

# THE INTERNATIONAL JOURNAL OF HUMANITIES & SOCIAL STUDIES

## The Practices of Traditional knowledge and Wisdom by Multi-Ethnics on Swidden Agriculture of Kalimantan, Indonesia

**Nella Naomi Duakaju**

Lecturer, Department of Agribusiness,  
Mulawarman University, Indonesia

**Ndan Imang**

Lecturer, Department of Agribusiness,  
Mulawarman University, Indonesia

### **Abstract:**

*Local wisdom and traditional knowledge have so far been neglected in the management of natural resources, especially in swidden agriculture or shifting cultivation (in Indonesian term so called ladang), whereas in reality there are still many communities of swiddeners practicing these traditional wisdom and knowledge. To promote an ecologically friendly agricultural system, this traditional wisdom plays an important role because it does not use chemicals that can damage the environment. However, there are still many local wisdoms, especially in farming practices that carried out by different ethnic groups in Indonesia, that have not been identified and have not been integrated so that they have not provided great benefits for environmentally and friendly agriculture. The objectives of the research are: (1) to explore traditional knowledge and wisdoms that believed by multiple ethnics on the practicing of Swidden Agriculture; and (2) to integrate the various traditional knowledge and wisdoms at every stage of work in swidden agriculture to improve rice productivity*

*This research was conducted from December 2020 to March 2021 in Kalimantan, especially the Provinces of East Kalimantan and North Kalimantan, Indonesia. This research is a qualitative descriptive study. Data and information were collected by in-depth interviews with 15 key informants who mastered traditional agricultural wisdom from different ethnicities and sub-ethnicities. The data were analyzed using descriptive qualitative analysis.*

*The results showed that the farming system was still widely practiced in the tropics by several ethnic groups who generally live in inland areas and utilize land and forests that are large enough for farming. In this cultivation system, various local wisdoms and knowledge are identified in practicing the swidden agriculture starting from the stages of looking for land, determining soil fertility, cutting, burning, controlling pests, harvesting and storing rice, especially rice for preparation of seeds for planting in the following year. The results of the research have also integrated various local knowledge and wisdom that are practiced by various ethnic groups at each activity stage so that when they combined, it can increase the production and productivity of upland rice and as a form of sustainable and environmentally friendly agriculture.*

*It is recommended that upland rice and upland rice farmers can adopt traditional wisdom from different ethnicities which are considered appropriate to local conditions. The government is also expected to acknowledge and support the practice of local wisdom in farming and utilizing forests as a form of environmental preservation.*

**Keywords:** Swidden agriculture, shifting cultivation, dayak, kenyah, kalimantan

### **1. Introduction**

Traditional Indigenous knowledge can be defined as a network of knowledges, beliefs, and traditions intended to preserve, communicate, and contextualize Indigenous relationships with culture and landscape over time (Imang, 2020a). One might distinguish 'knowledge' as factual data, 'belief' as religious concepts, and 'tradition' as practice, but these terms are often used imprecisely and interchangeably to describe Indigenous epistemologies (Imang, 2020b). Indigenous knowledges are conveyed formally and informally among kin groups and communities through social encounters, oral traditions, ritual practices, and other activities. They included oral narratives that recount human histories; cosmological observations and modes of reckoning time; symbolic and decorative modes of communication; techniques for planting and harvesting; hunting and gathering skills; specialized understandings of local ecosystems; and the manufacture of specialized tools and technologies (e.g., flint-knapping, hide tanning, pottery-making, and concocting medicinal remedies (Bruchac, 2014).

