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Land Evaluation for Sustainable Highland Agriculture in NW-Thailand (PangMaPha) — With Special Respect to Soil and Water Resources

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Abstract

The population of Northern Thailand steadily increased in the last decades and levelled agricultural land is scarce. Consequently, agriculture increasingly shifts towards steep sloping land of the mountains. Furthermore, the increasing land and water shortage forces the farmers to shorten the traditional fallow periods more and more. These factors caused a trend towards declining site productivity and increasing food deficiency for the small-holding highland population. Maintaining productivity and creating technological options for development are therefore the most important issues to agricultural research. Greater efforts should be made to develop conservation strategies in accordance with the needs of the local people and to achieve stabilisation of tropical highland agro-ecosystems.

The objective of this research activity is to physically evaluate existing and alternative mixed cropping systems under special consideration of water availability and soils, in a mountainous limestone area. Potential contribution of different conservation strategies to improve the present slash and burn agriculture will also be evaluated. Additionally, opportunities and constraints of organic agriculture will be discussed. The project is an interdisciplinary activity and connected to the Special Research Programme 564 “Sustainable Land Use and Rural Development in Mountainous Regions of Southeast Asia”

The first step was to analyse the soil conditions of a representative area (Sopong) in the limestone environment, located in Mae Hong Son province. Physical and chemical soil parameters necessary for the crop evaluation have been either determined in the field or analysed at the Chiang Mai and Hohenheim Universities. In the limestone area hilltribe farmers have been interviewed concerning their farming system and related problems.

As a next step, a simple water balance model will be run with the examined soil physical parameters and real climatic data collected from the local meteorological service. Focus is on the identification of water stress periods. This modelling step is taking place in Hohenheim.

As final result these data provide the basis for a site and cropping system evaluation according to the parametric FAO/ITC Ghent approach.

Keywords: Highlands, land evaluation, mixed cropping, organic farming, soil fertility, water stress