

Questioning the Development: The Maintenance of Local Variety of Rice in the Changing Dayak Community of Central Kalimantan, Indonesia

Semiarto Purwanto

Department of Anthropology
University of Indonesia
Kampus UI Depok 16424 Indonesia
semiarto.aji09@ui.ac.id

Sutji Shinto

Graduate Program, Department of Anthropology
University of Indonesia
Kampus UI Depok 16424 Indonesia.

Abstract - The paper is about rice landraces among the Dayak in Central Kalimantan, Indonesia. We found that today they still maintain the knowledge and keeping the existence of local variety of rice. While in Java, where the capital city is located and the development is centralized, these varieties have been replaced by a more-productive-and-resistant-to-pest varieties. The Dayak still maintain more than 60s varieties. From the biodiversity's perspective, it is a delightful news; while from the cultural perspective, the persistence of their custom regarding to the practice of traditional cultivation is fascinating as well. The local knowledge on agriculture is well conserved and practice daily. Our ethnographic observation conducted in April-July 2016, revealed that the resilience of those rice varieties is related to the local farming system. Experiencing the lack of programs for village development, the community has maintained the local leadership and its government structure at the village level. We came to the conclusion that an uneven development program across the country has caused some areas to be good biological and cultural conservation areas. If development is an option then, ironically, the less intervention actually makes biological and cultural sustainability achieved.

Index Terms - Development, local knowledge, farming, system, rice variety, Kalimantan, Indonesia

I. INTRODUCTION

Over a quarter century the idea of sustainable development has become global discussion [10]. In Indonesia, more than five decades since the development of the country took priority over any other matter, a discussion on the need of development is still an intriguing. Far from the enthusiasm of development programs undertaken by the Indonesian government since 1967, Dayak communities in the tropical forest land of Kalimantan was significantly lagged behind the changes. There were not many programs for the interior because the focus of development mostly was in Java island. Observers of development in Indonesia noticed that there is a gap between Java and outside Java island that result in inequality in wealth [19][20]. Consequently, the Dayak live their life as shifting cultivator that has been practiced for centuries.

The paper will explore the effect of how a neglected area, which was disregarded by development programs, sustains their culture and biodiversity. We would like to discuss

the how traditional farming system, along with ethnic tradition, play their roles to conserve local varieties of rice. The dynamics of the knowledge on rice varieties among the community in TumbangHabangoi, Katingan, Central Kalimantan, Indonesia, is connected with the idea of development and the practice of it that manifest in the unequal distribution of the development programs throughout the country. As the programs were less experienced by the people of TumbangHabangoi due to its isolated area, their customs are maintained. While the timber in the forest is exploited, the biodiversity in the fields and agroforest gardens are sustained. It is also our intention to examine the concept of sustainability whether it needed for the development programs, for the changes into a modern civilisation, or for the sake of the local to survive.

A. On the culture of rice production and consumption

Currently, rice is regarded as the staple food of more than half the world's population; more than 3.5 billion people depend on rice. Global rice consumption remains strong, driven by population and economic growth, especially in many Asian and African countries [4][5]. As main food, rice gets special honor with preferential treatment from the rice-consumed communities. This is reflected in myths and legends. In Indonesia, the worship of the rice in various symbols is found in the figure of *Sangiang Sri* (Makassar, South Sulawesi), *NyiPohaciSangiang Sri DangdayangTisnawati* (Sunda, West Java), *LuingIndungBunga* or *BiniKabungsuan* (Dayak, Kalimantan), *Seblang* (Banyuwangi, East Java), *Betari Sri* or *Sang HyangIbu Pertiwi* (Bali), and *BeruDayang*(Karo, North Sumatra), all of which are represent fertility [2]. In other Southeast Asian countries, myths and legends about rice also portray the elements of spirituality and culture. Rice is presumed to have a soul and is believed to interact with humans and nature [1].

