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Dayak Desa forest land use system as social capital to acquire forest management rights in West Kalimantan, Indonesia

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Abstract. *Roslinda E. 2016. Dayak Desa forest land use system as social capital to acquire forest management rights in West Kalimantan, Indonesia. Biodiversitas 17: 177-184.* People communities have an important role to play in biodiversity conservation. The ownership of land has often become a constraint on sustainable management of forest. The aim of this study was to explore the management system of forest land use in Dayak Desa in West Kalimantan, Indonesia. Data collection was undertaken through field observation, focus group discussion (FGD, and interviews with the community members. Dayak Desa has a several forest land use systems including *tawang semilas, tawang sebesai, tawang mersibung, tawang sepayan, tawang serimbak* and *bukit rentap* protection forest, which each system has its own function and utilization. Regardless of the system's differences, the forest land use systems have been supporting species diversity such as flora, fauna, and environmental services in Dayak Desa. This species diversity can support Dayak Desa community daily needs, regarding food, clothing, housing and other secondary needs. Forest utilization by Dayak Desa community is suitably paired to what can be produced by the land, which is equipped with their own rules. The role and the rule in managing, utilizing and protecting forest land use are Dayak Desa social capital. These are capital to acquire their rights to manage the forest.

Keywords: community, local knowledge, social capital

INTRODUCTION

Traditional communities have practiced conservation of forest land use. The term 'conservation' consists of the word 'con' (together) and 'servare' (keep/save) who have an understanding of the efforts to maintain or keep in wise use. The understanding of conservation is now translated as the wise use of nature resource or the management for the sustainable use. Conservation of forest land use should integrate local systems that adapt to changes for hundreds of years (Claus et al. 2010). It has been well-established that communities of natural resource users can play important roles in natural resource management (Shahabuddin and Madhu 2010). For example in Kasepuhan community of Western Java, their forest was divided into three categories of use, i.e. *leuweng geledegan*, *leuweng titipan*, and *leuweng sampalan* (Suharjito et al. 2008). Meanwhile community in Rantau Layung, East Kalimantan, their forest was classified into four subtypes of landscapes, i.e. *alas tuo, alas adat, alas nareng* and *alas mori* (Murniati et al. 2008). Examples of such features include effective monitoring and sanctioning processes, property rights, and enforcement mechanisms that limit access to an exhaustible resource.

The forest can be categorized as common-pool resource (CPRs). CPRs are natural resources for which it is hard to exclude potential users and which can be depleted through over-use (McKean 2000). Most CPRs in Indonesia are largely held under the common property. Common property resources belong to the community, and access rules are defined with respect to community membership. It is a system of shared private property with clear boundaries, rights and management and use rules, yet potential free-rider problems have to be surmounted for communities to organize collective action (McKean 2000).

Understanding the property rights systems is important as it is also based on understanding the local management of natural resources (Khumsri et al. 2009). The loose definition and careless usage of terms will be followed by a general misunderstanding of the various types of "property". There are essentially four types of property rights: open access, common property, private property and state ownership (Helberg 2001). Property rights regimes perform the functions of limiting utilization, coordinating users and responding to the changing of natural resource condition.

The protected forest areas in Indonesia are frequently surrounded by the local common property systems, and this situation has created an overlapping in the natural resources management. Hence, it is important to examine the function and contribution of the common property regimes towards the conservation. There has been limited research on common property regimes embedded with state property. Common property regimes in Ensaid Panjang communal, Kelam Permai Sub-district, Sintang District, West Kalimantan Province, Indonesia are suitable for the evaluation of such property right. The aim of this study was to explore the management system of forest land use in Dayak Desa, as a social capital to acquire the forest management rights.

MATERIALS AND METHODS

Conceptual framework

The main concept of this paper is social capital. Coleman (1988) stated social capital is defined by its function: "they all consist of some aspect of social structures, and they facilitate certain actions of actors-whether persons or corporate actors-within the structure." Since the 1990s, the concept of social capital has gathered an increased attention in the research regarding the CPRs' management and collective action, especially in relation to the sustainable use of natural resources and sustainable development (Ostrom 2000; Lethonen 2004).

