



Research article

The farming management of Dayak People's community based on local wisdom ecosystem in Kalimantan Indonesia

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ABSTRACT

This research aims to explain the urgency of the customary values and traditions in the farming management system of the Dayak People's in Kalimantan. The approach used was Kroeber and Kluckhohn (1952) in relation with the cultural cycle. This approach is important to explain the cycle of farming management systems and their concept about nature and environment in Dayak community. In the farming context, various existing values in Dayak community has been found such as values containing togetherness, compassionate, mutual cooperation, art, ritual and spiritual aspects. This research used a qualitative method through observation and direct interviews for its data collection techniques. The findings show that there were ten stages of whole series of farming management systems of Dayak community in Kalimantan, namely inspecting the land, determining the land area, cleaning or purifying farming tools, slashing, cutting the trees, burning the land, planting, weeding, harvesting, and performing thanks giving ceremony (*begawai*).

1. Introduction

Kalimantan Island frequently named as "Borneo" has its original inhabitants which so-called Dayak. According to Ukur (Banks, 1994), the Dayak tribe is divided into seven races or ethnics and grouped into 405 sub-ethnics (Bishop, 1994) which are spread in various areas in the world's third largest island by the width of 743,330 km². The grouping of Dayak ethnics and sub-ethnics is based on the similarity of place of residence and language while for custom, art, and culture are more or less the same (Matsumoto, 1996).

Based on this grouping, according to Nieuwenhuis (1994), a Dutch medical doctor and a botanist, mapped the residence of various Dayak ethnics in Borneo until the end of the 19th century. At that time, the distribution of the Dayak people was mapped based on their residence and the characteristic of homogeneous society that can be seen through its clans and organization system. There has not been much significant movement of population from one region to another. Therefore, the Dayak people in the pre-20th century lived in groups and settled according to their respective territories so that they were the rulers of their regions.

Reviewing from the livelihood system, as an effort to meet food for daily needs, the life of the Dayak people has been polarized with a system of "farming". Farming means a system of shifting cultivation from one plot

of land to another. Usually the field cleared by slashing, cutting, and burning the forest system without destroying the forest and the surrounding environment. That is what so-called by "system" that is the existence of a local wisdom and values behind it. This is not only the value of wisdom and the way to sustain life, but there are other values implied such as togetherness, compassion, mutual cooperation, arts, as well as ritual and spiritual aspects in the entire cycles of farming in the Dayak community. The treatment of indigenous peoples has gradually evolved, beginning with views of natives as endangered, followed by targeted assimilation and civilizing missions, protectionism and an ethical duty of care, and finally leading to discourses of rights and recognition (Tyson, 2010).

To comply with the needs of their daily lives, Dayak people maintain the system order and natural systems and their environment as stipulated in Customary or *Adat* Law. Acts of destructing and polluting the environment whether intentionally or unintentionally will be subject to sanctions to the doer (Lomon and Sareb, 2015). For instance, if anyone burns a field and the fire spreads to neighboring lands, he will receive a customary sanction or *adat* fine. Similarly, if people do fishing using poison (*tuba*), it can kill fish massively, then the doers will also be subject to customary sanctions. Thus, it is clear that the Dayak people place the environment and nature as an integral part of the whole series and their cycle of life.

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Preserving and taking care of the nature and environment means maintaining and preserving the breath, biota life, and creatures inhabiting it. On the other hand, destroying the nature and environment means harming and threatening the breath, biota life, and its inhabitants. Overall in the Kalimantan region, there are 5 (five) provinces consisting of West Kalimantan, Central Kalimantan, South Kalimantan, East Kalimantan and North Kalimantan which have a similar management system in farming. The management of the farming system of the Dayak community can be described in Figure 1 below:

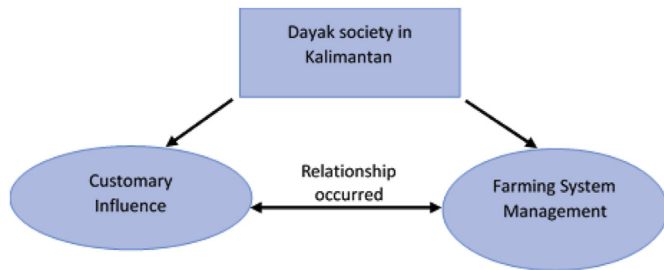


Figure 1. The interrelationship implication of farming.

