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Traditional markets and diversity of edible plant trading: Case study in Ujung Berung, Bandung, West Java, Indonesia

BUDIAWATI SUPANGKAT ISKANDAR[1], JOHAN ISKANDAR[2,3], BUDI IRAWAN[2,3], RUHYAT PARTASASMITA[2,3,♥]

[1]Department of Anthropology, Faculty of Social and Political Science, Universitas Padjadjaran. Jatinangor, Sumedang, 45363, West Java, Indonesia.
[2]Program in Environmental Science, School of Graduates (PSMIL & DIL) and Institute of Ecology (PPSDAL), Universitas Padjadjaran. Jl. Raya Bandung-Sumedang Km 21, Jatinangor, Sumedang 45363, West Java, Indonesia.
[3]Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Padjadjaran. Jl. Raya Bandung-Sumedang Km 21, Jatinangor, Sumedang 45363, Indonesia. ♥email: ruhyat.partasasmita@unpad.ac.id; rp2010rikkyo@gmail.com

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Abstract. *Iskandar BS, Iskandar J, Irawan B, Partasasmita R. 2018. Traditional markets and diversity of edible plant trading: Case study in Ujung Berung, Bandung, West Java, Indonesia. Biodiversitas 19: 437-452.* Traditional markets are where traders and buyers meet; places where the supply and demand activities of selling and buying between traders and buyers occur. Buying and selling activities are realized based on the practice of bargaining, made possible by a negotiated willingness to slide a price. In bargaining, social relationships are activated. Traditional markets are managed by local companies called *PD Pasar*. The traders are generally small business groups. A particular feature of traditional markets is that they are primarily places to trade various foodstuffs that are needed by urban dwellers, including products such as rice and other additional staple foods, vegetables, spices and fruits. The aim of the study reported here was to detail various edible plant species and their variations (landraces) that are the source of products traded in a typical traditional market of West Java, Indonesia. The products of interest to us included carbohydrate staple foods, vegetables, spices, and fruits, produced by village farmers. We investigated the trading network for these edible plant commodities; and the role of traditional markets in supporting the conservation of biodiversity in the edible plants traded. The method used in this study was qualitative, applying an ethnobotanical approach. Field techniques of direct observation, participant observation and deep interview were applied. The results of the study showed that the traditional market of Ujung Berung, in Bandung, West Java, plays an important role in trading various edible plants produced by village farmers. Altogether, 120 plant species were recorded in the market, out of a total of 188 variants (species, and intra-species landraces), representing 44 families. There were 103 species that provided vegetables, 58 species used as spices, 39 species used for their fruits, and 10 that provided carbohydrate staple foods. In general, these plants commodities traded in the Ujung Berung traditional market are supplied by village traders or are bought from the central market in Bandung. The traditional market of Ujung Berung, Bandung has an important role as a place of economic activity for small businesses Furthermore, it is a factor supporting biodiversity in the edible plants traded.

Keywords: Biodiversity conservation, diversity of traded edible plants, traditional market, Ujung Berung, Bandung

INTRODUCTION

Traditional markets are where traders and buyers meet; places where the supply and demand activities of buying and selling between traders and buyers occur. Nowadays, it has been recognized that there are two main types of market in Indonesia, namely the traditional and the modern market. The traditional markets are the oldest markets in Indonesia. In general, the physical condition of a traditional market is simple. Buying and selling activities are achieved by bargaining which is made possible by acceptance of a **sliding price** system. In bargaining, social relations are culturally activated (Supangkat-Iskandar 1998; Supangkat 2012).

The concept of modern markets refers to more than just the physical condition of the buildings that house them or to the sophistication of the technological tools used in their day-to-day operations. Rather, unlike traditional markets, in modern markets, various goods are sold at **fixed** prices. In the modern market, a face-to-face bargaining system is not practiced. As a result, social relations that include face-to-face routines with active communication between traders and buyers are not needed. Indeed, there is a form of modern market in which traders do not need to directly see the commodities that are available for trade; for example, in transactions that are undertaken in e-commerce markets.

A traditional market has an important function for the wider community: it is a place where people who are not absorbed by the formal sector can endeavor to earn a living; a place of business for those who do not receive a permanent income from economic activities involving the community; and a place for trading various agricultural commodities produced by village farmers (Supangkat-Iskandar 1998; Supangkat 2012)

There is a wide diversity of commodities traded in the traditional markets, not only dry foods (*barang pangan keringan*) and industrial products, but also various wet foods (*barang pangan basahan*), and various agricultural commodities, such as staple carbohydrate-containing foods including rice, as well as other edible plant products such as vegetables, spices, and local fruits produced by village farmers (cf. Arman 1996; Supangkat 2012; Susanti 2015;

Yurlisa et al. 2017).

Therefore, it can be inferred that traditional markets provide a lot of benefits to the community. They provide opportunities for employment, contribute to local economic development, and facilitate the trading of the agricultural output of village farmers. In addition, traditional markets provide an avenue for traders and buyers to negotiate an appropriate price based on local supply and demand contingencies. The prices for the various commodities are negotiated by bargaining in a process of face-to-face social interaction that reflects the economic realities of the local community (Supangkat-Iskandar 1998; Supangkat 2012; Widiandra and Sasana 2013; Muftiana and Maulina 2016). However, traditional markets do have limitations and weaknesses: for example, infrastructural constraints; a negative image as perhaps dirty and unhygienic; and locations often at the side of main roads and thoroughfares which can be the cause of significant traffic jams.

Nowadays, in recent developments, some traditional urban markets in Indonesia have been dramatically affected and threatened by the rapid growth of modern mini-markets (Supangkat 2012; Hasanah and Winarwati 2012; Arianty 2013; Masitoh 2013; Widiandra and Sasana 2013; Susilowati 2014). According to a survey conducted by Nielses, the number of traditional markets in Indonesia is estimated at 1.7 million, or about 73% of the total number of markets in Indonesia (Masitoh 2013). However, the growth rate of modern markets is much higher than that of the traditional markets. Modern markets have grown by 31.4% per year, while the growth rate of traditional markets that was previously at 31.4% per year has decreased to 8% per year (Arianty 2013).

The decrease, and in some localities extinction, of traditional markets has the potential to cause significant disadvantage to those people outside the formal economic sector who have come to rely on such markets as places to do business. In addition, decline in traditional markets may lead to a decrease in plant diversity for those agricultural commodities produced and traded by village farmers. The variety of edible plants produced by village farmers is predominantly traded in such traditional markets instead of in mini-markets. Unlike traditional markets, modern markets selectively trade in a limited range of agricultural commodities that are perceived to be of high-quality Moreover, the edible plant commodities, such as fruits, that are traded in modern markets, tend to be dominated by importation rather than by local produce. Consequently, the local agricultural commodities are sold in modern markets in relatively low amounts compared to imported commodities.

