CITIES 2015 International Conference, Intelligent Planning Towards Smart Cities, CITIES 2015, 3-4 November 2015, Surabaya, Indonesia

Formulation of Mangrove ecosystem management model based on eco-minawisata in the Coastal Sinjai, South Sulawesi

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Abstract

The rising price of crab in the world has fueled conversion of mangrove ecosystems into ponds, including in South Sulawesi. The conversion of mangrove allegedly contributed to environmental degradation in South Sulawesi Coastal Area. On the other hand, conservation efforts that have been made have not received a positive response from the public. Thus, it needed to formulate the proper management model. Analysis techniques used in this study is scoring and AHP (Analytical Hierarchy Process). The result are: (1) development and land use in areas suitable for fish and crabs in the mangrove conservation area; (2) development of fisheries areas based around the mangrove conservation area; (3) development of strategic infrastructure in a potential area for aquaculture, fisheries and marine tourism; (4) development and management of coastal areas and sea-based maritime tourism in mangrove conservation area; (5) development and management of coastal and marine areas based on mangrove conservation.

Keywords: Conservation; mangrove ecosystems; management model.

1. Introduction

Sinjai coastal area has mangrove area around 786 ha which is play an important role in the dynamics of coastal and marine ecosystems, particularly in the development of aquaculture and supporting the potential of aquatic biota. Not only have biophysical and biological function, mangrove forests in the coastal Sinjai also has a function to

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enhance productivity, economy of coastal communities, the potential of fisheries, coastal protection, and added value to the surrounding community. Physically, this ecosystem serves to maintain the stability of the coast from the effects of erosion, waves and abrasion, protective mainland (filter) of tsunamis, hurricanes, sea water intrusion, and the threat of various pollutants and pathogens.

Ecologically, mangrove ecosystem serves as a buffer of ecological balance between life on the land and the sea. Mangrove become an energy source for many species of marine biota such as fish, shrimp, clams, crabs and various types of other biota, spawning ground, enlargement (nursery grounds), foraging (feeding ground) and shelter. Economically, mangrove ecosystem serves as a supplier of products that bring economic benefits to humans, such as providers of recreational facilities, education, aquaculture (marine culture) and livestock (honeybees), and provider of products for the purposes of fuel (charcoal), paper (pulp), construction, household appliances, textiles, leather, food, drinks and medicines (anti-tumor, anti-inflammantory) (Bengen, 2001; Alongi, 1998; Salm and Clark, 2000).

Mangrove ecosystem has long been used by the community and can support the improvement of public welfare in the coastal areas, because this area produces a wide range of export commodities with high value such as shrimp, crabs and fish. The high price of crab in the world market has triggered conversion of mangrove ecosystems into fishpond in various areas, including in the province of South Sulawesi. On the other hand, the conversion of mangrove land suspected to contribute to the environmental degradation of coastal in the province of South Sulawesi, such as the intensification of coastal erosion, tidal flooding, decline in water quality and loss of spawning a variety of marine life, including fish and crustaceans. The phenomenon responded by the South Sulawesi provincial government to support the development of mud crab farming in ponds, with the area of development reached around 35,000 ha, cover the ponds in Wajo, Sinjai, and Luwu District.

However, rehabilitation and conservation efforts that have been made have not received a positive response from the public because there is no direct contribution to the improvement of people's income. Then it raises a conflict of interest between communities and local governments with the Regional Regulation No. 8 of 1999 on the prohibition of logging in mangrove areas of society, so that needs to be reviewed appropriate management model that government policy can be maintained but the wishes of the people fulfilled too.

On the other hand, the utilization of mangrove areas in a planned is also expected to increase the added value for the people who live around the mangrove area, including fish farmers and fishermen. While intercropping cultivation of mangrove crab (silvofisheries) can increase the production of crab as well as to suppress the encroachment of mangrove forests. To reduce fishing pressure on mud crab, it necessary to develop the cultivation effort to prevent a decline in production due to reduced resources. Based on this, the formulation required management model that can unify the perception among the public desire with the local government policies, thus ensuring the sustainability of mangrove ecosystems is maintained, but still provide added value to the surrounding community by utilizing a variety of alternative businesses that are economically viable and sustainable development.

2. Methods

2.1. Data Collection Technique

The data was collected through a primary and secondary data survey. The data collected is observational data of economic, social, cultural, legal, and public perception. Primary data is collected through observation and interviews. Interviews with local communities involved in the conservation and management of mangrove forests is done with PCRA method (Participatory Coastal Resource Assessment), local governments, relevant institute, ACI and Baku Lestari group, and community associated with the sites. Secondary data collected through searches the literature contained in the related government and private institutions.

2.2. Analysis Technique

The analysis technique used in this research is scoring method, which is based on the condition of ecological, economic, and social. The values of the scoring range from 1 to 3, the value of 1 (one) is given on the low or bad condition, the value of two (2) is given on the average condition, and the value of 3 (three) is given on the high or good condition. While the formulation of models and management strategies are done by using AHP (Analytical Hierarchy Process). This analysis is based on weighted criteria, wherein the weight value of each criteria and sub-