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To cite this article: Indri Puspita Sari *et al* 2019 *J. Phys.: Conf. Ser.* **1317** 012074

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Utilization and management of landscape unit in Dayak ngaju community in three villages, Mantangai sub-district, Kapuas Regency, Central Kalimantan

Indri Puspita Sari, Nisyawati* and Sofiah Rohmat

Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Indonesia, Kampus UI Depok, Depok 16424, Indonesia

*nsywt@yahoo.com

Abstract. Dayak Ngaju community especially in three villages, which are Tumbang Muroi, Tumbang Mangkutub, and Katimpun in Mantangai Sub-district, Kapuas Regency, Central Kalimantan has used environment unit as a place to fulfill the community's daily needs. The perception of the community towards each landscape unit utilization has been held in July 2018. The result of classification and utilization of the landscape unit is a belief and trust of the people which is able to influence the perception of the community towards sustainable utilization and management of the environment. Thus, this research provides explanation about utilization, development, and management based on Dayak Ngaju community norm in order to sustainably conserve the natural resources in the future.

1. Introduction

Dayak Ngaju community is classified based on language use. The mentioned society resides in the watershed of Kapuas, Kahayan, Katingan, Mentaya, Seruyan, and Barito. This Dayak Ngaju's ancestors are Dayak Ot-Danum which resided in the upstreams of those big rivers. Nowadays, Dayak Ngaju is the main tribe of these four big tribes which are Ngaju with 53 sub-tribes, Ma'anyan with 8 sub-tribes, with 21 sub-tribes, and Dusun with 21 sub-tribes (Riwut 1979).

Dayak Ngaju community has utilized environment unit as a place to fulfill their daily needs. A research by Usup et.al. (2008) shows that Dayak Ngaju knows landscape concept like *tajahan*, *sepan pahewan*, *kaleka*, *pukung himba*. That landscape concept is a traditional conservation effort done by Dayak Ngaju tribe. Another research about landscape unit utilization is by Helida (2016) about Kerinci which shows that there is correlation between natural resource conservation with its ecosystem. Kerinci community divides environment unit or landscape unit based on the function of the area which are settlement area (*dusun*, *umah*, *laman*), rice fields area, plantation area (*pelak*, *ladang pnanam mudo*, *ladang pnanam tuo*), secondary forest area (*bluko mudo*, *bluko tuo*), primary forest area (*imbo lengang*) and customary forest area (*imbo adat*). That landscape unit utilization becomes one of the community adaptation processes to survive existing condition.



Dayak Ngaju community utilizes environment where they live as a source of life. The environment provides resource in a form of landscape unit, plants, and animals while human through adaptation process tries to utilize natural resource and environment based on their local wisdom (Walujo 2011). Environment knowledge and management of the society positively affects sustainability of the resource around where they live. Local community involvement in forest conservation is very important to the sustainability of the whole ecosystem in the long term (Barber et.al. 1999). Nevertheless, now the local wisdom of the community is getting degraded more due to environment which dynamically brings change towards culture development. Other than that, generally community's local wisdom is only passed from generation to generation orally so that in the future that knowledge might be gone as time goes by. Thus, Dayak Ngaju's local wisdom in managing and utilizing environment unit in a form of landscape unit should be documented, be digged, and be analyzed as an effort of conservation and area development. Those things become Dayak Ngaju community's effort to preserve and improve environment quality.

2. Material and Methods

2.1. Time and Location

The research is done in July 2018 in three villages which are Tumbang Muroi village, Tumbang Mangkutub village, and Katimpun village, Mantangai Sub-district, Kapuas Regency, Central Kalimantan Province (Figure 1).

