



Lessons Learned Brief: 2013-33

## Economic Analysis of Climate Change Adaptation Strategies in Selected Coastal Areas in Indonesia, Philippines and Vietnam



Climate change with its attendant geophysical hazards is well studied. A great deal of attention has gone into analyzing climate change impacts as well as searching out possible mitigating adaptive strategies. These matters are very real concerns, especially for coastal communities. Such communities are often the most vulnerable to climate change, since their citizens frequently live in abject poverty and have limited capacity to adapt to geophysical hazards. Their situation is further complicated by the prospect of dealing with a confluence of hazards in comparison with those in other ecosystems.

Against this backdrop Worldfish and the Economy and Environment Program for Southeast Asia (EEPSEA) collaborated to implement the cross-country study “*Climate Change Impacts, Vulnerability*

*Assessments, Economic and Policy Analysis of Adaptation Strategies in Selected Coastal Areas in Indonesia, Philippines, and Vietnam*”. As its title suggests the study covered selected sites in Vietnam, Indonesia and the Philippines. Employing a gamut of interdisciplinary methodologies — ranging from community-based approaches such as community hazard mapping and focus group discussions (FGDs) to regression techniques — the study documented the impacts from three climate hazards affecting coastal communities. These were typhoon/flooding, coastal erosion, and saltwater intrusion. The team also analyzed planned adaptation options suited to implementation by communities and local governments, augmenting autonomous responses of households to protect and insure themselves from these hazards.

### **Project findings and policy-relevant lessons**

**A major impact of hazards related to climate change is foregone income.** The team found that damages to property and assets were very small across the different study sites. This is not surprising since households in coastal areas are classified as belonging to the ultra poor sector and the value of their property and assets would consequently be very low. When storms, flooding, and storm surges occur they disrupt the livelihoods of those whose households depend on coastal resources, especially the fishermen. Thus the value of income foregone due to these risks was higher than the value of damages from loss of assets and property.

**In all study sites environmental degradation exacerbated the damages from bio-geophysical impacts.** The team documented several environmentally degrading activities at the various study sites. For instance, the team discovered through Focus Group Discussions and Key Informant Interviews that sand quarrying and extensive foreshore development have hastened coastal erosion from rising sea levels and storm surges. Observed illegal fishing also confounded the impact of sea level rise on the decline of fish productivity. And in the case of Jakarta Bay, Indonesia there was land subsidence caused partly by groundwater extraction exacerbating the effects of the rising sea.

**Ecosystem-based approaches such as mangrove reforestation was the most cost-effective adaptation strategy.** Several planned adaptation strategies were considered, and often these were site-specific. However, the team found a consistent and common result across three sites — ecosystem-based approaches (using natural barriers such as mangroves) were more cost-effective than hard infrastructure investments.

The above insights can be associated with the following policy implications:

**Policy Implication No. 1:** Policies that address issues of poverty and environmental degradation need to be complementary. Such policies have long been considered sustainable development policies. The widening focus on climate-induced hazards only strengthens the imperative to urgently implement them.

**Policy Implication No. 2:** Economic as well as non-economic values should be accounted for and used to justify or rationalize interventions related to climate change and involving poor households. Using the value of damages in assets and property in these poor communities would provide only a weak justification for intervention.

**Findings on determinants of autonomous adaptation against climate-related hazards and impacts**  
**Autonomous adaptation by coastal households is conditioned**

**by the nature or characteristics of the hazards and has a gender dimension.** For recurring and often passing extreme events such as flooding and typhoons household male labor is an essential component for implementing recurrent or repetitive adaptation strategies. On the other hand, female labor is essential in dealing with permanent but creeping or slowly occurring hazards such as saltwater intrusion, since adaptation takes the form of a common household chore.

**Geographical location is significant.** Obviously in areas or countries where a hazard is less of a threat, we can also expect less adaptation. Coastal communities still rationally insure and protect themselves against nature. Even within sites, differences such as distance from coastline or other bodies of water lead to differences in autonomous behavior. Again this underscores the need for hazard mapping and the imperative of communicating to coastal communities the risks identified using these hazard maps.

**Policy Implication No. 3:** Policies aimed at increasing the effectiveness of autonomous adaptation can be designed with particular gender and geographical targets in mind. At the same time, policy makers must create the necessary information base to effectively craft these targeted policies. Essential elements are hazard maps and complete socio-demographic information.

**Increasing trust in a community also leads to increased autonomous adaptation.**

Specifically, this social variable can be a vital factor in combating coastal erosion and flooding. Extreme events are either recurring or permanent.

**Policy Implication No. 4.** Organizing communities and enhancing trust and relationships within communities can also enhance resiliency against climate-change-induced hazards.

**Government projects may crowd out autonomous strategies: there may be substitution between planned and autonomous adaptation in the study sites.** Similar to other studies, the team found natural protection such as mangroves and planned adaptation such as riverbank rehabilitation were substitutes for self-protection and self-insurance. Likewise, income from disaster and relief operations can also lead to a reduction in the probability of adaptation to extreme events such as coastal erosion.

**Policy Implication No. 5:** Public/planned schemes can have consequences for private/autonomous adaptation and may stifle private initiatives. Policy makers in the public sector should be vigilant to this prospect and be ready to craft effective adaptation interventions.

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