Study area

This study was conducted in the Ensaid Panjang Village, Kelam Permai Sub-district, Sintang, West Kalimantan, Indonesia. The total area of the village is 4905.75 hectares. Ensaid Panjang Village is geographically located at N 00°04'01"-00°09'39" and E 111°39'49"-111°42'27". The Ensaid Panjang Village is located of about 27 km from the capital of Kelam Permai Sub-district, 58 km from Sintang (capital city of Sintang District) and 478 km from Pontianak (capital city of West Kalimantan Province). This location can be reached by four wheel drive vehicle for nine hours from Pontianak, or by plane taking two hours from Pontianak. The location of Ensaid Panjang Village can be seen in Figure 1.

Research methods

Survey methods were used in this research. The respondents were communities living in the Ensaid Panjang Village. There were three sub villages, i.e. Rentap Selatan, Ensaid Baru and Ensaid Panjang. In three sub-villages around the study sites there were 162 households. Interviews involved 30 respondents were selected by random sampling. The number of samples or respondents from each sub-villages was ten respondents.

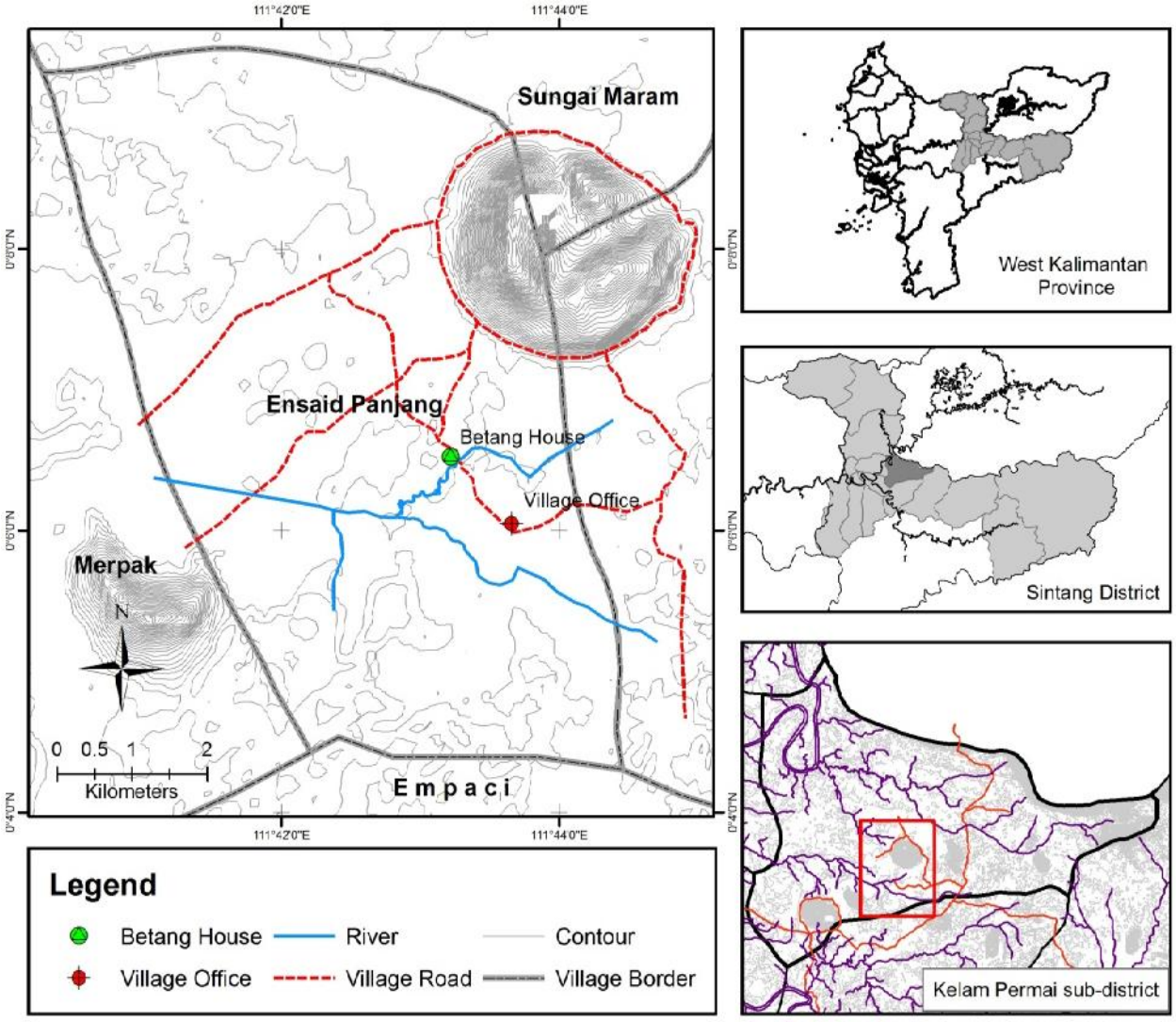

Figure 1. Location of Ensaid Panjang Village, Kelam Permai Sub-district, Sintang, West Kalimantan, Indonesia

Data collection

There were two types of data collected, i.e. primary and secondary data. The primary data were collected through personal interviews, general observation, and focused group discussion (FGD). Personal interviews were supposed to collect detailed information on local knowledge about forest land uses, and the utilization of forest land and natural resources. The general observation was conducted to describe the forest land use characteristics and natural resources. The observation was also done to cross check the information collected from the communities. The FGD was carried out basically to obtain general data from various people representing different groups in the community. A community meeting initialized the methods of data collection. The secondary data consisted of demography, education level, public facilities, and land use systems. The related literature was collected from several sources.

Community meeting

A community meeting was attended by most of the community members, comprising young and senior inhabitant, men and women, and traditional leaders. During the meeting, the participants were asked to discuss how they described the forest land uses around them. People defined six forest land used types i.e. bukit rentap, tawang mersibung, tawang sepayan, tawang semilas, tawang serimbak, and tawang sebesai.

Personal interviews

