



SOS-Uplands - Safe operating space in mountainous regions of SE Asia: Identification and management of critical thresholds in land-use intensification and biodiversity

Subproject: Water management

The upland regions of mainland Southeast Asia are currently facing a dramatic shift from subsistence cultivation to intensive, market-oriented cultivation. Although this development has a positive impact on the standard of living of the people, it leads to a massive loss of biodiversity and impairment of ecosystem functions. For example, land-use changes result in very high erosion rates, which cause soil degradation, water pollution and usage restrictions for drinking water or habitat loss for aquatic organisms.

At least temporarily, the degradation of sustainability is often compensated by different measures (e.g. intensified fertilizer usage). In addition, despite initially positive socio-economic effects, farmers tend to become indebted and impoverished in the medium and long term as a result of the high effort required. This is because critical thresholds are exceeded which cause a sustained change of socio-economic and ecological systems („tipping points“). Moreover, the causal interactions are not linear, which makes their prediction difficult.

Primary objective of the research project is to develop an integrated tool for decision support of the local administration for the identification and management of secure scopes for land management in the Southeast Asian Uplands.



Figure: Intensified land management leads to high erosion rates in the study area (Photo: M. Krauß)

Embedded in an intense public participation, the aim is to identify and model all relevant factors influencing land use systems, considering uncertainties.

For this purpose, within one year workshops will be held in Germany and Thailand to identify research partners. In cooperation with the research partners, an integrated model concept for the interdisciplinary analysis of tipping points during land use changes will be developed, as well as a feasibility study (University of Hohenheim) and a stakeholder analysis (Humboldt University of Berlin) will be carried out.

Finally, a research proposal will be jointly developed with the German and Thai partners and submitted to the German Federal Ministry of Education and Research.

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