Investment Dilemma of Coastal and Marine Zoning in Conservation Areas: Case Study of Karimunjawa National Park

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Abstract. Zoning is widely applied to control spatial use in marine conservation areas. However, experience from terrestrial planning showing an investment dilemma. This study aims to determine whether this dilemma also occurs in marine conservation areas. This research conducted a case study in Karimunjawa Marine National Park. Data were analyzed and presented descriptively. The results show that the conservation area faces an investment dilemma, mainly to accommodate the tourism development plan. This dilemma raises spatial compatibility issues, management space boundaries, and equitable benefits distribution that the planners must carefully handle.

Keywords: Marine Spatial Planning, Zoning, Investment Dilemma, Tourism, Karimunjawa.

1. Introduction

The zoning system has been a part of conservation area management in Indonesia since the 1990s. This system was chosen as the interpretation of Indonesian Law No. 5 of 1990 regarding Conservation of Biological Resources and Its Ecosystem to ensure living creatures' sustainability through a buffer zone. By this system, the authority may control competing activities so that conservation goals can be achieved. The Karimunjawa National Park (KNP) is one of the earlier conservation areas that adopted through a Minister decree of Forestry No. 53 / Kpts / Dji-VI / 1990. The zoning regulation was revised in 2005 and 2012 to adjust with the updated social, economic, and ecological conditions (BTNKJ et al., 2004; BTNKJ 2012). As a conservation area, the ecological objective should be prioritized in the decision making consideration. But in fact, other stakeholder interests may change the game and put it as the second or third priority. In this case, the tourism industry is more critical for local government and investors to be prioritized. This situation raises a question about how the authority deals with this issue. Can the zoning system be a guide for marine space utilization? Will investment take the lead?

Zoning is a spatial planning tool for managing conflict and maintaining marine ecosystems' critical value (Day, 2002). This tool was inspired by the management of conservation areas in the Great Barrier Reef (GBR), which later evolved into the Marine Spatial Planning (MSP). MSP is a planning process that affects where and when human activities occur in marine areas to balance environmental, economic, and social goals (Douvere, 2008). It emphasizes the ecosystem-based management (EBM) approach as the foundation for spatial arrangement (Douvere and Ehler, 2009). In practice, it depends on the
importance of the area and political support toward the ecological issue. Qiu and Jones (2013) found two different types of MSP in practices, first hard sustainability that favor the ecosystem protection for allowed activities. Second, soft sustainability by which considers ecosystem conservation equal to other pillars of economic development.

Coastal and marine zoning hopefully direct all activities and development in the area. But, the experience of terrestrial planning showed the opposite where the investment influences spatial use. The government's desire to control spatial development frequently is hard to be met due to its financial capacity. Savini et al. (2014) stated that planning might be lead by investment due to its importance to fill the government financial gap in boosting regional development. He further describes this situation as an investment dilemma in planning. In MSP, a similar indication was exposed by Jay et al. (2016) where different economic interests and institutional affiliations influence the planning process. Others give their attention to the ambiguity decision to simultaneously protect and exploit the environment (Portman, 2016; Ehler et al. 2019).

In this study, we argue that the investment dilemma is embedded in marine spatial planning of conservation areas. This study aims to uncover this phenomenon and unravel its causes and potential impact on the environment. We divide the following article into four parts. The first part will discuss the theory of the Investment Dilemma in Spatial Planning. The second part is the history of the spatial setting in Karimunjawa Marine National Park. Third, we present an analysis of the investment dilemma that occurs in Karimunjawa. Fourth, we offer a discussion that can enrich the debate on the compatibility of marine space for conservation and investment, especially in marine tourism-based investment.

2. Method
This study employed a qualitative approach to facilitate exploration and explanation of the phenomenon (Neuman, 2006). A case study has been conducted in Karimunjawa National Park employing several data collection techniques as a form of triangulation, such as observation, interviews, and focus group discussion (FGD) (Bryman, 2004). The survey was held on August 26 - September 14, 2020, covering the city of Semarang, Jepara district, and Karimunjawa national park. The interviews involved related stakeholders from the BTNKJ, Wildlife Conservation Society (WCS), Diponegoro University, and the Community of Karimunjawa. This study also conducted a literature study obtained from stakeholder and the internet.

