Forest Ecology and Management 257 (2009) 2054–2061

Contents lists available at ScienceDirect

Forest Ecology and Management

journal homepage: www.elsevier.com/locate/foreco

Local knowledge and management of *simpukng* (forest gardens) among the Dayak people in East Kalimantan, Indonesia

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ARTICLE INFO

Article history:
Received 23 June 2008
Received in revised form 16 January 2009
Accepted 24 January 2009

Keywords:
Agroforestry
Biodiversity
Indigenous knowledge
Intellectual property rights
Traditional ecological knowledge
Traditional forest management

ABSTRACT

Among the Dayak people in East Kalimantan, *simpukng* (''forest gardens'') are an important component of their traditional farming systems. Simpukng is managed secondary forests in which selected species of fruits, rattan, bamboo, timber and other plants are planted. While most are owned by families and passed down from one generation to the next, some are managed on a communal basis. Complex customary Dayak rules exist that control the use and inheritance of these forests that help to avoid over-exploitation of resources. There is clear gender division of labour among Dayak in the management of simpukng that provide a range of products – for household consumption and sale and for customary rituals – fruits, vegetables, medicines, fire wood, honey, rattan, bamboos, and timber. Local knowledge about the more highly valued species are discussed. These indigenous forest garden systems are currently under threat from large-scale mining and logging activities; conflicts between local and external agencies are unfortunately frequent. This paper examines the development and management of simpukng in four Dayak villages in East Kalimantan and their implications on sustainable management of natural resources, with particular emphasis on the role of local knowledge of some of the more highly valued species and the current challenges faced by these communities in maintaining their traditional agroforest management practices.

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1. Introduction

The knowledge systems underlying the management of natural resources by indigenous people have been studied for many years, primarily by social scientists whose work is well-represented in the anthropological literature. In recent years, natural scientists have also looked at local or indigenous knowledge in an effort to find ways to manage natural resources with minimal environmental degradation. In certain cases, as noted by Peluso (1992) in her powerful book ''Rich Forests, Poor People: Resource Control and Resistance in Java'', local resistance to forest conservation emerged due to the ''state theft'' that criminalized customary rights over land and resources. Nonetheless, there is now increasing recognition that indigenous knowledge and systems are a key to sustainable development (Crevello, 2004) and that local environmental knowledge should be an important basis for a sustainable natural resource management in many developing countries.

There are vigorous debates ongoing in the literature on the nature, role, validity and politics of indigenous people and their knowledge. Dove (2006) argues that while modernity has helped popularise indigenous knowledge and practices, it can also hamper progress and development of this indigeneity. Discussing the politics of indigeneity, the author advocates rethinking this issue and for new approaches to deal with conservation and development initiatives through better understanding of the co-evolution of science, society and environment.

In the literature of local knowledge (synonymous to indigenous knowledge for the purpose of this paper), one usually finds strong advocacy for its preservation as if it were a historical artifact. However, there is growing evidence that such knowledge is far from being static (Zhihong, 2003). As local knowledge has been popularized in the modern world, this has, in some ways, also hampered its development or evolution (Dove, 2006). Zhihong (2003) notes that although local knowledge is associated with specific local environments, it is also flexible and varied, develops and evolves to suit changing conditions and situations. He argues against the dichotomy of local knowledge and modern science, considering them to be supplementary to each other and, under certain circumstances, even transferable.

Sivalee (2003) provides interesting examples of how local knowledge about forest, land, and water have become integral parts of local culture and social functions in Thailand. In the same conference proceedings, Thu (2003) provides examples from

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0378-1127/$ – see front matter © 2009 Elsevier B.V. All rights reserved.
doi:10.1016/j.foreco.2009.01.042

northern Vietnam about how local rice farmers have maintained their traditional techniques while incorporating selected, tested, technologies into the traditional system.

Dayak, meaning "people of the upstream", are the indigenous non-Malay people in Borneo (Kalimantan in Indonesia, and in Sabah and Sarawak in Malaysian Borneo). These indigenous inhabitants prefer to be identified by their Dayak term with specific tribal names such as Kayan, Kenyah, Benuaq, Merab, Lun Dayeh, and Punan. The Dayak communities have been studied by many anthropologists (c.f. Lawrence et al., 1995; Dove, 2000, 2006; Gonner, 2002; Crevello, 2004). As part of his PhD dissertation, Gonner (2002) studied the Benuaq communities in Lempunah village in East Kalimantan, focusing mainly on the local resource use and forest management and the threat posed by increasing commercial interests of the state and external investors.

Traditionally, Dayak communities lived in communal longhouses (*lamin*) in which many families of a clan lived together under a single roof. Every longhouse had a customary chief who managed and regulated community owned resources including Bengkar or forest reserves and simpukng (forest gardens). Dayak communities have complex social structures and strata. However, in the modern era these social structures have undergone major changes due to socio-political interventions, trading and development activities.