Traditional knowledge is the foundation of indigenous peoples' identities, cultural heritage, civilizations, livelihoods and coping strategies over several centuries. Its promotion, protection and preservation is fundamental for the sustainability of the livelihoods of indigenous peoples, their resilience to human-made and natural disasters and the

development of their communities. It is also at the core of the rights of indigenous peoples. Imang (2020c) described that the implementation of the traditional knowledge have put them on low level to adopt modern agricultural practices. Like other ethnics, the 'Indigenous peoples' in Kalimantan has traditional knowledge that has been developed over generations through daily life practices and a close understanding of local environments. It can offer valuable responses to climate change, food insecurity, reducing inequalities and other challenges (Imang, et al. 2019)

Over time, Indigenous peoples around the world have preserved distinctive understandings, rooted in cultural experience, that guide relations among human, other-than human beings in specific ecosystems. These understandings and relations constitute a system broadly identified as Indigenous knowledge, also called traditional knowledge or aboriginal knowledge. Researchers can gain information and insight by consulting Indigenous traditions; these localized knowledges contain crucial information that can explain and contextualize scientific data. Archaeologists should, however, strive to avoid interference with esoteric knowledges, sacred sites, ritual landscapes, and cultural property. Research consultation with local Indigenous knowledge-bearers is recommended as a means to ensure ethical practice and avoid unnecessary harm to sensitive sites and practices (Brucah, M. 2014)

In Indonesia, local communities who practicing shifting cultivation generally still believe that traditional knowledge is still suitable to applied. However, traditional wisdom in *ladang* system by various ethnic groups is still partially implemented by each ethnic group so that its effect on increasing the productivity of the *ladang* is still not synergistic. By combining all these traditional wisdoms at each stage of *ladang*, it is hoped that it will further increase the effectiveness of the application of traditional wisdom. The objectives of the research are (1) to explore traditional knowledge and wisdom that believed by multiple ethnics on the practicing of Swidden Agriculture; and (2) to integrate the various traditional knowledge and wisdoms at every work-stage of swidden agriculture to improve rice productivity.

## 2. Methodology

### 2.1. Research Site and Time

Research was conducted in Kalimantan, particularly in East and North Kalimantan Provinces from October 2020 to January 2021.

### 2.2. Data Collection

Data and information were collected by field survey and interviewing some key-persons that considered have comprehensive knowledge related traditional ecological knowledge in practicing Swidden agriculture or shifting cultivation. Most of the key-persons were the Customary Chiefs in the villages. Other data were secondary data that collected through desk study.

### 2.3. Data Analysis

This research is a descriptive qualitative research, aimed at describing existing phenomena (Sukmadinata, 2006). The phenomena on shifting cultivation such as a tradition, traditional knowledge, characteristics, changes, and ongoing activities. All traditional knowledge and wisdoms that identified from various indigenous ethnics and communities will be put and combined at appropriate work-stage, i.e: land selection and clearing, cutting, burning, planting, weeding, harvesting and post-harvest activities.

## 3. Results and Discussion

### 3.1. The Practices of Swidden Agriculture and the Ethnicity

Swidden agriculture also called shifting cultivation in Indonesia is commonly called *ladang*. *Ladang* is one of the traditional practices of forest and land management by people in the tropics, and suitable with social typology in which there is a high interdependence between people and the environment (Inoue, 2000; Dove, 1993; Colfer et al., 1997). In Indonesian tropics, *ladang* is mostly practiced in Kalimantan, Sumatera, Sulawesi dan Papua island because these Island are still have enough land and forested land for shifting cultivation.

In relation with the motivation to practice swidden, Sardjono (1990) maintains that traditional forms of swidden agriculture reflect an optimum interrelation between the strategy to serve human needs and efforts to maintain ecological balance in tropical regions. Further, these practices can be improved through agroforestry technologies to adapt to local socio-economic dynamics and environmental changes. Conceptually, and indeed practically, swidden agriculture has a close relation with social forestry. Sardjono (2007) and Pasaribu (2007), for example, define social forestry as any conditions and efforts which intimately involve local people in forestry activities to ensure economic, ecological and social benefits, and simultaneously sustain the resources.

From the ethnicity aspect, most of the Swiddeners of Kalimantan Island are indigenous people who living in remote and forested area. Some of the indigenous are the Kenyah Dayak, Bahau, Kanayatn, the Tunjung Benuaq. Coomans (1987) describes that the Dayak groups are the descendant of migrants from Yunnan. They nomadic in Malay Peninsular and then crossed up to northern part of Kalimantan, Sarawak State. From this point they moved up in some groups to different directions in the upper stream of East Kalimantan. One of the groups is the Kenyah, who chose to move to Apau Kayan. Lahang, et. al (2000) also revealed that the Kenyah originated from Sarawak, and disperse to different settlement in the upstream of some major rivers in East Kalimantan such as Mahakam, Kayan and Bahau, Malinau, Kelay and Segai. Widjono (1998) also mentioned that the Dayak originated from some terms such as 'daya', dyak, daya, and dayak.