Personal interview was conducted with 30 selected households out of 162 total households using semi-structured questionnaires. The interview focused on local knowledge about forest land use and the utilization of forest land and natural resources. In addition, the interview was also accomplished with five key informants in the process to know how people manage their land and natural resources. The key informants were including the village head, customary leader, old villagers, and informal community leaders.

Focused group discussion (FGD)

The researcher facilitated FGD with the participated groups of villagers. Several topics were discussed including specific information about the importance of natural resources, forest land utilization, community's role and rules of forest land utilization.

Data analysis

The data from interview were tabulated and analyzed to obtain the general description of forest land use types and local knowledge of the community in Ensaid Panjang Village. The analysis includes two aspects. First, comparing the type of forest land use to obtain the conclusion whether there have any different characteristics in topography, covers area, types of forest, status of land, vegetation and animal, and function. Second, analyzing the results of data processing by using descriptive method, including literature about social capital as conceptual framework and literature about forest land use.

RESULTS AND DISCUSSION

People and livelihood

Ensaid Panjang Village has 162 households or 627 people with a population density of about one person/km^2 (Ensaid Panjang Village 2013). The dominant ethnic is Dayak Desa and most of them are indigenous people and live in the traditional longhouses. The majority of the community members have only completed their elementary school. There are also some community members who did not finish their elementary school and even some of them never gone to school at all. Customary law was still applied in the daily life as a guideline and rules to define what is right or wrong for the whole community. Communities depend on agricultural resources, and subsistence agricultural production became the family's main source of livelihood. They mostly work as shifting cultivators, rubber tappers, loggers, weaver (especially for women) and plantation workers. Most of the community members cultivated upland rice fields by shifting cultivation system for their daily consumption. They also practiced agroforestry in where they mixed the rice plantation with vegetables and fruit trees. The community members have left the area for a new rice field; it will become a fruit garden or agroforestry in the future. Besides, they also went to their garden for rubber tapping, hunting, fishing and collecting non-timber forest products (NTFP) such as rattan, fruits, vegetables, honey, *endas* (for mat), *senggang* (for webbing material), medicinal plant and dyed plant.