As a result of these concerns, various aspects of traditional markets have recently become important objects of research by some scholars in Indonesia, including Rufaidah (2008), Fonsah et al. (2008), Sudiayanto (2011), Sovina and Puspa (2012), Asri (2010), Kurniawan (2014), Fajrin et al. (2015), Muftiadi and Maulina (2016), and Slamet et al. (2017). In addition to a focus on sociological and economic aspects of this phenomenon, the research has also focused on some impacts on the diversity of edible plants traded in the traditional market of Indonesia. Examples of this research include: a study of trading in various local fruits in several traditional markets of Pontianak, West Kalimantan (Arman 1996); a study of trading in various local vegetables harvested from swamps sold in the traditional markets of Martapura, South Kalimantan (Susanti 2015); and a study on trading vegetables in several traditional markets in the district and municipality of Kediri, in East Java (Yurlisa et al. 2017). However, the biodiversity of local edible plants, including staple carbohydrate foods, vegetables, spices, and fruits traded in traditional markets has been a less frequent subject of study.

In this paper, four main aspects are elucidated concerning the trade in edible plant commodities in the traditional market of Ujung Berung, Bandung, in West Java, Indonesia, namely: (i) the ecological or environmental history of the Ujung Berung tarditional market; (ii) the species diversity and intra-species variation (*landraces*) of edible local plants, including staple carbohydrate food crops, vegetables, spices, and fruits that are commonly traded in the Ujung Barung traditional market; (iii) the trading network for edible plant commodities in the market; and (4) the role of the traditional market of Ujung Berung for conservation of the species and intra-species variations (*landraces*) of edible local plants traded.

MATERIALS AND METHODS

Study site

This research was carried out in the traditional market of Ujung Berung Bandung, sub-district of Ujung Berung, municipality of Bandung, Province of West Java, Indonesia (Figure 1). Geographically, the traditional market of Ujung Berung is located 668 m asl. It is situated in the eastern part of Bandung (Figure 1). The distance from central Bandung to the traditional market of Ujung Berung is approximately 12 km. This traditional place is located on the roadside of A.H. Nasution Street. To reach the traditional market of Ujung Berung from central Bandung various means of city transport are available, such as urban minibuses (*angkot*) and city buses (*bis kota)* that pass through Cicaheum terminal. Most of the public transport from Cicaheum and Ujung Berung heading in an East direction, can go on to Cileunyi, Sumedang and Cirebon or Garut and Tasikmalaya (Figure 2).

The total size of the traditional market of Ujung Berung, Bandung is registered at 8,515 m^2 consisting of 8,120 m^2 for buildings and the rest for parking area. The traditional market of Ujung Berung can be divided into two areas, namely the inside part and the outside part of the market. The inside part consists of 450 kiosks (*kios*) and 250 table stalls (*lapak meja*) as places for trading various everyday goods of the traders. The standard size of a kiosk is 2 x 3 m. The outside part of the market is composed of an *angkot* terminal, at the roadside of A.H. Nasution Street, behind the market, and adjacent to the area of Ujung Berung square (Figure 2). The traders who trade in the outside part of the market, predominantly sell their commodities from table stalls or without tables using just a rolled-out plastic mat. Each table stall has a simple roof made of tarpaulin or plastic.

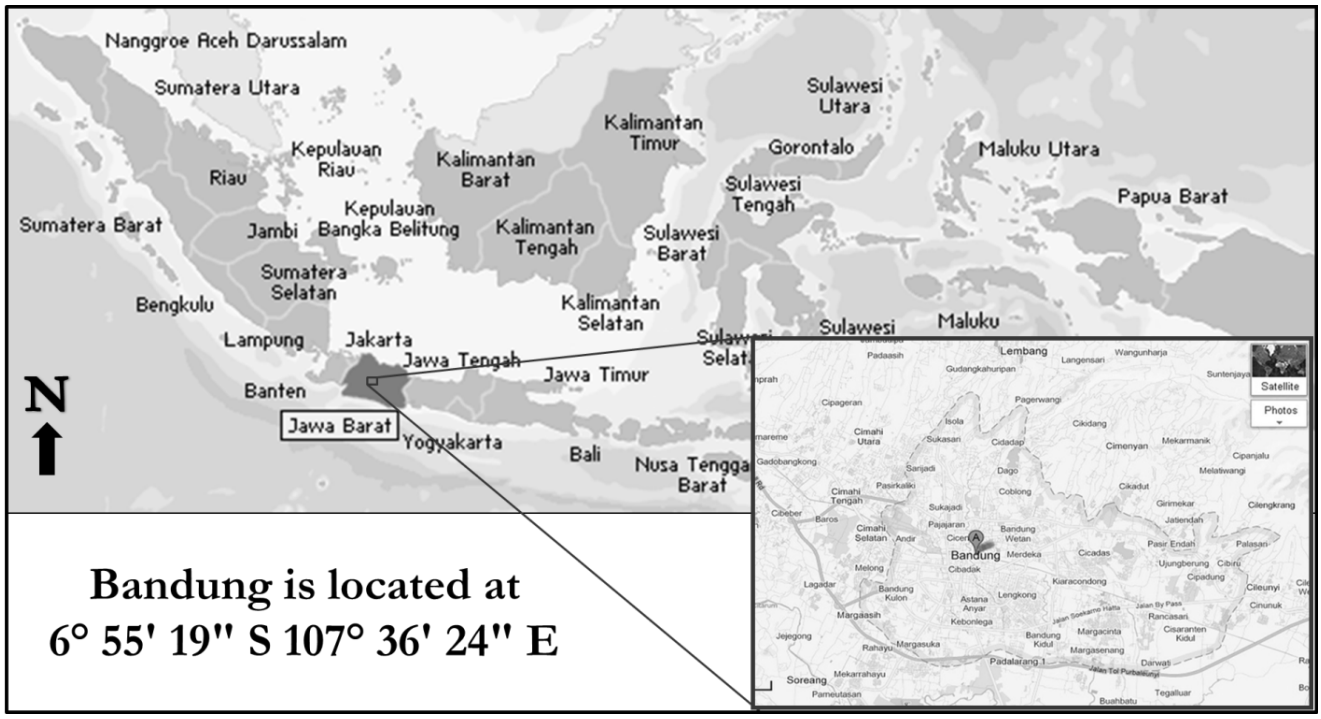

Figure 1. The location of the research, the traditional market of Ujung Berung, Bandung, West Java, Indonesia

Figure 2. The general view of the traditional market of Ujung Berung, Bandung, West Java, Indonesia (the front side)

Figure 3. The back part of the traditional market of Ujung Berung, Bandung, West Java, Indonesia

Regarding time of operation, Ujung Berung traditional market can be classified into two groups, namely the early morning market (*pasar subuh* or *pasar pagi*) and the day market (*pasar siang*). The early morning market takes place between 2.00 am and 7.00 am and is predominantly located in the outside part of the market. In contrast to the early morning market, the day market is held between 8.00 and 5.00 pm, and predominantly takes place in the inside part of the market.