3. Overview of the Theory of Investment Dilemma in Spatial Planning
Savini et al. (2014) describe the investment dilemma as a paradoxical reality of economic resources in planning. On one hand, planners need to manage space utilization according to regional development's context and needs. On the other hand, planners have insufficient power to control what and where investment can be implemented. The private sector's investment may not be anticipated in the planning scheme because investors are looking for innovative and simple business ideas. According to Salet et al. (2015), investors have a different way of thinking and working from state planners. They choose locations based solely on what is best for them either in response to a demand or as a form of business speculation. Savini et al. (2014) explained this situation as a conflict between the supply-led and the demand-led in planning.

Different interests from other government agencies may give another pressure on the planner. Healey (2006) revealed how the inter-governmental unit struggles for their interests in terms of social, economic, and environmental. Fierce debates about space's importance often occur between agencies defending their respective interests, leaving the spatial planning authority in a dilemma. Counsell et al. (2006) showed how fragmented planning agencies in England and Northern Island bring complexity to define priority over an area. Empirical evidence from Indonesia revealed many infrastructure investments did not comply with spatial planning (Mattingly and Winarso, 2000). It might happen because of uncoordinated planning among sectors or unprecedented investment opportunity. As a consequence, spatial planning should be adjusted to accommodate and legalize such culpability.
In marine spatial planning, the existence of the investment dilemma is indicated in several cases. The first is related to the incompatibility of marine space for conservation areas and development activities. Kyriazi et al. (2016) highlighted the potential negative impacts of alternative energy development and conservation in marine areas. The construction phase of giant wind turbines in coastal and marine areas can potentially disrupt the surrounding environment. Tourism investment is also a common problem in coastal and marine areas due to its threat to fragile ecosystems such as coral reefs, seagrass, and mangroves (Papageorgiou, 2016).

Second, coastal and marine characteristics raise investment dilemmas regarding dynamic sea level, water quality, and resource abundance. Sea level rise affects the planning boundary that triggers administrative debate among stakeholders. Ideally, the planning has already considered this dynamic, including connectivity between land and ocean (Smith et al., 2011). However, it is not a simple task, so that many MSP practices failed to deal with it (Tejo et al., 2016; Ehler et al., 2019). The administrative approach is more likely chosen to determine MSP boundary than the ecological approach, putting environmental and cultural interests in threat (Tejo et al., 2016). Land in the coastal area has substantial economic value for landowners and local government. Change in its coverage can lead to losses and benefits that create a competition of interests in this area.

Changes in water quality may significantly shift spatial suitability for a particular activity such as marine culture. It may affect marine space demand outside of its designation and trigger new conflict (Jodice and Norman, 2015). Windupranata and Hayatiningsih (2011) found a conflict between marine culture and tourism due to environmental impact and aesthetic problems. A dilemmatic situation appears when both sectors involve the local community in a significant number and influential capitalist.

Third, cases arise from the issue of equitable distribution of coastal and marine benefits. The local community may be negatively impacted because of access restrictions over coastal and marine areas, although they hereditarily use it for fishing or leisure (Knol and Jentoft, 2016). This issue is a big concern in MSP, especially for social scientists that underlined market logic domination in the planning definition and mechanism (Flannery et al., 2018; Swyngendouw, 2007). For them, planners must consider marine space as social and cultural functions, not only economic due to its relation to individual and communal identity (Gee, 2019). The privatization of marine space can potentially marginalize those who have no power to negotiate their interests.

