

Master project/thesis (2021/22)

Ecological-economic sustainable land use of rainforest transformation systems in Sumatra



We are looking for motivated Master students who are interested in simulation modelling with focus on economic/ecological sustainable land use of rainforest transformation systems in Sumatra.

You will be working in the [Ecosystem Modelling department](#) led by Prof. Dr. Kerstin Wiegand that focuses on model developments and analyses with respect to spatial dynamics of populations and communities, mainly in savanna, forest, and agricultural ecosystems. Within the department you will be working together with researchers of the [EForTS](#) subproject [B10](#) “Landscape-level assessment of ecological and socioeconomic functions of rainforest transformation systems in Sumatra (Indonesia)”. In the subproject, we investigate how to maintain biodiversity and ecosystem functioning of tropical landscapes while serving human needs. In doing so, we are using the ecological-economic land-use change model EForTS-ABM implemented in NetLogo. With the model, we assess the effect of land use options (rubber vs oil palm plantations) on farmers’ welfare (economic function) as well as on ecosystem carbon storage and habitat quality (ecological functions). In a next step, we want to expand the model by introducing further ecological functions as well as additional management options to finally assess economic/ecological sustainable land use options for a rainforest region in Sumatra.

We offer several Master projects and theses related to this goal:

(1) State-of-the-art of ecological-economic simulation models (1 master project)

- literature review: systematic assessment of existing simulation models from peer-reviewed publications on ecological-economic simulation models

(2) Environmentally friendly management options on economic and ecological functioning (1-2 master projects and/or theses)

- Definition of research question(s) (e.g. What is the effect of increased environmentally friendly managed areas on ecosystem carbon storage and farmers’ welfare?)
- Definition and implementation of one environmentally friendly management option (e.g. reforestation, reduction in fertilizers/herbicides)
- Model scenarios and analysis with respect to research question(s)

(3) Land use effects on additional ecological functions (1-2 master projects and/or theses)

- Definition of research question(s) (e.g. What is the long-term effect of different landscape settings on different ecological functions?)
- Definition and implementation of at least one additional ecological function (e.g. water storage, pollination)
- Model scenarios and analysis with respect to research question(s)

If you are interested, please contact Sebastian Fiedler (sebastian.fiedler@uni-goettingen.de).