Originally Dayak Benuaq people were hunters; forest resources have always been an inseparable component of Benuaq livelihood. Most Dayak now practice swidden agriculture, traditionally involving long and complex rotations of crops and trees on various patches of land. In many Dayak communities, there is a deliberate development of fruit gardens in preference or in addition to gathering foods from the more distant, primary forest (Lawrence et al., 1995). Variations in cropping systems have long existed among different Dayak groups. Some groups such as the Kenyah historically inhabited swampy sites where they grew taro and non-irrigated rice (Sellato, 2001). The logging and mining industries have brought rapid and irreversible changes to their traditional land use systems. To date the Dayak remain active in hunting, collecting honey, wax, scented woods, nuts and bird's nests; gathering of non-timber forest products (NTFPs) is still considered an important activity.

The Dayak believe that natural resources, including forests, are important for human existence. That "land and people are interdependent" is the basic philosophy of the Dayak communities. *Lati tana*, or forest land, is a concept of land use management related to many aspects of human life—religion, kinship, social and economy. Communities are aware of their dependence on their natural resources and the vital need to conserve. It is well recognized that degradation of resources can lead to serious negative consequences, mostly upon succeeding generations.

Simpukng is an important part of Dayak culture. Technically these are forest gardens or secondary forests enriched by planting additional species of economic value, typically fruit species, honey trees, medicinal and other useful species. Harvested products from simpukng are usually an important income source for the household. In addition to their being a source of income these forest gardens also provide food, firewood, timber and medicinal plants for household use, as well as indigenous plants of cultural and religious significance that are protected and actively managed.

Reviewing examples from South-east Asia and Africa, Michon et al. (2007) report the existence and importance of "planted forests" that are similar to natural forests, in their vegetation structure and composition as well as economic traits and ecosystem services. The authors propose the "domestic forest" paradigm for the integration into forest science of a new concept of land management. In earlier papers Michon and de Foresta (1997, 1999), Michon et al. (2000) and Wiersum (2004) provide examples where agroforests represent an important stage in the 'domestication of forests'. Other authors (including Momberg, 1993; de Jong, 1994) provide examples from Kalimantan. The simpukng system in East Kalimantan is another example where the indigenous Dayak communities, through a stage of agriculture intensification, domesticate their forests. The role and functions of simpukng have been studied by other researchers (Lawrence et al., 1995; Basuki, 1999; Gonner, 2000; Sardjono, 1990) and some anecdotal information about medicinal plants in forests and simpukng in this region can be found in the gray literature. To date, Dayak people's local knowledge about medicinal plants and their management in simpukng systems has not yet been studied. The present study describes these traditional agroforest management systems utilized by the Benuaq and Bentian Dayak people in selected villages in eastern Kalimantan with a special focus on their role in the production of medicinal plants and other non-timber forest products.

2. Methodology

2.1. Sites

The study was conducted in four villages of Kutai Barat—Banggris and Lambing villages in Muara Lawa sub-district; Dilang Puti and Suakong villages in Bentian Besar sub-district (Fig. 1). These villages, which still have relatively well-maintained simpukng, receive little government and other external support for their agricultural activities.

Banggris and Lambing village are located in the upper watershed of the Mahakam catchment in the sub-district of Muara Lawa. Banggris lies along Kedang Pahu River, about 2 km from the provincial road (Kalimantan highway). Lambing village is located close to the trans-Kalimantan road. Dilang Puti and Suakong lie in the sub-district of Bentian Besar, near the border with Central Kalimantan. These two villages are accessible by road.

The sub-district of Muara Lawa is dominated by the Benuaq Dayak people; Bentian Dayak form a majority in Bentian Besar sub-district. Although these two groups speak different languages, they have similar traditions and rituals. Both groups practice subsistence economy based on various land management, fallow fields and rice field (*umaq*), gardens (*kebotn*), simpukng, and forests. All four villages are within a major rattan producing region in East Kalimantan, and many villagers are rattan farmers. Most households (56%) earn less than IDR 300,000 a month (approximately US$ 33) and only about 8% of the households earn more than IDR 2 million (about US$ 220).

2.2. Methods

The knowledge based-systems methodology for acquisition of local ecological knowledge suggested by Walker et al. (1997) and Sinclair and Walker (1999) was adapted. This involves knowledge collection from a small sample of deliberately chosen individuals thought to be knowledgeable by other villagers about the domain of interest and willing to co-operate. The knowledge is collected through repeated, focused interviews with the key informants. A total of 23 farmers, including eight women, were interviewed—five from Benggeris village (Muara Lawa Sub-district), ten from Lambing village (Muara Lawa Sub-district) and eight from Dilang Puti and Suakong villages (Bentian Besar Sub-district). The checklist consisted of questions related to land use, land tenure, history, types, management and ownership of simpukng, role of men and women in simpukng management, useful plant species inside simpukng and other related issues. Field visits to simpukng for direct observations were an integral part of all interviews that enabled identification of plants and in-depth discussions of each

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