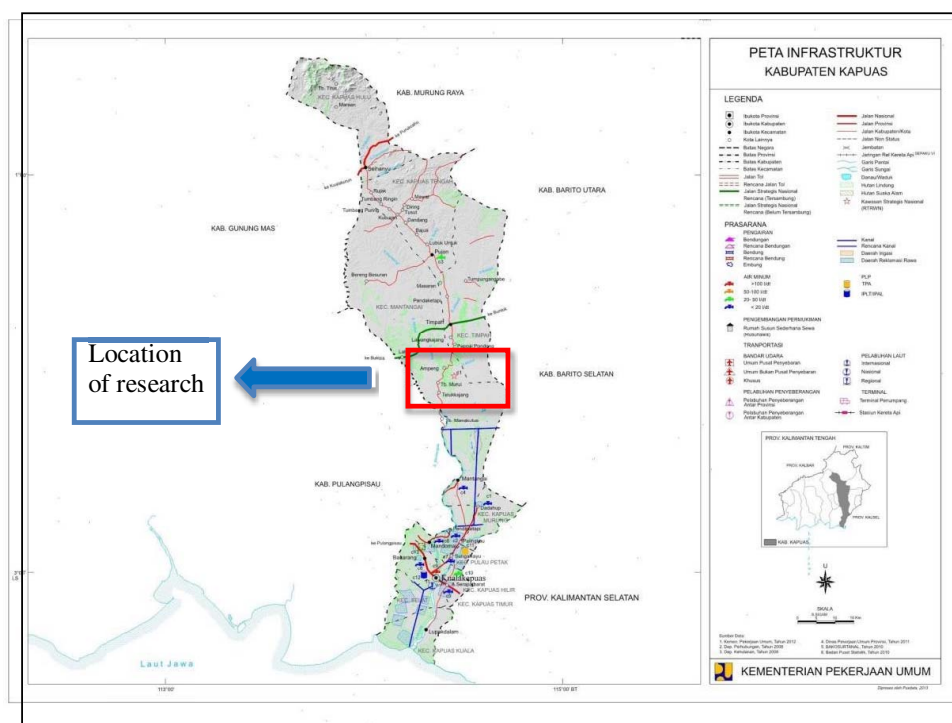


Figure 1. Study site of three villages, Mantangai sub-district, Kapuas regency, Central Kalimantan Province

2.2. Methods

Data collection is done by semi-structured interview, direct observation, and literature study. Interview is done with 6 key informants and 75 respondents. Key informants and respondents are decided by purposive and snowball sampling method (Sheil et.al. 2004). Key informants are head of the village, village apparatus, and mantir adat (the experts of local law). General respondents are Dayak Ngaju community members chosen based on the information from key informants. Quantitative data is taken by Pebble Distribution Method (PDM) (Sheil dkk. 2004) to know the proportion of each landscape unit.

3. Result and Discussion

3.1. Landscape Unit Utilization in Each Village

Dayak Ngaju community in Mantangai Sub-district, Kapuas Regency, Central Kalimantan has utilized environment unit in a form of landscape unit as their source to fulfill their daily needs. Landscape units that community know exist around them are *batang danum* (river), *parakayu* (protected forest, customary forest, and village forest), *kabun gita* (rubber plantation), *tana* (field), *bahu rambung* (ex-field), and *lewu* (settlement/village). Dayak Ngaju community that lives in the upstream part of Mantangai Sub-district, Kapuas Regency mostly work as fisherman. Nevertheless, condition of the environment that is getting worse due to gold mining, affects Kapuas river becoming muddy. That decreases fish population in Kapuas river. Additionally, the opening of palm oil plantation pollutes Kapuas river creek with heavy metals from chemical fertilizer used. Those effects affect community's occupation in the downstream part, they tend to have more various jobs and only a few work as fishermen.

This research takes three villages which are Tumbang Muroi village, Tumbang Mangkutub village, and Katimpun village in Mantangai Sub-district, Kapuas Regency. There is a difference of occupation among these three villages. According to key informants in each village, Dayak Ngaju community in 75% of residents of Tumbang Muroi village work as fishermen and 25% work as rubber tappers, in Tumbang Mangkutub village 80% work as fishermen, 10% work as rubber tappers, and 10% work as officers in Mawas, while in Katimpun village has more occupations. Occupations in Katimpun village are 25% as palm oil laborers and gold miners, 20% as rubber tappers, 15% as rattan farmers, 10% as galam wood collectors, and 5% as fishermen.