Coomans (1987) and Lahang et. al (2000) described the dayak as the descendants of the immigrants from Yunnan in South China who nomadic to Malay Peninsular and then crossing up to Northern part of Kalimantan in 1430s.

### 3.2. Traditional Ecological Knowledge and Wisdoms by Multi-Ethnics

This section presents various traditional knowledge, local wisdom, and ritual that have been trusted from generation to generation, as well as traditional rituals in practicing shifting cultivation with the aim that the results are good and the farmers also remain safe and secure while working in the fields. Different ethnics of course have different traditional knowledge at every stage of shifting cultivation, from the stage of testing soil fertility to the last stage of harvesting and storage of rice.

#### 3.2.1. Knowing Soil Fertility

The shifting cultivators have some traditional knowledges and indicators on how to know the fertility of soil that will be cleared for shifting cultivation and also for other agricultural purposes. Some of the knowledge by various ethnics are as follows: (a) the indigenous Basap Punan ethnic in East Kutai Regency of East Kalimantan Province checking soil fertility by picking the sample of soil using stick or parang. They put some water on the soil, and an experienced farmer will check the composition of sand, clay and other humus using his finger. Through this testing, he can know whether the soil is fertile or no, or at least he can determine how to grow and to treat rice in the land; (b) the indigenous Kenyah Dayak Swideners in Mahakam Ulu Regency used some species of plants as the indicator that the soil is not fertile (*tanaq megang*), for example (in Kenyah Dayak dialects): *kayu tat*, *dulin*, *keletang*, *tekalet* and *andkatan balut*. If they found the plants growing in a plot of land, it means that the soil is not fertile (in Kenyah dialect: *tanaq aga*). They will avoid to clear this land for farm; (c) indigenous Kenyah Dayak in Mahak Baru, Malinau Regency, North Kalimantan Province usually determine the soil fertility based on indicator vegetation such as *mpung* (*Blumea balsamifera*), *ulem* (NI), *siit* (NI), *balang* (*Lindera polyantha*), *lebem* (*Musa acuminata*), *sawan* (NI); (d) for the people of Batu Majang, Mahakam Ulu Regency and Pampang Village Samarinda City, some of the important indicator vegetation for fertile soil are: *mpung* and *sawan*, *karun*, *lebem*, *kayu uwa*, and *benuaq* (*Maccaranga triloba*). When the species found are dominant and grow well in a certain area, it means that the land is fertile enough for *ladang*; (e) for the Menyuke Malay ethnic in West Kalimantan, the slashing stage begins with performing a *Ngawah* ceremony for one or two days. The purpose of this ritual is to ask permission to forest deity to start of works for high productivity and the farmers are safe and secure while working in the fields. Some of the preparations for this *Ngawah* traditional ceremony are betel, leaf cigarette, Javanese tobacco, a little rice, and one nail.

#### 3.2.2. Selection of Land Cluster for Shifting Cultivation Field

In addition to determining the fertility of soil, a very important initial stage in farming is how to determine the location and cluster of farms as this will have an impact on farm yields and pests and diseases. Traditional knowledge on land selection based type of vegetation were practiced by some ethnics as follows: (a) the Kenyah Dayak of East Kalimantan Province are more preferable to select *Jekau dumit* (fallow period 4-6 years) and *Jekau Dadoq* (fallow period 7-10 years) because they learned that the soil already recovery and has enough accumulation of nutrient; (b) the Bahau Dayak in Mahakam Ulu Regency also has similar knowledge on how to select land for shifting cultivation based on fallow period of vegetation. In secondary forest, they prefer to clear *Sepitang Ayaq* (3-5 years of fallow) and *Tu'aan Uk* (6-10 years of fallow period).

