



Various Plants of Traditional Rituals: Ethnobotanical Research Among The Baduy Community

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DOI: 10.15294/biosaintifika.v9i1.8117

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History Article

Received 1 December 2016

Approved 30 January 2017

Published 1 April 2017

Keywords

ethnobotany; ritual plants;
swidden cultivation
management; Baduy

Abstract

On the basis of recent studies in many places of developing countries it has been revealed that the practices of conservation of biodiversity has strongly determined by traditional ecological knowledge, and beliefs or cosmos. The aim of the study namely to elucidate; (1) some traditional rituals in the swidden management system of the Baduy community; (2) various plants that have been used for performing some rituals in the swidden management system of the Baduy community; and (3) some functions of various plants that have been used in the rituals of the swidden management system of the Baduy community. A qualitative method with ethnobotanical approach was applied in this study. The result of study shows that 9 kinds of the traditional rituals that have been predominantly undertaken by the Baduy community in the management of swidden farming system. At least 50 plant species representing 28 families have been used for those performing traditional rituals. The main function of plants in the rituals is considered as the symbolic meaning and rational function. The result of study has been considered very important that the traditional ecological knowledge and beliefs must be considered to conserve biological diversity.

How to Cite

Iskandar, J. & Iskandar, B. S. (2017). Various Plants of Traditional Rituals: Ethnobotanical Research Among The Baduy Community. *Biosaintifika: Journal of Biology & Biology Education*, 9(1), 114-125.

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p-ISSN 2085-191X

e-ISSN 2338-7610

INTRODUCTION

In the past, rice farmers in Java, Bali and other areas of Indonesia have cultivated the upland rice farming or swidden farming (*huma*) and irrigated rice farming (*sawah*) system had strongly based on the traditional ecological knowledge (TEK) and beliefs or cosmos (Partohardjono, 2003; Adimihardja, 2004; Pfeiffer, et al., 2006). As a result, the local agroecosystem have been properly maintained by farmers.

Nowadays, however, the cultivate of the irrigated rice field (*sawah*) farming has focused on commercial purposes and various inputs, such as rice seeds, inorganic fertilizers and pesticides have been bought from markets (Gde Agung, 2006). In addition, various traditional ecological knowledge and cosmos of the farmers have been ignored instead of integrating into process of development and modernization (Surata, 2003; Gde Agung, 2006). Actually, some beliefs or cosmos of the famers have been an important role as adaptive functions. For example, a shared pattern of beliefs can provide a strong sense of group solidarity that unifies different individuals and socio-economic interest into a larger and more cohesive unit for benefits purposes, including conserving local biodiversity and ecosystems (Gde Agung, 2006; Iswandono, et al., 2015; Mantikayan & Abas, 2015; Ratna, et al., 2016).

Some studies on contribution the TEK and beliefs or cosmos have been an important role in conservation of biodiversity as well sustainable use of natural resources are conducted by scholars in many places in cross cultures (Carlson & Maffi, 2004; Gde Agung, 2006; Bagawati, et al., 2016). However, special researches on relation between rituals that are performed in the rice cultivation systems, including swidden farming, particularly in Indonesia, have rarely undertaken. As a result, some studies in relation to social cultural aspects, including cosmos or belief and traditional ecological knowledge systems and conservation of biodiversity and sustainable use natural resources have been considered very important to support sustainable development (Adimihardja, 2004; Berkes, 2008; UNEP, 2008; Toledo, 2000; Gde Agung, 2006; Bamin & Gajurel, 2015).

The aim of the study namely to elucidate; (1) some traditional rituals in the swidden management system of the Baduy community; (2) various plants that have been used for performing some rituals in the swidden management system of the Baduy community; and (3) some functions of various plants that have been used in the rituals of the swidden management system of the Baduy

community.

The benefit of this study, scientifically it can develop sciences, particularly ethnobotany and ethnoecology, including development of various traditional knowledge or traditional ecological knowledge of the local people on various plants, particularly plants are culturally used for rituals, while technically it may contribute awareness of the cultural aspects of traditional people, including beliefs rather than ignoring or attempting to replace it may more useful to be integrated with Western knowledge to conserve biodiversities.

METHODS

Research location

This research was carried out in the Baduy community, particularly Outer Baduy community of village of Kanekes, sub-district of Leuwidamar, District of Lebak, Province of Banten. Geographically, the Kanekes village is located in 6°27'27"-6°30' South and longitude 108°3'9"-106°4'5" East. Total area of Baduy village recoded approximately 5.136,58 hectares (Figure 1).

