ANALYSIS OF MARINE AND COASTAL RESOURCES SUSTAINABILITY IN BENOA BAY RECLAMATION SITE, BALI

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ABSTRACT

Land is one of limited natural resources. The high requirement of land made technology develop by reclamation method. The purpose of reclamation should be for increasing the benefit of natural resources and community welfare, but in fact the reclamation contribute the environmental problem and social conflict. Benoa bay is one of the bays in Indonesia that are proposed to be reclaimed by private sector and had declined by most local people. The aims of this research are analyzing the sustainability of marine and coastal resources in Benoa Bay Reclamation Site based on environmental dimension. This research was conducted quantitative approach by Multidimensional Scaling (MDS) for assessing the sustainability of marine and coastal resources on environmental dimension. The result of research shows sustainability value of environmental dimension is 49.88% (Less Sustainable). Further consideration is needed if the reclamation plan is to be implemented in Benoa Bay.

Keywords: Marine and Coastal Resources, Sustainability, Reclamation, Benoa Bay, MDS

METHODS

The research is a combination of qualitative and quantitative methods, by literature review, observation, interviews, questionnaires, and analyzing data with the Multi Dimensional Analysis method by using the Rapfish software. Rapfish is developed as a new multidisciplinary rapid assessment technique to evaluate the sustainability of fisheries (Pitcher, 2001). This software was modified to be able to assess the sustainability of marine and coastal resources at the reclamation site in environmental dimension.

RESULT AND DISCUSSION

Based on the results of the respondents’ discussion and literature review, the waters of Benoa Bay have indeed suffered damage and pollution since Serangan Island reclamation (1996), toll road construction, high load of pollutants entering the bay from inland waters due to tourism activities, port activities, and increased sedimentation (KLHK, 2017, Putra et al., 2017, Tanto et al., 2017; Wisha et al, 2018). The environmental conditions in Benoa Bay and the estimated impacts from the reclamation activities in the Benoa Bay are presented based on the physical, chemical and ecosystem aspects in Benoa Bay.

• Physical

Benoa Bay is a bay that has a semi-closed typology with sandy beach and mixed coral fragments. Beach types in the waters of Benoa Bay are sandy beaches. Patterns of sandy beaches are beaches that have high potential for erosion or changes in coastlines (Triatmodjo, 2016). There was a change in depth in the waters of the Benoa Bay when compared to the conditions in 1995 with conditions in 2015. Based on field observations also seen the condition of Benoa Bay waters had sedimentation at some points. This can be seen in Figure 2 and 3 as the documentation of the researcher at ground check and the waters of Benoa Bay are estimated occurred sedimentation.

• Chemical Condition

The results of measurements of sea water quality report in Benoa Bay is categorized as bad or heavily polluted based on sea water quality standards for marine tourism (KLHK, 2017). It is known that there is a value of sea water quality above the quality standard for some parameters such as brightness, DO, BOD, nitrate, ammonia, phenol, and coliform. Benoa Bay is not indicated as lead contaminated metal (Pb), but it is indicated to be contaminated by Cadmium (Cd), Detergent, and Phenol. Oil and fat contribute significantly to the quality of sea water in the Benoa Bay.

• Ecosystem Condition

Based on thematic maps the distribution of coastal habitats in 2017 from BIG (Figure 3), is still found in a small distribution of seagrass around the waters of Tanjung Benoa, while for coral reef only found around the outer bay waters. Changes in ecosystem conditions are also in line with the results of research from Putra et al. (2017) which states that changes in mangrove cover area from 2006 to 2015 were caused by land conversion for ponds and built zones with a change of 69.07 ha, and a decrease in coral cover in 1997 to 2012 covering 90.51 ha. This should be a concern if reclamation is carried out in the waters of Benoa Bay which has the potential to have turbidity impacts on the bay waters and affect coral cover outside the bay.

• MDS Analysis for Environmental Dimension

The result of Rapfish analysis showed the sustainability index value of the environmental dimension is 49.88% and it included in the category of Less-sustainable (Figure 4). The leverage of 7 attribute in environmental dimension is the sedimentation potential (Figure 5). This can be interpreted that the sedimentation conditions in Benoa Bay have an important and sensitive role in environmental sustainability in Benoa Bay. Engineering for handling sedimentation must be done as an intervention for the sustainability of the environmental dimension if reclamation is carried out in Benoa Bay.

CONCLUSION

The lack of sustainability of the Benoa Bay reclamation plan resulting from the values of the environmental dimension showed less sustainable results. Reclamation has the potential to increase the level of turbidity of the waters that will spread beyond the Bay. This has the potential to damage the ecosystem outside Benoa Bay which is considered to start to recover after the previous activities, so that development must be carried out sustainably and technologically manageable according to the principles of environmental management. The condition of Benoa Bay which has been polluted and high sedimentation, if reclamation it will worsen the condition of Benoa Bay and still become a community livelihood area. So that reclamation in Benoa Bay should be reconsidered, due to the lack of sustainability of marine and coastal resources at the reclamation site and in order to revitalize the bay according to its conditions and functions.

REFERENCES