Persist or vanish: The future of the Dayak Iban swidden agriculture in northern Kapuas Hulu, West Kalimantan

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Southeast Asia continues to experience rapid land-use transitions driven by the conversion of biodiversity-rich ecosystems to monoculture plantations, with mixed consequences for essential ecosystem services and rural livelihoods. As is the case for so many other places in Indonesia, dramatic agrarian changes have occurred in the Kapuas Hulu regency in West Kalimantan. Forests have been logged since the 1980s, including massive illegal logging activities that ended only in 2005. More recently, local government have promoted oil palm plantations development. The Dayak Iban living in the area practice swidden agriculture for subsistence, while tapping rubber trees or cultivating pepper for commercial purpose. They are also well known for having a long history of migration for labour or urban salaried jobs in Malaysia. In this context, this study explores the critical role that these indigenous communities play for the sustainable management of forested landscapes. We researched the factors determining forest dependency related to subsistence, commercial agriculture and migration patterns, and identify the links between different land management practices, resource use and ecosystem service provision. We used International Forestry Resources and Institutions (IFRI) survey instruments to collect socio-economic and institutional data on Dayak Iban communities in ten villages in Batang Lupar District, and also performed additional ecological surveys sampling to assess different land use practices effect on vegetation and soil erosion. We worked in ten randomly selected villages and their customary lands in Batang Lupar district. Focus Group Discussions and household surveys involved 139 respondents. Vegetation, soil and erosion sampling (2 hectares) was scattered across the study area to encompass the topographical variation and main land-use types. Our results showed that communities consider rubber, wage-labor and remittances as their three most important sources of income. Villagers manage swiddens, complex agroforestry systems including jungle rubber, communal forest, and occasionally irrigated paddy fields. The fluctuating price of rubber and lack of other sources of income continue to create a strong incentive for Iban men to look for jobs outside their villages, causing increased demographic shifts in both the gender and age compositions of the communities. This has also reduced villagers use of forest resources such as bush meat and timber, and increased the burden on women to do domestic work, prepare the fields and gather food. Moreover, young instead of old fallows are being reopened in surrounding areas, mainly by women and ageing community members due to the labor deficit. The area is dominated by degraded land covered by fern and shrub regrowth. The ecosystem service recovery time following initial slash-and-burn practices was longer in our study area than has been reported in the literature. However, all land uses related to the swidden agriculture system largely outperformed oil palm or rubber monocultures in terms of tree diversity, carbon storage and soil erosion control. Observed soil impoverishment related to reduction in rotation length is a serious threat likely to jeopardize the production of goods and services in the long-term. Secondary forests should be maintained or managed as an integral part of the swidden system. Such landscape multifunctionality should be sustained as a safety net against the price volatility of traded goods, upon which the economy of monocrop systems is more dependent. However, in the rapidly transforming socio-environmental context of this region, the long-term persistence of the swidden agriculture system is questionable.