

Marine Pollution Challenges in Jakarta Northern Coast Fishermen Settlement



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Abstract Indonesian coastal cities grow significantly with the strategic economic value. Jakarta is no exception. As the capital city and metropolitan, with the complexity of social and environmental long-term issues, the rapid growth of city economy and development of Jakarta coastal area and generates the big impact on social and environment. The marine pollution in Jakarta Northern Coast area causes the environmental and social issues in the informal fishermen settlement. The local communities were forced to adapt with these challenges, as there was limited affordable living environment alternative available for the poor. Government has planned the long-term agenda to mitigate the risks and the better future for the local community and environment. There was gap between the ground challenges faced by the fishermen community and the government related policies in achieving the better coastal development. This study presents a case-based analysis in Jakarta Northern Coast Fishermen Settlement. Results show that the multilayer backgrounds of social, economy and governance roles are complex interrelated factors to overcome the long term social and environmental challenges. A holistic approach is suggested for a strategic solution for a more sustainable and resilient Jakarta Northern Coast Area.

Keywords Jakarta Northern Coastal · Fishermen settlement · Social and environmental challenges · Marine pollution

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Fig. 1 Jakarta coastal area

1 Jakarta Coastal Area

Pasundan Kingdom, the origin of Jakarta, well-known as its' great era in trading port in coastal area has been explored till today rapid development time [1]. Jakarta's coastal area (Fig. 1) with a 514 km² resources play an important role in its' the economic movement. The coastal area has been also developed for a multi-use such as tourism, fishery, trading and a high traffic international port. The port areas are inseparable part of the fishermen settlement, as almost all fishermen settlement ranging from the informal to the formal ones are situated around the ports to support the economic activities. The rapid population and development have caused the increase of built-up land in the coastal area. This condition leads to the disposal of waste generated by the surrounding residents' activities [2] that cause damage of marine environment and coastal settlement, including the marine pollution.

The government through a spatial plan has regulated the management and land use along the coastal area of Jakarta Northern Coast. However, the planned plan faced some challenges to be enforced, thus it needs the support of the community for a holistic and resilience progress. This study explores two fishermen informal settlements within Jakarta Northern Coast area to investigate the social and environmental challenge in marine pollution.

2 Jakarta Marine Pollution Situation

Marine pollution has been discussed widely in Indonesian's environment debate. In general, the marine pollution has been resulted by the poor in land waste management. The Coordinating Ministry for Maritime and Investment Affairs [3] reported that 1.29 million ton yearly plastic waste pollute the coastal areas. A study [4] reported the accumulating Indonesian's coastal plastic debris has reached up to 0.40 Mt/year. Strategic policies and actions were intensely developed in addressing this challenge. At national level, Indonesia has released Presidential Decree Number 83/2018 on

commitment to mitigate the marine debris. It aims to target the marine debris mitigation to 75% in 2025. It also presents the National Action Plan (2018–2025) with the strategic marine mitigation agenda.

Coastal border areas have the potential to withstand the potential of land subsidence. In its quest to solutions to abrasion, land subsidence, flood, environmental degradation due to rapid development, the local and national authorities have created the National Capital Integrated Coastal Development (NCICD) masterplan in form of giant sea wall [5]. The seawall aimed to protect more than half of Jakarta's coastal communities from the high tide issues following the climate change symptom. However, the fishermen complained that the seawall cause the reduce of fishes around the coastal as the seawall that stretches making the marine ecosystem distance from the mainland. The sea wall and the pollution along the Jakarta Northern Coast area are the interrelated variables directly impact the social and environmental issues for the coastal communities.

3 Method

This study presents the impact of marine pollution on social environmental sectors in two informal fishermen settlements along Jakarta Northern Coast areas; Kalibaru and Muara Baru. Climatically, the case area is a hot and humid climate with the air temperatures range up to 22–37 °C. The land subsidence recorded between 1 to 15 cm every year. This area was recorded with the highest poverty compared to other areas in Jakarta [6]. Some of fishermen live on the water with their boats. The various economic and development activities in Kalibaru and Muara Baru such as real estate, power plant, industrial area, warehousing area, and reservoir cause a high volume of waste disposal and development of marine pollution. It was recorded that 63.6% of the area heavily polluted in 2015.

The primary data collection of this study was conducted through the field observation and deep interview on the fishermen in the two case studies. The literature review on the relevant policies and studies on the marine pollution issues and strategies were also conducted. The investigation on the marine pollution particularly the solid waste challenges were focusing mostly on the causal analysis of the pollution and social environmental aspects in the fishermen communities. The qualitative descriptive analysis of the primary and secondary data was used to present the research argument.

