

## Karangwangi people's local knowledge of bamboo and its role: Implications for management of cultural keystone species

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**Abstract.** Partasasmita R, An'amillah A, Iskandar J, Mutaqin AZ, Annisa. 2017. Traditional knowledge of bamboo and its role in Karangwangi Village Cianjur, West Java: Implications for management of cultural keystone species. *Biodiversitas* 18: 275-282. Indonesia has a high diversity of bamboo, with more than 160 species can be found around the country. Nowadays, this plant is rarely planted around rural communities of West Java due to land use conversions and economic reasons. This research is to discuss traditional knowledge of local people of Karangwangi Village, Cianjur, West Java, Indonesia on diversity of bamboo and its role. The qualitative method was used in this study, while the data collection techniques, namely semi structure interview or deep interview and observation participant are applied. The result of study shows that based on the traditional knowledge of Karangwangi people, it has been revealed 13 species of bamboo, e.g., *Bambusa blumeana* J.A. & J.H. Schultz, *Bambusa glaucophylla* Widjaja, *Bambusa maculata* Widjaja, *Bambusa vulgaris* Schrad. Ex. Wndl. var. *vulgaris*, *Bambusa vulgaris* Schrad. Ex. Wndl. var. *striata*, *Gigantochloa apus* J.A. & J.H. Schultz. Kurz., *Gigantochloa atrovilacea* Widjaja, *Gigantochloa atter* (Hassk.) Kurz., *Gigantochloa hasskarliana* (Kurz.) Backer ex Heyne, *Gigantochloa pseudoarundinacea* (Steud.) Widjaja, *Schizostachyum iraten* Widjaja, *Schizostachyum* sp., and *Dinochloa scandens* (Blume ex Neese) Kuntze. On the basis of deep interview, these bamboo species have traditionally various used, such as building materials, furnitures, household appliances, working tools, medicine, consumption, traditional musical instruments, traditional game, and decoration. In addition, Bamboo soften feature prominently in the language, ceremonies, and narratives of native peoples, so it can be considered as a cultural icons. The implications of these discussion are with respect to conservation as cultural keystone species.

**Keywords:** Bamboo, biodiversity, cultural keystone species, ethnobiology, Karangwangi

### INTRODUCTION

Bamboo is a vernacular term for members of subfamily Bambusoideae of family Poaceae, the giant grasses (McClure 1966). Bamboo has been so intricately related to the livelihood of the peoples of Asia representing the bamboo civilization in the continent (Nath et al. 2015). In Indonesia, bamboos have been utilized widely as raw material for industrial, medicinal and clothing industry (Maryanto et al. 2013). Bamboo forms integral part of daily life in the rural landscape of West Java. Over the millennia bamboos have been used as the material for traditional craft preparation and that have now been an important commodity for wood substitutes (Ekawati et al. 2013). On the basis of data recorded by Central Statistic Agency (2008), the use of bamboo as wall's material in urban, rural and urban-rural areas, West Java is second widest (m<sup>2</sup>) after brick.

In terms of conservation, the buffer zone is an area surrounding natural forest that serves to limit human activity to not damage the ecosystem in natural forest (Soemarwoto 1985). Karangwangi Village can be considered as a buffer zone. According to Garjita et al. (2014), the existence of communities near natural forest is

a component that directly interacts with it. Karangwangi Village in the sub-district of Cidaun, District of Cianjur, Province of West Java, Indonesia has a variety of bamboo that is grown both in the *kebun-talun* and in the forest. Around 90% of households of Karangwangi are recorded as farmers (Karangwangi Village Statistic 2015). Bamboos in Karangwangi have traditionally planted mixture with other plants in various land uses. Karangwangi has been known as one of the locations that correspond to the black bamboo ecology as the main component of making the Sundanese traditional music, '*angklung*' (Cundaningsih et al. 2015).