The implication of the cultural context in its development plays a very important role in human life. It acts as a connector of the rule of law determined by the values or legal culture that is internally lived by the community (Achmadi et al., 2020). Likewise, in the entire cycle of farming, there are values of togetherness and the cooperation implied on it. Therefore, farming system is a system in the Dayak society to maintain their life instead of preserving their cultural custom, tradition, and art. The system is also a way of defending their territory by marking the area where they live by replanting various folk crops. The important point of this research is to spotlight the farming management of Dayak people community in maintaining and preserving natural ecosystem equal with the values of local wisdom from generation to generation.

2. Methodology

This research used a qualitative approach in which the techniques of data collection used direct observation. The observation process was carried out by seeing and observing directly the events occurred in the Dayak community. During the observation, researcher wrote and collected the data in the form of field notes. Also, the researcher recorded whole events related to the farming process occurred in the indigenous society. In addition to the direct observation process, the data collection process was also carried out by collecting secondary data. The secondary data used in this research were government reports which were reported periodically in public. Other secondary data used in this research were also in the form of field documentations such as photographs and field notes written directly by the researcher on location.

Furthermore, all data collected were processed by data coding first. Then, the data coding process was done by taking into account the available data categorization before the data was interpreted. The interpretation process used Kroeber and Kluckhohn's (Miles and Huberman, 1994) approach in relation to the culture cycle. The final stage was the process of data presentation (see Figure 2).

3. Result and discussion

Kroeber and Kluckhohn (1952) stated that there are seven aspects of human culture which consist of (1) language, (2) knowledge system, (3) social organization, (4) living equipment and technology systems, (5) livelihood and economic systems, (6) religion, and (7) art (Widyosiswoyo and Vidiyanti, 2004). Regarding the farming of Dayak people, it can be seen through the whole process, sequence, harvesting yield (rice), and the peak of farming cultivation (*Gawai*—Dayak New Year's party) as the cultural system. Rice is the primary food of the Dayak people, which is the main source of life for generations. Farming is not merely a system of livelihood and economy, but also the form of knowledge system, social organization system, living equipment system, livelihood and economic system, religion, and the occurrence of art substance in it.

Related to the culture, we also recognize the existence of stages in the development of the livelihood and economic systems from time to time. According to Alfin Toffler (1980), there are three waves of human livelihood and economy from time to time, those are (1) Nomad, (2) Agriculture, and (3) Industry/Information. To protect various important assets inherited from ancestors who have been accustomed to passing on the social order system and the assets of indigenous peoples from generation to generation, the process is always based on a system influenced by the cultural domain. The interrelation of cultural domains plays an important role in the process, the system and concept that develop in the social order of rural communities or indigenous society groups (Achmadi, 2020).

We have passed the first stage when humans are no longer moving from one place to another, or nomads. In this first wave, the needs of human life and their social changes are not yet so complex. In such a way, it can be said that the livelihoods and economy of humankind in the nomadic era are still very simple. Then, entering the second wave where livelihoods and economy rely on agriculture humans have begun to settle in a certain area. It is believed that the agricultural system by burning the land has been started since this first wave, around 10,000 years BC. As stated by Lubis (1980), "Until today in our country there are still two-million people in Sumatra, Kalimantan, Sulawesi and other islands who have made their living with farming technology since around 10, 000 years before Christ" (see Figure 3).

Meanwhile, the third wave is the stage where humans enter a new civilization named a livelihood and economy based on industry or information technology which is marked by the emergence of factories, companies, information technology, and even now industry 4.0.

If we take a look at these waves and stages, there is a phenomenon which is more or less the same where in every wave of the human livelihood and economic system there is a static system (farming), but some is dynamic. The dynamic one is generally related to technology, speed, form and structure of society, social class and societal strata that we know as the social change. The practice of farming only occurs in certain communities whose large territory and are still not much reached by industries, such as in Kalimantan, Sumatra, Sulawesi, Maluku, and Papua (Pinxten, 1994).