Like other Dayak communities in Kalimantan, the DayakNgaju tribe has tradition that is still firmly held by the community. The Ngaju people practices traditional swidden agriculture and plants local rice for their subsistence needs. Several studies have identified the use of local rice varieties in Kalimantan and found varieties of local rice. [14] noted that in the Dayak community in the upper Bahau River, there are 58

local varieties of rice, and another 37 varieties in DayakKra-
yan community in Long Bawan. Meanwhile, [17] identified
183 local rice varieties from 18 villages along the Kayan and
Bahau rivers in East Kalimantan, [15] found 11 local varieties
of rice (*parei*) and sticky rice (*pulut*) planted by the Ngaju
people in TangkahSubdistrict, Central Kalimantan, and [14]
identified 13 rice varieties in Kurau, 11 in BumiMakmur, 26
in Tabunganen, and 12 inBarambai, Barito Kuala regency,
Central Kalimantan. Aside from cultural consideration, the last
researcher informed that the use of local rice varieties because
they have simpler maintenance than the new varieties.

[14] argues that the DayakKantu of West Kalimantan
believes that the goddest and gods of their native religion gave
them a lot of rice varieties that fit to the respective areas. He
identified that a family might plant 17 different of rice varie-
ties in a season. While many researchers have indicated the
local varieties of rice planted by the villagers, it is actually
difficult to be able to exactly identify the variety. [14] de-
scribed how among the Benuaq of East Kalimantan, the
knowledge is not equally distributed. It is only the community
leader, his wife, and three other senior citizens that able to
recognized 62% from 103 identified varieties.

The unequal distribution of knowledge among the
communities raises the question of what causes the tradition
and knowledge to survive, how to pass on to the next genera-
tion and how long the tradition and knowledge may survive in
the future. We found that it is not easy for the Dayak to hold
on their knowledge because of its low in productivity while
the populaion growing quite rapidly. However, their indige-
nous knowledge of farming system and richness of rice varie-
ties have enable them to live their everyday life in modesty.

B. Biological and cultural aspects of rice landraces

The researchers have conducted several studies to
explain the relationship between the sustainability of a variety
of plants with environmental conditions and traditions in a
particular place. Loutte (1998) in his research on maize varie-
ties and the availability of maize seeds in Mexico challenged
the idea that the extinction of a variety or genetic erosion was
caused by the introduction of new varieties. According to him,
when new corn seeds are introduced, maize diversity precisely
increases. In other case, different results occurred with the
introduction of new rice cases in Indonesia that we observed
in West Java (Purwanto 1995). The introduction of new rice
varieties apparently caused local rice was no longer planted
and became extinct.

Variations of physical and socio-cultural conditions are sus-
pected to be the cause of different outcomes. Physical condi-
tions such as geographical location (Thomson 2009) and soil
type (Saito 2006), are thought to affect genetic richness and
sustainability of various food varieties, including rice in a par-
ticular region. Other experts emphasize the importance of bio-
diversity conditions in general in favor of the continuity of
certain rice varieties (Jackson 2007). In addition, socio-
cultural factors also play an important role. Traditional farm-
ing systems are seen as one of the mechanisms for maintaining
certain varieties of food crops (Altieri 1987).

Some experts examine the link between traditional
farming practices and the interest of biologists concerned with
the survival of local rice varieties. They identified the poten-
tial of local rice as a seed to solve world food problems. [2]
says that food problems can actually be solved by the use of
genetic resource of rice. Local rice that was domesticated dec-
ades ago, and even hundreds of years [21], by traditional
farmers has become the parent of high yield rice varieties.
Rice in traditional farming systems according to experts has
more genetic variety than rice seeds stored in *ex-situ* conserva-
tion. In particular, [21] and [16] consider that local ethnic and
cultural traditions in China have had a positive impact on rice
cultivation that resulted in more diverse rice varieties.

The debate on the provision of rigid-defined rice con-
servation areas and the fact that traditional farming systems
are able to maintain sustainability of rice rises with the in-
creasing of world population. [18] says that the debate is actu-
ally dealing with whether we should provide special land for
conservation separate from production activities, or unify the
production process, which is friendly farming practices, along
with the idea of conservation. He further argued that the tradi-
tional farming system practiced by rural people is the perfect
choice to promote *in-situ* conservation.