Weaving is one of the daily activities that they carried during their leisure time, especially for Dayak Desa women. Ensaid Panjang Village is a producer of weaving clothes. Weaving is a culture that inherited from past generation to recent generation. Currently, *ikat* weaving has been developed as a commodity that can be sold by the community.

Forest land use types

There are several types of land use in Ensaid Panjang Village. The distribution of land use is dominated by agricultural land, rubber and oil palm plantation, shrubs, protected forest, and swamp forest. In this paper, we just identified the forest land use. Ensaid Panjang Village has a forest covers of about 99.5 hectares. There are two types of forest i.e. dry land forest and swamp forest (local name: *tawang*). The identification of the forest land use types in Ensaid Panjang Village including their characteristics are described in Table 1.

Ensaid Panjang community identified six types of forest land. Bukit rentap is a forest which was declared as a protected forest by Decree of Minister of Forestry and Plantation No. 259/KPTS-II 2000 Date 23 August 2000. With facilitation by People Resource and Conservation Foundation (PRCF) Indonesia, bukit rentap has been appointed as forest village (*hutan desa*) in 2014. The forest village means the utilization of the forest is to be organized by Forest Village Management. Secondly, tawang mersibung is a forest area which was declared as the Community Conserved Area (CCA). The usage of tawang mersibung is organized according to customary law

communally, located far from the settlement with a steep topography. This landuse cannot be exploited and converted into rice fields. Only NTFP can be utilized from this forest. Thirdly, tawang sepayan is a forest reserved for shifting cultivation area, located close to the settlement. Tawang semilas and tawang serimbak are the forest area that can be utilized by the community for their source of building materials, fire woods, craft materials, medicinal plants and dye plants, and places for fishing and hunting. Lastly, tawang sebesai is a forest that cannot be utilized by the community. There is no clear explanation on,-why tawang semilas was not utilized. Hence, based on information from community members, this forest that is believed to be a dangerous place or haunted area.

The trees in tawang semilas and tawang serimbak could only be logged for their subsistence or self-usage. Till now, this leader regulation is still being practiced by the community. Different from the bukit rentap, since management was carried out by the government, the timber production was extremely huge in this area. All of the forest area was infiltrated by water, but only bukit rentap provides source of clean water for community. Figure 2 shows the forested areas in Ensaid Panjang Village. Formerly, there was tawang sampur in Ensaid Panjang village (PRCF 2011). However, when this study was conducted, tawang sampur has been changed into farmland because of population growth.

All of forest land use system can support the Dayak Desa community needs, such as food, clothing, housing and other secondary needs. All participants indicated that vegetation in tawang sebesai, tawang mersibung, tawang serimbak, tawang semilas, and bukit rentap were dominated by tree and shrubs, except in tawang sepayan. Each species has its special use and can be fully utilized, but this utilization is guided by rules, norms and sanctions.

Local knowledge of forest utilization

Dayak Desa people have a close dependency toward their forest. It is not only limited to the utilization of timber and non-timber forest products, but also to the utilization of plant/animal species based on the suitability of its function. For example, plants that are used as building materials come from a specific species (see Table 2). When compared with Delyanet (2015), there are differences about number of plants that are used as building materials.