Various commodities are sold in the Ujung Berung market, including beef, chicken meat, fish, traditional foods, drinks, stationery, cosmetics, clothes, shoes, sandals, bags, baby clothes, music and movie CDs, gold jewelry, drapery, and tablecloths; staple foods such as rice, corn, taro, and cassava; spices; vegetables; and fruits (Figure 3-7). In general, the commodities can be divided into two categories: 'dry goods' (*garingan*), such as packed industrial foods, stationery and clothing; and 'wet 3 (*baseuhan*) including traditional foods, beef, chicken meat, and fish.

According to our survey, Ujung Berung tarditional market has on record about 1,500 traders of whom many

are local Sundanese people and others are of various ethnic identities, including Javanese and Betawi; Sumatrans from Padang, Palembang, and Batak regions; and Chinese. The traders are both males and females, with experience trading in the market of usually between 1 and 5 years, but in a few cases of more than 50 years.

Research procedures

The method used in this study was qualitative, based on an ethnobotanical approach (cf. Cresswell 1994; Martin 1995; Cunningham 2001). In order to collect primary data, several field techniques were used, namely direct researcher observation including a plant survey; participant observation; and deep interviews with informants experienced in the operations of the market. Observations recorded included the general conditions of the Ujung Berung market, such as the state of the trading booths (kiosks) and table stalls: aspects of the bargaining activities between consumers and traders; and listings of the various goods that are traded in the market. Both informal observations and systematic surveys of the edible plant species being traded by 178 traders were undertaken directly by authors and their research assistants. Special intensive surveys of the various commodities, particularly of staple carbohydrate foodstuffs (rice and others), vegetables, spices, and fruits that are commonly traded at the early morning market, were carried out before 7.00 am. Then, the same surveys of these commodities were repeated between 8.00 am and 5.00 pm, emphasizing the commodities being traded in the day market. Each species of staple food (e.g. rice, taro, and cassava), spices, vegetables and fruits being traded in both the early morning market and the day market was recorded. The data included the names of all species together with a listing of the infra-species variations (cultivars and landraces) on sale in the market. The surveys were conducted each week for about 3 months, with which we aimed to record a comprehensive listing of all plant commodities that were commonly sold in the Ujung Berung traditional market during that time period. However, these surveys were not undertaken according to specific times representing both rainy and dry seasons. Availability of the various traded plant commodities, in the Ujung Berung market are very likely influenced by such seasonal effects.

Deep interviews were conducted with competent informants purposively selected with regarded to heterogeneities among the market participants. These informants included rice traders, spices traders, vegetable traders, and fruit traders. Botanical information including local name, species, variations (landraces), origin of these traded plants, and details of the trading chain systems were collected. In addition, participant observation was also carried out. For example, the researchers participated with informants to buy edible plant commodities in the central market of Bandung, Pasar Induk Caringin. We went to Pasar Induk Caringin at midnight and after shopping we participated in preparations for the set-up of the stall tables.

Data analysis

The edible plants providing the traded commodities of staple carbohydrate foods, spices, vegetables, and fruits recorded in our observations and systematic surveys were identified to species level by using standard botanical literature, including Backer and Bakhuizen (1968); Heyne (1987); Partoharjono and Grubben (1996); and Siemonsa and Grubben (1996). Data collected in deep interviews and in participant observation were analyzed by cross-checking, summarizing and synthesizing, followed by compiling a narrative based on descriptive and evaluative analysis (Newing et al. 2011).

RESULTS AND DISCUSSION

Environmental history of the traditional market of Ujung Berung

According to local knowledge of the ecological and environmental history of the area, based on information of informants who retired trades whit age more than 70 years, they get story from their parent that the traditional market of Ujung Berung, Bandung has existed in1927. The informant are based on personal experiences can tell about the condition of traditional markets in 1960s (Supangkat 2012). Initially, the traditional market of Ujung Berung was included into the district of Bandung, province of West Java. In 1960's, traders in the traditional market of Ujung Berung, had not established permanent kiosks for selling their various goods. Rather, at that time, they sold their goods in a vacant lot. Each trader placed his or her produce on a rolled-out mat on the ground. The various commodities were put in a small flat bamboo basket (*nyiru* or *tampah*) called a *dadasar* (Figure 3). Therefore, the *dadasar* term is still being used today by traders to describe a container used for keeping various goods that are going to be sold and that are placed on the table or in the kiosk. Today if it is raining, each trader puts up a roof of tarpaulin that is tied onto several supporting poles.

In the 1960s, the activities of the traditional market of Ujung Berung, Bandung began at dawn and ended between 8.00 to 9.00 o'clock. Various commodities were primarily agricultural products, such as beef, fishes, chickens and traditional market foods, such as cakes, and rice and side dishes. In addition, other commodities were traded, such as a variety of products supplying the daily needs of the local community, including fabrics and readymade cloth.

In the period from 1965 up to the 1970s, the Ujung Berung traditional market was considered to be satisfy the requirements of the traders. Most of the buyers who visited the Ujung Berung market came from people who resided around the market. At that time, the commodities traded were predominantly those that met daily needs of the local communities, including rice, vegetables, and dry foods such as crackers, salted fish, green beans and so on (Figure 4,5,6,7).

In the 1970s, most traders in the Ujung Berung market, were selling their commodities in kiosks. The kiosks were of two types, namely semi-permanent kiosks made of basic materials of woods and bambu (*gedeg*), or permanent

kiosks made of solid walls and timber. Some traders, however, still sold commodities on rolled out plastic sheets or mat. After trading time, the commodities that had not already sold out were brought back to their homes carried in bamboo baskets (*tolombong* or *dingkul*).

Ten years later, by the period of the 1980s, a wider range of commodities were being traded, including meat balls (*baso*), noodles (*mie*), herbs (*bumbu dapur*), vegetables, tempe, and chicken. In addition, the number of clothing merchants had greatly increased. In general, most merchants occupied kiosks made of boards (*papan*) and bamboos (*gedeg*), but the street vendors (*pedagang kaki lima*) were placed in behind the inner market. The number of consumers who came to the market also significantly increased, including local people, people residing in new settlements, laborers, and employees of factories. Moreover, the merchants involved in trading commodities were not only predominantly Sundanese, but also from a variety of other ethnic groups. For example, the clothing merchants were predominantly of Minang or Padang ethnicity (Supangkat 2012).

In 1986, the Ujung Berung traditional market was hit by a fire disaster. As a result, almost all kiosks were burned to the ground. By 1987 the old kiosks had been replaced by new ones and were occupied by merchants. The merchants that daily opened their kiosks between 8.00 am and 5.00 pm o'clock were called merchants of the inner market, in contrast to the so-called traders of the outer market who daily traded from dawn to between 8.00 and 9.00 am in the outer kiosks such as in the front of the inner market at the roadside of A.H. Nasution Street, and behind the inner market.