Landscape unit utilization value in this case is landscape unit based on gender, Dayak Ngaju community in three villages has different perception about the utilization of each landscape unit. Dayak Ngaju community in Tumbang Muroi village, both men and women think river as the most important landscape unit in the village where they live (Figure 2). That is in line with their occupation as fishermen. The community utilizes river as income source such as for fish and prawn source. Fish is caught by fishing, trawling, and trapping, while prawn is caught by taking them with a spade between woods brought by the river flow. Catching prawn is normally done by the fishermen at night. Nevertheless, fish becomes first commodity of Dayak Ngaju community in Tumbang Muroi village. People sell the fish both in fresh condition and salted. Some fish commodities utilized by people both consumed and sold are snakehead fish, flotsam fish, baung fish, lais fish, betok fish, and sapat fish (Hadiaty, 2001).

Research result of landscape utilization unit in Tumbang Mangkutub village shows that men in Dayak Ngaju community think that protected forest is the most important landscape unit (Figure 3). That is because most of the men work as research assistant in Yayasan Borneo Orangutan Survival Foundation – Mawas. Dayak Ngaju community call orang utan as datuk (great grandfather) forest keeper so that they think if protected forest is destroyed, then the orang utan will be gone and that also means losing people's income. That is indirectly becoming a local community based conservation strategy by maintaining the orang utan population in the nature equals to maintaining social-economy of the people in that area. Other than that, they also think that forest as an environment service provider in a form of clean air and coolness to their surrounding. However, the women think river as the most important landscape unit (Figure 2), because most women utilize the river to do their daily activities like washing clothes, washing dishes, and washing side-dishes as well as do fishing, bathing and do the toilet thing.

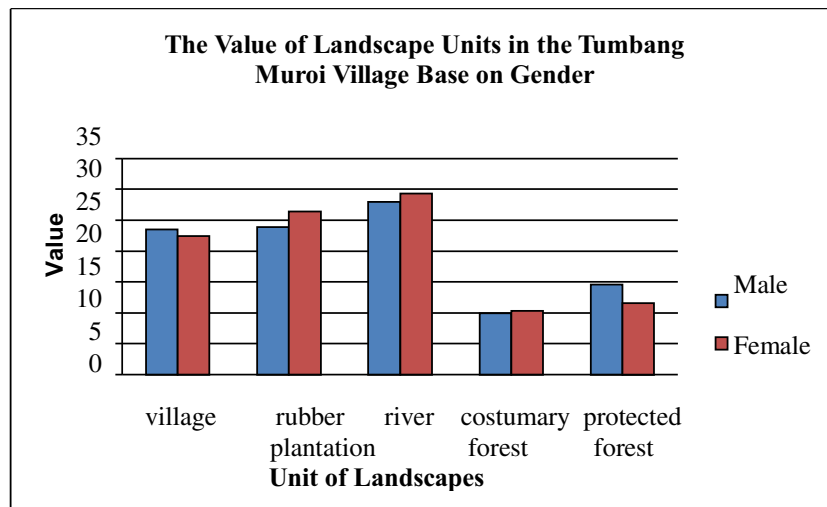


Figure 2. Diagram of the value of landscape units in the Tumbang Muroi Villages base on gender

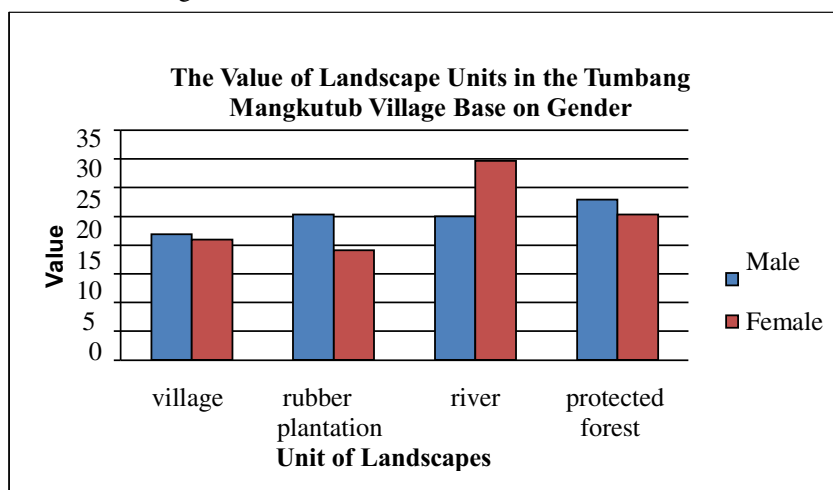


Figure 3. Diagram of the value of landscape units in the Tumbang Mangkutub Villages base on gender

