Modelling Farmers' Land Use Decision-Making after the 2004 Tsunami event
A case study from West Aceh, Sumatra, focusing on Annual &Tree-Crops-based Systems

World Agroforestry Centre
TRANSFORMING LIVES AND LANDSCAPES

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Introduction

After the tsunami in 2004, farmers faced the following constraints influencing agricultural land use:

● Reduced agricultural land area due to biophysical constraints (subsidence) and demand of land for relocation settlements inland.
● Devastated agricultural and marketing infrastructure such as irrigation, roads and transportation system
● Loss of part of the population and loss of knowledge about specific tasks in agriculture

Objectives

● To characterise typical land use sequences before and after the tsunami
● To understand driving factors determining farmers' decision-making on land use after the tsunami event

Methodology

● Data collection was carried out through semi-structured household and group interviews in 10 villages along West Aceh coast
● 30 datasets on socio-economic and biophysical properties of farmers' plots and 10 on farmers' behaviour were obtained
● Data analysis looked at cost-benefit analysis on household level and farmers' behavior analysis (Adopt and Learn concept)

Preliminary Results

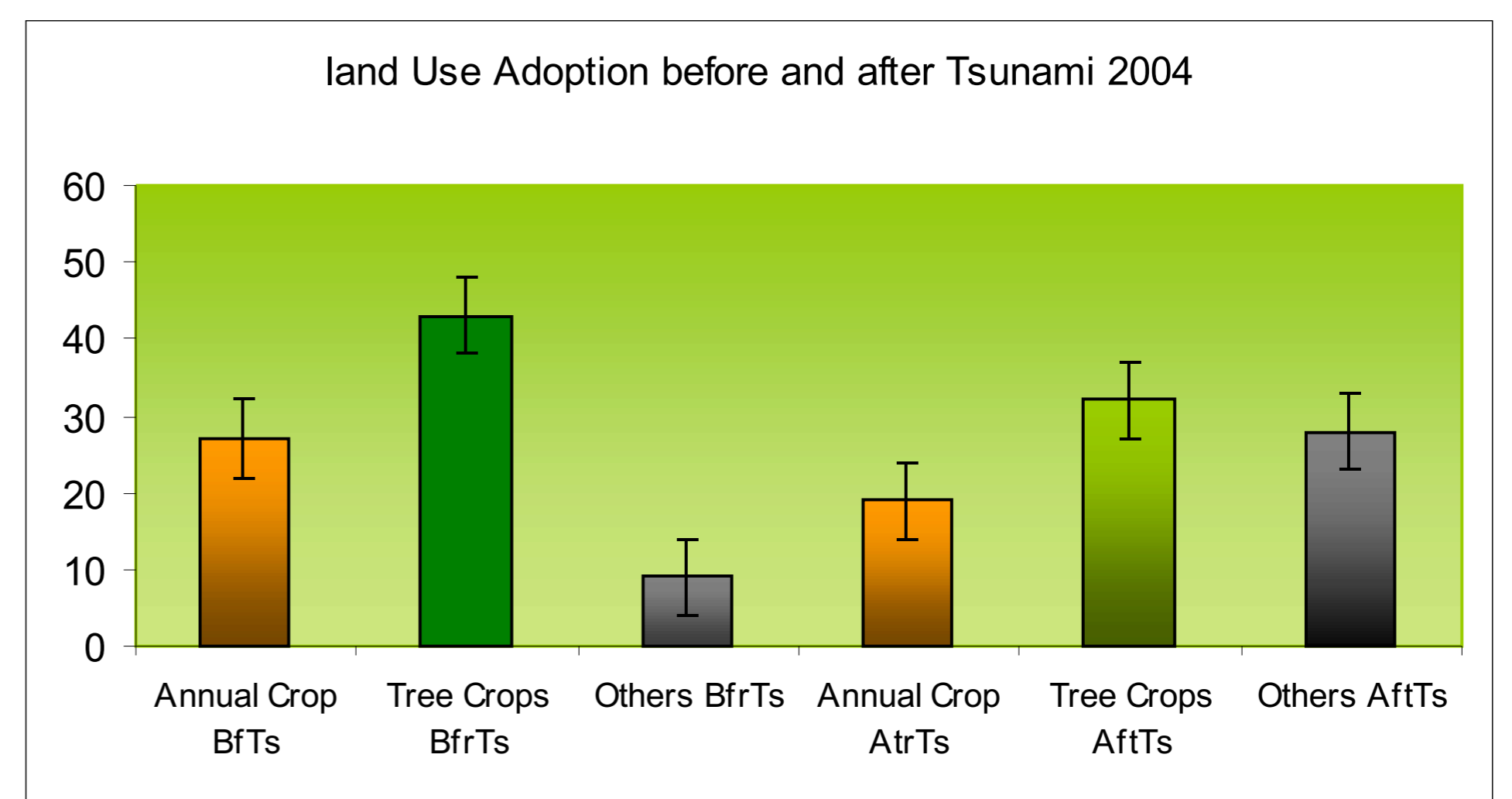Number of productive members per household before and after tsunami
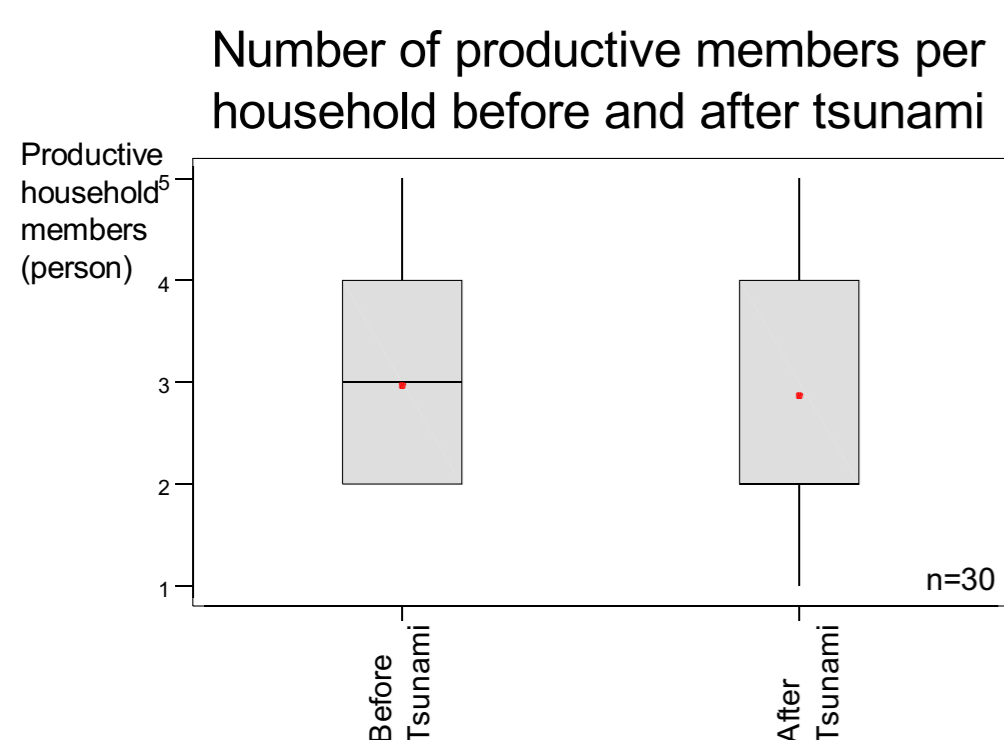
The ratio between productive and unproductive household members (n=30) is 3:1. Number of productive household members was not changed significantly through the Tsunami.