Beginning around the year 2000, modern markets such as supermarkets began to be constructed and operated in the Bandung precincts. A typical supermarket sold various commodities including vegetables; beef; fish; nine-basic daily needs of people (**sembako**) such as rice, sugar and cooking oil; glassware; and cloth of good quality. Overall, these modern markets also offered a more comfortable shopping environment. The traditional Ujung Berung market was affected not only by the development of supermarkets but also by the recurrence of fire disasters. For example, in 2010 the Ujung Berung traditional market was once again gutted by fire. Most kiosks of the inner market were affected by the fire disaster. Nevertheless, in the same year new kiosks were independently constructed by merchants with mutual local cooperation (*gotong royong*). Since the kiosks had been independently built by the merchants without any assistance from the government, the independence of the merchants increased. In other words, the merchants were not easily subject to any disruptive intervention.

Nowadays, the number of registered traders commonly involved in trading in the inner market of Ujung Berung, total 505 people, consisting of 309 males and 296 females. In addition, the number of merchants that commonly trade in the outer market has been documented as totalling 338 people; i.e. 218 males and 120 females (Supangkat 2012). The various commodities predominantly traded include rice, white floor, cooking oil, noodles, sugar, salt, salted fish, soap, and butter; which are all regarded as **barang-barang garing** (dry goods). In addition, there is a regular trade in commodities like tofu (**tahu**), tempe, vegetables, fish, chicken meat, beef, and vegetables that are normally called **barang-barang basah** (wet commodities). See Table 1) for a listing of the various types of commodities sold by traders in the inner and outer market areas of Ujung Berung traditional market, according to Supangkat (2012).

Species diversity and variations (landraces)

On the basis of our direct field survey and of deep interviews with informants in Ujung Berung market, we have recorded 120 plant species representing 44 families, and amounting to a total of 188 variations (landraces) of edible plant commodities. These commodities are classified as either staple carbohydrate foods, spices, vegetables or fruits in Table 2.

Of the 120 species, 103 have cultivars that are used as vegetables, 58 find uses as spices, and 39 have uses as fruits (Table 3).

From Table 2 and Table 3, it can be seen there is a high diversity of edible plants traded in the traditional market of Ujung Berung. For example, in our survey there were 39 species of plants that had uses as edible fruits. This result is similar to the results of the survey of markets by Arman (1996) in West Kalimantan. He found that 38 species of fruit are commonly traded in the eight traditional markets of Pontianak, West Kalimantan, including Pasar Mawar, Pasar Kemuning, Pasar Dahlia, Pasar Cempaka, Pasar Puring, Pasar Flamboyan, Pasar Teratai, and Pasar Dunia (Arman 1996).

Another category of edible plants, namely plants used as vegetables, also showed a very high diversity in our survey. We recorded at least 103 plant species with uses as edible vegetables in the Ujung Berung traditional market in Bandung. In contrast to this diversity in the Ujung Berung market, Yurlisa et al. (2017) recorded only a total of 28 species from 16 plant families with uses as edible vegetables in 15 traditional markets in the districts and municipality of Kediri, in East Java.

Both ecological and socio-economic cultural factors have been considered as contributing to the high species diversity in the vegetables traded in the traditional market of Ujung Berung.

Among the ecological factors, for example, it has been recognized that some of the highland areas of West Java, such as Lembang, Garut and Ciwidey, are significant centres of production for vegetables due to very favorable ecological factors, such as optimum temperatures and soil fertility (Hardjono 1991). Moreover, the vegetables produced there are regularly sold to central markets in Jakarta and Bandung, not only to the traditional Ujung Berung market. Indeed, the Palintang highland area on the northern outskirts of Bandung, located in close proximity to the Ujung Berung markets, is acknowledged as one of the major vegetable production areas of the Bandung region. Most vegetable products of Palintang are sold to middlemen in the traditional market of Ujung Berung (Iskandar et al. 2017).

An additional factor in the high species diversity of vegetable commodities traded in the Ujung Berung market, is a result of particular cultural attributes of the Sundanese people of West Java. Sundanese culture has traditionally favoured the consumption of a wide diversity of both fresh and cooked vegetable products in its cuisine. Among the fresh vegetables consumed are **engkol** (*Brassica oleracea* L), **salada** (*Nasturtium officinale* R.Br), **kenikir** (*Cosmos caudatus* H.B.K), **terong** (*Solanum melongena* L), **tespong** (*Oenanthe javanica* (Blume) DC), **takokak** (*Solanum torvum* Swartz), and **kemangi** (*Ocimum bacilicum* L). Examples of cooked vegetable species in Sundanese cuisine are **bayem** (*Amaranthus hybridus* L) often included in vegetable soup (**sayur bening**), **tumis** or **oseng**; cucumber (*Cucumis sativus* L) commonly made into **lotek**, acar, and tumis or osengan; **engkol,** the main ingredient in **karedok, tumis** or **osengan**, and **soto**; **leunca** (*Solanum nigrum* L) made into **tumis** or **oseng**, and **ulukutek**; and **kangkung** (*Ipomoea aquatica* Forssk) and **genjer** (*Limnocharis flava* (L) Bunchenau) made into **lotek**, and **tumis** or **osengan**. Thus, in their daily lives, most Sundanese households have traditionally consumed a quite specific menu of rice, *sambal*, fresh vegetables, cooked vegetables, and fish or meat (cf. Surawiria 2006). Certainly, a diversity of edible vegetables is a key component of most meals sold in popular Sundanese restaurants. As a result, edible vegetables are predominant in the commodities traded in traditional markets of Bandung City, including the traditional market of Ujung Berung.

Table 1. Various commodities, and details of traders selling them, in Ujung Berung traditional market, Bandung, West Java, Indonesia (Supangkat 2012)

Commodities	Traders in the inner market (number of individuals)			Traders in the outer market (number of individuals)		
	Male	Female	Total	Male	Female	Total
Gold shop	1	5	6	0	0	0
Stationery	2	11	13	1	0	1
Electronics	0	1	1	0	0	0
Cosmetics	3	5	8	1	0	1
Nine basic material foods (*sembako*)	11	7	18	25	22	47
Plastic & Packaging	0	3	3	2	7	9
Adult clothing	16	27	43	1	1	2
Children's clothing	9	14	23	1	1	2
Underwear	7	3	10	0	0	0
Drinks	0	4	4	2	5	7
Food	4	4	8	0	0	0
Coconuts and bananas	2	11	13	4	18	22
Vegetables	5	6	11	63	95	158
Chicken	4	10	14	22	33	55
Beef	2	4	6	2	11	13
Lamb	0	1	1	0	0	0
Snacks	8	15	23	16	17	33
Potpourri/Rampe	2	2	4	0	1	1
Mixed goods of kitchen tools (*klontongan*)	2	3	5	2	5	7
Shoes, Sandals	5	12	17	0	2	2
DVDs	0	3	3	0	0	0
Accessories	5	13	18	1	4	5
Tofu and Tempe	4	3	7	19	22	41
Rice	1	10	11	0	2	2
Salted fish	3	4	7	6	5	11
Spicy cooked milkfish, mackerel tuna (*pindang bandeng, tongkol*)	2	2	4	2	6	8
Freshwater fish	1	1	2	2	5	7
Sea food	1	0	1	3	5	8
Eggs	2	0	2	4	6	10
Seasoning foods	5	4	9	8	9	17
Cake ingredients	1	5	6	0	0	0
Meatballs ingredients	2	5	7	3	5	8
Fruits	2	8	10	2	8	10
Shoe soles	2	0	2	0	0	0
Services	2	0	2	0	0	0
Hijabs and Muslim Dresses	4	1	5	1	2	3
Tooling	2	2	4	0	1	1
Drugs	0	3	3	0	0	0
Pulses	1	0	1	0	0	0
Barber shop	0	1	1	0	0	0
Keys	1	1	2	0	0	0
Charcoal/ash rubs	0	0	0	0	4	4
Cigarettes	0	0	0	0	1	1
Cooks	0	0	0	3	6	9

