



# Inventory of Local Food Plants in Banceuy Traditional Village, Subang Regency, West Java, Indonesia

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## ABSTRACT

Plants are one of the most important food resources for human civilization. The Sundanese people of West Java, Indonesia, are well known for consuming raw plants as part of their food culture called lalapan. West Java consists of several traditional villages, including Banceuy Traditional Village in Subang Regency. No prior ethnobotanical study of local food plants in Banceuy has been recorded. Therefore, this study aims to document the diversity of local food plants and the indigenous people's knowledge of their utilization. Data were collected through semi-structured interviews with 32 informants, including two key informants, and field-guided observations accompanied by a key informant to identify and collect plant specimens. A total of 160 local food plant species belonging to 55 families were documented. The dominant families were Fabaceae, Cucurbitaceae, Solanaceae, and Zingiberaceae. The most common plant habits were herbs and trees. These plants were used as sources of carbohydrates, fruits, vegetables, spices, seeds, and beverages. Fruits were the most commonly used plant parts, while vegetables were the most prevalent food category, often consumed raw or sauteed. The findings indicate that the Banceuy indigenous people maintain a strong relationship with plants for daily food consumption.

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## 1. INTRODUCTION

Plants are one of the most important food resources for humans. Ever since prehistoric times, edible food plants have been essential in human nourishment and civilization (Copeland & Hardy, 2018). The concept of local food refers to plants that involve the whole repertory that characterizes the local diet, not only species which are strictly endemic in particular areas (Rivera, *et al.*, 2005). Meanwhile, discourse about food cannot be separated from culture since every tribe has unique dishes. Food plants are plants that are used as food and then consumed directly or processed first. Plants have always been part of human life for providing food as energy and nutrients for a sustainable living (Day, 2013). Food plants can be in the form of leaves, fruits, flowers, and tubers (Iqbal, *et al.*, 2022).

This diversity of edible plant parts is deeply intertwined with the cultural and ecological richness found across different regions. Indonesia is a country that has a high number of plant diversity and indigenous tribes that are scattered throughout Indonesia. Indonesia has a high number of biodiversity particularly plant diversity and indigenous tribes that are scattered throughout Indonesia with distinctive cultures (Widjaja, *et al.*, 2014). Each tribe has different knowledge and ways of utilizing plants for daily activities. Moreover, each village has distinct perceptions and conceptions toward natural resources in their environment (Tika & Bortakur, 2008; Dewi, *et al.*, 2018). This high number of plant and cultural diversity means that each tribe has a unique relationship with the plants in their environment.

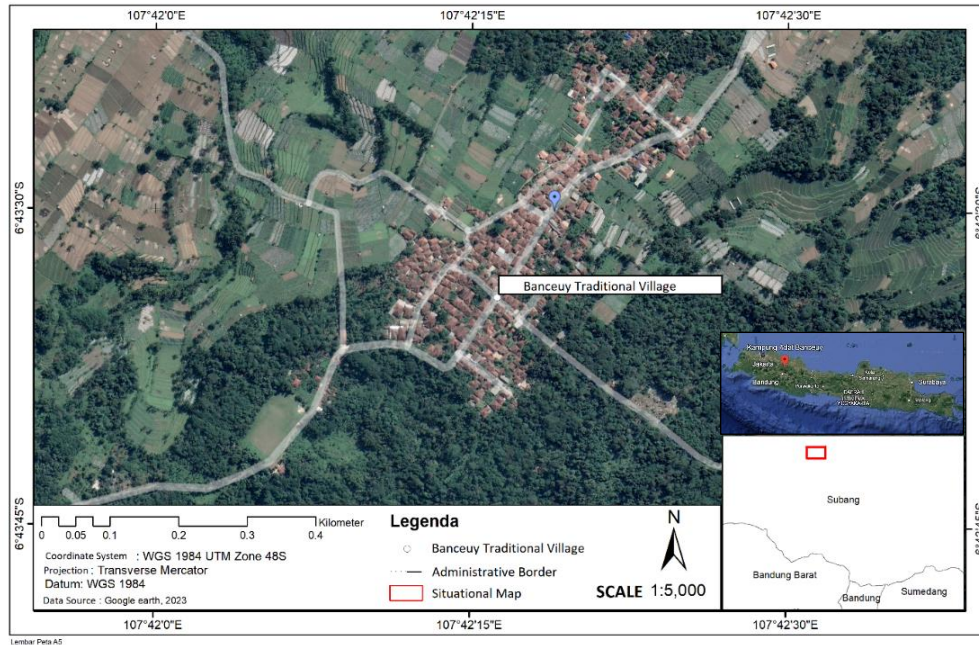
The Sunda ethnic group are well known for their unique food culture called *lalapan*, which is the consumption of raw, freshly-picked plants that play an important role in their daily diet (Hendariningrum, 2018). There are several remaining Sundanese traditional villages in West Java Province that live and maintain their culture and local wisdom, one of them is Banceuy Traditional Village, located in Subang Regency (Afif, 2020). Unlike regular villages, the people of the traditional villages still maintain their culture and practice it in their daily life. The ethnobotanical study of food plants in Banceuy Traditional Village has not yet been recorded, while the study of medicinal plants has been conducted by Weking *et al.* (2023) and Gondokesumo *et al.* (2023). This study aims to document the diversity of food plants in Banceuy Traditional Village, Subang Regency, West Java, Indonesia.

