



Tropentag, September 16-18, 2015, Berlin, Germany

“Management of land use systems for enhanced food security:
conflicts, controversies and resolutions”

Mangroves & Earth Plate Subduction: A Case Study from Nicobar Islands, India

NEHRU PRABAKARAN, HAUKE REUTER

Leibniz Center for Tropical Marine Ecology (ZMT), Theoretical Ecology & Modelling, Germany

Abstract

Mangroves are unique ecological communities that thrive in the intertidal habitats of tropical and subtropical coasts where their salt tolerance and unique morphological features leads to a competitive advantage over other vegetation communities. Owing to the occurrence of mangroves in the buffer zone between sea and land, natural disturbances such as hurricanes, cyclones, tsunami and sea-level change can cause significant damage to its habitats. The sea level change in the Andaman and Nicobar Islands, India due to the earth plate subduction during the Sumatra- Andaman earthquake 2004 is a striking example for how natural disturbances can cause everlasting impacts on mangrove forests. This earth plate subduction resulted in a third largest earthquake (9.3 Mw) in the known history of mankind and giant tsunami waves in the Indian Ocean. The Andaman and Nicobar Islands that were situated on the subduction trench had undergone tremendous landscape level changes due to the landmass uplift and subsidence relative to sea level. In general the Nicobar Islands in the South had sunk in the sea for about 1.1 – 3 m and the Andaman Islands in the North had uplifted from the sea for about 0.1 – 1.4 m. This has caused a significant damage to the coastal ecosystem in general and mangrove forests in particular.

We have studied the impacts of tsunami and landmass subsidence on mangrove vegetation and their natural recovery patterns from the Nicobar Islands. Our findings have suggested that nearly 95 % of mangrove forests undergone an irreversible damage and five species of mangroves have gone locally extinct from the Nicobar Islands. Also we found a landward migration of mangrove species to the habitats that were coastal evergreen forests before and became inter tidal habitats after the subsidence.

Keywords: Buffer zones, earth plate subduction, India, intertidal habitats, mangroves, sea level changes