Table 2. List of edible plants commodities are commonly traded in the traditional market of Ujung Berung, Bandung, West Java, Indonesia

Indonesian name (Local name)	Scientific name	Family	Category	Part of plant used
Adas	*Foeniculum vulgare* Mill.	Apiaceae	Spices	Seed
Adas manis	*Anethum graveolens* L.	Apiaceae	Spices	Seed
Anggur hijau	*Vitis vinifera* L.	Vitaceae	Fruit	Fruit
Anggur merah	*Vitis vinifera* L.	Vitaceae	Fruit	Fruit
Apel Malang	*Pyrus malus* L.	Rosaceae	Fruit	Fruit
Apel Puji	*Pyrus malus* L.	Rosaceae	Fruit	Fruit
Apel Washington	*Pyrus malus* L.	Rosaceae	Fruit	Fruit
Alpukat [Alpuket]	*Persea americana* Mill.	Lauraceae	Fruit	Fruit
Aren [Kawung]	*Arenga pinnata* (Wurmb) Merr.	Arecaceae	Fruit	Fruit
Asem Jawa [Asem]	*Tamarindus indica* L.	Fabaceae	Fruit	Fruit
Asem kandis	*Garcinia xanthochymus* Hook.f ex T. Anderson	Clusiaceae	Fruit	Fruit
Bambu rebung [Iwung awi]	*Dendrocalamus giganteus* Munro	Bambucaceae	Fruit	Bamboo shoot
Bangle	*Zingiber* montanum (J.Koenig) Link ex A.Dietr	Zingiberaceae	Spices	Rhizome
Bawang Bombay	*Allium cepa* L. var. *cepa* L.	Allaceae	Spices, Vegetable	Bulb
Bawang daun bikang	*Allium fistulosum* L.	Alliaceae	Spices, Vegetable	Leaf
Bawang daun jalu	*Allium fistulosum* L.	Alliaceae	Spices, Vegetable	Leaf
Bawang merah [Bawang beureum] Berebes	*Allium cepa* L. *aggregatum* L.	Alliaceae	Spices, Vegetable	Bulb
Bawang merah batu	*Allium cepa* L. var. *ascalonicum* L.	Alliaceae	Spices, Vegetable	Bulb
Bawang merah batu karet	*Allium cepa* L. var. *ascalonicum* L.	Alliaceae	Spices, Vegetable	Bulb
Bawang merah Filipina	*Allium cepa* L. var. *ascalonicum* L.	Alliaceae	Spices, Vegetable	Bulb
Bawang merah Sumenep	*Allium cepa* L. var. *ascalonicum* L.	Alliaceae	Spices, Vegetable	Bulb
Bawang putih [Bawang bodas]	*Allium sativum* L.	Alliaceae	Spices, Vegetable	Bulb
Bayam [Bayem]	*Amaranthus hybridus* L.	Amaranthaceae	Vegetable	Leaf
Bayam merah	*Amaranthus tricolor* L.	Amaranthaceae	Vegetable	Leaf
Belimbing [Balingbing]	*Averrhoa carambola* L.	Averrhoaceae	Fruit	Fruit
Bengkuang [Bangkuang]	*Pachyrhizus erosus* (L.) Urb.	Fabaceae	Fruit	Tuberous root
Beras burung wali	*Oryza sativa* L.	Poaceae	Staple food	Seed
Beras IR64	*Oriza sativa* L.	Poaceae	Staple food	Seed
Beras Jembar Super	*Oriza sativa* L.	Poaceae	Staple food	Seed
Beras Jembar Wangi	*Oriza sativa* L.	Poaceae	Staple food	Seed
Beras Kepala Biasa (IR2)	*Oriza sativa* L.	Poaceae	Staple food	Seed
Beras Kepala Super (R1)	*Oriza sativa* L.	Poaceae	Staple food	Seed
Beras Ketan Putih	*Oriza sativa* L.	Poaceae	Staple food	Seed
Beras Pandan Wangi	*Oriza sativa* L.	Poaceae	Staple food	Seed
Beras Pn	*Oriza sativa* L.	Poaceae	Staple food	Seed
Beras Sentra Ramos	*Oriza sativa* L.	Poaceae	Staple food	Seed
Beras Sentra Wangi	*Oriza sativa* L.	Poaceae	Staple food	Seed
Brokoli	*Brassica oleracea* L. var *italica*	Brassicaceae	Vegetable	Leaf
Brungkol [Bunga kol]	*Brassica oleracea* L. var. *botrys*	Brassicaceae	Vegetable	Leaf
Brungkol ungu	*Brassica oleracea* L. var. *capitata*	Brassicaceae	Vegetable	Leaf
Buah bit	*Beta vulgaris* L.	Chenopodiaceae	Vegetable	Tuberous root
Buah naga	*Hylocereus lemairei* (Hook.) Britton & Rose	Cactaceae	Fruit	Fruit
Cabe gendot	*Capsicum annuum* L. var. *grossum*	Solanaceae	Spices, vegetable	Fruit
Cabe hijau	*Capsicum annuum* L.	Solanaceae	Spices, vegetable	Fruit
Cabe Jawa	*Piper retrofractum* Vahl	Piperaceae	Spices, vegetable	Fruit
Cabe Kriting Hijau	*Capsicum annuum* L.	Solanaceae	Spices, vegetable	Fruit
Cabe Kriting Merah	*Capsicum annuum* L. var. *annum*	Solanaceae	Spices, vegetable	Fruit
Cabe merah	*Capsicum annuum* L.	Solanaceae	Spice, vegetable	Fruit
Cabe rawit hijau [Cengek hejo]	*Capsicum frutescens* L.	Solanaceae	Spices, vegetable	Fruit
Cabe rawit merah [Cengek beureum]	*Capsicum frutescens* L.	Solanaceae	Spices, vegetable	Fruit
Cabe tanjung	*Capsicum annum* L. cv tanjung	Solanaceae	Spices, vegetable	Fruit
Cangkring	*Erythrina fusca* Lour.	Fabaceae	Vegetable	Fruit
Cabe TW	*Capsicum annuum* cv TW	Solanaceae	Vegetable	Fruit
Cenkeh	*Syzygium aromaticum* (L.) Merr. & L.M.Perry	Myrtaceae	Spices	Fruit
Eceng padi	*Monochoria vaginalis* (Burm.f.) Presl	Pontederiaceae	Vegetable	Leaf
Gambas [Oyong]	*Luffa acutangula* (L.) Roxb.	Cucurbitaceae	Vegetable	Fruit