## 2. METHODS

The study was conducted in Banceuy Traditional Village, Subang Regency, West Java, Indonesia. Banceuy Traditional Village is located 50 km away from Bandung City, the capital city of West Java Province, at an altitude of 770 m a.s.l. and with a central coordinate of 6°42'16" W - 107°42'2" S. Banceuy Traditional Village has an area of 157 hectares which consists of 47 hectares of forest, 78 hectares of rice fields, 20 hectares of gardens, and 12 hectares of settlement.

The population in Banceuy Traditional Village is 948 people, consisting of 470 males and 478 females. Most Banceuy indigenous people work as farmers who plant rice, various vegetables, and fruits. In addition, Banceuy indigenous people are prohibited from entering rice fields and plantations on Fridays based on their local wisdom. The map of Banceuy Traditional Village is shown in **Figure 1**.

### Banceuy Traditional Village Map Location



**Figure 1.** Map of Banceuy Traditional Village

## 2.1. Materials

Food plants specimens that were collected from Banceuy Traditional Village various area start from rice field, plantation, forest, and yard. All specimens are preserved as voucher specimens.

## 2.2 Data collections

Data collection was carried out from May to July 2023 in Banceuy Traditional Village, Subang Regency, West Java, through semi-structured interviews. A total of 32 informants were interviewed, which consisted of two key informants (one traditional ruler and one head of the farmer group) and 30 regular informants who were housewives. Their ages range from 20 to 90 years old (average:  $48.5 \pm 15.75$ ).

There were 30 randomly selected housewives who are assumed to have knowledge about food plants used in their daily lives. Subsequently, the two key informants were purposely selected as they have comprehensive information on the village's cultural value and crop plant commodities. The collected data included food plant species diversity with their uses such as local names, plant names, scientific plant names, plant families, habits, locations, and used parts.

## 2.3 Identification of specimens

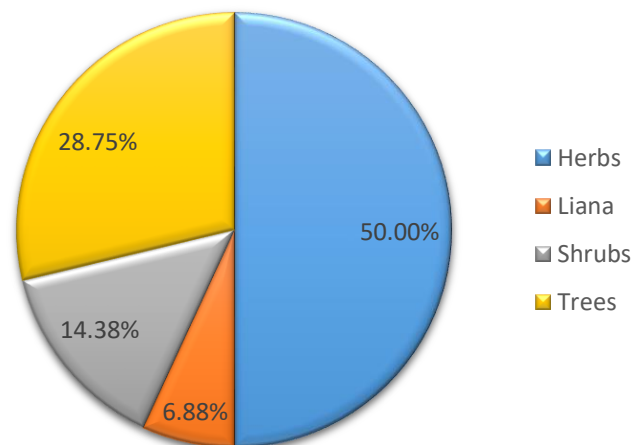
Voucher specimens which were collected during the field-guided observation were deposited at the Plant Systematics Laboratory of the Faculty of Biology, Universitas Gadjah Mada, Special Region of Yogyakarta, Indonesia. These specimens were identified using the identification key in *Flora of Java* (Backer & van den Brink, 1963; Backer & van den Brink, 1965; Backer & van den Brink, 1968) and refer the plants local name in *Tumbuhan Indonesia Berguna* (Heyne, 1987). The botanical nomenclature and accepted plant species names were validated using the Plants of the World Online (<https://powo.science.kew.org/>) website.