#### 3.2.3. Land Clearing

When cutting small trees and grasses, (a) the Dayak Kenyah ethnic groups of East Kalimantan have traditional wisdom on how to cut it properly because it will have an impact on the subsequent work process and also affect rice productivity. An example of this local knowledge is if the topography of the land or the land is sloping, the process of slashing usually starts from the bottom of the slope or the part of the field near the river (*cen ndaaq/cen bena*). This is conducted so that trees and bushes that being slashed are easily thrown down the slope so that not to disturb the working farmers and point towards the top or the ridge. For the better drying process, at the cutting stage, all shrubs and plants at the pole level and sapling level (<5 cm in diameter) are usually cut with the lowest possible stump so that later they do not become a stepping place or stepping stone for pests such as rats and sparrows; (b) for the Pagu customary community in North Halmahera, the land preparation process takes place after the harvest is carried out. The land preparation is carried out on land in another location that has been planted and then abandoned for some years (locally called: *Jorame*). *Jorame* is usually covered with small trees or shrubs and bamboos; (c) the isolated ethnic of Baduy in West Java Province, usually perform the *Narawas* ritual, a ritual to start clearing land to be planted, aimed of refusing devil while farming; (d).

#### 3.2.4. Felling or Tree Cutting

Felling of big trees plays very important role in shifting cultivation system. Felling technic will impact to the accumulation of biomass from the burnt trees and leaves. The direction of the trees that already cut will also can protect wild fire when the field is burn. Therefore, direction of felling is 'inside-ward', means that direction of felled trees are directed into the field with the intention of preventing forest fires around when the field is burned, and also the more humus accumulates in the field area so that the soil is more fertile. For the Dayak Kenyah ethnic group in Mahakam Ulu Regency, local knowledge in cutting is as follows: (a) the felling process starts from the bottom or near the river or from the valley (*men idaaq / cen bena*). This is done because in general the wood is leaning downwards or towards the river so that the felling process is not disturbed by the wood that has been felled first; (b) the direction of felling is attempted

towards the slope by adjusting the down notch and the back notch when felling. Try not to make efforts to keep the trees on top of each other so that later birds and mice do not use them as footholds; (c) it is crucial to ensure that all parts of the field get the felled wood evenly so that after burning it, the nutritional content of the biomass can be distributed evenly; (d) wood stump (*tunggul/tu'et*) is trimmed low so that it will not be used as a foothold for rats or birds to eat rice after the rice bears fruit; (e) tidy up logs (*mepat/metoq*) carried out when the wood being cut is still fresh. If it is done after the wood has dried, the leaves will fall from the branches so that the drying process does not run completely. Dry wood will also be tougher, making it harder to chop.