According to the local regulation of District of Lebak No.32 year of 2001, the Baduy area considered as the communal land (*tanah ulayat*). On the basis of the Baduy tradition, Baduy area can be divided into 2 areas; Inner Baduy (*Baduy Dalam*) composing of 3 hamlets, namely Cibeo, Cikartawarna and Cikeusik, and Outer Baduy (*Baduy Luar*) constitutes more than 50 hamlets (Wessing & Barenddrecht, 2005). The Inner Baduy and Outer Baduy are dissimilar in that the Inner Baduy community has a much smaller population than Outer Baduy. In addition, the Inner Baduy community has more strong maintaining the culture compare to that of the Outer Baduy. In 2010, total population of Baduy was recorded 11,172 persons representing 2,948 households. It is dominated by Outer Baduy (89.52 %) and the rest is the Inner Baduy (10.48 %). In 2015, the total Baduy population increased to 11,620 persons representing 3,395 households (Kanekes village Statistical Data, 2015).

Data collection

This study applied qualitative and ethnobotanical approach (Albuquerque, et al., 2014). Data were collected through observation, in-depth interview with informants, and species collection. Non-participant observations conducted to environmental conditions and to various rituals by the Baduy in the performing of the rituals related

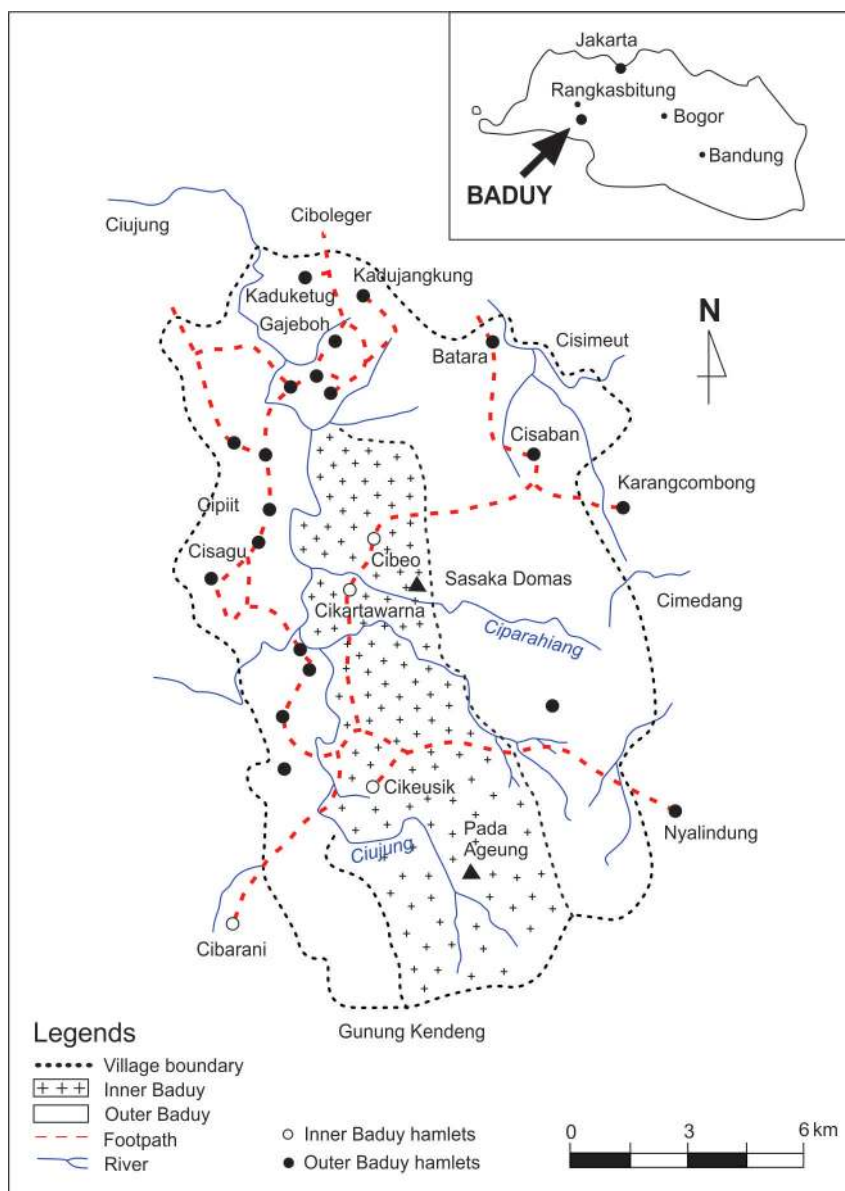


Figure 1. Map of the Baduy area, Kanekes village, Banten province

to management of swidden farming systems. In addition, participant observation was conducted by involving the researchers with some ritual activities, such as planting rice, harvesting rice, and storing rice in the rice barns. Deep interviews were conducted with some competent informant or local expert in both practicing swidden farming systems and performing traditional rituals in the swidden farming systems that were purposively selected with considering informant variations, including ender. The informants were selected namely the formal village leader (*Jaro Pamarentah*) and his staffs; non-formal leader staffs, such as *Jaro Tangtu* in Inner Baduy hamlets, and *Kokolot Lembur* of outer Baduy hamlets; and the old male and old female of Baduy households of Inner and Outer Baduy hamlets of Cibeo, Kaduke-

tug, Babakan Marengo, Gajeboh, Cicakal Hilir, and Kadujungkung. Some important data were obtained, including some traditional rituals in the swidden management system, various plants that have been used for performing some rituals in the swidden management system, and some functions of various plants. While to identify various plants that were predominantly used in the traditional rituals of the Baduy swidden farming system was carried out by making herbariums of plants and identified in the Herbarium Bogoriense of LIPPI, Cibinong, West Java.