### 3. RESULTS AND DISCUSSION

#### 3.1. Species Diversity

Based on interviews and guided-field observation, Banceuy indigenous people utilize 160 local food species belonging to 55 families and 117 genera. Fabaceae is the most dominant family with 12 species, followed by Cucurbitaceae and Solanaceae with nine species each, and Zingiberaceae with eight species. Banceuy indigenous people know and utilize four types of habits with 50,00% (80 species) are herbs since most of them work as farmers, followed by trees with 28,75% (46 species), shrubs 14,38% (23 species), and liana 7,36% (11 species) for the minor habit. The type of food plant habits chart is displayed in **Figure 2**. The complete table about local food plants in Banceuy Traditional Village is displayed in supplementary table.

Herbs are the most dominant habits due to the cultivated food plants are generally found in Banceuy Traditional Village, including species in the family of Alliaceae, Brassicaceae, Cucurbitaceae, Zingiberaceae. According to [Petruzello \(2023\)](#), economically the majority of food plants in the world are herbaceous, such as cerealia, fruits, and vegetables. The Banceuy indigenous people also utilized other species that grow wild which are found in the rice fields, gardens, forests, roadsides, and yards. For example, they use plants from the Asteraceae family such as *Acmella paniculata*, *Crassocephalum crepidioides*, and *Emilia sonchifolia*, then *Limnocharis flava* and *Monocharia vaginalis* which are commonly found in rice fields.

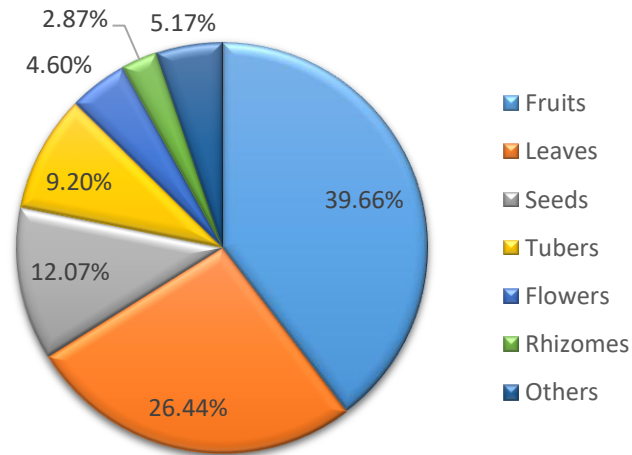


**Figure 2.** Types of food plant habits

Trees are the second most abundant food plant habits after herbs. This is due to various kinds of trees which were planted in the yard of the Banceuy indigenous people's house or their plantation. Most of the trees in the yard are *Syzygium aqueum*, *Syzygium aromaticum*, *Psidium guajava*, *Syzygium polyanthum*, *Garcinia mangostana*, and *Averrhoa carambola*. Around the forest were found *Lannea coromandelica*, *Durio zibethinus*, *Planchonia valida*, *Persea americana*, and *Nephelium lappaceum*. However, tree species are a good source of nutrients including carbohydrates, protein, fat, and fiber ([Lykke & Padonou, 2019](#)). In addition, trees can also provide a kind of healthy foods which are contained in fruits, leaves as vegetables, legumes, seeds, and vegetable oils that can diversify diets and overcome nutritional and seasonal food gaps ([Jamnadass, et al., 2015](#)).

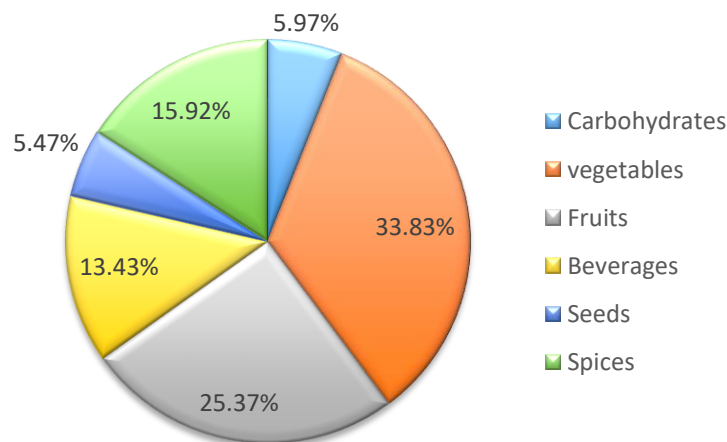
Banceuy indigenous people utilized 10 plant parts, with fruits being the most used part at 39.66% (69 species), followed by leaves at 26.44% (46 species), seeds at 12.07% (22 species), tubers at 9.20% (16 species), and flowers (8 species). Other parts such as roots, rhizomes,

barks, stems, etc. Fruits which are consumed by humans contain vitamins, minerals and fibers, various phytochemicals are regarded as beneficial to human health (Rodriguez-Casado, 2016). Leaves are plant parts that are widely used as food. This is due to their parts being easy to reach and can grow faster than other parts (Septiani, *et al.*, 2020). Moreover, leaves contain various metabolites and photosynthetic products (Ross, 2013). The food plant parts chart is shown in **Figure 3**.