### 3.2.5. Burning

For ordinary people, burning *ladang* is often blamed for destroying forests and causing forest fires and even erosion. In fact, burning *ladang* is an important process so that the swiddeners already have knowledge about how to burn *ladang* safely. Imang et al. (2018) described there are even farm farmers who are imprisoned for burning their fields where as this is a part of the usual farming process. Burning the field is not just about burning, but farmers have methods and techniques of burning so that the results are more perfect and also safe for farmers. For farmers, the time to burn the farm is determined by several factors, how long the field has dried, signs that the field is ready to be burned, and what time the field should be burned because it is related to the wind direction and safety of the farm farmer who burns the field. Some local knowledge and ritual related to the best time to burn the fields: (a) for the Dayak Menyuke ethnic group in West Kalimantan Province, a ritual called '*bubur abang*'ted with some material such as: rice, brown sugar, salt, lime betel, tobacco leaves, banana leaves. The material put into a box and then installed to four corners of the farm so that the burning process is smooth and safe; (b) for the Kenyah and Bahau of Mahakam Ulu Regency, the indicator that the field dried enough to burn is based on the appearance of the twig and leaves. All leaves already fell and separated from the twig, and the twig is baunchy; (c) to develop barricades or buffer-zone before burning by cleaning around the field from bushes as wide as 1-4 meters. If the field originated from the primary forest where the dry materials in the form of twigs and leaves are in a big volume, the buffer-zone is made about 10 m wider for the purpose to protect from wild fire; (d) in Padang West Sumatera Province, awareness of the construction of buffer-zone (*melandang*) is always related to customary law and ancestral beliefs. For example, the *Talang Mamak* community creates fire boundaries around a field in order to localize the fire so that it doesn't spread to other places. They clean dry leaves and rotten logs because fire can spread through these objects; (e) beside the physical method to protect wild fire, non-physicalnon-physical methods are also used so that the burning process of the fields runs safely, for example *Petalla Guru*, performed by someone with supernatural abilities and is usually presented before burning the field. The purposes this ritual are all people will secure and animals will move out from the field so that they will survive, and also a stable wind-direction; (f) the Batak Customary community of *Komunitas Adat Janji*, burning a field usually starts from a higher point if the land is sloping. Such a burning process makes it easier for farmers to protect the fire from spreading to surrounding forest (in local dialect: *mangararati*); (g) for the Pagu customary community in North Halmahera, the method used to prevent fire from spreading to other locations, Pagu farmers pay attention to the weather. The best time to burn is before the rainy season. If the weather is too hot during the day, the land is burned at night with the consideration that there is more dew at night so the chance of fire spreading is very unlikely; (h) The Pagu Indigenous Community cultivators are proficient in applying safe burning techniques following the wisdom of their ancestors implicit in customary law, namely '*Sapat*' or '*Jalan Api*'. The method is to use a hoe to separate the fields from the outer area with a width of 1-2 m so that the fiber roots are also removed dibuang; (i).For the Dayak Benuaq Ohokng Sangokng community in Muara Tae Village, West Kutai Regency, East Kalimantan Province, the process of burning fields begins by making the boundary of the land to be burned with its surroundings, then waiting for 3-4 days of rain, assuming that the land is still moist and dry. The burning process is always controlled, paying attention to the direction of the wind so that the burning can be controlled, conducted in the afternoon because the wind is not strong; (j) if other ethnics have local wisdom in burning fields, the Mentawai ethnic in North Halmahera Maluku, on the other hand, do not burn the fields. Based on a hereditary belief, burning trees in the forest will anger the spirits of the forest guards and will cause disease for the burner or his family. Trees that have been felled or cut are allowed to rot in their place. These rotting plants are in fact very useful because they eventually become natural fertilizers for their fields; (k)for the Dayak Ngaju in Central Kalimantan, burning the fields must be done in a group of some people. They also always pay attention to the wind-direction for the safety of the groups who burn the fields. Burning is usually carried out from noon to afternoon at the time the sun is right above the head (*bentok andau*). At that time, leaves, twigs, branches and trees will burn perfectly (*bakehu*).

### 3.2.6. Land Preparation for Planting

in the Kenyah Dayak dialect, this stage is called *mekup*. Farmers already know that if this work-stage is carried out properly, it will increase soil fertility and also reduce pest attacks. If the farmer burns all the leaves, twigs and branches properly, it will produce humus as natural fertilizer. Likewise, if all the twigs and branches have been burned, the attack of rats and birds will be reduced because there is no place or foothold for these pests. In addition, if the farmer clear the land properly will reduce weeds and caterpillars as well as earthworms.

### 3.2.7. Planting/Dibling

for the shifting cultivation farmers, planting is a very important stage and also the most enjoyable compared to other stages of work. This stage becomes important because the fertility of rice is determined by the selection of the best day or date to start plowing. If one chooses the first day incorrectly, the field may be fail. This stage is said to be the most