4. History of Marine Spatial Arrangement in Karimunjawa National Park

Conservation areas are a pioneer in zoning implementation in Indonesia for the management of coastal and marine areas. Before the Law. 27 of 2007 Jo UU. 32 of 2014, the zoning system has been regulated based on Law no. 5 of 1990 concerning the Natural Resources Conservation and Its Ecosystem and Law. No. 41 of 1999 Concerning Forestry. This system hoped to effectively work for the protection of some essential areas due to its ecological function. In Karimunjawa, the initial spatial planning exist in the Forestry Minister's Decree No. 123 / Kpts-II / 1986 that mentions three crucial areas, namely; (1) Protection area for a sunken boat around Karang Katang and Karangbesi; (2) Turtle protection area around Cemara Besar Island; (3) Rock research center area around Menjangan Kecil Island. Later on, the Ministry of Forestry released the Decree of Director General of PHPA No. 53 / Kpts / DJVI / 1990 concerning zoning in Karimunjawa that consists of four zoning: 1) The core zone (25 Ha of land and 1,274 Ha of marine waters); 2) The Protection zone (1,620.5 Ha of land and 6,170.5 Ha of marine waters); 3) The Utilization Zone (land 768 Ha and marine waters 3,663.5 Ha); 4) The Buffer zone (marine waters 98,093.5 Ha).
### Table 1. Historical Zoning in Marine National Park of Karimunjawa.

| No. | Year          | Region Status                                                                 | Area (Ha)                        |
|-----|---------------|-------------------------------------------------------------------------------|----------------------------------|
| 1.  | April 9, 1986 | Appointed as CAL Karimunjawa (Minister of Forestry Decree No.123 / Kpts-II / 1986) | Total 111,625 ha:                |
|     |               |                                                                               | a. water area: 110,117.30        |
|     |               |                                                                               | b. land area: 1,507.70           |
| 2.  | December 28, 1989 | The nature reserve is managed in 4 zones: (Decree of the Director General of PHKA No. 127 / Kpts / DJ-VI / 1989) | Total area 111,625 ha:            |
|     |               |                                                                               | 1. Core Zone: 1.229 (25 ha land early , 1274 ha of marine waters) |
|     |               |                                                                               | 2. Protection Zone: 7801 ha (1,620.5 land. 6170.5 marine waters) |
|     |               |                                                                               | 3. Use Zone: (768 ha of land and sea waters 3,663.5) |
|     |               |                                                                               | 4. Buffer Zone: 98,093.5          |
| 3.  | February 22, 1999 | Changes in the function of the area from the Karimunjawa Islands Nature Reserve and marine waters to the Karimunjawa National Park (Decree of the Menhutbun No.78 / Kpts-II / 1999) | Land on the island of Karimunjawa: ± 1,285.50 ha |
|     |               |                                                                               | Mainland Island Karimunjawa: ± 222.20 ha |
|     |               |                                                                               | Water: 110,117.30 ha              |
|     |               |                                                                               | Total: 111,625.00 ha              |
| 4.  | June 30, 2005 | Rezoning into seven zones (Dirjen PHKA No. SK.79 / IV / Set-3/2005)           | 1. Core Zone (Water): 444.63      |
|     |               |                                                                               | 2. Zone of Protection: 2,587.71 (Mainland 1,507.7; Waters 1080.01) |
|     |               |                                                                               | 3. Tourism Use Zone: 1,226.53     |
|     |               |                                                                               | 4. Cultivation Zone (Water): 788,213 |
|     |               |                                                                               | 5. Rehabilitation Zone: 122.51    |
|     |               |                                                                               | 6. Settlement Zone: 2,571.55      |
|     |               |                                                                               | 7. Traditional Fisheries Zone: 103,883.86 |
| 5.  | March 6, 2012 | Rezoning into 9 Zones (Decree of the Director General of PHKA No. SK. 28 / IV-SET / 2012) | 1. Core Zone:                    |
|     |               |                                                                               | a. Bodies of water: 444.63        |
|     |               |                                                                               | b. Jungle Zone: 1451.77           |
|     |               |                                                                               | 2. Maritime Protection Zone: 2,599.77 |
|     |               |                                                                               | 3. Land Use Zones: 55.93          |
|     |               |                                                                               | 4. Maritime Tourism Use Zone: 2,733.74 |
|     |               |                                                                               | 5. Cultivation Zone (Water): 1370.73 |
|     |               |                                                                               | 6. Religious, Cultural and Historical Zones: 0.86 |
|     |               |                                                                               | 7. Rehabilitation Zone: 68.33      |
|     |               |                                                                               | 8. Traditional Fisheries Zone: 102,899.25 |