On the other hand, there is a growing awareness (Bryant, 1996) that the value of indigenous community' forests is much higher than the temporary economic value, for example for mining, plantations, or for building housing and offices. "For the customary community,

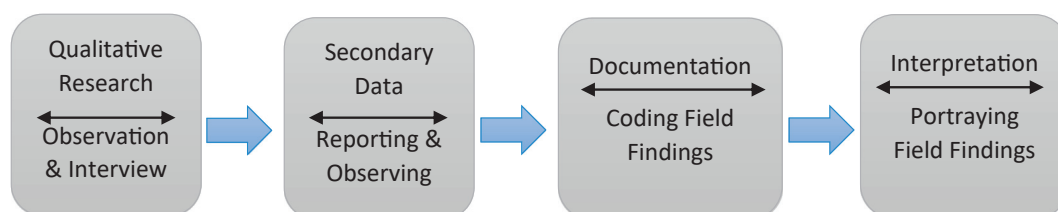


Figure 2. Research framework.

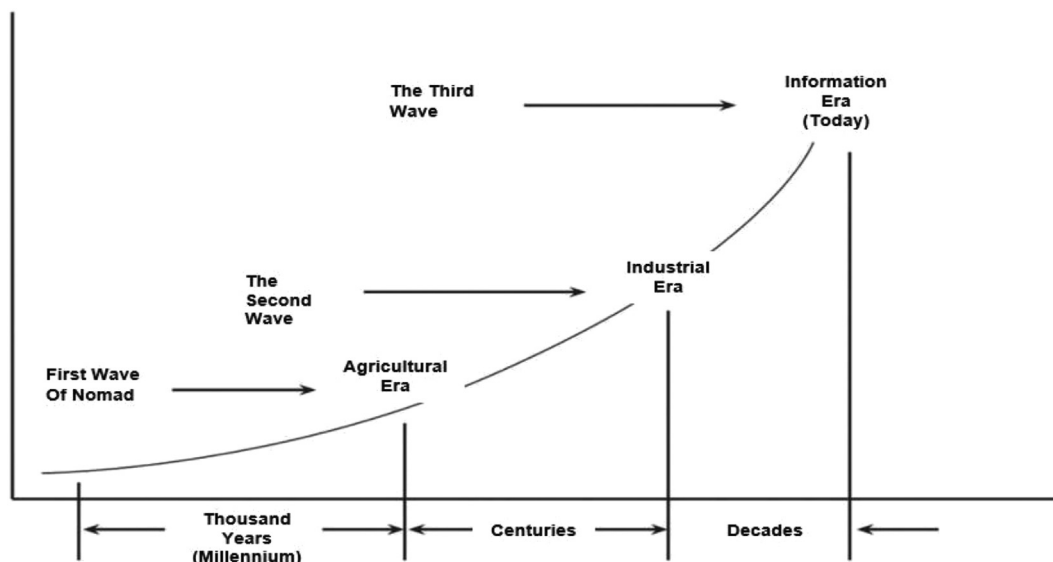


Figure 3. The waves of livelihood and economic over time, creatively developed from Toffler.

forests and sea as well as other natural resources in their customary territories have high economic values. Not only that, natural resources in their customary territories are the center of social cycle, cultural and spiritual activities. Essentially, this is related to the effort to preserve nature which does not only provide concrete consumption products such as food, but also ecosystem services which become the enabling factor for the sustainable production process". Observing the sustainability of the environmental ecosystem in the forest areas of the customary society in Kalimantan, we may view from the perspectives of the natural resources where people live and exist for generations (Yansen, 2019).

In Masiun's (Brown, 1995) study, he calculated the economic value of customary forests owned by the indigenous community of Seberuang Riam Batu located in Tempunak District, Sintang Regency, West Kalimantan Province. Besides practicing subsistence economy, the people in Riam Batu have also followed an open economy system. However, the people do not want to sell their customary forest for various momentary benefits because they realize that the value of forest is much higher than mining, plantation, housing, and others.

The Dayak people also implement the loop back farming system that returns the plants back to their original cycle based on the natural law within 15 years. That all laws are created through some kind of social process; a conventional norm is the outcome of something resembling a deliberative convergence of behavior and attitude on the norm, while other social norms are manufactured through social processes like those set forth by a rule of recognition and imposed on non-members of the group (Himma, 2013). This only likely happens since the customary community manages their forests wisely and place their entire process and livelihood system as a sustainable system. Thus, the farming systems of the Dayak people are well-integrated with nature and its environment.

The way of being (*modus essendi*) and the way of life (*modus vivendi*) of Dayak people cannot be separated from the nature and the environment where they live, reside and exist. In the past, from various literatures and research conducted by foreign authors, many things have not been revealed to the surface related to the wisdom, insight, and values in the farming system of the Dayak people. Morrison (1957), David Jenkins and Guy Sacerdoti (1978), for instance, tend to view in general the cultivation of the Dayak people in Borneo merely to produce rice.