There are some important rules to use the timber for building materials. For example, belian (*Eusideroxylon zwageri*) is used for the first pole (*tiang mun*). For this usage, community must use lively belian. While for others usage, community should use a dead/lightning strike tree, especially durian (*Durio zibethinus*). Struck wood is considered as the best timber for building materials. Kumpang (*Horsfieldia polyspherula*) is used for the roof, because, it is believed to protect the occupant from evil spirit. Related to culture, in timber harvesting activities are always held an event *meramu*. Meramu was carried out in *tawang*. These were done by the elders with deep traditional and local knowledge.

Table 1. Identification of forest land use types in Ensaid Panjang Village, Kelam Permai Sub-district, Sintang, West Kalimantan, Indonesia

Land type	Topography	Covers (Ha)	Type of forest	Status of land	Vegetation/ animal	Function
Bukit rentap	Slope to steep and undulating	750.000	Dryland	Protected forest	Mixture of dipterocarps trees	Source of water, protected area
Tawang mersibung	Flat, undulating	53.983	Swamp	Other uses area	Trees, medicinal, ornamental, dyes plants and various types of animals	CCA, source for craft material and dye plants, place for hunting (especially *babi hutan*). Only non-timber forest product (NTFP) can be utilized.
Tawang sepayan	Flat, undulating	17.457	Swamp	Other uses area	Paddy, maize	Shifting cultivation area
Tawang semilas	Flat, undulating	42.778	Swamp	Other uses area	Trees, medicinal, ornamental, dyes plants and various types of animals	Source for building material, firewood, craft material, medicinal plant and dye plant, place for fishing and hunting
Tawang serimbak	Flat, undulating	67.012	Swamp	Other uses area	Trees, medicinal, ornamental, dyes plants and various types of animals	Source for building materials, fire woods, craft materials, medicinal plants and dye plants, place for hunting
Tawang sebesai	Flat, undulating	8.867	Swamp	Other uses area	Trees, medicinal, ornamental, dyes plants and various types of animals	Conservation area

Note: CCA: Community Conserved Area (area managed by customary law communally)

