

Dayak Land Use Systems and Indigenous Knowledge

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ABSTRACT The Dayak are a forest dwelling people of the interior of Borneo who rely on a subsistence base of agricultural products cultivated in shifting cultivation plots and forest gardens. Their indigenous knowledge systems are heavily integrated into their mosaic of land use practices. In the field of development there is now recognition that indigenous knowledge may be the key to sustainability. Concepts long used by indigenous groups have maintained populations for several hundred years and continue to due so successfully in times of rapid change in the world.

1. INTRODUCTION: INDIGENOUS DAYAK LAND USE SYSTEMS

Indigenous knowledge and tradition is often seen as static and unchanging, when in fact it is a fluid and transforming agent (Ellen et al., 2000). It is therefore adaptable and influential. The Dayak and other indigenous groups who use traditional knowledge in their land use and cultural evolution also have adapted strategies in which to develop new techniques and ideologies in time of need. However, the value of indigenous knowledge of Dayak cultures remains laden in every aspect of their lives.

Throughout history the Dayak have had a reliance on forest resources. As forest dwelling people, the environment has thus shaped their culture and lifeways. The Dayak are interwoven with their surroundings and have developed a complex system of cultural aspects in relation to the forest that they depend on for survival. The Dayak have historically and currently practice shifting cultivation¹ or hill rice farming with long fallow periods, intensive agroforestry, and natural resource extraction. Shifting cultivation is a complex agricultural system dedicated to non-permanent shifting field use that is associated with fire for clearing land (Dove, 1985; Geertz, 1963; Whitten et al., 1987). This process accelerates the process of decomposing organic material allowing nutrients to return to

the soil. After 3-5 years of crop rotation fields are left to regenerate. Resources from fallow fields remain important to Dayak communities. In fallow rice fields, intensive agroforests are often maintained to supply needed wood and food products. In many scenarios hill rice fallows are converted to agroforests permanently (Colfer, 1997).

Forests in close proximity to indigenous communities are often heavily managed and productive. Researchers who have conducted extensive studies in Kalimantan, Indonesian Borneo have found that there are several different forest management schemes that are sustainable and involve minimal clearing of primary forest. Lawrence et al. (1995) found that it was more beneficial to extract resources in managed agroforests than primary forest due to higher yields in managed forests. The Dayak use several types of managed forest gardens to produce marketable products such as durian fruits, rubber, medicinals, and timber. Agroforests are found to be very high in diversity and within 30 years are distinguishable from other secondary and primary forest only by the high density of fruit trees along with other valuable tree species (Lawrence et. al., 1995).

In opposition to Colfer (1997), Lawrence et al. (1995), and many others conducting research in Indonesia (Padoch and Peluso, 1996; Dove, 1985; King, 1993), indigenous groups, in particular the Dayak, are accused of fostering deforestation due to unsustainable forestry practices. National governments in Southeast Asia tend to blame ethnic minorities for loss of forests due to large-scale forest fires caused by

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¹ Shifting cultivation and Swidden agriculture are used interchangeably in this article.

Swidden agriculture, primary forest clearance, etc. (Dove, 1985; Le Trong Cuc, 1996; Rambo, 1996). However, the main perpetrator in deforestation and wasteful use of forest resources are timber concessions and mining companies, not indigenous people. Indigenous people throughout the world are in fact defending larger areas of tropical forests from large-scale deforestation and logging than national parks, thereby conserving the ecological services provided by these forests and the majority of their plant and animal component (Schartzman, Meira, and Nepstad, 2001).

The Benuaq Dayak manage several different types of land units; *Umaq* are rice cultivation plots, *Uratn* is an *Umaq* fallow where resources continue to be extracted, the *Simpukng* is a fruit garden, *Kebotn* is a plot of land where resources such as rattan and rubber are cultivated. Although most of the land in Benuaq Dayak communities is communal, these land use mosaics are inherited through families. Land is usually divided equally among siblings in a family. If one does not choose to farm the land or extract resources, other siblings have the option of using this land. The community will lend land to people who move in to the village in order for them to produce crops for subsistence. The most common land use type that is "borrowed" is the *Umaq*, where the staple of rice and cassava are cultivated. The Benuaq Dayak along with other indigenous groups practice communal systems that sanction sharing of land and resources, this allows for a great amount of reciprocity between individuals in a community.

The Benuaq Dayak also maintain reserves that contain a surplus of natural resources. The *Bengkar* is the community forest reserve that provides wild game and forest resources such as rattan, wood, and medicinals. The communities' reserves have had minimal timber extraction and are primarily used for hunting and small-scale extraction. The *Kapala Desa* (village head) grants permission for resource extraction by community members. Fees are associated with extraction of timber; non-timber forest products including flora and fauna are extracted at the discretion of community members.

Many indigenous groups throughout the tropics practice a mosaic of land use patterns in which conservation and sustainability ensures resources for the future.

2. INDIGENOUS KNOWLEDGE AS A THEORETICAL APPROACH IN DEVELOPMENT

Over the past decade there has been an insurgence of indigenous knowledge as an applied theoretical approach in relation to socioeconomic methodologies. The theory of Cultural Ecology and Neo-Evolutionism ideologies stem from the influence of environment on cultural development. The basic features include the impact of environment on culture, focus on adaptation, and reciprocal links between culture and ecology as is seen by indigenous groups who rely forest on resources for survival (Barrett, 1996). Indigenous conservationism is now a widely accepted ideology that is culturally expressed in conservation ethics, and in natural resources use and animistic religious beliefs. For example, the Mentawai of Siberut Island, Indonesia, who through their traditional religion believe that all elements of the earth have a soul, believe that proper offerings must be given in order to maintain cosmic harmony (Crevello, 1998). Benuaq Dayak shamans heavily rely on spirits from the natural world for healing ceremonies. Aspects of indigenous conservationism have been identified for many indigenous groups who continue to rely heavily on natural resources for subsistence economies.