*Source: BTNKJ, 2018*

Based on the table above, the zoning covers all water areas and some land areas. Based on this regulation, mangrove areas are perceived as terrestrial areas even though they are part of the coastal and marine ecosystem. This perception refers to the explanation of Law 32 of 2004 concerning regional government by which the coastal boundary is the lowest tidal line. Consequently, some tidal area arrangement belongs to terrestrial spatial planning (RTRW) instead of MSP under BTNKJ authority.
This perception has persisted until now, although recent regulations mention coastal planning starting from the highest tide (Law No. 1 of 2014 and Law No. 32 of 2014).

Since 1989, zoning in Karimunjawa has evolved two times, the first one in 2005 and the second in 2012. The underlying background for the two rezonings was quite different. In 2005, BTNKJ paid great attention to the environmental degradation issue due to the uncontrolled fisheries practice. The previous zoning did not effectively work because of low public participation (BTNKJ et al., 2004). The enactment of Law No. 22 of 1999 on the Regional Government, as the product of the reformation era, encourages a paradigm shift from top-down into collaborative management (BTNKJ et al., 2004). Therefore rezoning was considered to solve environmental problems derive from fisheries.

The main issue raised in the second rezoning was the dynamic of utilization management (Hidayat et al., 2009; BTNKJ, 2012). This issue refers to the development of marine culture and the increasing space demand for tourism. Besides, BTNKJ wanted to increase the core zone to enhance the conservation function, where the existing one was too small compared to the total area (0.4%). Apart from all reasons, the rezoning was a response to the Jepara Regent's request, who saw the need for adjustments to the tourism industry's development in the Karimunjawa area (Prihatinningsih, Interviewed August 30, 2020).

5. The investment dilemma in Karimunjawa MSP

Based on rezoning in 2012, zoning for tourism activities increased significantly from 1,226.5 hectares to 2,733.7 hectares, or more than 120% (BTNKJ, 2012). Changes in space allocation for tourism occurred due to collaboration between investors and local actors during the planning process. For example, changes in the protected zone around small islands used demands on behalf of the community as the main reason. This change is vital to allow tourism activities and the development of supporting facilities. Based on regulation, only local people can own land in Karimunjawa. Therefore investors depend on the local community to take care of the legal aspect of land use. Investors also received assistance in obtaining Karimunjawa ID cards or marrying residents so they can get land ownership certificates (Firman, Interviewed Sept 4, 2020).

Rezoning in the coastal and marine areas of Karimunjawa showed the role of investment and economic development to drive decision making. Moreover, the Central Java provincial government has promoted this area as a leading tourist destination by issuing Regency's regulation no. 14 of 2004 concerning the master plan for tourism development in Central Java. This policy was then adopted at the district level, making the Karimunjawa development vision based on tourism. This condition puts planners under pressure, creating a dilemma between maintaining conservation objectives and at the same time accommodating the needs of tourism development. Further problems related to this dilemma can be classified as below.

5.1. Zoning compatibility

The beauty of a small island beach and underwater life around the coral reef is the main tourist attraction in Karimunjawa. Unfortunately, this attraction is located near the core and protection. Allowing tourism activities next to the conservation area is not ideal for BTNKJ, especially considering tourist characteristics coming to this area. Planners realized this threat and mentioned the need for limiting tourism development in various documents (BTNKJ et al., 2004; Hidayat et al., 2009; SASRABIRAWA, 2010; BTNKJ, 2012; BTNKJ, 2018). However, intensive pressure from other stakeholders has made BTNKJ continue to accommodate it in spatial planning (BTNKJ, 2010). Further, tourism activities are even allowed in the protection zone as long as it does not change the natural landscape (BTNKJ, 2012).