Morrison (1957) acknowledges the importance of farming for the Dayaks while pointing out that rice is *the staff of life* for the people. Rice is so important to the Dayaks in Borneo, so that Morrison writes the title "*Padi - The Staff of Life*". It describes how the Dayak people obtain rice, starting from clearing the land to getting feast together after harvesting.

Meanwhile, David Jenkins and Guy Sacerdoti calculated that each family head of Dayak people who cultivates one hectare of land will yield roughly 900 kg of rice. This is, according to the Western's perspective, considered unequal between the woods cut down and burned becoming charcoal, and the results gained from it.

However, if we observe carefully that the farming of the Dayak people is not solely and only rice as a target to be yielded. Farming for the Dayaks is not just a rice cultivation. A lot of wisdom, values, customs, traditions, culture, arts, even economic and educational values are enclosed behind it. Researchers and authors from "inside", known as the intellectuals of the Dayak people, have tried to describe the hidden dimensions and tacit knowledge that outside researchers have never seen, written, and even published them. In such a way, what 'insiders' have studied and written seems to be considered correctly because there are no other research results and publications arguing or adding other elements of farming rather than rice as its novelty.

Yansen (2018) notes that the environment, forest, and farming cannot be separated from the activities and the life of customary or traditional communities. "For hundreds of years, the ancestors of the Dayak people have a forest area as their territory. The territory is usually determined based on the status of the family group or family clan. They continue to develop and to build evolutionarily cultural and social characters in line with their interactions with their nature and environment. The environment and nature shape various social models and customary territorial boundaries of the Dayak people, such as hunting and farming activities. These two activities can determine and legitimize the right of their customary territorial. This cultural and customary model has been institutionalized, accepted, maintained, and conserved from generation to generation by individuals, customary communities, or customary institutions even by village bodies. Thus, it is implicitly explained that there is a social function of the forest. On the other hand, throughout the farming process there is a dimension or activity that includes or involves many people during the process (Oers, 1996).

3.1. The stages of farming

According to Kroeber and Kluckhohn the cycles or stages of farming of the Dayak people integrate the management of ecosystem and the traditional culture of Dayak community. In general, the stages of the farming found in this study are: (1) inspecting the land, (2) determining the land area, (3) cleaning or purifying farming tools, (4) slashing, (5) cutting the trees, (6) burning the land, (7) planting, (8) weeding, (9)

harvesting, and (10) performing thanksgiving ceremony (*begawai*) (Purwanto, 2020).

Those ten stages of farming are applicable everywhere among the Dayaks and those are mandatory to get through (Hiebert and Carpenter, 1992). However, there are some practices or other activities in some places added by the clans or customary communities in the process. It is quite interesting to observe as a social exchange process where the stage becoming the crown or the peak of the farming system and cycle is the thanksgiving ceremony or *Begawai*. It is not only in a village that people festive the ceremony, but also it involves the nearby villages, or even likely villagers from other areas who have an interest or still have family relationship with the host of the event (Santrock, 1999).

The farming or cultivation is carried out once in a year and simultaneously in the season which is considered to be the right time to start the opening of farming activities (Anna and Rukka, 2020). When farming is done in a group and together, pests and crop diseases will be avoidable. Or if pests and diseases attack crops in fields other than rice, their attacks are still within tolerance limits since there are many fields to be affected. Therefore, pests and diseases can spread over to the large areas so that they do not affect just one field which can cause mass destruction. In certain Dayak tribes, for example the Dayak Lundayeh in Krayan of North Kalimantan, there is a well-known tool to determine the right season to start the cultivation named "*Batu Tabau*". It is a kind of traditional tool to see the direction of the sun rotation. Meanwhile, among the Dayaks in Kapuas Hulu of West Kalimantan they start cultivating on their fields by observing the astrological sign. They know the "three-star sign" which give them a sign to slash, to burn, to plant and so on (Sareb, 2010).

Among the Dayak people of West Kalimantan, Central Kalimantan, South Kalimantan, East Kalimantan and North Kalimantan there are similarities in determining to begin the farming cycle. That is, the starting point of the period is to inspect the land starting in May and ending by harvesting in March or April by the next coming year. To plant at the end of August after the land is burned in dry season and welcoming the rainy season in the early of September. By the time, the soil becomes fertile since the rainwater falls soaking dust and charcoal of the land. The age of rice ranges from six to seven months, so the age of rice is very ideal since the start of planting to the harvest time. During this farming period, the final product is not only rice but many things emerge which will be discussed further.