Landscape unit use of Dayak Ngaju valuation in Katimpun village based on gender shows that the men think that the settlement or where they live is the most important compared to other landscape units (Figure 4). According to the people, becoming fishermen now is not a profitable occupation because fish population decreases due to gold mining, palm oil plantation, and electric fishing. Gold mining makes the river muddy and polluted by mercury chemical, palm oil plantation also makes the canals polluted by pesticide, and electric fishing kills little fish so it decreases more fish population. Thus, Dayak Ngaju communitu in Katimpun village develops other business to fulfill their daily needs by building swallow house in every settlement. People get income as much as Rp 13.000.000,00/ 1kg of swallow nest. They believe that swallow nest can fulfill their family need in long term and could be the biggest source of income compared to other jobs. Other than that, people also work as palm oil laborer in the plantation around them. This is an adaptation strategy of the people in developing landscape unit around them.

Women of Dayak Ngaju community in Katimpun village has different perception. They think rubber plantation as the most important landscape unit (Figure 4). That is because in the past before forest fire in 2015, the price of rubber sap went down from Rp 15.000,00/kg to Rp 5.000,00/kg and the existence of palm oil plantation, the women are rubber tappers and it was the most important commodity for their lives. Other than that, rubber plantation is seen as landscape unit that can be inherited by the parents to their children in the long term so that in the future the children will not face financial difficulty.

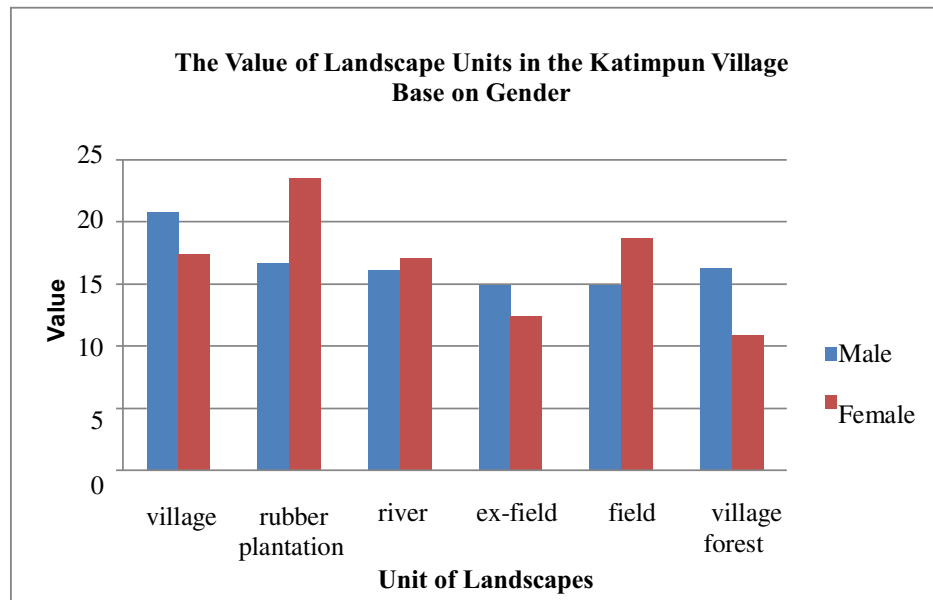


Figure 4. Diagram of the value of landscape units in the Katimpun Villages base on gender

2.2. Management of Local Community Value-Based Landscape Unit

Local knowledge of Dayak Ngaju community towards the use of landscape unit is very diverse including knowledge about local community-based environmental management. The practice of natural resources utilization based on local wisdom affects the landscape units formed (Nasution 2018). Changes in environmental conditions that occur encourage people to develop their local wisdom to manage sustainable natural resources. It is also community strategy to maintain their survival.

