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## Assessment of Physical Mitigation Provided by Tree Crops in the December, 2004 Tsunami Event in West Aceh-Indonesia

JUAN CARLOS LASO BAYAS<sup>1</sup>, CARSTEN MAROHN<sup>1</sup>, GERD DERCON<sup>1</sup>, SONYA DEWI<sup>2</sup>, ANDREE  
EKADINATA<sup>2</sup>, LAXMAN JOSHI<sup>2</sup>, MEINE VAN NOORDWIJK<sup>2</sup>, UWE MEYER<sup>3</sup>, GEORG CADISCH<sup>1</sup>

<sup>1</sup>*University of Hohenheim, Institute for Plant Production and Agroecology of the Tropics and Subtropics,  
Germany*

<sup>2</sup>*World Agroforestry Centre, Southeast Asian Research Program, Indonesia*

<sup>3</sup>*Federal Institute for Geosciences and Natural Resources (BGR), Germany*

### Abstract

Post-Tsunami call's for establishing or improving coastal protection has been quick and loud, as presence of live barriers could probably have reduced loss of many human lives. Effective coastal zone management has to provide environmental protection but also has to meet economic targets by providing sustainable livelihood options. Tree crops and in particular trees preferred by farmers contribute to both objectives. Before the Tsunami event, 40–60 % of the economy of West-Aceh, Sumatra (Indonesia) depended on tree crops. The present study aims to assess and understand the physical mitigation provided by these tree crops in the Tsunami event of 2004 in the Aceh Barat District. High and low resolution satellite images from periods before and after the Tsunami event (December 26, 2004) are used to identify transects perpendicular to the coast line and characterised by common and distinctive landcover sequences. The tools used for gathering field information for ground-truthing are focal groups and semi-structured interviews. The emphasis is laid on data collection of damage inflicted by the giant wave and backwash effects inland. This last information is derived from estimations on flooded area, run-up height, loss of human lives, infrastructural damage and loss of arable land. Pre-conditions to develop the study include similar coastal orientation, homogeneous topographic features, distance to rivers as well as soil characteristics. Depths from the near-shore seabed are neglected since bathymetrical maps for the zone show no appreciable differences. The distance from the epicentre is also neglected due to the proximity of transects to each other. The data obtained will be used to develop correlational case studies and if possible a replicable statistical model of the influence of land use types on the mitigation of the Tsunami, especially the mitigation provided by tree crops present in the area. Preliminary investigations shows contradictory results regarding the importance of tree crops in the mitigation of Tsunami event.

**Keywords:** Aceh, ecosystem services, mitigation, remote sensing, tree crops, tsunami