



Landscape Ecological approach enhances Eco-DRR: Exemplified from workshops with both professional and fun divers toward better restoration of coastal environments and resources

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Three quarters of the world's population live in vulnerable coastal areas. Despite the hazardous risks posed upon the coastal communities, the benefits of natural ecosystems bring food security, commercial fishery, and protection of human livelihoods. Coastal ecosystem consists of diverse habitats such as reed beds, salt marshes, mangrove swamps, tidal-flats, river deltas, sea grass fields, seaweed grounds, coral reefs, sandy and rocky-shore beaches and other coastal marine habitats that harbor both biodiversity and abundance of coastal lives. These complex coastal ecosystems are sustained by the function of land-sea linkage.

Coastal ecosystems provide wide ranges of ecosystem services and processes among natural environments, fisheries, and human livelihoods. Protecting coastal ecosystems secure material cycle, which is fundamental for sustainable human livelihood in coastal communities prone to disasters. In addition, bio-diverse coastal species such as seaweeds, function as nursery areas for commercially important seafood species such as fishes, clams and shrimps. Coastal ecosystems provide natural infrastructure for both prevention and reduction from hazardous events, known as ecosystem-based disaster risk reduction (eco-DRR). For establishing concept of eco-DRR, we should work together with local citizens and fishermen who are working at sea in daily basis. They should know well about underwater landscapes at the sea where they are working. The situation is also the same for fun divers who are frequently diving in the sea for watching seaweed forests and fishes and other landscapes.

Recently, we have started to have workshops with professional and amateur divers for mapping coastal underwater landscapes where they are diving. They clearly recognize different rocky and sandy landscapes from the past to the present. These practices are quite effective to monitor the changes in coastal underwater ecosystems, as they visit the same place frequently. Divers certainly play a role as witnesses of coastal ecosystems and environments. Earthquakes and Tsunamis give damages to coastal lives and coastal ecosystems. Together with the conventional hard-infrastructure measures, we have witnessed in previous disasters, that eco-DRR is both affordable and sustainable solution. Eco-DRR should be further promoted, not only in the preparedness and mitigation, but also for the better reconstruction from the disasters so to "Build Back Better" with "Sustainability".