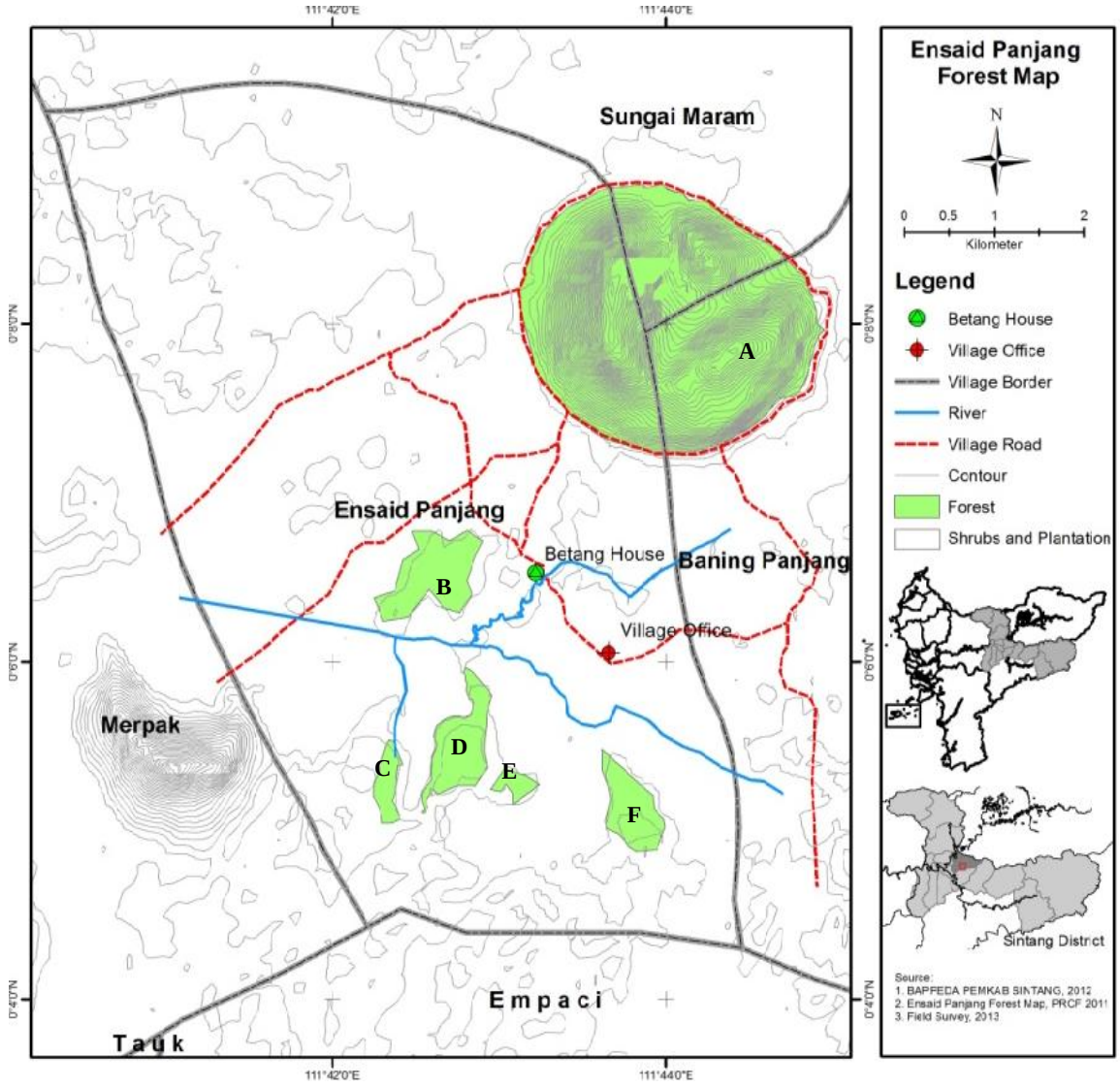

Figure 2. Map of Ensaid Panjang Village forest, Kelam Permai Sub-district, Sintang, West Kalimantan, Indonesia: A. Bukit rentap, B. Tawang serimbak, C. Tawang sepayan, D. Tawang mersibung, E. Tawang sebesai, F. Tawang semilas

Discussion

Dayak Desa people is one of the Dayak tribes who live in modern times but still have a visible state of primeval nature of their religious system. Dayak Desa community often mentions the name *Petara* (lord of the heaven), *Puyang Gana* (lord of the land) and *Raja Juata* (lord of the water). They believe the natural and supernatural is a distinct entity dimension. Supernatural beings have a major effect on human life and should be in harmony with nature. They always do traditional ceremonies to get permission from their lord when doing activities. The traditional ceremony, like *meramu*, is a form of communication and worships the unseen forces that have a higher position that determines life.

A leader in a *kampung* originally was *tumenggung*, however, recently there is a village head who administers a few kampung. Tumenggung is not under the authority of village head. The village head represents formal leader to handle administration while tumenggung is informal to handle social problems. The Catholic priest is also the spiritual leader besides tumenggung.

Dayak Desa people have their agricultural calendar that marked the harvest celebration with *nyelapat taun* ceremony that marks the ending of cultivating season activities. This calendar is a kind of computation time of harvesting heritage associated with rainy and dry seasons. Rice fields are very limited and are on a slope that is hard to apply with modern farming technology. Farm management is still traditional using organic systems, but some people have started using fertilizers and chemical pesticides.

The traditional education system has been altered by the presence of a formal education; people send their child minimal elementary school, where Ensaid Panjang Village has one elementary school. Accessibility and, its complement electricity are quite good though limited to an area on the edge of the highway. Communication from the area outside of the village is possible by the presence of a cell phone signal even though sometimes there is only have a weak signal available.