3.2. The social dimension of farming

According to Kroeber and Kluckhohn the culture of a nation can be seen or characterized in seven dimensions. One of them is the livelihood system. By examining the whole process in the Dayak farming system above, it can be summarized that farming is a concrete existence of the Dayak people's livelihood system. Therefore, Dayak people will not be able to live and to continue their life without farming (Purwanto, 2020).

In the context of the cultural dimension the Dayak farming system must be seen and placed in the chain of cultural values and traditional custom which is full of knowledge and wisdom where not merely the result to be seen farming for rice. Social learning requires shared goals and cannot be defined as having a single goal or goals isolated from each other (Reed et al., 2010; Van Assche et al., 2013; Sanders et al., 2020). Broad social goals that transcend the immediate interests of those involved in a decision can enhance social learning by fostering trust and reducing conflict (Beierle, 2005; Sanders et al., 2020).

Where is the social dimension of Dayak people's farming? The social dimension is found in each farming stage where the Dayak people do work mutually in cooperation known as *handep*. In carrying out stages of farming, it also contains various expressions of ritual, custom, culture, art, and various aspects that represent farming is part of Dayak people's life for being able to be understood through the explanation of farming stages in the following.

3.2.1. Inspecting the land

Not all Dayak people can cultivate an area since they must first go through an initial process that is inspecting the land. Typically, inspecting the land for farming is done through deliberation by notifying the neighbor who has land borders, or is next to the land to be cultivated. By doing so, it will become clear in case of the land ownership whether the field belongs to the farmer, the customary land, the disputed land, the inheritance land (which is not allowed to be cultivated), the fruit-tree land, and so on. If there is no problem with the ownership, then the land is able to be farmed or cultivated. Social values and processes related to social integrity is the foundation of Dayak community cohesion (Islam et al., 2020).

3.2.2. Determining the land area

If there is no problem with the neighbors' borders related to the land planned to be farmed, then the land is inspected to stick some stakes on the field to be farmed. The one who inspects the land may also not be alone. It should involve related parties by doing mini ceremonial gathering and offering some meals and drinks before and after inspecting.

3.2.3. Cleaning or purifying farming tools

For the Dayak people, farming is not just human work. It also involves all beings, especially The Highest, The Owner of this universe. In this regard, people must ask Him for blessing in order to be safe through the entire farming process and gain the maximum yield. Farming tools must be cleaned to avoid hazards and accidents, so that people using them will not get injured. In addition, farming tools also may have luckiness. In fact, there is a ceremony to clean the farming tools which symbolically go along with prayers. The tools cleaned consist of knives, axes, pickaxes, sickles, handheld blades for harvesting, rattan-woven hats, and also rattan-woven baskets.

3.2.4. Slashing

Only after the tool cleaning ceremony, all farming tools can be used. The first work to do is to slash the weeds and grasses on the land to be farmed. After slashing the bushes, we could see the boundaries of the farming field from edge to edge. Thus, slashing the land is an important stage to mark officially the area of the farm.

3.2.5. Cutting the trees

When slashing, big trees are left and have not been cut down yet. The only tools used when slashing are knives while axes and pickaxes are not. This means certain tools are only used for certain purposes. So, pickaxes and axes later are only used to cut down big trees and chopping them to the ground. This is done firstly by seeing and calculating the height of the land. Then, the trees are cut down starting from the edge of the field on the lowest ground level to the upper one. The cutting wood period is usually done in June and July of the year.

3.2.6. Burning the land

All trees on fields that have been cut down are labelled by various names. Dayak Bidayuh in West Kalimantan, for instance, names them as "*robatn*". The logs cut down are let to be dry for about two months until they are ready to burn. The stage of burning the land is a very critical issue today, though it was not a problem before 1990s. If we refer to Lubis's (1980) study that the practice of farming in the archipelago, including Kalimantan, has been going on since 10.000 years ago before Christ. By this fact, for approximately twelve centuries no one has questioned the Dayak farming system, which is popular by slash-and-burn technique to clear the land and to produce the soil fertility.