The bamboo has traditionally cultivated in many places (Nath et al. 2015b,c), including in the Karangwangi village of Cianjur, West Java. In addition, the bamboos have strongly related with various socio-economic cultural functions over times. As a result, if the bamboos can be categorized as cultural keystone species (cf. Garibaldi and Turner 2004; Platten and Hefrey 2009). The *cultural keystone species* can be defined as the culturally salient species that shape in a major way the cultural identity of a people, as reflected in the fundamental roles these species have in diet, materials, medicine, and/or spiritual practices). The knowledge about utilization of bamboo and

its role in Sundanese culture at large, the bamboo can be categorized as cultural keystone species. It shows the group of bamboo has role according to indicator of cultural keystone species. Garibaldi and Turner (2004) mentions there are five indicators a species can be considered to be cultural keystone species namely intensity, type, and multiplicity of use; naming and terminology in a language, including use as a seasonal or phenological indicator; role in narratives, ceremonies, or symbolism; persistence and memory of use in relationship to cultural change; and extent to which its role can be replaced or substituted. Bamboo as cultural keystone species is one form of conservation efforts. For example, it has similar to that of the sago palm (*Metroxylon sagu*) in Eastern Indonesia (Garibaldi and Turner 2004) and carrots (*Daucus carota*) in Rurukan Village, North Sulawesi, Indonesia (Platten and Hefrey 2009).

The aim of the paper is to discuss on traditional knowledge of Karangwangi Village, Cianjur, West Java, Indonesia on bamboos, including diversity of bamboo, function and use of bamboo, name and terminology, and impilcation for management of cultural keystone species.

## MATERIALS AND METHODS

### Study area

The study was carried out in Karangwangi Village, Cidaun Sub-district, Cianjur District, West Java Province, Indonesia (Figure 1).

## Procedures

The method of this research used qualitative, while the data collection techniques mainly semi-structure interview or deep interview and observation participant (cf. Martin 1995; Creswell 2009; Newing et al 2011; Iskandar 2012). Competent informants were selected by purposive and deeply interviewed using an interview guidance list (cf. Martin 1995; Waluyo 2004; Newing et al. 2011). In addition, observation participation was undertaken. For example, the researchers have actively observed and participated in some activities of communities, including harvesting bamboo, using bamboos for various cultural purposes (cf. Newing et al. 2011).

## Data analysis

Data were analyzed namely by cross-checking, summarizing and synthesizing from different sources in order to build up a narrative account, and narrative of descriptive analysis and evaluative (cf, Newing et al. 2001)

## RESULTS AND DISCUSSION

### Diversity of bamboo

Karangwangi Village communities have recognized 15 species of bamboo. However, based of botany, two of fifteen bamboo species have same name, so in terms of botany these species categorize into 13 species bamboo instead of 15 species based on the community perception (Table 1).