The indigenous knowledge perspective has been studied at great length in academia and development although have remained largely independent of one another (Sillitoe, 1998: 224). The structure of development has transformed moving drastically towards grassroots focused paradigms. In the past, the focus was on modernism, with the classic transfer-of-technology model and top-down approaches (Sillitoe, 1998: 224). With a more grass-roots approach being implemented in the past decade, indigenous knowledge is often incorporated into agricultural systems and participatory development when non-governmental organizations (NGOs) and outside agencies are implementing development projects. Often times when government involvement or stakeholders in highly valued natural resources are involved indigenous knowledge is often overlooked and ignored.

In the name of development, many countries have attempted to force or employ indigenous groups to abandon their traditional livelihoods in order to "save the forests" and assimilate them

into modern society. Many development and conservation related projects have failed due to the lack of involvement and knowledge of local people and the ecosystems. In the past, top-down approaches were initiated by outside agencies attempting to develop natural resource management or extraction techniques which were also unsuccessful due to local ecosystem constraints (Gegeo, 1998) and lack of interest in local perspectives or involvement. The influx of indigenous knowledge approaches has led to a locally informed perspective into development (Sillitoe, 1998). The most relevant approach to working with indigenous groups is the neopopulist, as it advocates participation and empowerment. The neopopulist focus is to contribute long-term positive change, promoting culturally appropriate and environmentally sustainable adaptations as increasing resources are commercially exploited (Sillitoe, 1998: 224). Indigenous participation is used as a process of empowerment to amplify traditionally unacknowledged voices (Slocum et al., 1995). Participation focuses on ways to mobilize local resources, engage in diverse social groups in decision-making, and identify patterns to eliminate poverty (Feldstein and Jiggins, 1994; Slocum et al., 1995). Active and meaningful involvement of indigenous people and the researcher or outside agency involved in the processes regarding issues related to land tenure and social-cultural development, and in decisions related to it, creates a partnership of equals while linking ecological and social justice concerns. It is important that researchers or agencies link management practices to social, temporal, and environmental circumstances to particular communities where such practices are present (Eghenter, 2000).

3. INDIGENOUS KNOWLEDGE AS A SYSTEM

Indigenous knowledge is characteristically holistic, integrative, and situated within broader cultural traditions (Ellen et al., 2000). Indigenous people in many societies see themselves as a part of the natural world as opposed to detached from nature, as in much of western ideology where man conquers nature. Many indigenous people have a respect and knowledge for the environment as their lifeways are intermingled with nature. Some scholars now

recognize indigenous people as shapers of environmental history (Smith and Wishnie, 2000: 514). This is not to say that indigenous people are in constant harmony with nature, there has also been destruction of forests due to their presence. Evidence of non-conservationists activities have been found in archaeological sites, there is also evidence based on research by contemporary biologists and ethnographers, such as anthropogenic faunal extinction and habitat degradation. Indigenous societies have however maintained lands and resources better than other societies, due to low population densities and with less environmental degradation. In general, however the damage caused by indigenous groups has had less impact on the ecosystem than large scale timber harvesting, mining, and migrants from other regions who are not familiar with the ecosystem (Schartzman et al., 2001; Redford and Sanderson, 2001).

Since the 1980s there has been a radical shift in the thinking towards the rights of indigenous people and access to natural resources. The acknowledgment that local people have their own effective science and resource use practices is now recognized more than ever before (Sillitoe, 1998: 223). Indigenous groups are quite capable and have developed their own methods of conservation and sustainable management practices (Colfer, 1997; Gegeo, 1998). Herlihy (1990) has been an active participant in the implementation of regional natural reserves inhabited by indigenous people in Central America. His research has shown that in Central America a lack of land tenure and deforestation are closely related. Providing land users with secure access to property rights will result in more sustainable land use, protection of biodiversity, and less deforestation (Nelson et al., 2001). Indigenous people, conservation organizations, and development agencies have come to be perceived as allies in the quest to conserve the last remaining parcels of land that contain great biodiversity (Eghenter, 2000).

Local management by those who are familiar with the ecosystem and have a personal interest in the well being of the forest appears to be the most effective procedure for conservation and sustainable development in developing countries (Colfer, 1997; Furze et al., 1996). Indigenous people have a wealth of knowledge on plant usage, function, efficient growth methods, and

medicinal properties, to name a few. Indigenous knowledge and involvement is crucial to the development of conservation and sustainable forestry related projects. The main issues that need to be addressed are the needs of the local people as far as resources and incentives are concerned. It is in the best interest for local people to conserve their natural resources for future generations. In many cases indigenous groups have put limits on harvesting and hunting through customary laws and have developed reserves to protect their lands from new migrants in the region (Furze et al., 1996).

When a voice is given to indigenous people and importance is paid to the immeasurable knowledge of their lands, there is a sense of pride given when involved in management and conservation projects (Furze et al., 1996). The benefits for local people would be three-fold if involved in conservation and management issues. They could then be assured of future resources; possible employment through conservation projects; and the land would be protected from outside encroachment.

With the future needs of natural resources and land in constant competition with timber concessions and other constraints it is vital for indigenous people and conservation groups to work together to protect the future of the forests and the people who depend on them. Forest dwellers hold a wealth of knowledge about the environment. Conservation agencies have used this knowledge to develop and implement plans for both conservation of biodiversity and the development of economics, social and cultural interests of marginal peoples (Eghenter, 2000).

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