Therefore, this "burning" stage is often a crucial point to be taken into account since on this stage some philosophies and wisdom implied behind become a reason to be practiced. The reason is that to burn the fields is a traditional way to clear the land. Besides, ashes and charcoals generated from the result of burning will enrich the soil fertility. As in

Java Island, for instance, there are volcanoes that can fertilize the soil after eruption. This is also similar technique of the soil fertilization compared with Kalimantan and other areas since they have no volcanoes to do such thing.

Indigenous and traditional peoples, as well as other local small holders worldwide, ignite vegetation for sustenance, territorial management, and cultural expression. They often do so with the objectives or effects of promoting resource availability, diversity, and resilience. Cultural burning traditions and their influences on local fire regimes are immensely diverse and contribute to ecological processes and conservation narratives in heterogeneous ways (Bowman, 2014; Fowler and Welch, 2018a; Roos et al., 2014; Welch and Coimbra, 2019). Indigenous peoples lands and traditional burning practices are often shown to be positively associated with landscape conservation, maintenance of vegetation cover, and biodiversity (Adeney et al., 2009; Garnett et al., 2018; Nepstad et al., 2006; Reyes-García et al., 2018; Schwartzman et al., 2000; Soares-Filho et al., 2010; Trauernicht et al., 2015; Welch and Coimbra, 2019).

In burning the field, the Dayaks work together to protect the land from possible fires that can spread to areas nearby the field. They carry some water and traditional fire extinguishers. By doing such thing in burning the land, the area burned is only for the field to be farmed. In this regard, it is relevant with what Brigadier General Dinar—a Dayak and a former Chief of Regional Police of Central Kalimantan who understands the philosophy of burning the land. He stated that “in the past, burning the field for farming do not cause socio-economic problems because the land is still large. Besides, the Dayak people work together to protect the land while burning, so that the fire does not spread anywhere. Again, burning the field is done in the mutual cooperation between relatives in-turn for those who plan to farm. Also, the fields burned are not just left without controlling since the fire is dangerous to let it flare with no one to watch around. Unlike present, where burning fields does not follow the traditional wisdom, safety and environmental sustainability. Therefore, it makes sense that to burn the land today is prohibited by the official of law enforcement because the way or technique of burning is no longer wise as it used to be” (Sareb and Lomon, 2015).

However, in practice, not all officials understood the philosophy of burning the fields. In Sanggau and Sintang of West Kalimantan Province, for instance, farmers were arrested by law enforcement officials and brought on trial before the Court. Still, the people fought concurrently to maintain their traditional way of burning the land. Finally, the farmers were released. By realizing and observing this problem, the Governor of West Kalimantan, Sutarmidji issued the Governor Regulation No. 39 in 2019 regarding forest and land fires or termed as *Karhutla*. This means that the Dayak's farming practices highly consider environmental sustainability aspects. Some local governments (cities or counties) also have passed ordinances or other local laws governing environmental issues of local concern (Schroeder, 2008). The point is that one of the farming cycles of the Dayak people named burning the field has not only practiced



Figure 4. Planting a form of mutual cooperation the Dayak people's.

recently, but it has been done since twelve centuries ago. During that time, there was no destruction to nature and the environment. Yet it is often misunderstood and misinterpreted. To be emphasized here is that Dayak people are not burning the forests, but burning areas that are merely to become their farming fields. This is what a misperception emerges serious problems in almost all regions in Kalimantan where Dayak people burn the land in every farming season. The season for burning fields usually occurs from the end of August to the beginning of September. Those two months belong to the dry season in which not long after burning, the rains soaking ashes and charcoals. Then, the rain fertilizes the soil besides making it easier to dibble or to plant.

3.2.7. Planting

The part of the farming system that also shows a mutual cooperation is when planting or dibbling the land. The seeds are first collected into one place. Then planters or dibblers gather together to carry out praying. After praying the seeds are sprinkled with water before being planted. In the process of planting the seeds, the men are dibbling the land using a sharpened wooden stick to make holes on the ground while the women are called as “to pass the seeds” which means putting rice and vegetable seeds into the holes dibbled. Planting by dibbling is very interesting part of farming stages where the people are served with quite extraordinary food. The farming field owner usually cooks chicken or other domestic animals as a feast in the field. Everybody has a portion to eat meals including all residents of the entire village, which was calculated based on the number of the head of family. This planting time also perform various arts and culture such as reciting quatrains in-turn to each other, smearing on people's faces with charcoal, playing jokes, and so on. Then, for rich families in the evening there is still a feast to eat together, which among the Dayak Bidayuh is so-called “*manyakng*”, or extending the dibbling-planting ceremony. It is also a gathering session to plan whose field to be planted for the next day. Looks in Figure 4 below:

3.2.8. Weeding

Other than rice, there are actually many kinds of crops in the Dayak people's fields. For example, *binamut* (a type of fungus) that grows on the ground and on logs, mustard greens, spinach, bamboo shoots, cucumber, watermelon, pumpkin, and various kinds of traditional vegetables. This implies that the value-benefit as well as the economic value of the fields is not only rice. Behind the farming there is an invaluable culture that cannot be measured and calculated merely from the yield of rice. Rice is indeed only one of the many values of farming.

The weeding season—done from November to December is the activity of cleaning grass around the rice and other plants. This is usually done manually by-hand or with traditional tools in mutual cooperation and in-turn. The grass uprooted over time will become compost that fertilizes the plants.

3.2.9. Harvesting

The time period between weeding and harvesting is roughly three to four months. The rice that has been weeded from the grass in the field will grow more, so that around in March or April the rice is yellowing and ready to be harvested. In this harvest season there is great joy among Dayak people. They go to the fields in a crowd to harvest the rice, either manually by hand or using *ani-ani* (a handheld blade), or the rice stalks are cut with a knife or a sickle, then the rice is beaten so that the grains fall to be collected. In Figure 5 below, now most Dayak people harvest rice by cutting its stalks, then separating the grains from the stalks by knocking them out using a simple tool, namely *gebyok*, a board made of wood. The grains of rice that are detached from their stalks are collected and put into sacks or rattan-woven baskets, then they are brought back home to be stored in the barn.

3.2.10. Performing a thanksgiving ceremony (*begawai*)

The crown or peak of the whole series of Dayak's farming is a thanksgiving ceremony. In West Kalimantan (Indonesia) and Sarawak



Figure 5. The traditional process of harvesting rice.

(Malaysia) the ceremony is called *Gawai* while the Kanayatn—Dayak people in West Kalimantan call it as *Naik Dango*. In Malaysia, *Gawai* is recognized as a National Holiday which falls every May 30 to June 1. The same date and month is also celebrated in West Kalimantan, Indonesia.

In the thanksgiving ceremony after this harvest, the Dayak people will cook their special dishes with various vegetables and all kind of foods for a blessed feast. At the time there are also serving a special drink, namely "tuak" or toddy. So, the moment is filled with crowd of art and cultural performances. Friends, families, relatives, guests are invited from all over the village and the nearby neighborhood to have fun and eat together in the moment of joy and happiness.

After this harvest-end ceremony, the fields are not abandoned but they are looked after and cared for. The harvested fields are called "bawas", or ex-farming fields where huts still stand there and are still often visited for picking out vegetables and various plants from the fields such as cassava, caladium, ginger, tubers, *binamud*, and various mushrooms that are still able to be collected. After harvesting the land is also planted with various fruit trees other than rattan and ironwood. Thus, the ex-farming field will return to its natural condition becoming a secondary forest owned by somebody with various folk crops grow on it.

4. Conclusion

The Dayak people have continually practiced the farming management based on ecosystem for about twelve centuries without causing any damage or destruction to the nature and environment. This farming management system has a sustainable ecosystem function since it carefully takes the season and climate into consideration and keeps its farming stages wisely. The community of Dayak people indeed does not burn the forest, but they burn the land to become their farming fields. Also when they burn, they keep control the fire in a mutual cooperation in order not to spread the flare to its surrounding fields. After the blooming of plantation and mining companies entering Kalimantan around the 1990s, the Dayak's farming system becomes the focus of attention. The farming system is misinterpreted or even deliberately raised an issue that the cultivation harms nature and produces haze and smoke that destruct the environment. To strengthen the management of the farming system of local wisdom of the Dayak people in Kalimantan, the role of Governor Regulations in supporting the farming system is very useful as a legal protection allowing or regulating traditional farming practices. In fact, there are ten stages or processes of farming in the Dayak people community, namely inspecting the land, determining the land area, cleaning or purifying farming tools, slashing, cutting the trees, burning the land, planting, weeding, harvesting, and performing thanksgiving ceremony (*Begawai*). All processes represent the life of the Dayak people as the personal beings on the one hand and are also as the empathetic social beings on the other hand.

Declarations

Author contribution statement

Suriansyah Murhaini: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

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The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

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