, providing valuable input for government stakeholders to develop robust regulations for sustainable coastal area management.

2. Materials and Methods

2.1. Time and Location

This research was conducted in Environment One (I) of Bumi Waras Sub-district, Bumi Waras District, which consists of 22 Neighborhood Associations (RT). The research was conducted for one month in April 2019.



Figure 1. Map of tourist attraction locations

2.2. Data Collection

The main data collected are primary and secondary data. Primary data were collected through observation at the research location and interviews guided by a questionnaire. Secondary data were collected based on literature studies and official documents from related agencies. Secondary data and document review results were used as supporting data. Respondents were determined using random sampling techniques in communities closest to the coast based on the Slovin formula:

$$n = \frac{N}{1 + Ne^2}$$

Description:

n = sample

N = population

e = error tolerance limit

According to Arikunto (2010), if the population is more than 100, then the error tolerance limit used is 10-15%. Based on this statement, the error tolerance limit used in this study is 10%. Based on the formula above, the calculation of the sample size taken was carried out so that a sample of 105 respondents was obtained.

2.3. Data Analysis

The data obtained were analyzed using SWOT analysis. SWOT analysis is a way to identify existing factors to be used in formulating strategies (Kamargo et al., 2018). SWOT analysis is used to formulate strategies by utilizing strengths and opportunities and minimizing weaknesses and avoiding existing threats to create coastal area development strategies (Reza & Azkia, 2023). The steps taken in developing coastal settlements using SWOT analysis are as follows

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create coastal area development strategies (Reza & Azkia, 2023). The steps taken in developing coastal settlements using SWOT analysis are as follows.

- Data Collection

The data required in the development of coastal settlements is internal and external factor data. Internal factors consist of strengths and weaknesses in coastal settlement conditions. Meanwhile, external factors consist of opportunities and threats. Both of these factors are conditions that are outside the conditions of the area to be managed. Opportunity factors are factors that can be utilized in management and threat factors are factors that must be avoided in coastal settlement management (Reza et al., 2023).

- Evaluation of Internal and External Factors

These factors are evaluated by giving weight and rating values. The weight value states the importance value of external and internal factors in coastal settlement conditions in Bumi Waras Sub-district which need to be developed as a basis for formulating strategies, while the rating value states the real conditions and situations that are currently occurring in coastal settlement conditions in Bumi Waras Sub-district. The scale used in giving weight values starts from 1 (very important) to 0 (not important). The rating scale used starts from 4 (very strong) to 1 (very weak).

- Internal Factors Analysis Summary and External Factors Analysis Summary

Internal Factors Analysis Summary (IFAS) and External Factors Analysis Summary (EFAS) are tools in SWOT analysis that help summarize internal and external factors that influence coastal area development. The weighting and rating results are then analyzed using the IFAS and EFAS matrices. The weighting of strengths and weaknesses is analyzed using the IFAS matrix. While the weighting of opportunities and threats is analyzed using the EFAS matrix.

- Strategy Formulation

After the results of the IFAS and EFAS matrix values are known, the values are represented in nine SWOT quadrants. The SWOT quadrants consist of two axes, namely x and y. The X axis describes the IFAS matrix value and the Y axis describes the EFAS matrix (Reza et al., 2019).

		IFAS Score			
	4				
	High	VII	VIII	IX	EFAS Score
	3	Shrinkage	Growth	Growth	
	Medium	IV	V	VI	
	2	Shrinkage	Growth/ Stability	Stability	
	Low	I	II	III	
		Liquidation	Growth	Growth	
		1	2	3	4
		Low	Medium	High	

Figure 2. SWOT quadrant

The position of the quadrant will determine the condition and situation of coastal settlement development in Bumi Waras Sub-district. This position will determine the process of formulating coastal settlement development strategies in Bumi Waras Sub-district. The strategies produced are: strategy (S-O) using strength elements to take advantage of opportunities; strategy (S-T)

using strength elements to face threats; strategy (W-O) utilizing opportunities to minimize weaknesses and strategy (W-T) minimizing weaknesses and avoiding threats (Rangkuti, 2006).

3. Results

3.1. General Condition

Based on Bandar Lampung City Regional Regulation Number 04 of 2012 concerning the Arrangement and Formation of Sub-districts and Districts, the geographical location and administrative area of Bumi Waras District originates from part of the geographical and administrative area of Teluk Betung Selatan District with the following boundaries:

- North side borders Kedamaian District
- South side borders Lampung Bay
- East side borders Panjang District
- West side borders Teluk Betung Utara District

Bumi Waras District has an area of 376.5 Ha with a population of 58,875 people (BPS, 2018). Bumi Waras Sub-district is one of the areas in Bumi Waras District which has the largest area, namely 73 Ha. The population of Bumi Waras Sub-district is 13,792 people with 3,507 Heads of Families (Bumi Waras Sub-district, 2019). Bumi Waras Sub-district consists of 3 Neighborhoods (LK) and 45 Neighborhood Associations (RT). Bumi Waras Sub-district, precisely in Neighborhood 1 (LK 1), has a population of 6,856 people in 1,713 families. This neighborhood consists of 21 Neighborhood Associations (RT) and the location of the neighborhood is close to the coast and has the densest population. In the study, only 15 RTs were used as research samples, namely areas that are very close to the coast. The location of the 15 RTs has a very high population density, irregular community-owned houses and a slum environment. Most of the people in neighborhood 1 are dominated by residents who work as laborers and traders. The following are the social conditions of the coastal community of Bumi Waras.