Data analysis

Data consisting of field notes, interview transcripts, and photos were analyzed and built a narrative account describing and interpreting.

To build a narrative account, initial step in analysis of data include analyzed annotations, memos and coding. In ethnobotany data were collected such as the local names of plants that have predominantly used in ritual of swidden farming system, meanings of the plants, and scientific name of all plant species were identified in the Herbarium Bogoriense of LIPI, Cibinong, West Java. Moreover, the process involved an intensive interrogation of the data by reading and re-reading the data that have been gathered, triangulation between different sources and examining them for validation, summarizing, synthesing, and making narrative accounts with descriptive analysis.

RESULTS AND DISCUSSION

Farming activities and associated rituals

On the basis of Baduy calendar, there are 9 main stages in the Baduy swidden cycle, each interspersed by rituals, and various plants are used in those rituals (Table 1). A more detailed various plant species that are predominantly used in each rituals can be seen in Table 2. Main farming activities and associated rituals of nine stage of the Baduy swidden farming are described.

Cutting under brush, and felling and pruning trees: ritual of *narawas* and *nukuh*

Each household of the Baduy community must select appropriate site, particularly appropriate good soil fertility by using various indicators, including tall shrubs, soil color, and occurring predominant species of ki sereuh (*Piper aduncum* L), kitepus (*Amomum coccineum* (Blume) K.Schum), and mardelan (*Macaranga* sp), befo-

re beginning cultivates the swidden field. After choosing the land, the first activity in preparing land for swiddens is to cut underbrush (*nyacar*). Before underbrush is performed, *narawas* ritual must be performed. The word *narawas* or *narabas* is derived from *tarawas*, means ‘clear away’ or pioneering effort’. This ritual also intended to put a sign informing the land has been claimed by a family to be used as swidden field. The *narawas* is usually undertaken in *Kanem* (June-July) a month in the Baduy calendar.

In the *narawas* ritual, objects, such as strong stone, a whetstone, a bamboo (*Gigantochloa apus* (Bl ex Schult f) Curz) internode containing water, incense in a coconut shell, and rhizome of panglay (*Zingiber cassumunar* Roxb), are placed in the center of the field. Incense or *menyan gaharu* (*Gonistylus marcrophyllus* (Miq) is burned and *panglay* is chewed and spat on the soil. In addition, some incantations (*jampe*) are uttered: such as for chasing away snakes, and evil spirits such as a devil, *kunti anak*, and *kaliboro*. The ritual is performed by each male household head, or where newly married man lacks experience, a widow, assisted by relatives. After *narawas*, cutting underbrush begins; through it need not begin immediately.

After cutting the shrubs (*nyacar*), in the month of *Kadalapan* (August-September), selective felling and pruning takes place. Three days before work begins a special ritual called *nukuh* is held. *Nukuh* is conducted on the same day as *narawas* and in the same place or nearby. Various plants including rane (*Sellaginella willdenowii* Desv. ex Poir), sulangkar (*Leea indica* (Burm.f.) Merr), areuy geureung (*Stephania javonica* (Thunb) Mers,

Table 1. Nine stages of the Baduy swidden farming and associated rituals

The Swidden farming activities	Associated rituals	Number of plant species used in rituals
Cutting underbrush (<i>nyacar</i>), and felling and pruning trees (<i>nuar</i> and <i>nutuh</i>)	<i>Narawas</i> and <i>Nukuh</i>	11
Planting rice (<i>ngaseuk</i>)	<i>Ngaseuk pare</i>	16
First weeding (<i>ngored munggaran</i>)	<i>Ngirab sawan</i>	5
Second weeding (<i>ngored ngarambas</i>)	<i>Ngubaran pare</i>	10
Harvesting rice (<i>panen</i> or <i>dibuat</i>)	<i>Mipit</i>	8
Storing rice (<i>ngaleuitkeun pare</i>)	<i>Ngadiukeun pare</i>	8
Managing the rice in the rice barn (<i>ngarawat pare di leuit</i>)	<i>Ngukus</i> and <i>ngapret</i>	7
Taking rice from the rice barn for pounding in the rice pounding shelter (<i>saung lisung</i>)	<i>Ngahudangkeun pare</i>	4
Offering to ancestor	<i>Ngalaksa</i>	5
Total		50

Table 2. Various plant species are predominantly used in the management of Baduy swidden farming system

