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Findings of an Upland Rice Farming Study Using a Participatory Mapping Approach in Sarawak (Malaysia)

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Abstract

Cultivation of rice plays an important role in food security and nutrition in the life of the Eastern Penan, a former hunter-gatherer society in Borneo (Sarawak, Malaysia). The main farming practice is upland rice cultivation by the means of slashing and burning in a shifting cultivation system. However, a shortening of fallow periods, caused by population growth, and the intensive land use led to a decline in the forest ecosystem functionality and soil quality, which in turn affected the rice yield. Therefore, sustainable hill rice production is essential to maintaining natural resources and mid- to long-term food security for the locals. To give recommendations for sustainable hill farming practices, a preliminary study in the Penan village of Long Lamai (Upper Baram watershed) was conducted. With a population of roughly 600 the village relies on rice farming for subsistence. A participatory research approach was chosen, in which local community members were part of the research team. 183 structured interviews and participatory mapping were conducted to assess key variables of hill rice cultivation, including: production methods, soil aspects, rice varieties, yields and weather conditions during cropping. Spatial references were drawn on aerial images and in a later stage digitised with a GIS program.

Results show a median 6-years fallow period and a one-year cropping phase. Generally, fields are intercropped with two or more kinds of crops, i.e. corn, cucumber or tapioca. The yields comes to a mean of 1.8 t ha^{-1}. Soil fertility was rated as high/ medium/ low/ degraded with ratios of 28 %, 35 %, 28 %, and 7 % respectively. Overall, fertiliser application is not common in the village, while pesticides are used on 50 % of the examined fields. On average, the farmers used 3.8 l ha^{-1} per year of pesticides. The amount applied has steadily increased since 2013. Because of poor weed management, higher use of pesticide weakly correlates with higher yields. With the participatory mapping approach, a first impression was drawn that the applied farming practices is showing a trend of shorter fallow periods and higher external inputs in the village of Long Lamai.

Keywords: Food security, participatory mapping, shifting cultivation, upland rice

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