Table 1. Social conditions of the coastal communities of Bumi Waras

Variable	Total	Percentage (%)
Education		
Low	60	57,1
High	45	42,9
Total	105	100
Working Status		
Not working	3	2,9
Working	102	97,1
Total	105	100
Revenue		
Low	65	61,9
High	40	38,1
Total	105	100

3.2. Identification of Internal and External Factors

The formulation of coastal settlement management strategies in Bumi Waras Sub-district begins with identifying internal factors (strengths and weaknesses) and external factors (opportunities and threats).

- Strengths

- a) Adequate Facilities and Infrastructure

Facilities and infrastructure are strength factors in coastal settlement management in Bumi Waras Sub-district. There are several facilities and infrastructure such as schools, hospitals, shopping centers, clean water, trash cans and others. Adequate and supportive facilities and infrastructure can support and develop social, economic, and cultural life of the community (Massiki, 2005; Ambarwati & Ma'rif, 2014; Sultani, 2016).

- Weaknesses

- a) The community is less active in planning, implementing and supervising coastal area management.

The condition of the coastal community of Bumi Waras is still ignorant of coastal area management. The community as the main actor who utilizes the resources in the coastal area should be able to play an active role in the sustainable management of coastal areas in the future (Roziqin & Kismartini, 2016). Without active community participation in management, sustainable coastal settlements will be difficult to achieve because the community is the main actor who inhabits and utilizes the coastal area (Hiariey & Romeon, 2013; Indrasari, 2020).

- b) Low understanding of business actors and the community in managing coastal settlement areas.

The coastal area of Bumi Waras, which is located in the economic center area, has an impact on the spatial planning of settlements and waste from existing activities. This impact starts from the absence of a spatial plan that is considered by business actors, such as in building construction and waste disposal. The low understanding of business actors in economic activities can have a negative impact on the environment such as coastal erosion, sedimentation, water pollution, and reduced green open space (Manaf, 2015; Putri & Citra, 2018).

- c) Facilities and infrastructure are not utilized properly.

Facilities and infrastructure play an important role in managing an area. The fewer the number of facilities and infrastructure and the greater the number of residents to be served, the less effective the existing facilities and infrastructure are in serving the needs of the population (Dharmasanti & Ritohardoyo, 2016). The condition of facilities and infrastructure is still not utilized properly in the Bumi Waras residential area because there are several factors, including the lack of public awareness of environmental cleanliness.

- d) Policy makers are not firm enough in imposing sanctions on violators.

The policies issued by related parties to regulate settlements and coastal spatial planning are good, but the implementation of these policies is still not optimal. In terms of building construction without permits in coastal areas, related parties are still not firm enough in imposing sanctions or punishments on parties who violate the rules. Law enforcement in

Indonesia regarding environmental issues is still relatively weak and not firm enough (Nisa & Suharno, 2020).

- Opportunities

a) The private sector participates in providing physical assistance.

The development of a region involves many stakeholders, both government, private sector, and community (Adyla & Nurlaela 2018; Al Mukarim et al., 2021). One of the opportunities that can be utilized in the management of urban settlements in Bumi Waras is the involvement of the private sector in supporting regional development in the form of physical assistance.

b) Regulations regarding the management of coastal settlement areas

The regulations that have been made by the government in the Zoning Plan for Coastal and Small Islands (ZPCSI) will have a positive impact on the environment and the sustainability of community life. The development of coastal urban settlements must be based on the zoning plan that has been made (Suparno et al., 2022).

- Threats

a) Cessation of private sector participation in supporting coastal and marine management

Private sector participation realizes optimal and sustainable coastal area management (Trinanda, 2017; Rudyanto, 2004). The cessation of private sector participation in supporting coastal area management has the potential to cause suboptimal management.

b) Potential damage to the coastal and marine environment

Coastal and marine environmental damage is a threat to people living in coastal areas. Damage will cause climate change, geographic conditions and others. This will greatly affect future coastal area management.

3.3. Formulation of Urban Settlement Management Strategy in Bumi Waras

Urban settlement management is carried out to create healthy settlements, based on the environment and having an impact on the socio-economics of coastal communities. Strategy formulation is based on strengths, weaknesses, opportunities and threats that have been identified in advance. Strengths and opportunities are factors used to minimize weaknesses and threats (Tarigan et al., 2018). The following are the results of the weighting and rating of internal factors (strengths and weaknesses).