Scientific name	Family	Vernacular name	Organ of plants	Associated rituals of the Baduy swidden farming*)										
				1	2	3	4	5	6	7	8	9		
<i>Acorus calamus</i> L	Araceae	Jaringao	Root											
<i>Aleurites molucana</i> (L) Willd	Euphorbiaceae	Muncang	Fruit		+								+	
<i>Amomum</i> sp	Zingiberaceae	Barahulu	Branch		+	+								
<i>Amomum walang</i>	Zingiberaceae	Walang												
<i>Areca cathecu</i> L	Arecaceae	Jambe	Fruit		+		+							+
<i>Arenga pinnata</i> (Wurmb) Merr	Arecaceae	Aren	Leave, flower	+										+
<i>Arenga porphyrocarpa</i> (Bl. ex.Mart) H.E. Moore	Arecaceae	Ki hura	Branch		+		+							
<i>Artocarpus champeden</i> Spreng	Moraceae	Nangka beurit	Fruit peel											+
<i>Artocarpus elasticus</i> Reinw ex Blume	Moraceae	Teureup	Leave										+	
<i>Bambusa wrayi</i>	Graminae	Tamiang pugur	Branch and leave			+								
<i>Blumea balsamifera</i> (Linn) DC	Asteraceae	Capeu	Branch and leave	+										
<i>Bridelia monoica</i> (Lour) Merr	Euphorbiaceae	Kanyere	Leave					+						
<i>Citrus grandis</i> (L) Osbeck	Rutaceae	Jeruk Bali	Fruit peel						+					
<i>Cocos nucifera</i> L	Arecaceae	Kelapa	Fruit		+	+	+							
<i>Coleus galeatus</i> (Poir) Bth	Labiatae	Jawer kotok	Tree		+									
<i>Cordyline fruticosa</i> (L) A.Chev	Agavaceae	Hanjuang	Branch and leave		+									
<i>Costus speciosus</i> (Koen) J.E. Smith	Zingiberaceae	Pacing	Branch		+								+	
<i>Crinum asiaticum</i> L	Amaryllidae	Penuh	Branch							+				
<i>Curcuma domestica</i> Val	Zingiberaceae	Kunir/ Konef	Rhizome	+										
<i>Gigantochloa apus</i> (Bl ex Schult f) Curz	Graminae	Bambu	Branch											
<i>Dianela nemorosa</i> Lam	Liliaceae	Jambaka	Branch											+
<i>Donax cannaeformis</i> (G.forst) Schm	Maranthaceae	Bangban	Branch						+					
<i>Gigantochloa apus</i> (Bl ex Schult f) Curz)	Graminae	Bambu tali	Branch	+			+							
<i>Gonistylus marcrophyllus</i> (Miq)	Gonistylaceae	Gaharu	'Galih' of wood	+	+	+								+
<i>Gossypium barbadense</i> L	Malvaceae	Kapas	Fruit		+									
<i>Homalonema rubescens</i> Kunth	Araceae	Cariang asri	Leave							+				
<i>Hoya diversifolia</i> Bl	Aclepiadaceae	Kakan-delan	Leave							+	+			
<i>Kaemferia galanga</i> L	Zingiberaceae	Cikur	Root											+

H.E. Moore), bingbin (*Pinanga coronata* (Bl ex Mart), barahulu (*Amomum* sp), jawer kotok (*Coleus galeatus* (Poir) Bth), panglay (*Zingiber cassumunar* Roxb), pinang (*Areca catechu* L), sirih (*Piper betel* L), kelapa (*Cocos nucifera* L), pisang (*Musa paradisiaca* L), kemenyan (*Gonistylus macrophyllus* (Miq), kapas (*Gossypium barbadense* L), bintinu (*Kleinhovia hospita* L) and muncang (*Aleurites molucana* (L) Willd are collected for use in the *pungpuhunan*. All plants are placed in the *sawan* that is mainly made of stem and madrib of Arenga (aren or kawung-*Arenga pinnata* (Wurmb) Merr) (Figure 1), located in the middle of swidden field and considered as very sacred place.



Figure 1. Stem and madrib of immature arenga palm leaf (kawung-*Arenga pinnata* (Wurmb) Merr) is traditionally used for the swidden planting rice ritual of *sawan* and put at the sacred place at the swidden field

On the day will planting rice, in the early morning, the head of family prepares in *pungpuhunan* (ritual place of 0.5 m x 1 m, bordered by stick of barahulu (*Amomum* sp) in the middle of the swidden field. The ritual performance begins when the head of family enters to the *pungpuhunan* and sits down in front of woven bamboo basket containing sacred grain. His hands and hair are smeared with coconut oil. Gaharu incense is burned and incantations pronounced. On the basis of Baduy tradition, it is believed that in sowing rice *Nyi Pohaci* becomes engaged (*direremokeun*) to the earth, *Pertiwi*.

After the incantations, a couple of seeds of sacred rice, called *pare indung* (rice mother), are sown in the middle *pungpuhunan*. In addition, 7 holes inside and 7 holes outside *pungpuhunan* are sown. Immediately after conducting the ritual, men walk ahead of the women, making holes in the ground while women place rice seed in the holes.