Compatibility issue has also happened between tourism in small islands and turtle conservation. Small islands in Karimunjawa are the natural habitat for the green turtle (Chelonia mydas, registered as Appendix II, Red Book CITES) and Hawksbill turtle (Eretmochelys imbricata, registered as appendix I, Red Book CITES). These two turtles are also protected under Law No. 5 of 1990 and Government Regulation No. 7 of 1999 concerning the preservation of protected plant and animal species. However,
most coastal areas have been privatized both on the main island and on the small islands around it (BTNJK, 2009). Well-known islands as nesting areas and touristic sites are P. Menjangan Kecil, P. Cemara Kecil, P. Sintok, and P. Tengah (BTNJK, 2018).

A recent compatibility issue is intensive shrimp ponds that were reactivated by the investor in 2017. Intensive ponds began reoperating around Jatikerep, Karimunjawa Village, which then spread into several points in Karimunjawa and Kemojan Village. This kind of activity produces dangerous waste to the environment if not handled properly. Most cases cause algae blooming that make dissolved oxygen in surrounding water drop significantly so that no more living biota can resist. The worst part is that the ponds are located near the mangrove ecosystem, where many coral and pelagic fishes come for food, reproduction, and growth. Although there is still missing research on the environmental impact, it is believed that a decrease in fish abundance occurred. Based on observation near pond activity, there were no more prolonged fishing activities since last year (Firman, interviewed Sept 4, 2020).

5.2. Coastline boundaries

The administrative boundaries of BTNJK overshadow the coastal and marine spatial planning in Karimunjawa. A clear limit is well defined for the outer part referring to the four-point coordinates as in Table 2. Unfortunately, the inner boundary that separates the land and sea areas is not expressly stated by coordinates resulting in multiple interpretations. If the coastal references use the tide highest level, BTNJK can manage the mangrove ecosystem for all areas. Conversely, the authority belongs to the local government if the boundary uses the tide's lowest level.

| No. | Point       | Location | Position  |
|-----|-------------|----------|-----------|
|     |             |          | BT        | LS         |
| TN 1201 | P. Bengkoang | 110 ° 24'44.82 " | 05 ° 44’10.01 " |
| TN 1202 | Tanjung Pudak | 110 ° 26'54.93 " | 05 ° 53'18.10 " |
| TN 1203 | P. Mosquitoes | 110 ° 10'55.96 " | 05 ° 49'04.54 " |
| TN 1204 | P. Twins    | 110 ° 11'25.60 " | 05 ° 44'20.97 " |

*Source: BTNJK, 2009*

At the time of rezoning in 2012, the authority should consider Law No. 27 of 2007. Based on this law, coastline as a planning subject starts from the highest tide level to twelve nautical miles towards the open sea or archipelagic waters. Meanwhile, Law. No. 32 of 2004 concerning regional government regulates coastal and marine planning counted from the lowest tide level. Consequently, local governments consider some affected areas by the seas as terrestrial planning. The presence of these two regulations makes the boundaries of BTNJK authority is unclear.

A clear coastline boundary is essential because there is a struggle between conservation and investment. Investors are looking at this area due to its strategic location for their business. In 2010, many mangrove areas were converted into solid land by the local community to benefit from the land selling value to investors. Rochwulaningsih (2011) stated that the tourism sector's development had changed local communities' orientation towards the existence, function, and role of land. Local governments such as the village and sub-district seem to have approved the land conversion even though it is illegal.