Plot area per household before and after Tsunami
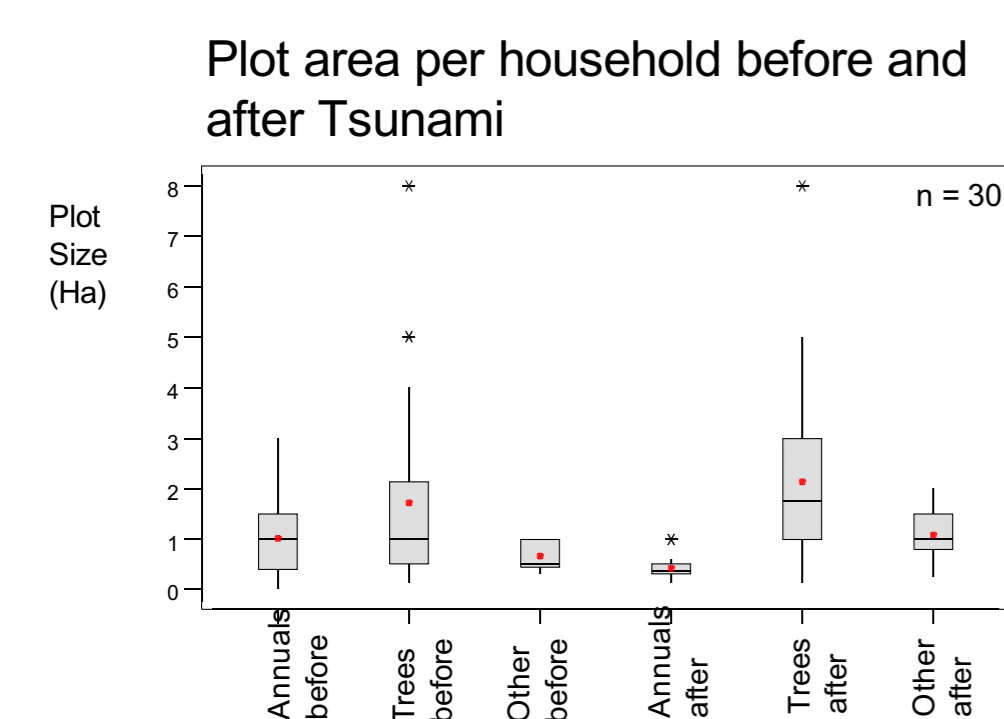
Plots under annuals have been converted into other uses, while the number of plots under tree uses remained stable.

land Use Adoption before and after Tsunami 2004

As a general tendency, annuals (staple food) are given preference over tree uses, where land or labour force are limited,.

While the number of productive household members did not change significantly, land use frequency and plot sizes per land use (tree vs. non-tree vs. other) shifted. This occurred due to changes on soil properties, subsidies, crops prices, land demand for settlement area and off-farm work.

Conclusions

Direct consequences of the tsunami as well as such of disaster relief and reconstruction of infrastructure have influenced farmers' decision-making on land use options. Apart from land suitability and plot size, labour capital (in context with off-farm income) influence farmers' decisions.

Outlook

Data on information exchange, network and adaptive expectation (Adopt & Learn concept) will be added to existing datasets on biophysical parameters. Combining these data with a plot cost-benefit analysis, different land use scenarios will be simulated.

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