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

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Introduction
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). Since the 1960s the Eastern Penan started to cultivate rice, which was introduced to them by missionaries and the neighboring communities (Janowski & Langub 2011). The main farming practice of the Penan, upland rice cultivation, is by the means of slashing and burning in a shifting cultivation system. Recently, a social transition in the Penan communities and other factors, such as industrial logging and plantations, increased the pressure on natural resources (Cramb & Sujang 2011). Therefore, shorter fallow periods, caused by population growth, and the intensive land use led to a decline in the forest ecosystem functionality and soil quality (Li et al. 2014), which in turn affected the rice yield. Sustainable upland rice production is essential to maintaining natural resources and mid- to long-term food security for the locals. To give recommendations for sustainable upland farming practices, a preliminary study in the Penan village of Long Lantai was conducted.

Study Area
The village of Long Lantai (population of 600) is located in the upper Baram region in Sarawak (Malaysia) (Figure 1). In a tropical upland-rainforest environment in the ethnically diverse landscape, the Eastern Penan of Long Lantai were the first group who founded a settlement and started to farm upland rice. Access to the village is possible by boat and walking.

Materials and Methods
A participatory research approach was chosen to gather agronomic and environmental information on upland rice fields*.
• 6 supervised local village researchers
• 127 usable structured interviews
• Spatial references on aerial orthophotos
• Sketch mapping (Fig. 3)
• GIS cartography and analysis

Results and Discussion
The mapping result can be seen in Figure 4 for field No. 316. The map shows the distribution of the fields, overlaying of fields, different soil segments, weed (Lalang), erosion and landslide occurrences as well as rice varieties distribution. Information from the questionnaires, including distances and field area hectares are linked to the database for every field and segment.

Conclusion
With the participatory mapping approach, we understood general farming practices, the cultivation cycle and distribution of fields. A first impression was drawn that the applied farming is showing a trend of shorter fallow periods and higher external inputs. The method still needs improvements in terms of the specification of the subjects asked for.

References
Bruun, T.B.; Mette, O.; Elberling, B. (2008): Linking yields of upland rice in shifting cultivation to fallow length and soil properties. Agriculture, Ecosystems & Environment 113 (1-4), 130-149.

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