Fish is the main commodity for Tumbang Muroi village, this indirectly demands the community to protect the river environment. In addition, the villagers of Tumbang Muroi are also required to be creative in managing fish for sale. Therefore, they sell fish in fresh and dried conditions (in the form of salted fish). Tumbang Mangkutub village considers orangutans as important animals for the community because by protecting the forest the orangutans will remain sustainable. Thus, their source of income will not be lost. Rubber commodity (*Hevea brasiliensis*) is an important commodity for people in the village of Katimpun. Tapping rubber is the main source of income for people in the region before the existence of palm oil plantations and gold mining. After the big fire in 2015, the burned forest was then planted by rubber. However, the planting did not last long because the fires continued to occur due to a long dry season, so the community no longer planted rubber. The people in Katimpun village are now turning professions into palm oil laborer and gold miner.

Based on observations in the three research villages, Dayak Ngaju community also has myths and beliefs to protect the forest to remain sustainable. The community considers lunuk/banyan trees (*Ficus benjamina*) and jingah / rangas trees (*Gluta aptera*) to be species that cannot be cut down. They believe the two trees have a watchman and the person who cuts the tree will get sick and then die. Ecologically, the lunuk / banyan tree is a keystone species, meaning that the existence of the tree determines the survival of other species. In addition, lunuk/ banyan trees are plants that bear fruit throughout the season (Syatiriah 2012). This causes the tree to be the main food source for animals (Baskara & Wicaksono 2013), especially birds, while the jingah / rangas tree is a habitat for bees to lay their beehives producing honey. The community also believes that the existence of protected forests cannot be over-harvested or damaged and there are forest guards who guard them. Therefore, these community behaviors indirectly help maintaining the preservation of forest ecosystems.

Based on the description above, Dayak Ngaju community in the three villages have the capacity of local wisdom to utilize natural resources derived by their ancestors. The ability of the community to fulfill their daily needs is a form of food security and socio-economic welfare of local communities. This makes Dayak Ngaju community becomes independent because it is able to utilize its environment fairly and wisely. Local community-based environmental management based on their knowledge and beliefs becomes more sustainable. However, local wisdom that has been formed long time ago will be gone as the time goes by. Therefore, the participation of universities and research institutions in documenting, studying, analyzing and educating local communities is expected to be able to strengthen their belief in safeguarding the forests even though these beliefs have shifted because of the times.

Dayak Ngaju community already has environmental, knowledge and social capital to develop their area. However, local communities do not have the capital of trust from the government, so that the local community has not been much involved in regional development programs. The government considers that local culture is often referred to as a barrier to development. Local communities are also often regarded as a factor that causes environmental damage (Tambunan 2008).

Environmental management strategies that can be applied are: (1) documenting local wisdom of the community before it is lost. The threat of loss of local wisdom is enormous as the times develop and the knowledge of local communities is only passed down orally from generation to generation, (2) the need to increase the capacity of human resources for local communities through education, (3) official recognition of the rights of local communities to managing natural resources, therefore legality related to local community-based environmental management is needed, (4) government assistance to local communities is needed to direct communities to be responsible for environmental management practices based on their local wisdom, and (5) collaboration of all multi-stakeholders, the government directs and controls the course of development while the community accommodates the local wisdom they have in environmental management practices that are inherited from their ancestors, so that researchers and governments as development practitioners can exchange information so that the environment management can run accordingly and sustainably.

4. Conclusion

Local wisdom of Dayak Ngaju community in three villages of Mantangai Sub-district, Kapuas Regency, in utilizing environmental units or landscape units are vary. The utilization practice shows that the Dayak Ngaju community has been able to adapt to the environmental conditions around them by paying attention to the supporting capacity of each environmental unit. Utilization is adjusted to the daily needs of the community. Utilization must also be accompanied by effective environmental management so that utilization can last from generation to generation. The involvement of the government, local communities, and research institutions and education institutions has positive role in sustainable environment management.

Acknowledgments

Thank to Universitas Indonesia and Directorate of Research and Public Service (DRPM UI) for Hibah Publikasi Internasional Terindeks untuk Tugas Akhir (PITTA) UI 2018. We are grateful to BSOE-Mawas Program, Universitas Nasional, and to all the interviewees in Tuanan Research Station, Tumbang Mangkutub, Katimpun, and Tumbang Muroi villages, Mantangai Sub-district, Kapuas Regency, Central Kalimantan Province.

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