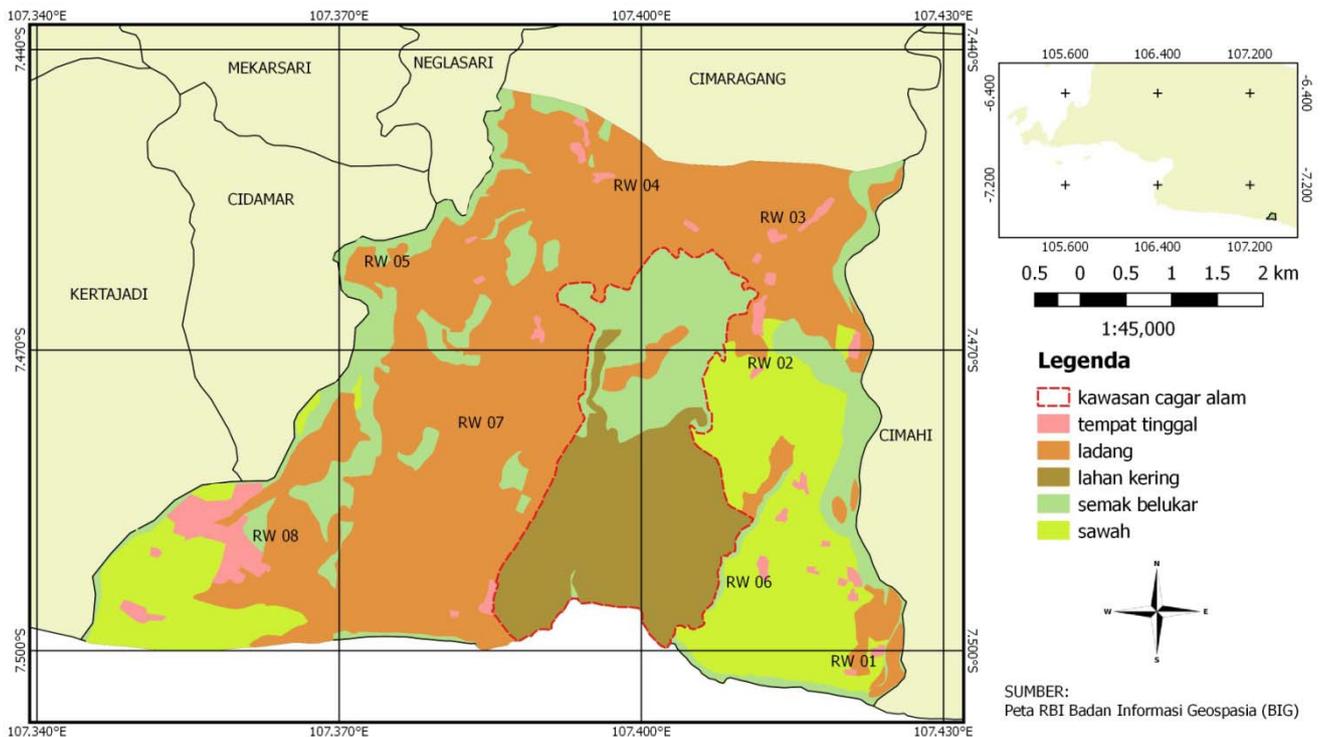


Figure 1. Map of Karangwangi Village, Cidaun Sub-district, Cianjur District, West Java Province, Indonesia

**Table 1.** Various bamboo species recorded in the Karangwangi Village, Cianjur, West Java, Indonesia

Species name	Sundanese name
<i>Bambusa blumeana</i> J.A. & J.H. Schultz	<i>Haur gereng</i>
<i>Bambusa glaucophylla</i> Widjaja	<i>Awi hias</i>
<i>Bambusa maculata</i> Widjaja	<i>Haur seah</i>
<i>Bambusa vulgaris</i> Schrad. Ex. Wndl. var. <i>vulgaris</i>	<i>Haur geulis</i>
<i>Bambusa vulgaris</i> Schrad. Ex. Wndl. var. <i>striata</i>	<i>Haur koneng</i>
<i>Gigantochloa apus</i> J.A & J.H Schultz. Kurz.	<i>Awi tali</i>
<i>Gigantochloa atroviolacea</i> Widjaja	<i>Awi hideung</i> or <i>awi wulung</i>
<i>Gigantochloa atter</i> (Hassk.) Kurz.	<i>Awi temen</i>
<i>Schizostachyum iraten</i> Widjaja	<i>Awi tamiyang</i>
<i>Gigantochloa pseudoarundinacea</i> (Steud.) Widjaja	<i>Awi gombong</i> or <i>awi surat</i>
<i>Gigantochloa hasskarliana</i> (Kurz.) Backer ex Heyne	<i>Awi lengka</i>
<i>Schizostachyum</i> sp.	<i>Awi gembong</i>
<i>Dinorchloa scandens</i> (Blume ex Neese) Kuntze	<i>Cangkoreh</i>

On the basis of diversity, the diversity of bamboo species recorded in the village of Karangwangi was considered as quite high. Because based on data recorded by Savlona (2006), in the village of Kebon Kalapa, Cisarua, District of Sumedang, West Java, Indonesia total species bamboo were recorded only seven species that have been known and culturally cultivated by local communities, i.e. *Gigantochloa apus*, *Gigantochloa pseudoarundinaceae*, *Gigantochloa atter*, *Bambusa vulgaris vulgaris*, *Bambusa vittata*, *Dendrocalamus giganteus* dan *Schizostachyum iraten*. Similarly, Christatanty (1989), noted that only four species of bamboo commonly managed by native communities in Sadu Village, Soreang, District of Bandung, West Java, i.e. *Gigantochloa ater*, *Gigantochloa verticillata*, *Gigantochloa apus* dan *Bambusa vulgaris*. However, the diversity of bamboo in Karangwangi Village are lower than diversity of bamboo in Bali. In Bali, 18 species of bamboo were reported that have potential role in craft preparation of the local community (Arinasa and Peneng 2013).