First and second weeding: ritual of *ngirab sawan* and *ngubaran pare*

About two weeks after sowing, the swidden is already covered in terrestrial weeds. Therefore, it is common that during the month of *Kasapuluh* (October-November), less than forty days after sowing, the swidden is completely weeded in order to minimize soil nutrient competition between rice and terrestrial weeds. Before second weeding a ritual named *ngirab sawan* is conducted. In this ritual, various plants, such as kelapa (*Cocos nucifera* L), gaharu (*Gonistylus macrothyllus* Miq), bambu tali (*Gigantochloa apus* (Bl ex Schult f) Curz), and bangban (*Donax cannaeformis* (G.forst) Schm) are used.

Ngirab sawan is performed by a man in the *pungpuhunan*. It takes place on the same day as sowing. Articles such as gaharu incense in coconut shell, bamboo water (*tuak awi*) in a bamboo internode, and a stem of bangban wood are placed in the *pungpuhunan*. The incense is burned and incantations pronounced. The spells (*tawa*) used are of various types: *tawa hujan poe*, *tawa getih*, *tawa karang*, *tawa apu*, *tawa papadon opat*, *tawa cai beureum*, *tawa sewu*, *tawa raga*, *tawa tutup lubang*, and so on. In addition, leaf of rice grown in the *pungpuhunan* (*pare indung*) is stroked from base to tip using a *kored* and the tip slightly cut. Water from the bamboo is sprayed over *pare indung* in the *pungpuhunan*.

The next step is the second weeding (*ngored ngarambas*). At this time, special ritual called 'treating rice' (*ngubaran pare*) is usually undertaken. During the second weeding, rice is 'fed' by men with herbal medicines (*ubar pare*) between five and nine times, always using an old number. Various plants are used to treat rice (Table 2). For example, mengkudu (*Moringa citrifolia* L) fruits are mixed with rhizome of laja/langkuas (*Languas galanga* (L) Stuntz), green coconut milk (*Cocos nucifera* L), orange peel (*Citrus grandis* (L) Osbeck), fermented palm sugar juice (*Arenga pinnata* (Wurmb) Merr), and kitchen ash. The day before a carita *pantun* (sung verse) is usually performed from about 20.00 until 4.00 o'clock early morning, in a hamlet or farm shelter. Furthermore, in the early morning, these botanical pesticides are spread by hand over the swidden. In addition, other botanical pesticides composing fruit of bingbin (*Pinanga coronata* (Bl ex Mart), rhizome of panglay (*Zingiber cassumunar* Roxb), and water sand are mixed and spell of *tawa kungkang* pronounced. Plants, including leaves of kanyere (*Bridelia monoica* (Lour) Merr), bungur (*Lansium domesticum* Corr), and walang (*Amomum walang*), are placed or burned twice a day in the farm shel-

ter, and at various places in the swidden field.

Harvesting rice: ritual of *mipit*

About five months after sowing, in month of *Katiga* (March-April), rice matures and is ready to be harvested. Three day before harvesting a special ritual named *mipit* is performed. One day before ritual, the head of family and his wife undertake a fast, *mutih*. They drink and eat just a little rice, but do not eat fish, before sleeping, and fast until the afternoon of the following day. Thus, over the next three days, special meals must be provided, such as steamed swidden rice, glutinous rice, fresh water fish (*paray*=*Rasbora* sp) and squirrel meat (*buut/bajing* (*Calloscurus notatus*). Salted fish is prohibited, as is harvesting other swidden crops, such as vegetables.

On the day rice of the rice harvest, some preparations are undertaken. For example, the stem and mad rib of an immature sugar palm leaf is embedded in ground of the *pungpuhunan*, and supported by bamboo. Each pair of leaf midribs is woven to make oval shape, and the leaves are tied together at the tip. A finger knife (*etem* or *ani-ani*) and plants, including panglay (*Zingiber cassumunar* Roxb), tumbueusi (*Phyllanthus niruri* L), kukayaan (*Kibara coricea* (Bl) Tulasne), kakandelan (*Hoya diversifolia* Bl), seureuh (*Piper betel* L), penuh (*Crinum asiaticum* L), cariang asri (*Homalonema rubescens* Kunth), and bingbin (*Pinanga coronata* (Bl ex Mart) are hung on the midribs in the *pungpuhunan*.

The ritual performance begins when head of family squats in the *pungpuhunan* in the front of the *pucuk*. Gaharu incense is burned and incantations are pronounced; panglay is chewed and spat or sprayed. Various incantations are pronounced: *jampe kukus gaharu*, *jampe pertanian*, *jampe pangadeg*, *jampe kajayaan*, *jampe kagancangan*, *jampe angen*, *jampe ngaran pare*, *jampe sabawarna*, *jampe pamundutan*, *jampe kakandelan*, and *jampe menta keupeul*. Seven rice panicles are cut individually using a finger knife and put in the base of the *pucuk*. This is also done on the second and third day. Moreover, rice is harvested separately for each variety in each block.