4 Marine Pollution and Coastal Communities

Coastal areas were mainly targeted for continues development due to its' richness of natural resources, energy sources, and ecosystem services, as well as range of socio-economic potential features [7]. The marine pollution as the results of the massive

coastal development causes the multiple impacts in coastal social, economic and living environment. The concentration of plastic in the water threatens marine life and fishing activities [8]. Thus, the marine pollution control should not only consider the marine ecological life but also the economic consequences [9]. The economic loss due to marine pollution in Jakarta is quite significant, 700 million rupiah per year was from fishery sector [10]. Moreover, the development of reclamation has also an important impact on the fishery lost up to 207 million rupiah per year. Reclamation also accumulating the additional waste around the seawall in the coastal area that worsen the marine pollution challenges for the community (Fig. 2).

Muara Baru and Kalibaru fishermen villages have been a highly concerned coastal informal area, as they were busy small scale fish industry yet very poor and turning into a continues slum. The rapid economic activities within this area increase the settlement density, most of the informal building construction squeezed each other and turn into a contrast view over the surrounding development. The communities which most of them are small scale fishermen [11] living with the poverty, with the clean water and sanitation issues. With the existing marine pollution around the seawall, the settlement activities also contributing to the accumulation of the stuck waste below the fishermen's elevated houses. This situation was worsened by the neglect attitude of the local communities on their living surroundings. The insufficient land and poor local authority's initiative to provide green open space, waste facilities and management seems added the developing marine pollution issues in the area. As result, the potential of natural coastal area has not been explored for landscape and coastal tourism.

The local fishermen live with poor social economic issues. Most of the children forced to stay with low level of formal education as they need to help the family's economy by involving in the fishing activities [12]. Therefore, the children used to enjoy their daily activities around the dirty and smelly living environment (Fig. 3). Lacking of open and green space gives no alternatives to the local community to have an active social interaction. However, with this poor and unhygienic condition, the local community yet live mostly happily and healthy. The pandemic crisis did not significantly influence their living activities even tough with the economic disruption and adjustment.



Fig. 2 Informal settlement behind the seawall (left) and its' accumulation of marine plastic pollution (right)



Fig. 3 The poor waste management in the fishermen village (left) and children playing around the dirty coastal living environment (right)

The development of informal fishermen village in the Jakarta Northern Coastal area confronts the authorities' regulations on the coastal border, spatial and environmental protection. Many areas are not in accordance with the spatial planning, and some buildings on the river border are classified as illegal and non-permanent buildings. Technically, the regulations have been formulated to reach out to these issues, however it faced some issues including the on-ground conflicts. For instance, the field survey of this study found out that there was the authority's notice board on the government's land ownership installed in the coastline area, yet the community still constructed the permanent houses (Fig. 4).

The major problem such as land legal rights over the uncontrol city population and informal sector settlement development. Indonesian regulations regarding coastal borders have been regulated in Law No. 27, 2007 [13]. Article 31 paragraph 2 stipulates the function of coastal borders as protection against earthquakes, tsunamis, erosion, abrasion, and protecting coastal ecosystems. One of the main objectives of structuring Jakarta's coastal landscape protecting biodiversity, restore green open space for the public and develop ports and docks to support the economy. Spatial regulation for the development of coastal border areas including flats as an alternative to relocate fishermen from the densely populated fishermen villages. Government regulation No. 26, 2007 concerning Spatial Planning Article 31 also mandates the need for provisions regarding the provision and utilization of green open space



Fig. 4 The authority's notice board on the land ownership yet the permanent buildings were densely found in the noticed area

and non-green open space. Green open space clearly functions as lungs, while the non-green open space for community activities.

Changes in the coastline that occur throughout the year as the results of climate change do not really affect the coastal settlement much, because many fishermen's houses were above the water or some of them even living on their boards. The protection and empowerment of fishermen has been regulated in government regulation no. 7 of 2016 [14]. Article 12 has stated the government's protection strategy for fishery businesses, including fishermen. Jakarta spatial planning zoning planning in accordance with statutory regulations regulated the coastal informal settlement to a coastal border. This regulation makes all densely populated settlements in the area need to be relocated. This relocation then followed by the fisheries issue of distanced fishing area to the new set fishermen settlement. Besides, the community also were not used to the new living environment. However, the existing informal coastal settlement still remains un-relocated though the plan had been widely informed to the communities.

5 Conclusions

Indonesia's coastal area is a richness in natural and spatial resources, economic force and social diversity. Besides the water-based settlement, the coastal communities bring the strong coastal culture. However, the rapid economic and development had caused great environmental degradation in Indonesian coastal area. Marine pollution is seen as an urged coastal problem with complex involvement of causal variables, including the coastal community. This study pinpoints that the fishermen villages take significant role in the causal variables. The marine pollution strongly impacts the living environment of the coastal communities; however, they also take part in contributing to the accumulating waste due to the poor living behavior and insufficient settlement facilities and amenities in the informal setting of fishermen village. The clear, firm and holistic government legal and regulation on the coastal area as well as its' enforcement is urged to be concerned and formulated.

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