Table 2. Plant species used as a building material in Ensaid Panjang Village forest, Kelam Permai Sub-district, Sintang, West Kalimantan, Indonesia

Local vernacular name	Scientific name	Functions
Bambu	*Gigantochloa latifolia* Ridl	Temporary pole
Belian	*Eusideroxylon zwagery* Teijsm	First pole (*tiang mun*), stairs
Bengkal	*Albizia procera* Roxb	Floor
Durian	*Durio zibethinus* Murr	Floor
Durian burung	*Durio carinatus* Mast	Roof, floor
Empetir	*Copaifera pallustris* (Symington) Dewit	Roof, floor
Emperpat	*Combretocarpus rotundatus* (Miq.) Danser	Floor
Entemau	*Cratoxylum glaucum* Korth	Roof
Geronggang	*Cratoxylum arborescens* (Vahl) Blume	Roof
Jaung	*Nicolaia speciosa* Horan	Roof
Jengger	*Ploiarium alternifolium* (Vahl) Melch	Floor, wall of *ruai*
Kelampu'	*Sandoricum koetjape* Merr	Roof
Kelansau	*Dryobalanops oblongifolia* Dyer	Wall
Keleban	*Vitex pubescens* Vahl	Floor
Kumpang	*Horsfieldia polyspherula* (Hook.f.) J.Sinclair	Roof
Mabang	*Shorea pachyphylla* Ridl ex Sym	Roof, wall
Medang	*Dehaasia caesia* Blume	Floor
Melingkat	*Nepenthes ampullaria* Jack	Rope
Mengeris	*Kompassia malaccensis* Benth	Floor
Menyatu'	*Palaquium leiocarpum* Burl	Roof
Meranti	*Shorea* sp.	Roof, wall
Merbung	*Dactylocladus stenostachys* Oliv	Floor
Pelambabi	*Mangifera* sp.	Floor
Pendu'	*Polyalthia glauca* (Hassk.) Boerl	Rope
Ramin	*Gonystylus bancanus* (Miq.) Kurz	Floor
Rengas	*Gluta renghas* L.	Floor
Resak	*Dipterocarpus borneensis* Slooten	Roof
Terentang	*Campnosperma auriculata* Blume	Floor
Ubah	*Eugenia* sp.	Floor
Uwiantu'	*Calamus zonatus* Becc.	Rope

Table 3. Comparison of forest land use types in Ensaid Panjang Village, West Kalimantan, and Rantau Layung Village, East Kalimantan, Indonesia

Function	Ensaid Panjang	Rantau Layung (Murniati et al. 2008)
Source of water, protected area	Bukit rentap	Alas tuo
Community conserved area	Tawang mersibung	Alas adat
Shifting cultivation area	Tawang sepayan	Alas nareng
Source for community needs	Tawang semilas, tawang serimbak	Alas nareng
Conserved area	Tawang sebesai	Alas mori

Dayak Desa community is heavily dependent on the existence of natural resources for their livelihood but has no legal right in management of forest. Dayak Desa communities have an important role to play in biodiversity conservation, it is a social capital. The existing traditional rights of the local communities have been ignored, lead a claim about there are not capable of facing the recent condition. It is important to realize that local knowledge is not necessarily static, pristine, and culturally specific; it is dynamic and continuously evolving (Thomas et al. 2004). This change is influenced by cultural variation, rising population, market opportunities, and policy shifts. If biodiversity is to be maintained in the forest ecosystems, there is a need to recognize that these forest are present because of the actions of the local people who live in and around them (Berkes et al. 2000).

The forest land use types and system in Ensaid Panjang Village have created by local knowledge and have been practiced by the communities for a long time. This situation is similar to community in Rantau Layung. Their forest was classified into four sub types of landscapes, i.e. alas tuo, alas adat, alas nareng and alas mori (Murniati et al. 2008). Comparison between Ensaid Panjang dan Rantau Layung forest land uses can be seen in Table 3. The traditional community will contribute to the forest conservation if they receive benefit from the forest either directly or indirectly.