II. METHODS

To examine the relationship between genetic diversi-
ty of rice and its relation to geographical and cultural factors,
[17] identifies local knowledge about rice that includes the
names, origins, and benefits of the landrace they have done so
far. Referring to what Thomson did, we will reveal knowledge
about the local rice varieties of people living in the upper Kat-
inganriver. Local knowledge of local rice is obtained by the
villagers through experiments, information exchange with
other farmers, and by careful observation of the plants in other
farmers' gardens. This formation process is continuous and
there is always new knowledge [15]. Therefore we have to
stay in the research site for quite a long time to capture with
that dynamic and unequal distribution of knowledge. The re-
search was conducted in TumbangHabangoi village, sub-
district of PetakMalai, Katingan district for two months in
March to April 2015 along with the harvest season. Another
three weeks of observation conducted during the land prepara-
tion in November 2015. The participant observations and se-
ries of in-depth interviews were conducted to obtain data from
the informants. We learned that women, men and children
have relatively the same knowledge about the types of rice
they plant. To keep the data valid we conducted interviews
and cross checks on informants with different gender and age.

III. RESULTS AND DISCUSSION

A. The village of Tumbang Habangoi

Located approximately 307 km from Palangkaraya
(BPS, 2014), TumbangHabangoi can be reached in about 8
hours by rented cars. There is a paved road from Palangkaraya
to Tumbang Samba, but afterward we have to follow logging
road to get to TumbangHabangoi. When the logging road was

damaged due to rain, travel time can be around 12 hours. Tumbang Samba is a big village in Central Katingan sub-district that has some excellent facilities such as market, health center, schools, banks, restaurants, church, and post office. It is a strategic place to connect Central Kalimantan to West Kalimantan areas. Here the laborers from logging and plantation companies usually spend their weekend. The logging companies, namely PT SinarPirantiUtama and PT GrahaSentosaPermai developed the road and maintain it regularly to enable it passed by four-wheel vehicles.

TumbangHabangoi is a village in the middle of tropical production and community forests. Out of its 19,500 hectares (BPS 2014), it has 16,614 hectares forested areas. There are three big forest companies around the village namely PT Gaung Satyagraha Agrindo, PT SinarPirantiUtama, and PT GrahaSentosaPermai. The concession areas is so close to the village, even the last two companies have forest areas inside the village of TumbangHabangoi. Those two companies are then obliged to conduct a social development programs for the villagers. Since 1978, when PT Handayani as the first forest company operated around the area, the villagers have had an intensive interaction with industry. On the other side, TumbangHabangoi situated directly adjacent to Bukit Baka-Bukit Raya National Park. Visitors to the park usually stop at the village to rest before entering the forest.

In 2015, there are 950 people or 246 household reside in TumbangHabangoi. Most of the population are Kaharingan –a native religion of Kalimantan Dayak (720 people), followed by Protestant and Catholic (214 people), and the immigrant Moslem (15 people). They live in 152 wooden stilt houses, spreading along the rivers of Raon, Pasoi, and Musang. The native Dayak in Habangoi belong to the Ngaju sub-ethnic who mostly live as shifting cultivators [6]. They open the forest and converted into their field to plant rice and fruit trees, in a year, they usually live in the field called *ladang* or *huma* for about 10 months to look after their rice fields. After 5 to 20 years, the land fertility will become exhausted, marked by the decline in rice yield. That is the time for the Dayak to move to other places, open the forest, and make new *ladangs* and compounds. Since this farming system has been practising for centuries, they do not actually open a virgin forest but a secondary forest of their ancestor's own.

B. Livelihood system

All the Ngaju in TumbangHabangoi involves in the practice of shifting cultivation, however, since it often seen as 'destructive to forest' and 'sensitive to fire', the government continuously promoting another safer cultivation. Modernizing agriculture was the first priority and became the development strategy during the Suharto's new order era [4]. As the programs mostly conducted in Java island that has intensive wetland agriculture, the dryland agriculture and regions outside Java island were not very much exposed to development programs. As a result, the economic of the community in TumbangHabangoi, like in many other places in Kalimantan, heavily depend on forest, river, and all the natural resources available nearby.

Berladang or planting rice in the dryland, with slash-and-burn technique, is the primary livelihood. Since the term 'shifting' in shifting cultivation tend to define as moving to another new places, and so makes forest to open more often and wider, the local people then called their farming system as *perladangan bergulir* 'repeated' cultivation to refer to reopen their old field and garden that has been left and became secondary forest. During the land preparation, planting season, and harvesting time the village will be left. People go to their *ladang* and spend their night and day there to manage their *ladang*. The village became increasingly quiet, because the young children moved to Tumbang Samba to get education.