#### Intensity, type, and multiplicity of use

Bamboos have many uses and functions. The Karangwangi people have used bamboos into 10 usages, namely material, household appliances, working tools, medicine, consumption, traditional music instruments, traditional game, decoration, and ecological function.

#### Materials

Local people in Karangwangi use bamboo as a material for house construction because it is cheap and found in affordable price. Moreover older bamboo culms use in construction that is not susceptible to termites and almost as strong as other wood. The experiences of the farmers and craftsman indicate that some species of bamboo as *Gigantochloa apus* resistant powder dry trunk infestation. Low starch content in older culm protects bamboo from stem borer (Arinasa and Peneng 2013). The utilization as a material can be variously used, such as *bilik* and

*matawalik*, rafter and lath, fence, cattle sheds, *saung*, and toilets (Figure 2).

#### Household appliances

The Karangwangi people use bamboo as processed material for making household appliances such as *aseupan*, *hihid*, *boboko*, *ayakan*, *nyiru*, *pipiti*, *tetenong*, *kele*, and *gonje* (Figure 3). These tools still in great demand by native communities of Karangwangi and also other communities in West Java (cf. Savlona 2006). Given communities considers household utensils made of bamboo has its own advantages than modern equipment. As well as household appliances used for cooking rice. Before cooking the rice, the rice washed by using *boboko*. *Nyiru* used to clean rice from leather, stone and dirt. Related functions, *nyiru* still widely used because there is no modern equipment to replace the function of *nyiru*. After the rice is steamed using a furnace with *aseupan*. According to the community, cooked rice using *aseupan* will make the rice taste good and fluffier.

#### Furniture

The local peoples of Karangwangi use bamboo for making furniture, such as chair and table (Figure 4). This furniture is made by *awi wulung/awi hideung* (*Gigantochloa atroviolacea* Widjaja). Craftsman deliberately use this type of *awi hideung* for furniture because it has a natural black color rarely observed for other bamboo species.

#### Working tool

Bamboo used by Karangwangi as equipment for workings. For example, *awi tamiyang* is used for making *sumpit* of hunting animals; *korang* used as stash fish at fishing, *tuturus* used as wraps plant (e.g. bean, cucumber, etc.) at farming systems, and *lodong kawung* used as pace bugged sugar palms. In addition, bamboo can be used as traditional water pipe system (cf Christanty 1989; Savlona 2006).



Figure 2. Bamboo as material (a) house (b) saung (c) cattle sheds (d) bridge (e) fence (f) toilets



Figure 3. Household appliances made of bamboo (a) stove cooking rice using aseupan (b) hihid (c) boboko (d) nyiru



Figure 4. Chair (A) one set furniture (B)



**Figure 5.** Working tool: (A) *korang*, (B) *tuturus*, (C) *lodong kawung*, (D) *lodong pipa saluran air*



**Figure 6.** A. *Kuyuk* as traditional food of Karangwangi people, B. *Cangkoreh* as *peureuh* or tear water



**Figure 7.** A-B. *Agustusan* festival (left) and *gayar* (right), C. *Awi hias* has function as decoration at the homegarden

### Consumption

The Karangwangi people uses bud of bamboo (*iwung* in Sundanese or *rebung* in Indonesian) as food item but not all of 'rebung' bamboo can be consumed. Only *rebung* of *haur geulis* (*Bambusa vulgaris*), *awi temen* (*Gigantochloa atter*), *awi hideung* (*Gigantochloa atroviolacea*), and *awi lengka* (*Gigantochloa hasskarliana*) are eaten by people Karangwangi so food called *kuyuk* (Figure 6.A). Meanwhile, according to native communities rebung bamboo in other species make *weureu* or poisoned. Bamboo shoots have poison so that after cutting must be soaked periodically. *Iwung* can be consumed as *kuyuk* (vegetable food). Local communities of Karangwangi use *iwung* of *haur gereng* (*Bambusa blumeana*) as pesticide and poison to catch fish in river. Toxicity on a bamboo shoot, can kill fish. In addition, bamboo leaves used as feed for livestock.