The internal parties of the BTNJK have responded to this issue differently. Some considered the mangrove areas are their authorities because they are affected by marine water. For the other, excluding this area from their control will reduce conflict tension among BTNJK, the local community, and the local government (Prihatiningsih, interviewed August 30, 2020). Kustiwan (interviewed, 1 September 2020) said BTNJK personnel often get threats that endanger their safety if they forbid people strictly. He further explained his personal experience when confronted by the angered community using a machete regarding a land dispute on the coastal area.
5.3. Equitable Benefits Distribution of Coastal and Marine Zoning

The allocation of space for tourism also has a conflict of interest with local communities due to intersection areas with traditional fisheries. The coral reef ecosystem has been used for fishing for a long time. Three types of fishing gears usually work in this area, fishing rod, beach net, and speargun fishers. Almost all fishers have those fishing gears that show they depend on the coral reef ecosystem. They automatically lose some fishing areas due to incompatibility issues. Tourists cannot snorkel and dive while fishers are operating because they are prone to get caught by nets and fishing rods. Buildings over the sea as tourism facilities block and reduce fishing activities. Therefore, zoning also regulates the prohibition of fishing in marine tourism areas (BTNJK, 2012). Administratively, the total area lost to fishing due to marine tourism designation is 2.733,7 Ha.

Apart from the conflict of economic interests, the allocation of tourism space also threatens the loss of socio-cultural benefits from the coastal and marine areas. Many investors want exclusive access and restrict people to get in for any purpose as experienced by Kemojan Village people when they could not access the beach on P. Tengah for leisure or other social purposes (Idris, interviewed 5 Sept 2020). A similar experience was mentioned by Solikul (interviewed, 4 September 2020) where people had to debate hardly before finally permitted to access P. Menyawakan.

Despite the negative impact of tourism, planners also see the benefits generated for the local community. One of them is an alternative income, which is vital to reduce community dependency on coral reef fishery. It was known that 77% of local livelihood was fisher/farmer (BPS Jepara, 2012). Fishermen dominate the farmer category here because it is the primary job for all local communities (Rochwulaningsih, 2011; Hafsaridewi, 2019). Today, many fishers are involved in marine tourism as tour guides and boat charter businesses. Unfortunately, the benefit from tourism is not evenly distributed across all regions but concentrated in the Village of Karimunjawa. This situation creates people jealousy from other villages (Idris, interviewed 5 Sept 2020).

6. Discussion

BTNJK in various documents reveals that tourism development should refer to its primary function as a conservation area (BTNJK, 2018). However, tourism generated tends to be mass tourism-oriented. For example, in 2013 Central Java government announced Karimunjawa as one of the tourism destination priorities in a program called "Visit Central Java Year 2013". As a result, tourists from various backgrounds started to come and left a new environmental problem. Pressure on the coral reef ecosystem was increasing and caused a lot of damage such as inverted and split corals at a depth of 1-8 meters with an area of 30.98 ± 5.95 SE m²/Ha (Wisnuhamidaharisakti et al., 2013). Farid et al. (2018) found a close relationship between tourism activities around Tanjung Gelam with a reduction in coral reef habitat by 4.22 ha only from 2015-2017. This damage does not include damage from the construction of tourism facilities around the islands such as a jetty, shark attraction pool, and lodging.

Tourism activities are often considered as compatible activities in conservation areas. However, evidence of the strong influence of economic interests on planning in conservation areas may contradict this opinion. Planners face an investment dilemma that can reverse the ideal zoning scheme to regulate space utilization. Of course, it becomes a critical question regarding environmental sustainability if zoning turns out to be in line with investment demands. Conservation area planners without strong political support from other stakeholders will find difficulties in designing ideal scenarios. Therefore, it needs shared awareness of the environmental issue and better institutional design to make conservation area management work more effective.

7. Conclusion

This study succeeded in finding the investment dilemma of marine spatial planning in conservation areas. The thing that led to this dilemma was the enormous pressure from various stakeholders who favor the regional economic development interests. Investors take advantage of this situation by converting land in the coastal area to support tourism activities. Unfortunately, this conversion involved a mangrove ecosystem, which plays an essential ecological role. Three crucial issues must be addressed
by planners carefully as a consequence of the investment dilemma, namely zoning compatibility, planning boundary issues in coastal areas, and equitable distribution of benefits. How planners respond to these three issues is the key to whether the investment dilemma will affect the sustainability status of the conservation area or not.

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