From their rice fields and gardens, people will get rice and vegetables for their subsistence. They do not sell the rice because of the low of productivity and that everybody has rice from their own *ladang*. They got cash money to buy their needs from other jobs. Logging was the main source of income from the villagers until the government launched President Instruction Number 4, Year 2005, on The Elimination of Illegal Logging. An intensive anti illegal logging operations were made people terminate their logging activity. Today, people only cut the trees for domestic needs and not for sale. Before, logging is a very money-making job; it could give a man IDR 5,000,000-10,000,000, or equal to USD 500-1,000 in a month.

Fruits are another source of income. People planted fruit trees while opening forest for rice field. Among the trees they planted are jackfruit, mangoes, guava, soursop, coconut, and durian. The Dayak was also well known for their hunting ability. They use spears and blades to hunt accompanied by their hunting dogs to hunt hornbills, pangolins, boars, and deers. As the village is in the five rivers' upper stream, fishing is obviously becomes the livelihood of the people too. In addition, a lot of non-timber forest products are available inside the forest is also benefitted the villagers. Rattan, rattan fruit, *damar* resins (Dipterocarpaceae family), *gaharu* or agarwood (*Aquilaria malaccensis*), and *kayugemor* bark (*Nothaphoebe coriacea*) are usually collected. Other types of livelihoods in TumbangHabangoi but not so much in demand is looking for gold and rubber gardening.

C. Rice, knowledge, and its conservation

To learn about the knowledge of rice and how the villagers maintain their varieties of rice, we use the case of Ibu Leni. She is a native of TumbangHabangoi who has her *ladang* quite far away from the village, about 12 kms., but is considered to be a good farmer by the villagers.

Ibu Leni or Mama Roni, to refer to his son who is the village head of TumbangHabangoi, is a 47 years old woman whom the villagers usually come to ask for rice seeds. Every family plants rice and keeps the rice seeds for the next season. However, they sometimes run out for seeds or need different seeds. Mama Roni's family has the widest *ladang* in the village and collects the most varied rice varieties. Generally, a family possesses five to six varieties of rice, but Mama Roni has more than 10 varieties. The people acknowledges Mama Roni's farming strategy; she always carefully looks after the *ladang* and smoke it while pests attack the rice field. That is

why her harvesting is abundance and the seeds she keeps is good. It seems that she and her second husband spend more of their times in the field hut than in their house in the village. The villagers usually come to the *ladang* during the planting and harvesting seasons, and when the *ladang* needs special maintainance such as after the rain comes or when the pests attack.

Mama Roni said that she started to learn about farming since 7 years old from her parent. Her mother passes down the name, characters, color, and taste of dozens of rice varieties. This year, 2015, she planted 23 kind of rice comprises of 16 types of rice and 7 types of sticky rice. She explained that many rice planted allow her to have various rice so that she and family can enjoy different taste everytime. Beside, the various rice in the *ladang* may have cross breeding to one another to make a new types of rice. "Last year, I found a strange kind of rice in my *ladang*, it was a new type of rice. Its grain has wings and furry, like a *paroy* (rice), but it apparently *pulut* (sticky rice). I have not named it yet."

The government, through the village head, has suggested the villagers to limit their opening forest for *ladang*. Roni, the village head, has even prohibited his mother to open more *ladang* to continue the swidden cultivation. But Mama Roni explained us about the Dayak and Dayaknese, "We have to, if we don't, the Dayak will be died. *Berladang* is our life, if we don't do *ladang* then we are not a Dayak". This is a very strong statement to relate rice, traditional farming system, and Dayak identity.

We have identified the various rice varieties in TumbangHabangoi. There are 68 kinds of *paroy* or rice and 19 *pulutor* sticky rice found during the research. In association with the various types of rice known by the villagers, we seek for the reasons why people plants a number of variety of rice. Firstly, its flavour; the villagers plant many kinds of rice to get different taste. Secondly, the rice is believed to have soul, and it selects which farmer is suitable for particular rice. If it is not suitable, then a farmer may fail to harvest particular kind of rice. Thirdly, the seeds and knowledge on rice are passed down from generation to generation. Today people plants a certain rice because of seeds availability that are kept by family. Fourthly, the villagers aware that if they did not plant a particular rice, then in the future it may be vanished. Fifthly, the more rice in the *ladang* vary, the less pests can destroy them because pests tend to choose certain kind of rice. The more varieties in a *ladang* then means that pests do not get the preferable food.

