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Modelling Farmer's Land Use Decisions after the 2004 Tsunami Event: A Case Study in West Aceh, Sumatra, with Respect to Annual and Tree-Crops-Based Systems

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Abstract

The coastal zone of West Aceh was the most affected area by the Indian Ocean earthquake and the following Tsunami in 2004. Not only thousands of people were killed and infrastructure swept away, but the event also led to drastic changes in land use along the coastal area, due to subsidence, ground water salinisation and changed soil properties by mud deposits. In response to these biophysical and infrastructure changes, farmers as main agents in the agricultural sector faced important challenges in making decisions to select the right livelihood options to fulfil their needs. Furthermore, Post-Tsunami socio-economic changes as consequence of disaster relief and reconstruction of infrastructure influenced farmers' decision making to allocate their time either for agricultural or off-farm activities.

The aim of the present study was to understand farmers' land use-related decision making after the Tsunami and the principal driving factors influencing these decisions. Four objectives have been included in the study: **(i)** to identify land use dynamics from before the Tsunami event until present, **(ii)** to understand biophysical and socio-economic factors determining farmer's decision making on annual and tree crop based land use systems, **(iii)** to prospect a baseline land use sequence in the next three decades using a simulation model, and **(iv)** to explore alternatives future land use trajectories through scenario studies using a simulation model.

Collecting socio-economic and biophysical data related to farmer's decision making is the first methodological step. Data gathering is carried out through in-depth interviews at household level. Selecting households, purposive random sampling is applied along existing transects used by two associated subprojects. Interview data will serve as baseline for these studies but are mainly intended for parameterisation of a modified Adopt & Learn Model.

The expected results from the study are a better understanding of land use before and after the Tsunami, and biophysical and socio-economic drivers of farmers' land use decision-making in the study area, a prospect of the land use dynamics based on farmers' adoption strategies and finally, a simulation of alternative future land use trajectories.

Keywords: Decision-making, Indonesia, land use, modelling, tsunami