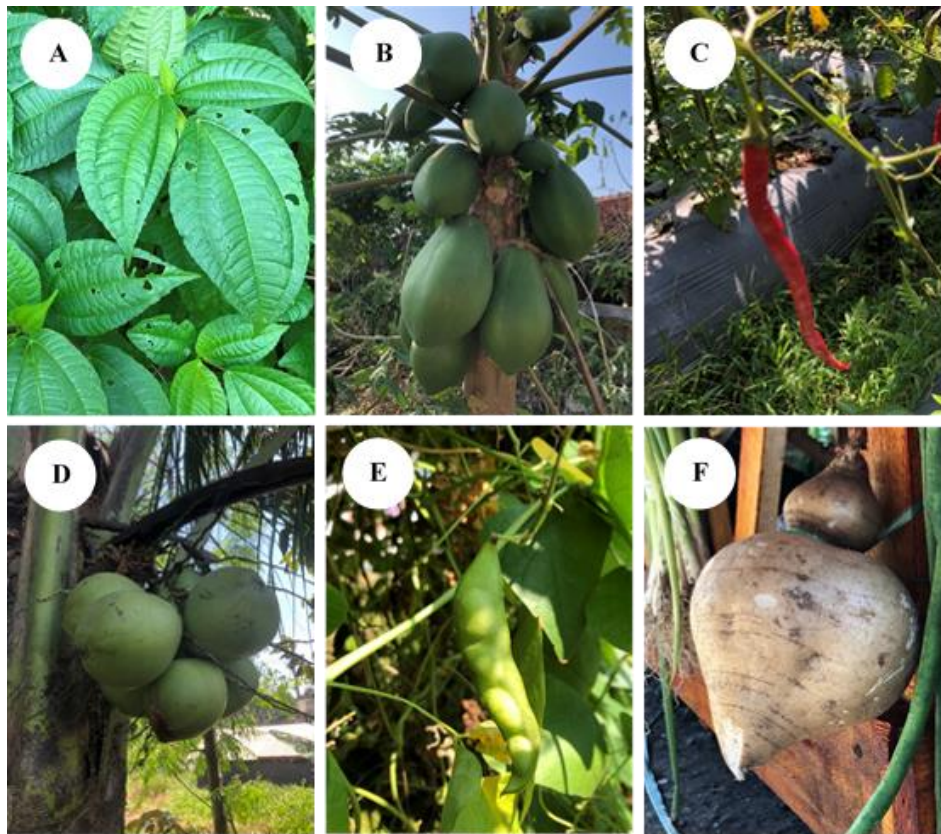


**Figure 3.** Food plant parts

There are 6 food plant categories which are utilized by the Banceuy indigenous people. The 6 food plants categorization is referred to Al-Yamini *et al.* (2023). Vegetables are the most used category with a percentage of 33.83% (68 species), followed by fruits at 22.37% (51 species), spices at 15.92% (32 species), beverages at 13.43% (27 species), while carbohydrates and seeds are the least utilized food categories with 5.97% (12 species) and 5.47% (11 species) each. The chart of food plant categories percentage is displayed in **Figure 4** below, while the example of food plant categories is shown in **Figure 5**.



**Figure 4.** Categories of food plants utilization



**Figure 5.** Source of food plants categories. A. Vegetables (*Pilea melastomoides*), B. Fruits (*Carica papaya*), C. Spices (*Capsicum annum*), D. Beverages (*Cocos nucifera*), E. Seeds (*Phaseolus lunatus*), F. Carbohydrates (*Pachyrhizus erosus*).