For common knowledge to function as an incentive mechanism or institutional arrangement for collective action, it is not enough to create it, yet it also need to be shared or diffused effectively among the members of the community (Ishihara, et al. 2009). It is different with the local community knowledge in which, it will automatically be internalized in the community's daily life. It can be taken as an incentive.

Dayak Desa people use a diversity of plants from diverse forest land use type. Based on Pei et al. (2009), this will help to maintain forest system generally in a good condition, impacting similar trend in species diversity as a whole. Sustainable utilization of non-timber is a form of interference at a medium level (intermediate) that impact sustainable maintains the level of biodiversity in the high category (Gueze 2011). In tawang mersibung they utilize some of the plant species in the forest to meet the needs of food, beverage, medicine, dyes, tools and crafts, rope materials, fodder and ornamental plants and fencing. In tawang semilas and tawang serimbak, they utilize some of the plant species in the forest to meet the needs of timber, firewood, food, beverage, medicine, dyes, tools and crafts, rope materials, fodder and ornamental plants and fencing. The numbers of crops that are cultivated Dayak Desa people in tawang sepayan, like paddy, maize, chili, etc. The use of plants is part of wisdom to survive by exploiting the diversity of species in the forest beside the cultivation of a limited number of species. Species diversity meets the needs of the number and quality of needs (Zhang et al. 2013).

Common rules, norms, and sanctions are the mutually agreed or handed-down norms of behavior that place group of interest above those of individuals. They give individuals the confidence to invest in collective or group activities, knowing that others will do similarly. People can take responsibility and ensure their rights are not infringed. Mutually-agreed sanctions ensure that those who break the rules know they will be punished.

Forest village (hutan desa) was a forest management model in Indonesia to accommodate the community knowledge. It is an institution. The institution is important enabling factors for effective governance of the forest commons. Institutions can be more specifically defined as a set of accepted social norms and rules in making decisions about resource use and these defined that controls the resource, how conflicts are resolved, and how the resource is being managed and exploited (Richards 1997). Indigenous groups offer alternative management perspectives and knowledge based on their time-tested management practices (Thomas et al. 2004). Strengthening local-level social institution is not by itself sufficient to institute effective co-management (Ticktin 2004). The role of government should be prepared to assist local people in their reconstruction of emerging knowledge systems and the adaptation of strategies for interacting with large-and global-scale political, economic realities (Agrawal 2007).

Dayak Desa community has practiced conservation based on the rule, role and inherited tradition. Conservation of local knowledge affects forest sustainability practiced by local people when they act as a subject in the management and benefits that sustain their needs. There were six forest land use types in Dayak Desa ethnic in Ensaid Panjang Village, where each system has its function and role. Dayak Desa forest land use systems are tawang semilas, tawang sebesai, tawang mersibung, tawang sepayan, tawang serimbak, and bukit rentap protection forest. Each system has its supporting biodiversity such as flora, fauna, and environmental services. Forest utilization by Dayak Desa community is appropriately paired to what can be produced by the land. This forest land use system supports almost Dayak Desa community needs, such as food, clothing, housing, and other secondary needs. The community conservation efforts generate as a local knowledge that is applicable from past generation to recent generation, which is equipped with their own rules. The rules contain what the communities must do to their resource management which also accompanied with sanctions.

In the remote areas, local knowledge such as the Dayak Desa knowledge related to conservation could be integrated into the activities of the protection, preservation and sustainable uses of natural resources. It ensures the sustainable conservation of forests in the long run as there are still many rural communities living within or at the fringe of forests in Indonesia. This local knowledge is Dayak Desa social capital to acquire their rights to manage the forest in forest village model. Indonesia Government should implement sustainable forest management by involving local communities as subjects who participated actively in managing the forest. Active involvement of local community based on existing local conservation rules, roles and tradition in forest management ensures sustainability of forest resources. Such a shift in forest management paradigm requires a change in national forest policy for effective implementation at local level.

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