### Traditional medicine

There are four bamboo species that are believed by native communities in Karangwangi that capable of healing diseases such as *cangkoreh* (*Dinochloa scandens*), *awi hideung* (*Gigantochloa atroviolacea*), *awi gombong* (*Gigantochloa pseudoarundinacea*), and *haur koneng* (*Bambusa vulgaris*). According to the local communities, drinking water juice of *Cangkoreh* capable of healing cough. While *peureuh* or tear water of *cangkoreh* in the eyes capable of treating and healing eyes (Figure 6.B). While the water morsel *awi gombong* and *awi hideung* are believed to heal a cough. According to (Wijaya et al. 2014) water inside the cavity bamboo segments in bamboo are used for a variety of drugs, such as cough medicine, internal medicine, and fever medicine. While, the water in a segment of bamboo cavity containing 18.34 oxygen and 5.95 minerals so the water is very good for healing any diseases without side effects (Maryanto et al. 2013). As well as *haur koneng* is believed to treat liver disease and gonorrhoe. Bamboo for drug research underdeveloped in Indonesia so that this information cannot be proven scientifically even though people already use (Wijaya et al. 2014).

### Traditional music instruments

Bamboo species are commonly used as musical instruments, including *awi hideung* and *awi tamiyang*. *Awil hideung* is used to create *angklung* and *calung*. *Angklung* and *calung* are recognized as Sundanese musical instrument made of bamboo. *Angklung* is regarded as the original musical instruments from Priangan (West Java). Musical instrument consists of two or three medium-sized short bamboo which is placed in a rectangular frame. *Awil tamiyang* used to make flutes. Nowadays, *awil tamiyang* in Karangwangi has not been used any longer to make flutes due to lack of interest from the utilization of *awil tamiyang*.

### Traditional game

Since the first, children in rural areas of West Java and Banten also use bamboo for playing a game (cf. Alif 2016). So also with Karangwangi, the children play game such as *gatrik*, *gayar*, and *enggrang* (Figure 7.A-B). However, today *gatrik* and *gayar* have rarely played by children in

Karangwangi. The *enggrang* is still frequently played within the scouts. *Enggrang* is usually made of two types of *awil hideung* bamboo stems.

### Decoration

The Karangwangi people know the species bamboo of *awil hias* (*Bambusa glaucophylla*) for decorating homegarden. Utilization of *awil hias* has been known around 2000s. Initially it has been introduced by someone then spread to other people and planted in mostly all homegarden in Karangwangi. The form that neat and unique colors favored by the local communities. Its presence is relatively new, so not at all people have well known about this species. The *awil hias* is traditionally used by people of Karangwangi for esthetical function that is usually planted in homegardens. For this purpose people in the region plant the species in for enhancing aesthetic value (Figure 7.C).

### Ecological function

Generally bamboos have ecologically functioned at the local environment of Karangwangi. Bamboos provide numerous ecological services (Nath et al. 2015a). Bamboo gardens of the upstream have been an important role in conservation of water and soil so that water can still be continuously used by farmers even in dry soil while the soil conservation can be maintained in order to avoid landslides of the steep slope of the land uses. According Chrisatanty (1989) and Rabik et al. (2009) bamboo roots are fibrous root (fibers) and rhizomes bamboo beads bind the soil and help reduce erosion. The hair of bamboo roots has a remarkable ability to expand so that bamboo has a high water storage capacity and act as living aquifer is storing water for use later. Bamboo leaves fall and accumulate in the soil is able to increase the absorption of water into the cavity of groundwater and reduce the carryover of rainwater into the river, and reduce floods in the rainy season. Surface water is sourced from groundwater cavity that released slowly all year, providing a source of water for humans, the life of the river, the tree farm for a longer time in the dry season

### Naming and terminology in a language including use as a seasonal or phenological indicator

Naming of bamboo by local communities in Karangwangi has several purposes and meaning. For instance, naming of *awil hideung*, because the stems are black or *haur koneng* because the stems are yellow. In addition to its color, naming is based on nature of bamboo culm. For example, *haur gereng* namely 'greng' in the sense of making people fear or *haur seah* namely 'seah' (the sound of rushing water) which meant that when the wind blew *haur seah* as if it make sound like rushing water. The bamboo has these phases in infancy are of bamboo shoot, young stem, adult stem, and old stem (Figure 8). These phases will facilitate the native communities to tell the age of bamboo stem that can be cut according to utilization. Growing bamboo shoots can be used as a sign of the entry of the rainy season.