### 3.2. Source of Carbohydrates

A total of 12 food plant species besides rice are utilized as carbohydrates by Banceuy indigenous people. Most of the carbohydrate sources come from tubers such as *Manihot esculenta*, *Colocasia esculenta*, *Ipomoea batatas*, *Pachyrhizus erosus*, *Canna indica*, *Maranta arundinacea*, *Solanum tuberosum*, *Raphanus raphanistrum* subsp. *sativus*, *Daucus carota*, and *Dioscorea hispida*, while *Artocarpus altilis* from the fruits and *Zea mays* from the seeds. For consuming these sources of carbohydrates, usually, the tubers, fruits, and seeds should be processed first, through boiling or frying. Processing can make these food plants more palatable and soften the texture.

Carbohydrates play an important role in human life as a major source of energy (Lafiandra, *et al.*, 2014). Carbohydrates have a special place in the fulfillment of nutrition in human life because they are the largest single source of energy in food and satisfy the desire for sweetness (Brand-Miller, 2002). In general, carbohydrates can be found from several sources such as rice, cassava, potatoes, yam, and corn (Eke-ejiofor, 2015).

### 3.3. Source of Fruits

A total of 51 food plant species are utilized as fruits by Banceuy indigenous people, such as *Mangifera indica*, *Syzygium aqueum*, *Psidium guajava*, *Muntingia calabura*, *Garcinia mangostana*, and *Carica papaya*. Usually, these fruits are consumed freshly. *Mangifera indica* was one of the most favorite fruits among others according to the Banceuy indigenous people during interviews. Alongside vegetables and seeds, fruits have a significant role in fulfilling nutritional sources for humans, especially as a source of vitamin C in the form of ascorbic acid,

minerals, fiber, and folic acid, which are essential for human health (Hernández, *et al.* 2006; Vincente, *et al.* 2014).

Research conducted by Kulsum and Susandarini (2023), the people of Cigalontang Village in Tasikmalaya Regency were found to consume the same fruits as in Banceuy Traditional Village, such as *Psidium guajava* and *Syzygium aqueum*. Study by Ramdianti *et al.* (2013) in Pulo Traditional Village, Garut Regency found similarities in fruit plant species that are also consumed in Banceuy Indigenous Village, including *Mangifera indica*, *Mangifera foetida*, *Durio zibethinus*, and *Punica granatum*.

### 3.4. Source of Vegetables

A total of 67 food plant species are utilized as vegetables by Banceuy indigenous people, meaning this food plant category has the most species. This source of vegetables can be consumed either fresh as *lalapan* or through a cooking process such as stir-fry or sauté. For *lalapan* which is consumed fresh, they utilize food plant species, namely the leaves of *Polyscias fruticosa*, *Pilea melastomoides*, *Manihot esculenta*, and *Ocimum basilicum*. These species are consumed by cooking, such as leaves of *Amaranthus hybridus*, *Ipomoea aquatica*, *Brassica* spp., *Gnetum gnemon*, then leaves and flowers of *Carica papaya*. Vegetables are a key component in human food consumption and source of nutrients, minerals and vitamins (Jena, *et al.*, 2018).

A study by Cahyanto *et al.* (2018) in several villages of eight sub-districts in Subang Regency with 100 informants found that 50 food plant species were utilized as *lalapan*. However, the Banceuy Traditional Village was not included in that study. There are several similar species in Banceuy Traditional Village, although some species that Banceuy indigenous people consume differ from other villagers, such as *Polyscias fruticosa*, *Staurogyne elongata*, and *Cnidocolus aconitifolius*.

There are similarities in food plant species as a source of vegetables between Banceuy Traditional Village and several indigenous villages in West Java. For example, in Naga Traditional Village, Tasikmalaya Regency, some food plant species such as *Staurogyne elongata*, *Polyscias fruticosa*, *Cnidocolus aconitifolius*, *Breynia androgyna*, and *Planchonia valida* were consumed by Naga indigenous people based on research by Septiani *et al.* (2020).

Those species are also found and consumed in Banceuy Traditional Village. Various plant species by Banceuy indigenous people are also consumed in Cireundeu Traditional Village, Cimahi City, based on a study conducted by Tahnia (2022), namely, *Carica papaya*, *Pilea melastomoides*, *Gnetum gnemon*, *Brassica rapa* var. *parachinensis*, and *Planchonia valida*.

### 3.5. Source of Beverages

A total number of 27 food plant species are utilized as beverages in Banceuy Traditional Village. Several derived plant products can be categorized as beverages, such as juice, coffee, herbal, and tea. Banceuy indigenous people utilize a number of species like *Persea americana*, *Psidium guajava*, *Carica papaya*, *Musa x paradisiaca*, *Annona muricata*, and *Solanum lycopersicum* as juice. Juice is a kind of beverage that made from fruits or vegetables which have had their natural liquid get extracted (Alshammari, 2021; Milanda, *et al.*, 2021).

