



Tropentag, October 9-11, 2007, Witzenhausen

“Utilisation of diversity in land use systems:
Sustainable and organic approaches to meet human needs”

Assessing Short and Long Term Time Dimensions of the Tsunami Impact on the Green Infrastructure in Aceh, Indonesia: A Challenge to Data Collection and Methodological Approaches

CARSTEN MAROHN¹, ANDREAS DISTEL¹, JUAN CARLOS LASO BAYAS¹, DIAN YUSVITA INTARINI¹, GERD DERCON¹, SONYA DEWI², BETHA LUSIANA², UWE MEYER³, LAXMAN JOSHI², MEINE VAN NOORDWIJK², GEORG CADISCH¹

¹University of Hohenheim, Institute for Plant Production and Agroecology in the Tropics and Subtropics, Germany

²World Agroforestry Centre, Southeast Asian Research Program, Indonesia

³Federal Institute for Geosciences and Natural Resources (BGR), Germany

Abstract

The earthquake and Tsunami of December 26, 2004, had far-reaching effects on all sectors of coastal Aceh Barat, Indonesia, the district closest to the epicentre. While direct effects on human population shortly after the event received adequate attention by relief organisations, various trends in land use change and its impact on livelihoods were not addressed. With a focus on the green infrastructure, this research aims at linking up short- to long-term impact of the Tsunami on tree crop damage and land use change. A combination of biophysical and socio-economic parameters covering appropriate time horizons has been selected to unveil underlying patterns. Under the aspect of losses of lives as well as physical damage to infrastructure and trees immediately after the event, the role of existing tree belts in coastal protection is assessed using and combining tools such as high resolution satellite images, GIS-based land use classification and statistical data at sub-village level. To determine short- to mid-term effects of soil subsidence, salinisation and mud deposits by the Tsunami on crops and trees, repeated biophysical measurements were conducted, which were consolidated through farmer interviews and field observations to quantify tree damage.

Farmers' perception of the mentioned biophysical factors and the largely changed socio-economic settings influence land use decision making on household level in a longer perspective. Major factors playing an important role in the decision-making are development of markets and prices, the role of extension through development organisations and farmers' adoption and learning style. Present changes are monitored and an understanding for farmers' motives is developed using individual and focus group interviews. These data serve as input for a modelling approach to prospect a baseline as well as alternative land use scenarios over a time horizon of 30 years.

The recent opening after decades of social unrest and isolation, massive external influence and interests and cultural peculiarity make Aceh a unique case to observe changes on different time-scales. The challenge of selection, combination and triangulation of data in an extremely dynamic environment will be highlighted in the presentation.

Keywords: Aceh, biophysical impact, Indonesia, land use change, temporal dynamics, tree crops, tsunami