D. The future of the richness of rice varieties in Kalimantan

We believe that the survive of many varieties in TumbangHabangoi is related to three conditions: rituals, *berladang* activities, and knowledge on rice variation. Those three conditions are intertwined one another. Although it is slowly fading in reality, the richness of rice varieties in TumbangHabangoi is quite resilience. There are some conditions that influence the dynamic of knowledge and practice of maintaining many local rice varieties.

Firstly, rice is part of *berladang* which for the villagers not only an economic activity but also deal with religion. Scharer explains that the conception on god for the OtDanumKaharingan is represented by the surrounding nature [12]. Rituals and ceremonies are conducted by involving elements of nature both biotic and abiotic. Rice became important to make foods in those rituals. Christianity has in fact been introduced to the people of Kalimantan since XIX century, however, for a century it did not really influenced the Dayak [12]. Only in 1935 when the missionary built schools and translate the bible into Dayak language, they began to convert to Christianity. Today most of the Dayak is Christian, and mostly in the urban areas Kaharingan is fading in their everyday life. Yet, in the rural territory, some people still practicing their local religion. People in TumbangHabangoi, is consider Kaharingan as important although they converted to Protestant, therefore a lot of rituals such as life cycle's ritus and productive rituals are still performed.

Secondly, swidden agriculture and its system of technology is remain the most popular technique for the people in TumbangHabangoi. However, the changing landscape since the coming of forest companies is inevitably avoided. [14] describes the economic change in two innermost groups of Dayak and found that the state interest on the richness of natural resources in Kalimantan is obvious. Therefore, aside from introducing principles of modern farming, the state also systematically control the land and other resources' property. Forest concession given to private sectors is one of the state strategy to maximize the control of land and resources. Some parts of the forest became production forest controlled by the companies have restricted people to open forest for *ladang*. Moreover, the people began to learn about modern economy by involving in logging activity. *Berladang*, ultimately, is no longer a choice for households with a member working in logging.

Thirdly, although we can found some boys and girls at their teen age who able to mentioned around twenties types of rice, but the elderly women who recognize more than forties rice varieties are declining. They may recall thirties varieties but often forgot the names of them. Out informants explained that the decline is related to education of the youngsters. When they go to school, their interest in *ladang* is contested with other chance to work in industries.

Forthly, our observation also examined some conditions to endure the knowledge of rice varieties. Many programs in agriculture developed to transform traditional farming system into the modern one. Wet-land agriculture, which is practiced for centuries in Java, became the model and orientation for the transformation. Thus, the programs in Kalimantan are mostly deal with producing more *sawah* or irrigated rice fields. In 2016, the government of Central Kalimantan plans to have 300.000 hectares of sawah, high yield rice varieties will distributed, and modern inputs like fertilizers and pesticides will also disburse for the farmers. Before, in 2013-2014, an agricultural extension stationed in TumbangHabangoi. He talked about how productive the *sawah* he made as demonstration plots because of the use of high yield rice varieties.

The people tried to adopt the new technology but failed. The rice planted along the river was not growing well, and as the result, the people concluded that sawah is just not suitable for them. Our research also indicates that the farmers do not really believe that they can produce abundance rice without any rituals. They can not truly explain how the rituals work but they do believe that fortuneless and failure of farming will come as a kind of punishment from their gods.

IV. CONCLUSION

Examining the case of people maintaining their knowledge of local rice varieties in TumbangHabangoi, we end up our discussion with final statement that it is connected with the practice of local farming system. In this case the knowledge on many kinds of *paroy* and *pulut* the villagers hold is closely related to the *berladang*. Through history we learnt that *berladang* as part of swidden agriculture has not preferable for some developing country, like Indonesia, and therefore has to be changed into a more advance system. The modernization of local agriculture practice was then became priority for the government. Unfortunately, the development programs are not always evenly distributed throughout the country. There were many reasons, ranging from the distance, isolated areas, accessibility to ethnic bias and political reasons.