Ganyol	*Canna indica* L.	Cannaceae	Additional staple food	Rhizome
Genjer [Baeng]	*Limnocharis flava* (L.) Buchenau	Alismataceae	Vegetable	Leaf
Honje	*Etlingera elatior* (Jack) RM.Sm	Zingiberaceae	Vegetable	Flower, fruit
Jagung manis	*Zea mays* L.	Poaceae	Additional staple food, vegetable	Fruit
Jahe Besar	*Zingiber officinale* Roscoe	Zingiberaceae	Spices	Rhizome
Jahe Kecil	*Zingiber officinale* Roscoe	Zingiberaceae	Spices	Rhizome
Jahe Merah	*Zingiber officinale* var. rubrum	Zingiberaceae	Spices	Rhizome
Jambu air	*Syzygium aqueum* (Burm.f) Alston	Myrtaceae	Fruit	Fruit
Jengkol	*Archidendron pauciflorum* (Benth) I.C.Nielsen	Fabaceae	Vegetable	Fruit
Jengkol Sumatra	*Archidendron pauciflorum* (Benth) I.C.Nielsen	Fabaceae	Vegetable	Fruit
Jeruk Lemon	*Citrus limon* (L.) Osbeck	Rutaceae	Spices	Fruit, leaf
Jeruk manis	*Citrus sinensis* (L.) Osbeck	Rutaceae	Fruit	Fruit
Jeruk Medan	*Citrus sinensis* (L.) Osbeck	Rutaceae	Spices	Fruit, leaf
Jeruk Nevile	*Citrus sinensis* (L.) Osbeck	Rutaceae	Fruit	Fruit
Jeruk Nipis	*Citrus aurantiifolia* (Christm.) Swingle	Rutaceae	Fruit	Fruit, leaf
Jeruk purut lokal	*Citrus hystrix* DC.	Rutaceae	Fruit	Fruit, leaf
Jeruk purut Medan	*Citrus hystrix* DC.	Rutaceae	Fruit	Fruit, leaf
Jintan hitam	*Nigella sativa* L.	Ranunculaceae	Spices	Seed
Jintan putih	*Cuminum cyminum* L.	Ranunculaceae	Spices	Seed
Kacang Bogor	*Voandzeia subterranea* (L.) Verdc.	Fabaceae	Vegetable	Fruit
Kacang buncis	*Phaseolus vulgaris* L.	Fabaceae	Vegetable	Fruit
Kacang ercis	*Pisum sativum* L.	Fabaceae	Vegetable	Fruit
Kacang hijau	*Vigna radiata* (L.) R.Wilczek	Fabaceae	Vegetable	Fruit
Kacang kapri	*Pisum sativum* L.	Fabaceae	Vegetable	Fruit
Kacang kedelai	*Glycine max* (L.) Merr.	Fabaceae	Vegetable	Fruit
Kacang merah [Kacang beureum]	*Phaseolus vulgaris* L.	Fabaceae	Vegetable	Fruit
Kacang panjang	*Vigna unguiculata* (L.) Walp.	Fabaceae	Vegetable	Fruit
Kacang tanah [Suuk]	*Arachis hypogaea* L.	Fabaceae	Spices, Vegetable	Seed
Kacang uci	*Phaseolus umbellata* (Thnb.) Ohwi & H.Ohashi	Fabaceae	Vegetable	Seed
Kangkung	*Ipomoea aquatica* Forssk.	Convolvulaceae	Vegetable	Leaf, stem
Katuk	*Sauropus androgynus* (L.) Merr.	Phyllanthaceae	Vegetable	Leaf
Kapulaga [Kapolaga]	*Elettaria cardamomum* L. Maton	Zingiberaceae	Spices	Seed
Kaweni	*Mangifera odorata* Griff.	Anacardiaceae	Fruit	Fruit
Kayu manis	*Cinnamomum burmanii* (Nees & T.Nees) Blume	Lauraceae	Spices	Stem
Kecipir [Jaat]	*Psophocarpus tetragonolobus* (L.) DC.	Fabaceae	Vegetable	Fruit
Kedondong	*Spondias dulcis* Parkinson	Anacardiaceae	Fruit	Fruit
Kelapa [Kalapa]	*Cocos nucifera* L.	Arecaceae	Spices	Fruit
Keluwek	*Pangium edule* Reinw.	Flacourtiaceae	Spices	Fruit
Kemangi [Surawung]	*Ocimum basilicum* L.	Lamiaceae	Vegetable	Fruit
Kemiri (Muncang]	*Aleurites moluccanus* (L.) Wild.	Euborbiaceae	Spices	Fruit
Kencur [Cikur]	*Kaempferia galanga* L.	Zingiberaceae	Spices	Seed
Kenikir	*Cosmos caudatus* Kunth	Asteraceae	Vegetable	Leaf
Kentang [Kumeli] Dieng	*Solanum tuberosum* L.	Solanaceae	Additional staple food, vegetable	Tuber cauligenous
Kentang gramola	*Solanum tuberosum* L.	Solanaceae	Additional staple food, vegetable	Tuber cauligenous
Kentang lokal	*Solanum tuberosum* L.	Solanaceae	Additional staple food, vegetable	Tuber cauligenous
Kentang rending	*Solanum tuberosum* L.	Solanaceae	Additional staple food, vegetable	Tuber cauligenous
Kentang atlantik	*Solanum tuberosum* L.	Solanaceae	Additional staple food, vegetable	Tuber cauligenous
Kentang mata merah	*Solanum tuberosum* L.	Solanaceae	Additional staple food, vegetable	Tuber caliginous
Ketumbar [Katuncar]	*Coriandrum sativum* L.	Apiaceae	Spices	Fruit
Kubis [Kol, Engkol]	*Brassica oleracea* L. var. *capitata*	Brasicaceae	Vegetable	Leaf
Kubis tunas [Kiciwis]	*Brassica oleracea* L. var. *capitata*	Brasicaceae	Vegetable	Leaf
Kucai	*Allium ramosum* L.	Alliaceae	Vegetable	Leaf
Kukuk	*Lagenaria siceraria* (Molina) Standl.	Cucurbitaceae	Vegetable	Fruit
Kulabet	*Trigonella foenum-graecum* L.	Fabaceae	Spices	Seed
Kunir [Kunyit, Koneng]	*Curcuma longa* L.	Zingiberaceae	Spices	Rhizome