Storing rice: ritual of *ngadiukeun pare*

The rice bundles are hung on bamboo pole supported by other bamboos to the height of about two meters, which is placed near the farm shelter. After drying, the rice bundles are carried out to the settlements. Moreover, the rice bundles are store in a barn, the ritual placing the 'rice mother' in a barn or to place 'mother rice' (*ngadiukeun*

pare indung). The performance begins with the upper part of the rice panicles harvested from the *pungpuhunan* being cut to flatten the upper part of the panicles. The rice divided into three bundles: 'the rice couple', 'male and female', and one bundle of 'companion'. The 'rice couple' is tied with various plants, such as leaves of kukayaan (*Kibara coricea* (Bl) Tulasne), kakandelan (*Hoya diversifolia* Bl), ilat mintul (*Scaleria purpurascens* Steud), tumbueusi (*Phyllanthus niruri* L), mara asri (*Macaranga triloba* (Bl) Muell. Arg), areuy geureung (*Stephania javonica* (Thunb) Mers), pacing (*Costus speciosus* (Koen) J.E. Smith) and teureup (*Artocarpus elasticus* Reinw ex Blume). Some of these plants are placed on the woven bamboo wall of the rice barn or door of rice barn (Figure 2 and Figure 3). Another rice bundle is wrapped in white cotton cloth (*boeh*) and carried in the cloth by a woman to the rice barn. In the barn the rice is put (*dielep*) in the middle by a man, and other rice bundles placed by it.



Figure 2. Kakandelan plant (*Hoya diversifolia* Bl) is placed on woven bamboo wall of the rice barn after performing ritual of placing new rice in a rice barn (lumbung padi or leuit)

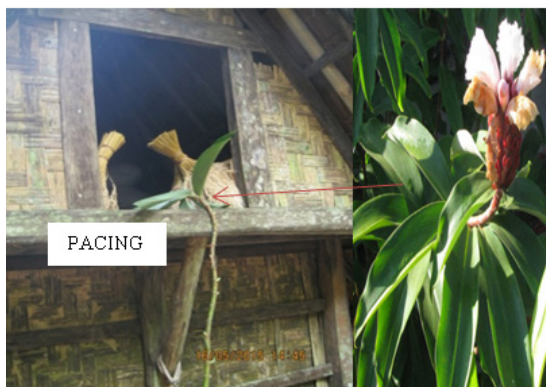


Figure 3. Pacing plant (*Costus speciosus* (Koen) J.E. Smith) is placed on a rice barn door or on woven bamboo wall of the rice barn after performing ritual of placing new rice in a rice barn (lumbung padi or leuit).

Managing rice in the rice barn: ritual of *ngukus* and *ngapret*

After all rice it has been stored, and between two and five times a week, rituals are performed to respect *Nyi Pohaci*. These are involved the burning of plant medicines such as gaharu (*Gonystylus macrophyllus* MI), piston peel (*Lancia domestic* Corer), nangka beurit (*Artocarpus champeden* Spring), and jam Baka root (*Daniella nervosa* Lam) under the rice barn. In addition, the spreading of liquid (*garret*) is performed, in which jaringao (*Acorus calamus* L), cikur (*Kaemferia galanga* L), and panglay (*Zingiber cassumunar* Roxb) are finely pounded and mixed with water are spread inside and outside the rice barn.

Taking rice from the rice barn: ritual of *ngahudangkeun pare*

On the basis of the Baduy tradition, each household of Baduy people has prohibited to seal swidden rice. As a result, the swidden rice has predominantly used for performing various rituals and daily consumption in the household. Every time is taken (*nguyang*) by a woman for pounding in the rice pounding shelter (*saung lisung*), betel leaves/sirih (*Piper betel* L), gambir (*Uncarina gambir* Roxb), jambe (*Areca cathecu* L), and panglay (*Zingiber cassumunar* Roxb) are chewed and spread on the rice barn to 'wake up' (*ngahudangkeun pare*) called *ngocek*. In addition, after all the rice has been stored, and between two and five time week, rituals are performed to respect *Nyi Pohaci*.

Offering new rice to ancestor: ritual of *upacara ngalaksa*

After all swidden rice has completely been stored in the rice barn, in each *dangka* hamlet must be performed *ngalaksa* ritual. *Ngalaksa* is performed in the month *Katiga* (March-April), after completing third *Kawalu* ritual in Inner Baduy. The *ngalaksa* ritual is spread over 3 days. The first day, *ngababay*-bundle of arenga palm leaves are put in special places, such as the house, rice barn and farm shelter-- is the responsibility of each household. After *ngababay*, Outer Baduy come from different hamlet, consisting of men, women, boys and girls, go to house the *Jaro Dangka*. Each household representative carries about half a liter of new rice from the *pungpuhunan*. Some patat leaves (*Marantha* sp) are also carried by men and boys. These bundles are mixed with 4 rice bundles from the swidden to the *Jaro Dangka*, and stored (*didiukeun*) for one night in his house. Early next morning, the rice bundles are ponded by selected women in *saung lisung*.

