

Book abstracts

**Eight International Ecosystem Services  
Partnership Conference 2015**

*Ecosystem Services for Nature, People, and  
Prosperity*

9–13 November 2015 Stellenbosch, South  
Africa

*Type of submission: Voluntary contribution*

T8 The role of ecosystem services in disaster risk reduction, climate change adaptation and sustainable development

## **Enhancing community resilience to climate variability through ecosystem services from forest and trees in Indonesia**

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Rural communities have long been using forested ecosystems to sustain their livelihoods and support development aspirations. In times of extreme climatic events, which can affect people's sources of income and exacerbate poverty, forest ecosystem services have often been recognized as playing an important role as safety nets and natural buffers. However, recent literature has highlighted the need for a better understanding of how climate variability drives changes in land use and its implications for people's vulnerability, especially in forested rural areas. We examined how the ecosystem services from forests and trees can enhance people's resilience by influencing elements of risk: exposure, sensitivity, and adaptive capacity. We conducted several participatory rural appraisal exercises, with a total of 24 focus group discussions and 256 household surveys in smallholder-dominated rural landscapes in Indonesia. The Sustainable Livelihoods Framework was used to analyse people's abilities to respond and maintain their wellbeing in the presence of climate-related stresses such as floods, drought and disease outbreaks. Our results suggest that forests and trees are important in supporting community resilience to climate-related stresses in different ways. The role of trees for adaptation varied according to the type of ecosystem service, whether provisioning or regulating, in relation to the time of the disaster (before or after). Communities' recognition of environmental conditions, climate variability and their linkages encouraged the development of practices that actively use natural resources and ecosystems to address climate-related hazards. For example, people avoided locating infrastructure and production activities in hazard prone areas, spread the risks with livelihoods diversification, maintained or enhanced trees on hilltops, near cultivated areas or along rivers to prevent erosion and regulate water run-off. An increased consideration of the complex linkages between vegetation cover and human vulnerability and their temporal dimension, would help ecosystem services to be a valuable option to reduce disaster risk and climate-related vulnerabilities.

*Keywords:* Climate variability, climate change adaptation, ecosystem services, natural resource management, social vulnerability