Kurma [Korma]	*Phoenix dactylifera* L.	Araceae	Fruit	Fruit
Labu [Waluh]	*Cucurbita moschata* Duchesne	Cucurbitaceae	Vegetable	Fruit
Labu Siem [Waluh Siem]	*Sechium edule* (Jacq.) Sw.	Cucurbitaceae	Vegetable	Fruit
Lada hitam [Merica, Pedes]	*Piper nigrum* L.	Piperaceae	Spices	Seed
Lada Putih [Merica, Pedes]	*Piper nigrum* L.	Piperaceae	Spices	Seed
Lengkeng	*Dimocarpus longan* Lour.	Sapindaceae	Fruit	Fruit
Lengkuas [Laja]	*Alpinia galanga* (L.) Willd.	Zingiberaceae	Spices	Rhizome
Leunca	*Solanum nigrum* L.	Solanaceae	Vegetable	Fruit
Lobak	*Raphanus sativus* L.	Brassicaceae	Vegetable	Tuberous root
Mangga Cengkir [Buah Cengkir]	*Mangifera indica* L.	Anacardiaceae	Fruit	Fruit
Nangka	*Artocarpus heterophyllus* Lam.	Moraceae	Fruit	Fruit
Melinjo [Tangkil]	*Gnetum gnemon* L.	Gnetaceae	Vegetable	Fruit, leaf
Melon	*Cucumis melo* L.	Cucurbitaceae	Vegetable	Fruit
Mentimun [Bonteng]	*Cucumis sativus* L.	Cucurbitaceae	Vegetable	Fruit
Mentimun Jepang	*Cucumis sativus* L. var. *hardwickii*	Cucurbitaceae	Vegetable	Fruit
Mentimun suri [Bonteng suri]	*Cucumis sativus* L.	Cucurbitaceae	Vegetable	Fruit
Nenas [Danas]	*Ananas comosus* (L.) Merr.	Bromeliaceae	Fruit	Fruit
Pak Choy	*Brassica rapa* L. var *parachinensis*	Brassicaceae	Vegetable	Leaf
Pakis [Paku] (daun)	*Diplazium* sp.	Pteridaceae	Vegetable	Leaf
Pala	*Myristica fragrans* Houtt.	Myristicaceae	Spices	Seed
Pandan wangi	*Pandanus amaryllifolius* Roxb.	Pandanaceae	Spices	Leaf
Suji	*Dracaena elliptica* (Thunb.) N.E.Br.	Agavaceae	Spices	Leaf
Paprika	*Capsicum annuum* L. var. *grossum*	Solanaceae	Spices	Fruit
Paria Jakarta	*Momordica charantia* L.	Cucurbitaceae	Vegetable	Fruit
Paria Lokal [Pare]	*Momordica charantia* L.	Cucurbitaceae	Vegetable	Fruit
Pepaya [Gedang]	*Carica papaya* L.	Caricaceae	Fruit, vegetable	Fruit, leaf
Pepaya California	*Carica papaya* L.	Caricaceae	Fruit, vegetable	Fruit, leaf
Petai [Peuteuy]	*Parkia speciosa* Hassk.	Fabaceae	Vegetable	Fruit
Petai Cina [Peuteuy selong]	*Leucaena leucocephala* (Lam.) de Wit	Fabaceae	Vegetable	Fruit
Petsai	*Brassica rapa* L.	Brassicaceae	Vegetable	Fruit
Pir	*Pyrus communis* L.	Rosaceae	Fruit	Fruit
Pisang Ambon [Cau ambon]	*Musa X sapientum* L.	Musaceae	Fruit	Fruit
Pisang Cavendis [Cau cavendis]	*Musa X paradisiaca* L. cv. Cavendish	Musaceae	Fruit	Fruit
Pisang Kapas [Cau Kapas]	*Musa X paradisiaca* L.	Musaceae	Fruit	Fruit
Pisang mas [Cau Mas]	*Musa X paradisiaca* L.	Musaceae	Fruit	Fruit
Pisang raja bulu [Cau raja bulu]	*Musa X paradisiaca* L.	Musaceae	Fruit	Fruit
Pisang raja cere [Cau raja cere]	*Musa X paradisiaca* L.	Musaceae	Fruit	Fruit
Pisang muli [Cau muli]	*Musa X paradisiaca* L.	Musaceae	Fruit	Fruit
Pisang nangka [Cau nangka]	*Musa X paradisiaca* L.	Musaceae	Fruit	Fruit
Pisang siem [Cau siem]	*Musa X paradisiaca* L.	Musaceae	Fruit	Fruit
Roay	*Lablab purpureus* L.	Fabaceae	Vegetable	Fruit
Salak	*Salacca zalacca* (Gaertn.) Voss	Arecaceae	Fruit	Fruit
Salam	*Syzygium polyanthum* (Wight) Walp.	Myrtaceae	Spices	Leaf
Saledri	*Apium graveolens* L.	Apiaceae	Spices, Vegetable	Leaf, stem
Sawi daging	*Brassica juncea* (L.) Czern	Brassicaceae	Vegetable	Leaf
Sawi hijau	*Brassica juncea* (L.) Czern	Brassicaceae	Vegetable	Leaf
Sawi putih	*Brassica juncea* (L.) Czern	Brassicaceae	Vegetable	Leaf
Sawo	*Manilkara achras* (Mill.) Fosberg	Sapotaceae	Fruit	Fruit
Selada air [Salada]	*Nasturtium officinale* R.Br.	Brassicaceae	Vegetable	Leaf
Selada bokor	*Lactuca sativa* L.	Brassicaceae	Vegetable	Leaf
Semangka [Samangka]	*Citrullus vulgaris* Schrad	Cucurbitaceae	Fruit	Fruit
Serai [Sereh]	*Cymbopogon nardus* (L.) Rendle	Poaceae	Spices	Leaf
Sirsak	*Annona muricata* L.	Annonaceae	Fruit	Fruit
Singkong [Sampeu]	*Manihot esculenta* Crantz	Euphorbiaceae	Additional staple food, vegetable	Tuber, leaf
Sampeu mentega	*Manihot esculenta* Crantz	Euphorbiaceae	Additional staple food, vegetable	Tuber, leaf
Sampeu manihot	*Manihot esculenta* Crantz	Euphorbiaceae	Additional staple food, vegetable	Tuber, leaf
Sampeu pete	*Manihot esculenta* Crantz	Euphorbiaceae	Additional staple food, vegetable	Tuber, leaf
Sosin	*Brassica juncea* (L.) Czern	Brassicaceae	Vegetable	Leaf
Strawberry	*Fragaria X annanasa*	Rosaceae	Fruit	Fruit
Takokak	*Solanum torvum* Sw.	Solanaceae	Vegetable	Fruit
Talas Bogor [Taleus Bogor]	*Colocasia esculenta* (L.) Schott	Araceae	Additional staple food, vegetable	Tuber, leaf

