

The 3rd International Conference on Tropical and Coastal Region Eco-Development (ICTCRED 2017)

Yogyakarta, Indonesia, 2nd - 4th October 2017

INVESTING IN CLIMATE CHANGE MITIGATION AND ADAPTATION ON MANGROVE AND AQUACULTURE DOUBLES BENEFITS.

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Abstract

Java's north coast, particularly the shorelines of Demak, north-east of Semarang, is threatened by subsiding land and disappearing mangrove forests. Land subsidence, resulting from intensive groundwater extraction by nearby industries, rural and urban communities, and some of the shrimp farmers, is much faster than sea level rise. Although forbidden by law, farmers have cleared the mangrove almost up to the coastline, thus reducing sedimentation and increasing the risk of coastal abrasion. Farming of shrimp and milkfish provides food and livelihoods, but have high benefits only for some years unless farmers are properly trained and do not disregard the importance of mangrove forest. Mangroves planted in ponds, on dikes and along canals look nice and provide some timber, but their long-term effect is mostly negative.

Three interventions are needed: protecting the residual mangrove, giving up ponds along sea and rivers for mangrove to recover, and improving aquaculture. To facilitate a fast recovery of the mangrove habitat, concerned government needs to earmark budget to build permeable dams along the eroding coast, displace dikes along rivers, and establish coastal field schools to improve farmer's know-how on aquaculture. The *Building with Nature* project, together with Indonesian institutions and villages, is currently implementing these interventions in Demak district together with Indonesian institutions and villages. For Tambakbulsan, covering about 750 ha, we estimated the benefits of these actions with a Cost-Benefit-Analysis. We accounted, next to investments and profits including those for fisheries, the cost of destroyed houses and ponds, and of forgone benefits due to new mangrove forest and loss of land.

Our baseline scenario assumes that Tambakbulsan would suffer from subsidence and abrasion to the same extent as that of the villages that are closer to Semarang, where most lands were engulfed the last 25 years. For such a period, a *no-intervention* scenario would cost 40 billion IDR, and thus the contribution of Tambakbulsan to the national economy would become negative. Investing 1.2 billion IDR on *recovering mangrove-only* or on *improving aquaculture-only*, would generate benefits of 106 billion or 14 billion IDR, respectively. However, when simultaneously investing on both mangrove recovery and aquaculture improvement, the estimated net economic benefit would increase to 204 billion IDR. Parallel investment in climate change mitigation (recovering mangrove) and adaptation (improving aquaculture) would, thus, be highly beneficial.

Keywords: Aquaculture, mangrove recovery, abrasion, investment, climate change.