A few species are consumed by pouring it with hot water, such as a herbal tea such as *Clitoria ternatea*, *Cymbopogon citratus*, and *Mentha x piperita*. Subsequently, rhizome decoction of Zingiberaceae species, namely *Zingiber officinale*, *Curcuma longa*, and *Curcuma zanthorrhiza* is consumed by Banceuy indigenous people and is believed to have various benefits toward health. Zingiberaceae can be utilized as beverages or known as *wedang empon* for some species like *Zingiber officinale*, *Curcuma longa*, and *Kaempferia galanga*

(Fitriarni, *et al.*, 2021). Leaves decoction of several species is consumed, including *Piper betle*, *Piper sarmentosum*, *Tinospora crispa*, and *Blumea balsamifera*. Implementation of these herbal drinks in Banceuy Traditional Village has been studied by Weking *et al.* (2023) and Gondokesumo *et al.* (2023).

### 3.6. Source of Spices

A total of 32 food plant species are the source of spices and used as seasonings by Banceuy Indigenous people for their daily cooking. The daily cooking cannot be separated from Banceuy Traditional Village's life. Many species are planted by the Banceuy indigenous village in their yard or plantation, such as *Allium fistulosum*, *Zingiber officinale*, *Alpinia galanga*, *Curcuma longa*, *Capsicum annum*, *Capsicum frutescens*, *Arenga pinnata*, *Syzygium aromaticum*, *Syzygium polyanthum*, *Apium graveolens*, *Piper nigrum*, and *Cymbopogon citratus*, despite some species like *Allium cepa* var. *aggregatum*, *Allium sativum*, *Coriandrum sativum*, *Aleurites moluccana*, and *Myristica fragrans* are bought from the market.

The source of seasonings is spices, which have been used for centuries and play an essential role in civilization (Erhenhi, *et al.*, 2016). Spices as a source of seasonings are obtained from various plant parts, not just leaves, but seeds, rhizomes, fruits, roots, and barks (Green, *et al.*, 2012). The spices are utilized in minute amounts for cooking to enhance taste, aroma, and color or can even act as preservatives (Sachan, *et al.*, 2018). Benke *et al.* (2022) states that onion species such as *Allium cepa* var. *aggregatum*, *Allium sativum*, and *Allium fistulosum* are essential major food crops. Chili pepper (*Capsicum* spp.) of the Solanaceae family is widely cultivated in Indonesia (Habibi, *et al.*, 2013) such as *Capsicum annum* and *Capsicum frutescens* and are important in Sundanese food for making chili sauce.

### 3.7. Source of Seeds

A total number of 11 food plant species are utilized as seeds by Banceuy indigenous people, of which most of them are classified in the Fabaceae family such as *Psophocarpus tetragonolobus*, *Archidendron jiringa*, *Glycine max*, *Mucuna pruriens* var. *utilis*, *Parkia speciosa*, *Phaseolus lunatus*, *Arachis hypogaea*. As the third largest plant family in the world, Fabaceae is widely cultivated and consumed due to its seeds having high protein content.

Moreover, the plants of this family can fertilize the soil by fixing nitrogen into the soil (El Sabagh, *et al.*, 2020). The seeds of Fabaceae family are rich source of protein, fat, carbohydrates, vitamins, and several micronutrients (Gulewicz, *et al.*, 2014) and can be one of the most important food sources to fulfil daily nutrition. Other than Fabaceae, some species are used as a source of seeds by the Banceuy indigenous people namely, *Anacardium occidentale* of Anacardiaceae, *Theobroma cacao* of Malvaceae, and *Elettaria cardamomum* of Zingiberaceae.

## 4. CONCLUSION

In conclusion, this study's results indicate that Banceuy Traditional Village, Subang Regency, West Java, still maintains their local knowledge regarding the utilization of local food plants. These plant species are also essential sources of carbohydrates, vegetables, fruits, seasonings, seeds, and beverages. In addition, the local food plants also support Banceuy indigenous people economically, as most of them are farmers. Information based on local knowledge of the local food plants' utilization is essential.

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## 6. AUTHORS' NOTE

We declare that there is no conflict of interest regarding the publication of this article between authors. We confirmed that the paper was free of plagiarism.

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