enjoyable because at the time of digging, farmers will usually prepare delicious food such as a feast for all farmers who work digging. Farmers usually work in a 'gotong-royong' or mutual system. Here are some traditional knowledge and some customary rituals performed by several different ethnics: (a) the indigenous Kenyah Dayak of East Kalimantan usually conducted ritual *malan tau*, in which a adult man is assigned to look for the best dates for sowing through some restrictions (Imang, Makoto, 2010); (b) for the Melayu ethnic in West Kalimantan, before sowing, they conduct ritual *morok* or *pemorokan* ceremony with preparation material such as seeds of rice, a little of betel, yellow rice, and grilled chicken. The trick is to make a rectangular stake with a size of 1 m x 1 m, after that a hole with a size of 10 cm is made, then each stake is cut. After that, a campfire was made sprinkled with sugar until it smelled good and then the prayer was recited to ask God to make the rice grow fertile and get a lot of rice; (c) for the Baduy tribe, one of the tribes that are still very traditional in West Java Province, farming or *ngahuma* is a form of worship and sacred ritual or respect for *Nyi Pohaci Sanghyang Asri* in their religion *Sunda Wiwitan* (Senoaji, 2011). Therefore, all rice farming activities are determined by the *Pikukuh* which has been established and continues to be preserved until now. The best day to sowing is determined by *Puun*, starting with various rituals led by *Puun Cikeusik*; (d) for the Bahau ethnic in Kampung Mamahak Besar, Mahakam Ulu Regency, the Village Head Bibing stated that at the time of planting (*nugal*), the *Hudoq Ngawit* ritual was performed. *Hudoq Ngawit* is held from September to November each year. The goal is for the abundant of rice, and bring prosperity to the community. After *Hudoq Ngawit*, the *Nebeq* ceremony was also held to get rid of bad luck, including preventing the outbreak of disease; (e) The Dayak Kenyah sub-ethnic in Kalimantan plateau of Apau Kayan determine a good day to start dibling based on the journey of the sun or '*asat tau*' at the position of '*seleng Punan*' to the '*petatip*' sun position. The position of the sun of '*lekoq sang*' is also good for planting or dibling, while the position of '*mujun upit*' is not good for planting because there will be many bird pests (*upit*). This way has been used since they were in original settlement in Apau Kayan. Some of them now are living in down rivers and near cities but still practice swidden agriculture; (f).

### 3.2.7.1. Weeding

(a) When the indigenous Punan Basap in East Kutai clears the weeds in the fields, they usually accumulate the weeds on logs that placed across the hillside. The aim is to prevent erosion and to collect topsoil that is washed away with the surface runoff so that this humus will be accumulated which will later become fertilizer for rice (Dano, 2019).

### 3.2.7.2. Harvesting and Treatment for Seed

(a) For the Bahau ethnic group in Matalibaq Village, the harvest season begins with ritual ceremony '*Hudoq*'; (b) for the Dayak Kenyah ethnic group in Kalimantan, the *Umen ubek* ceremony is performed before harvest as a form of gratitude to God who has blessed their fields so that the rice bears fruit and is free from pests. After the harvest is finished, the *umen undat* or *mecaq undat* ceremony is carried out and also the *pelas tahun* ceremony which is a form of thanksgiving to God for the rice they will consume for the following year; (c).

### 3.2.7.3. Post-Harvesting and Rice Storage

(a) The Kanayatn Dayak ethnic in West Kalimantan Province usually celebrate their gratitude to God the Creator for the abundant rice harvest by holding the *Naik Dango* ritual. This ritual is carried out every April 27 at the traditional house of the Dayak Chief. The *Naik Dango* traditional procession is an actualization of the local wisdom of the Kanayatn Dayak community as a ritual of gratitude and respect for the gift of the Creator.; (b) the indigenous Punan Basap usually stores rice seeds in boxes made of *Dipterocarpaceae* bark. The reason is because the temperature of a box of bark is cooler and moist so the seeds are still good for planting in the following year and the percentage of rice seed growth is also higher; (b)

## 4. Conclusion and Recommendation

- Most of the indigenous communities have various traditional knowledge and wisdoms in farming, particularly in practicing swidden agriculture at every stage of work, from first stage land clearing, cutting-burning to the last stage of work, harvesting and storing rice. These traditional knowledges are believed very valuable in their daily activities.
- Some of the various traditional knowledge and wisdoms that identified in this research are then combined at every related stage of work so that every ethnic could adopt other ethnics' knowledge so that they could their way in practicing swidden agriculture to increase productivity.