The following day, all of the hulled rice is carried from the house of the *Jaro Dangka* to the pounding shelter, and pounded to flour by seven women selected by the *Jaro Dangka*. After the rice pounding, the rice flour is brought to the house of the *Jaro Dangka* where it is stored for one night. The following day, all items that are used in the ritual, including *teke*, *tututumbakan*, and *anak-anakan* made of arenga leaves are blessed by to the *Jaro Dangka*, and carried by a group of men to the forest outsides the hamlet, located near the pounding shelter. Once at the forest shelter, the leader of the group utters an invocation. After this invocation has been made the leader clears his throat three times. This indicates that the ritual offering of *laksa* is complete. Various plants namely rice (*Oryza sativa* L), patat (*Marantha* sp), honje (*Nicolaia hemispherica* (Bl) Horan), teureup (*Artocarpus elasticus* Reinw ex Blume), aren (*Arenga pinnata* Wurm Merr), and panglay (*Zingiber cassumunar* Roxb) are used in *ngalaksa* ritual (Table 2).

On the basis of various rituals that are predominantly undertaken by Baduy people in the annual swidden farming cycle, it has been considered more holistic compared to that of practice by other Sundanese village farmer groups. For example, based on study ethnobotany undertaken in Rancakalong village, Sumedang, West Java, revealed that only 3 rituals namely *upacara nitipkeun* before planting rice, *upacara nyalin* before harvesting rice, and *upacara ngalaksa* after harvesting rice, respectively have predominantly performed by the rice farmers of Rancakalong. In general, nowadays the ritual in the wet rice farming (*sawah*) system has been rarely undertaken by farmers due to impact of the Green Revolution. Before the introduction of the Green Revolution, various rituals including ritual of *sedekahan* at the *hulu wotan*, *mitembayan* at the beginning the rice planting, *ngukus* and *gecok* during maintaining rice, *nyalikeun* and *netepkeun* during the storing rice in the rice barn, *nanghikeun* before taking rice for pounding rice, and *ngalaksa* for offering to ancestor have been traditionally undertaken by the Sundanese wet rice farmers (Darpan et al., 2013).

Various plant species of the rituals

On the basis of direct observations and interviews with informants, it has been revealed 50 species representing 28 families that are predominantly used in 9 rituals of the swiddening cycle of the Baduy people (Table 2). Among 50 plant species, recorded 5 plant species namely panglay (*Zingiber cassumunar* Roxb), gaharu (*Gonystylus macrophyllus* (Miq), aren (*Arenga pinnata*

(Wurmb) Merr), bingbin (*Pinanga coronata* (Bl ex Mart), and tumbeusi (*Phyllanthus niruri* L) are predominantly use in the Baduy rituals (Table 2).

From the diversity of plants that have been used in various ritual of swidden farming of Baduy, it can be seen that indicate the diversity is considered to be high if we compared to that of the diversity of plants that has been used in ritual of wet rice farming of farmers in Rancakalong village, Sumedang West Java, repealed totally 21 plant species (Iskandar et al., 2011). Indeed, the plant diversity of ritual of swidden farming is also more high compared to that of plant diversity used in various rituals, such as weeding (*nikahan*), seven monthly pregnancy baby (*tujuh bulanan kandungan bayi*), circumcision (*sunatan*), planting rice in the wet rice field (*tanam padi sawah*), and sea ceremony of fishermen (*upacara nelayan di laut*) of the Karangwangi village, South Cianjur, West Java that are recorded 25 plant species (Alillah 2015). Undoubtedly, various traditional agroforestry agroforestry systems, such as the swidden farming and hamlet forest have been planted with a high diversity of plants. For example, 66 plant species and 41 crop species have been recorded as traditional medicines and botanical pesticides, and carbohydrate and non-carbohydrate food, respectively in the Baduy.

Function of some plants species in the rituals

On the basis of this perception, the Baduy farming activities and associated rituals has strongly related with respect to goddess of rice, *Nyi Pohaci Sanghyang Asri*. For example, it can be seen that various incantations, including incantations pronounced in planting rice that has respect to *Nyi Pohaci Sanghyang Asri*. Baduy believe that in sowing rice *Nyi Pohaci Sanghyang Asri* becomes engaged to the earth, *Pertiwi*. Therefore, to obtain good rice yield, in ritual of planting rice, *Nyi Pohaci Sanghyang Asri* must be entertained by performing Baduy *angklung*. In this ritual, the top of rice seeds are covered with the so-called, *cocoan* (toy) of *Nyi Pohaci Sangyang Asri*, including picung seed (*Pangium edule* Reinw) and muncang seed (*Aleurites moluccana* (L) Willd).

Various plants that have been used in the rituals of swidden farming of Baduy have function symbolic meaning and functional. For example, hanjuang (*Cordyline fruticosa* (L) A Chev) (Figure 4) has two colors, green and red, which link body (*lahir*) and soul (*batin*), the outer and inner worlds. It is believed that in sowing rice, body and soul are combined, the soul of the rice goddess, *Nyi Pohaci Sanghyang Asri* becoming engaged to the earth (*pertiwi*). *Kapas* or cotton (*Gossypium*

barbadense L) and white cotton cloth (*boeh rarang*) bring water and coolness to the rice, as signifying pure whiteness (*murni* or *batin* or body soul) and linked to water in cosmological scheme. *Cau* or banana (*Musa paradisiaca* L), stands for new life (*kahirupan anyar*), and huma prosperity (Figure 5).