### Role in narratives, ceremonies, or symbolism

In Karangwangi, bamboos have been an important role in narrative that flows from generation to generation. History of bamboo still cannot be separated from the culture of traditional ceremonies and myths. Local communities believe that the large trees like bamboo, there are creatures that inhabit. According to the communities *awi hideung* according to the communities is a witness to history in its use as stakes in independence against invaders. In addition, *awi tamiyang* as one plant species that is culturally used in the ritual *ngukus padi* or *haur geulis* is used in marriage ceremonies. *Haur koneng* is used to ward off black magic symbols that serve as antidote or starting reinforcements. In the *Sunda Buhun* philosophy, respect for paddy occupy high positions held with joy farmers (Soeganda 1982). Bamboo music is always presented in a cycle of rice planting ceremony so it is reasonable to bamboo musical presence in Sundanese culture is still preserved, especially in the traditional agrarian society (Budi et al. 2014).

### Persistence and memory of use in relationship to cultural change

Bamboo is very closely related to the cultural life of Karangwangi. Almost all of the activity of native communities are using bamboo. In social and economic aspects, bamboo enhances primary or secondary source of income. In addition to the rural communities, bamboos can be savings, a resource buffer reliable in case of a state of famine. Bamboo shoot can be eaten. Bamboo stem can also be traded (Batubara 2002). In addition, local communities still use stilts made from bamboo. When people replace from using bamboo into wood or cement, bamboo is certainly no longer be used as the base material.

### Extent to which its role can be replaced or substituted

According to local communities of Karangwangi, bamboo has a diverse role. Even so, its role may be replaced. For example, bamboo as raw material for making *giribik*. Nowadays, *giribik* almost hard to find its use by the

native communities because it is replaced by a plastic products (Figure 9). *Giribik* well known to accelerate the drying of grain drying. But because the craftsman of *giribik* already rare and tarp more durable in storage, native communities of Karangwangi to shift from *giribik* into tarp. In addition, household appliances such as *kele*, *pipiti*, and *gonje* has also been replaced with other raw materials such as plastic.

Based on this study, it can be conclude that local communities of Karangwangi, Cidaun Sub-district, Cianjur District, West Java Province, Indonesia have traditional knowledge all about bamboo. According to intensity, type, and multiplicity of use; naming and terminology in a language, including use as a seasonal or phenological indicator; role in narratives, ceremonies, or symbolism; persistence and memory of use in relationship to cultural change; and extent to which its role can be replaced or substituted, so that group of bamboo can be categorized as ‘cultural keystone species’.

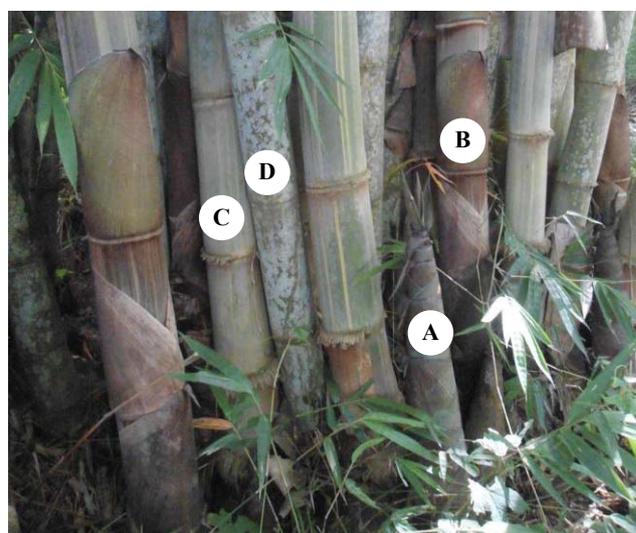


Figure 8. Phenology of bamboo: A. Bamboo shoot, B. Young stem, C. Adult stem, D. Old stem



Figure 9. Displacement of bamboo's uses value; still using *giribik* (A) and now using tarp (B)

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