### 4.1. Recommendation

- The indigenous communities actually have traditional knowledges that suitable for sustainable agriculture. So that, it is recommended that government provides strong support for the swiddeners to improve the practice of the traditional knowledge and wisdoms
- Government should recognize the practice of traditional knowledge in shifting cultivation especially in burning stage (*membakar ladang*) in which the farmers were often blamed and even imprisoned due to wild fire.

## 5. References

- Bruchac, Margareth. 2014. University of Pennsylvania, mbruchac@sas.upenn.edu Indigenous Knowledge and Traditional Knowledge Margaret Bruchac University of Pennsylvania.

- ii. Colfer, C., Peluso, N., and Chung, C.S. 1997. Beyond Slash and Burn. Building on Indigenous Management of Borneo Tropical Rainforest. The N.Y. Botanical Garden, New York, 236 pp.
- iii. Cooman, M. 1987. *Manusia Daya: Dahulu, Sekarang dan Masa Depan* (The Daya people: In the Past, Present and Future), Gramedia, Jakarta, 215 pp.
- iv. Dano, M. 2019. Response of the Indigenous Basap Dayak Community to Settlement Relocation by Coal Mining Company in East Kutai District, Kalimantan, Indonesia. *The International Journal Of Humanities & Social Studies*. Vol 7 issue 2.
- v. Dove, Michael R. 1988. Sistem Perladangan di Indonesia. Suatu Studi Kasus dari Kalimantan Barat (*Swidden Agriculture System in Indonesia. A case Study from West Kalimantan*). Gajahmada University Press. 509 pp.
- vi. Imang, N: makoto, Sardjono. 2019. Decentralization and The Life of Indigenous Kenyah Dayak In East Kalimantan. Mulawarman University Press.
- vii. Imang, Ndan. 2020a. Kearifan dan Pengetahuan lokal (indigenous Knowledge) pada Sistem Perladangan Multi-etnis. Mulawarman University Press.
- viii. Imang, Ndan. 2020b. Mozaik Sistem perladangan dan Pertanian Berkelanjutan. Mulawarman University Press.
- ix. Imang, N., Rujehan, Nella N. 2018. Daleh Assessment of daleh swidden agriculture as an innovative alternative to conventional swidden under conditions of external pressure on local forest management in Kalimantan, Indonesia. *Biodiversitas*, Vol 19 No. 3, may 2018.
- x. Imang, Ndan. 2020c. 'Adoption Level of Indigenous Communities to Agricultural Technology, Problem and Adaptive Solution in East Kalimantan, Indonesia'. *Biodiversitas*, Volume 21, Number 2, February 2020
- xi. INOUE, Makoto. 2000. Mechanism of Changes in the Kenya's Swidden System: Explanation in terms of Agricultural Intensification Theory. *Ecological Studies* 140. Eds: E. Guhardja, M. Fatawi, M. Sutisna, T. Mori and S. Ohta. Rainforest Ecosystems of East Kalimantan. Springer Tokyo, pp 167-184.
- xii. Lahang, L., Laway, D., Uda, K., Ingan, Y., Ikin, R. 2000. Sejarah Perpindahan dan Penyebaran Dayak Kenyah Lepoq Bakung di Kaltim (*History of Migration and the Spreading Sub-ethnic of Bakung in East Kalimantan*). Tanjung Selor. 2000. 51 pp.
- xiii. Pasaribu, Hadi S. 2007. Social Forestry. Litbang Kehutanan, Dephut RI.
- xiv. Sardjono, M. A. 2007. Agroforestry: An Appropriate Technology of Social Forestry to Revitalize Local Wisdoms towards Community Empowerment in Indonesia. Faculty of Forestry/Center for Social Forestry, Mulawarman University. Samarinda. 16 pp.
- xv. Sukmadinata, N.S. 2006. Landasan Psikologi Proses Pendidikan, Bandung: PT Rosda Karya.
- xvi. Widjono, R.H. A.M.Z. 1998. Masyarakat Dayak Menatap Hari Esok. Grasindo. Putijaji - LPPS-KWI, Jakarta, 162 pp.