Figure 4. Hanjuang plant (*Cordyline fruticosa* (L) A.Chev is traditionally used for planting rice ritual, which has symbolic function two colors, green and red, which link body (*lahir*) and soul (*batin*).



Figure 5. Young banana pant (*Musa paradisiaca* L) is placed in the *pungpuhunan* (sacred place) at the swidden field, symbolic meaning stands for new life (*kahirupan anyar*), and huma prosperity

In addition, *penuh* (*Crinum asiaticum* L) and *kakandelan* (*Hoya diversifolia* Bl), that are usually used in the harvesting rice have symbolic meaning. For example, *penuh* means 'full', encourage the rice harvested to fill the rice barn. Similarly, *kakandelan* is derived from *kandel* meaning 'thick' and 'luxuriant'. Thus use homonym is commonly found in Indonesia. For instance, *tebel-tebel* (related to *tebel* or 'thick'), *teteg* (meaning 'fixed' or 'substantial'), and *kayu sugih* (*Pleomele* sp), *sugih* meaning 'wealthy' or 'rich' are used in the Balinese ritual of *mantenin padi*, performed after

the harvest and drying of the grain (Gde Agung, 2006; Adiputra, 2011; Surata, et al., 2015).

In addition, various plants that have been used for rituals of the Baduy swidden farming have rational functions. For example, in ritual of storing rice to the rice barns, these involve burning of plants medicines such as gaharu (*Gonystylus macrophyllus* (Miq), pisitan peel (*Lansium domesticum* Corr), nangka beurit peel (*Artocarpus champeden* Spreng), and jambaka root (*Dianella nemorosa* Lam). Most of the plant medicines used in swiddening and in the rice barn is typified by their strong aromas, and some have long been recognized as traditional insecticides in some Asian countries. For example, the fruit peel of *pisitan* when burned, gives an aromatic smell and in the past was used by the Javanese to drive away mosquitos. As a result, the rice can safely be put in the rice barn for decades. Indeed, on the basis of the chemical compound, the fruit peel of *pisitan* has a new triterpenoid that is belonged to the lansioside D as the major antimicrobial compound (Marfori, et al., 2015), while the methanol extract *jambaka* leaves possessed cytotoxic activity as considered as anticancer compound (Karim, et al., 2012).

On the basis of this study, we can understand that ecosystem and including biodiversity of the Baduy have been shaped jointly by biological and cultural dynamics. In other words, the Baduy people have not only disturbed forests with use of fire for annual swidden cultivation but also creating cultural landscapes, such as swidden field, gardens, hamlet forest, and enhancing as well as maintaining various plant for sociocultural purposes, including traditional rituals.

To sum up, the result of this research generally obtained the important aspect in recognizing that it has strong relation between socio-cultural aspects, such as conducting rituals of the local community and managing and maintaining biodiversity. In other words, the result of the study on ethnobiology, ethnoecology and ethnobotany has an important role and significant contribute to more recognition that local community who has deep traditional ecological knowledge and cosmos as local wisdom can directly and indirectly, to the maintenance and even to the creation of biodiversity for their socio-economical purposes. Moreover, in terms of technical purpose, the result of study concerning traditional ecological knowledge, beliefs as local wisdom and practices of the local community can be used as 'lesson learn' to make more applicable concept of conservation biodiversity as well as to sustainable use of natural resources in the nature conservation

program in Indonesia (Baghawati, et al., 2016).

CONCLUSION

The Baduy community has cultivated the swidden farming based on the local knowledge or traditional ecological knowledge and cosmos or beliefs. To conduct the 9 rituals of the Baduy swidden cycle have been used 50 plants species representing 28 families. We suggest those species have both symbolic meaning and rational functions. For example, as symbolic function, *kapas* or cotton (*Gossypium barbadense*) is usually use in the ritual of planting rice, meaning symbolic as pure whiteness (*murni* or *batin*) and bring water and coolness to the rice and coolness to the rice, while rational functions including gaharu incense (*Gonystylus macrothyllus*), *pisitan* peel (*Lansium domesticum*), and the root of *jambaka* (*Dianella nemorosa*) that have strong aromas are burned in the ritual of storing rice may be has rational function to drive insect pest in the rice barns.

Finally, we can say that due to Baduy community has strongly practiced the swidden farming based on the traditional ecological knowledge and beliefs, and within the framework of cultural biodiversity. It can be confirmed that various ritual plant species would be conserved if those species still needed for performing rituals of the local community and *vice versa*. In other words, socio-economic cultural aspects must be essentially considered to be used for diversity conservation purpose in Indonesia instead of neglected based on nature conservation concept of Western knowledge, particularly in the past time.

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