Land Use, Agrobiodiversity and Smallholder Rubber Farmers' Risk Perception: A Case Study from Xishuangbanna, China

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Abstract

Natural rubber plantation, especially smallholder rubber plantation, has been rapidly expanding in Xishuangbanna during the last three decades, triggering profound changes in land use and reducing agrobiodiversity. Although rubber expansion has improved smallholders' income this development carries risks due to the possibility of price decline and environmental degradation. Due to high profits of rubber farming during the recent past, many smallholder rubber farmers in Xishuangbanna have given up their traditional multiple cropping systems and specialised in rubber farming. This paper hypothesises that a major factor that determines the land use strategy of smallholder farmers is their perception of riskiness of rubber farming. Farmers with a higher risk perception are more likely to diversify land use and less likely to specialise in rubber.

To test this hypothesis, we use cross-section data of some 600 rubber farmers in Xishuangbanna. Individual risk perception was measured by a score that expresses the decision maker's subjective assessment of the riskiness of rubber farming. As methodology we use four econometric models, namely Probit, Tobit, Poisson and Seemingly Unrelated Regressions (SUR). We introduce instrumental variables to control for endogeneity. Our results show that farmers with a higher risk score are more likely to plant other crops in addition to rubber, including food crops. Results also indicate that land use strategies are associated with ethnicity, household wealth, off-farm employment, land tenure status, altitude and the household's experiences of rubber farming. Overall, this study can provide a better understanding of smallholder rubber farmer's decision making with regards to land use. Potential entry points for improving agrobiodiversity in rubber-based land use systems can also be identified.

Keywords: Crop diversification, land use, risk perception, rubber, Xishuangbanna

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