Table 2. Scoring of internal factors

No.	Internal Factor	Rate	Weight	Score
Strengths				
1	The existence of adequate facilities and infrastructure	3	0,25	0,75
Sub Total				0,75
Weaknesses				
1	Communities do not participate actively enough in planning, implementation and supervision of coastal area management	3	0,24	0,73

No.	Internal Factor	Rate	Weight	Score
2	Low understanding of business actors and communities in managing coastal residential areas	3	0,22	0,65
3	Facilities and infrastructure are not utilized properly	4	0,17	0,67
4	Policy makers are not firm enough in imposing sanctions on violators	3	0,13	0,38
Sub Total				2,417
Total			1,0	3,167

Source: Primary Data, 2020

The result obtained from Table 2 is 3.167. If the weighting and rating values are above 2.5, it indicates that the position of internal factors is quite strong in formulating strategies (Tyas & Criswahyudi, 2017).

External strategic factors in the management of coastal settlements in Bumi Waras Sub-district were identified and analyzed, then these factors were evaluated using the EFAS matrix. The following are the results of the weighting and rating of external factors (opportunities and threats).

Table 3. Scoring of external factors

No.	External Factor	Rate	Weight	Score
Opportunities				
1	The private sector participates in providing physical assistance	3	0,24	0,718
2	The existence of regulations regarding the management of coastal residential areas	3	0,28	0,833
Sub total				1,542
Threats				
3	The cessation of private sector participation in supporting coastal and marine management	3	0,33	1,000
4	Potential damage to coastal and marine environments	4	0,15	0,611
Sub total				1.611
Total			1,0	3,153

Source: Primary Data, 2020

The results of the calculation of external factor weights and ratings were obtained at 3.153. This condition illustrates a good response to the opportunities available in urban settlement management. If the score obtained is above 2.5, the condition is classified as strong (Muchransyah et al., 2018).

Based on the results of IFAS and EFAS, a formulation of the coastal settlement management strategy for Bumi Waras Sub-district was obtained. This stage is carried out by matching internal and external factors to obtain the right strategy. The SWOT matrix can be seen in Table 4.

Table 4. Strategy Formulation

No	Internal and External Factor	Strategy
1	Strength-opportunity strategy (S-O)	<ol style="list-style-type: none"> 1. Maximize the use of facilities and infrastructure provided by the government and the private sector as an effort to overcome environmental sanitation problems 2. Maintain facilities and infrastructure to create integrated urban coastal settlement areas
2	Weakness-opportunity strategy (W-O)	<ol style="list-style-type: none"> 1. Involve all stakeholders as social control in the management of the urban coastal settlement area of Bumi Waras Sub-district 2. Maximize socialization regarding sanctions for people who throw garbage on the coast. 3. Provide training for business actors and the community in managing urban coastal settlements
3	Strength-threat strategy (S-T)	<ol style="list-style-type: none"> 1. Maximize the use of existing facilities and infrastructure to prevent damage to the coastal and marine environment.
4	Weakness-threat strategy (W-T)	<ol style="list-style-type: none"> 1. Improve the quality of human resources through socialization or counselling regarding the management of urban coastal settlements initiated by the government and the private sector 2. Maximize the use of facilities and infrastructure to prevent environmental damage

Source: Primary Data, 2020

After the strategy is obtained, the next stage is determining the priority of the strategy. Determining the priority of the strategy is obtained by adding up the factors related to the strategy. The following are the priority strategies for managing urban settlements on the coast of Bumi Waras.

Table 5. Priority of Bumi Waras Coastal Urban Settlement Strategy

No.	Alternative Strategy	Value	Ranking
1	Weakness and threat (WT)	4,028	1
2	Weakness and opportunity (WO)	3,959	2
3	Strength and threat (ST)	2,361	3
4	Strength and opportunity (SO)	2,292	4

Source: Primary Data, 2020

The calculation results obtained above inform that the largest value is the number of weakness and threat (WT) of 4.028. Based on this value, the strategy carried out is to minimize weaknesses and avoid threats. The weakness and threat factors that are the focus in the development of coastal areas in Bumi Waras are that the community is less actively participating in planning, implementing, and supervising coastal area management and the cessation of private sector participation in supporting coastal and marine management.

4. Conclusions

The coastal settlement management strategy of Bumi Waras is to make maximum use of the facilities and infrastructure provided by the government and the private sector as an effort to overcome environmental sanitation problems; maintain facilities and infrastructure to create an integrated urban coastal settlement area; involve all stakeholders as social control in the management of the urban coastal settlement area of Bumi Waras sub-district; maximize socialization regarding sanctions for people who throw garbage on the coast; provide training for business actors and the community in managing urban coastal settlements; maximize the use of existing facilities and infrastructure to prevent damage to the coastal and marine environment; improve the quality of human resources through socialization or counseling regarding the management of urban coastal settlements initiated by the government and the private sector; maximize the use of facilities and infrastructure to prevent environmental damage.

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