While TumbangHabangoi experienced less programs and changes compare to what happened in Java island, the local knowledge and tradition have provide an example of how we may achieve sustainability of local institutions and the maintenance of biodiversity. The many rituals held as part of Dayak tradition, influenced by their local religion, has enforced the practice of *berladang*. Furthermore, the rice landrace in a *ladang*, where people plants dozens of rice types in one plot, has made the seeds conserved. Even in some cases, the in-breeding among rice varieties in one plot has produced a new kind of rice to enhance the biodiversity.

REFERENCE

- [1] Altieri, Miguel A., and Laura Merrick. "In situ conservation of crop genetic resources through maintenance of traditional farming systems." *Economic Botany* 41.1 (1987): 86-96.
- [2] Bellon, M. R., J-L. Pham, and M. T. Jackson. "Genetic conservation: a role for rice farmers." *Plant genetic conservation*. Springer Netherlands, 2000. 263-289.
- [3] Bernsten, R. H., B. H. Siwi, and H. M. Beachell. "The development and diffusion of rice varieties in Indonesia." (1982).
- [4] Booth, Anne. *Agricultural development in Indonesia*. Asian Studies Association of Australia, 1988.
- [5] Bornstein, Daniel. "The social realities of technology transfer: smallholder farmers' encounter with a new rice variety." *African Geographical Review* 34.1 (2015): 8-12.
- [6] De Jong, W., et al. "Farming secondary forests in Indonesia." *Journal of tropical forest science* (2001): 705-726.
- [7] Jackson, Louise E., Unai Pascual, and Toby Hodgkin. "Utilizing and conserving agrobiodiversity in agricultural landscapes." *Agriculture, ecosystems & environment* 121.3 (2007): 196-210.
- [8] Louette, Dominique, and Melinda Smale. "Farmers' seed selection practices and traditional maize varieties in Cuzalapa, Mexico." *Euphytica* 113.1 (2000): 25-41.
- [9] Louette, Dominique, André Charrier, and Julien Berthaud. "In situ conservation of maize in Mexico: genetic diversity and maize seed management in a traditional community." *Economic Botany* 51.1 (1997): 20-38.
- [10] Sachs, Jeffrey D. *The age of sustainable development*. Columbia University Press, 2015.
- [11] Saito, Kazuki, et al. "Farmers' knowledge of soils in relation to cropping practices: A case study of farmers in upland rice based slash-and-burn systems of northern Laos." *Geoderma* 136.1 (2006): 64-74.
- [12] Scharer, D. H. 1963 *Ngaju Religion, The Conception Of God Among A South Borneo People*. (R. Needham, Penerj.) The Hague - MartinusNijhoff: The Netherlands Institute For International Cultural Relations.
- [13] Schiller, Anne. "Religion and identity in central Kalimantan: the case of the NgajuDayaks." *Indigenous Peoples and the State*, ed. Robert Winzeler (1997): 180-200.
- [14] Sellato, Bernard. *Innermost Borneo: studies in Dayak cultures*. NUS Press, 2002.
- [15] Setyawati, Indah. "Biodiversity and traditional knowledge: rice varieties among the Leppo'Ké of Apau Ping." *Social science research and conservation management in the interior of Borneo*. Bogor, Indonesia: CIFOR (Center for International Forestry Research) (2003): 35-48.
- [16] Shen, Shicai, et al. "Agrobiodiversity and in situ conservation in ethnic minority communities of Xishuangbanna in Yunnan Province, Southwest China." *Journal of ethnobiology and ethnomedicine* 13.1 (2017): 28.
- [17] Thomson, Michael J., et al. "Genetic diversity of isolated populations of Indonesian landraces of rice (*Oryza sativa* L.) collected in east Kalimantan on the island of Borneo." *Rice* 2.1 (2009): 80-92.
- [18] Tschamtké, Teja, et al. "Global food security, biodiversity conservation and the future of agricultural intensification." *Biological conservation* 151.1 (2012): 53-59.
- [19] Van der Eng, Pierre. "Growth and Inequality: The Case of Indonesia, 1960-1997." (2009).
- [20] Van Leeuwen, Bas, and Peter Foldvari. *The Development of inequality and poverty in Indonesia, 1932-1999*. No. 0026. 2012.
- [21] Wang, Yanjie, et al. "Influence of ethnic traditional cultures on genetic diversity of rice landraces under on-farm conservation in southwest China." *Journal of ethnobiology and ethnomedicine* 12.1 (2016): 51.