Coastal settlement planning to respond the risk of sea-level rise: Local adaptive capacity

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Abstract:
This paper briefly sets the context of the nature and scale of sea-level rising as well as climate-change impact on human settlements based on secondary data and written documents. Later, the discussion is focusing on more analytical understandings of household/community vulnerability and coping strategies in relation to sea level rising and environmental hazards due to climate change. It also discusses modes of intervention, before suggesting directions for future research work given more likely increases in the phenomenon of sea level rise and other environmental hazards as a result of climate change. It is argued that all societies are fundamentally adaptive and there are many circumstances in the past where communities have adapted to changes in climate and to similar risks. But, some groups in society more vulnerable to the risks posed by climate change than others. Yet all societies need to improve their adaptive capacity to face both present and future climate change outside their experienced surviving capacity. The main challenge, therefore, are at two different scale. At the local scale is the natural resource management and at the scale of international agreements and actions, is to promote adaptive capacity in the context of sustainable development objectives. The paper ends with summary for further research.

Keywords: sea-level rise, settlements, Indonesia, adaptive capacity

Introduction: The risk of sea-level rise due to climate change on settlements

Indonesia situates to be influenced and 'suffer' the occurrence of climate change. Being an archipelagic country, Indonesia is very vulnerable to the impacts of climate change. Prolonged famines, increased frequency in extreme weather events, heavy rainfall leading to big floods, are only a few examples of what climate change has brought about. The inundation of some parts of the country, for instance in Jakarta Bay, has take place; Indonesia's rich biodiversity is also under threat. In turn, this may lead to harmful effects to agriculture, fishery and forestry sector, resulting in threat to food security and livelihood of the whole population.

Sea level rise will reduce farming and coastal livelihoods. Sea level rise would also be likely to affect fish and prawn production. In the Krawang and Subang districts the loss is estimated at over 7,000 tonnes and 4,000 tons, respectively (valued at over US$ 0.5 million) (Meliana 2005 in Susandi 2007). In the lower Citarum Basin sea level rise could result in the inundation of about 26,000 ha of ponds and 10,000 ha of crop land. This could result in the loss of 15,000 tons of fish, shrimp and prawns productivity, and about 940,000 tons of rice productivity. The overall effect would be to reduce potential average income. The estimated reductions of yield would cost the rice farmer US$ 10 to US$ 17 annually, the soybean farmer US$ 22 to US $72 and the maize (corn) farmer US$ 25 to US $130 annually. It is estimated that the decrease in yield would cause, in the Subang District alone, about 43,000 farm laborers to lose their jobs. In addition, more than 81,000 farmers would have to look for other sources of income due to the inundation of their rice fields or prawn and fish farms due to sea-level rise (Parry & Nih, 1992 in http://www.ciesin.org/docs/004-149/004-149.html).