Taleus padang	*Colocasia esculenta* (L.) Schott	Araceae	Additional staple food, vegetable	Tuber, leaf
Taleus jahe/Taleus laja	*Colocasia esculenta* (L.) Schott	Araceae	Additional staple food, vegetable	Tuber, leaf
Taleus biasa	*Colocasia esculenta* (L.) Schott	Araceae	Additional staple food, vegetable	Tuber, leaf
Taleus bentul	*Colocasia esculenta* (L.) Schott	Araceae	Additional staple food, vegetable	Tuber, leaf
Tebu [Tiwu]	*Saccharum officinarum* L.	Poaceae	Spices	Stem
Temu ireng	*Curcuma aeruginosa* Roxb.	Zingiberaceae	Spices	Rhizome
Temu lawak	*Curcuma zanthorrhiza* Roxb.	Zingiberaceae	Spices	Rhizome
Tenu putih	*Curcuma zedoaria* (Christm.) Roscoe	Zingiberaceae	Spices	Rhizome
Terong hijau	*Solanum melongena* L.	Solanaceae	Spices	Fruit
Terong ungu	*Solanum melongena* L.	Solanaceae	Spices	Fruit
Tespong	*Oenanthe javanica* (Blume) DC.	Apiaceae	Spices	Leaf
Tomat apel	*Lycopersicon esculentum* Mill.	Solanacaeae	Spices, Vegetable	Fruit
Tomat ceri	*Lycopersicon esculentum* Mill.	Solanaceae	Spices, Vegetable	Fruit
Tomat sayur	*Lycopersicon esculentum* Mill.	Solanaceae	Spices, Vegetable	Fruit
Ubi jalar [Hui Boled]	*Ipomoea batatas* (L.) Lam.	Convolvulaceae	Additional staple food, vegetable	Tuber cauligenous, leaf
Wortel	*Daucus carota* L.	Apiaceae	Vegetable	Tuberous root

Table 3. Various categories of edible plants traded in the traditional market of Ujung Berung, Bandung, West Java, Indonesia

Food use categories	Number of species	Percentage of the total of species (%) *
Vegetables	103	85.8
Spices	58	48.3
Fruits	39	32.5
Carbohydrate staple food	10	8.3
Total of species*)	120	100.0

Note: *) One plant species may have more than one function; often different cultivars or landraces of a species have different culinary functions i.e. the species has multiple culinary uses. In some cases, the different culinary forms of a species are categorised as different botanical varieties; for example in the species *Brassica oleracea*

The botanical diversity in traded plant commodities in the Ujung Berung market is not confined to the species level. There is significant intra-species diversity in the plant products on display in the market. Within-species diversity between cultivars and landraces in the plant products being traded usually reflect different endues and culinary preferences. For example, 12 variations (landraces) of hulled rice (*Oryza sativa* L) are recorded as commonly traded in the Ujung Berung, market (Figure 4). On the basis of folk classification, the variants in hulled rice traded can be categorized into 4 groups, based on morphology, color, fragrance, and stickiness of the cooked rice (Table 4). On the basis of quality, the hulled rice can be further divided into two categories; namely 'superior' and 'non-superior' quality. The superior hulled rice consists of **pandan wangi** and **jembar wangi**, while non-superior hulled rice is comprised of **sadane, burung wali**, **kepala biasa (IR2),** and **kepala super (IR1).** In contrast to the categories of this folk classification, botanists distinguish two distinct varieties of rice, namely *Oryza sativa indica* and *Oryza sativa japonica* (Fox 1991; Widjaja et al. 2014).

Based on the local knowledge of traders, multiple intra-species variants of several other edible plant species are sold in the Ujung Berung markets. Examples of species for which a range of cultivars/landraces with different culinary characteristics are sold include taro or **talas**/**taleus** (*Colocasia esculenta* (L) Schott); cassava or singkong/**sampeu** (*Manihot esculenta* Crantz); potato or **kentang**/**hui jerman** (*Solanum tuberosum* L); and onion or **bawang merah**/**bawang beureum** (*Allium cepa* L *var ascalonicum* L). Taro as a commodity can be divided into seven variant forms (landraces), namely **taleus padang**, **taleus jahe/taleus laja**, **taleus hideung**, **taleus jepang**, **taleus bogor**, **taleus biasa** and **taleus bentul**. These variations are classified based on morphology, color, and taste of the cooked tuber (Table 5). Cassava as a commodity is traditionally classified into three variations, namely **singkong/sampeu matega**, **sampeu manihot**, and **sampeu pete**. As for taro, these variants of cassava are traditionally recognized and classified on the basis of morphology, color, and taste of the cooked tubers (Table 6). The potato or **hui** may be divided into four variations, **hui jerman dieng**, **hui jerman mata merah**, **hui jerman atlantik**, and **hui jerman granola**. These variants are also classified on the basis of morphology, color, and taste of cooked tuber (Table 7). Onions sold in the market can be divided into five types, namely **bawang beureum Filipina, bawang beureum batu karet, bawang beureum batu, bawang beureum berebes,** and **bawang beureum sumenep.** This classification of onions is based on morphology; color; taste of bulbul; painful or not painful to the eyes when the bulbuls are sliced; and water content of the bulbul segments (Table 8).

Table 4. Variations (landraces) of the hulled rice /beas (*Oryza sativa* L) that are traded in the traditional market of Ujung Berung, Bandung, West Java, Indonesia (Yardenia 2011)

Variations (landraces)	Culinary	Fragrance	Sticky rice	Color	Morphology of rice grains
Burung wali	Not tasty	Not fragrant	Not sticky	Yellow	Moderate size
IR 64	Good tasting	Not fragrant	Not sticky	Yellow clean	Long slim size
Jembar super	Good tasting	Not fragrant	Not sticky	Yellow clean	Moderate slim size
Jembar wangi	Good tasting	Fragrant	Sticky	Yellow clean	Moderate slim size
Kepala biasa (IR2)	Not tasteful	Not fragrant	Not sticky	Yellow	Moderate size
Kepala super (IR1)	Not tasty	Not fragrant	Not sticky	Yellow	Moderate size
Ketan putih	Good tasting	Fragrant	Sticky	Yellow clean	Moderate size
Pandan wangi	Good tasting	Fragrant	Sticky	Yellow clean	Moderate size
Pn	Good tasting	Not fragrant	Not sticky	Yellow clean	Round flat size
Sadane	Not tasty	Not fragrant	Not sticky	Yellow	Moderate slim size
Setra ramos	Good tasting	Not fragrant	Not sticky	Yellow clean	Long slim size
Setra wangi	Good tasting	Not fragrant	Not sticky	Yellow clean	Long slim size

Table 5. Characteristics of seven variants (landraces) of taro/**taleus** (*Colocasia esculenta* (L) Schott) traded in the traditional market of Ujung Berung, Bandung, West Java, Indonesia (Yardenia 2011)

Variations/Landraces of taro (*taleus*)	Culinary characteristics	Color	Morphological forms
Taleus padang	Not tasty tuber	White tuber	Round, long tuber; bigger tuber than that of **taleus bogor;** and leaves rougher than that of **taleus bogor**
Taleus jahe/taleus laja	Less tasty tuber	Cloudy white tuber	Tuber lengthwise shaped and smaller than that of **taleus bogor**
Taleus hideung	Quite tasty tuber	Yellowish butter colored tuber with a reddish tuber skin Dark bluish color stems and leaves.	Round shape of tuber; its form is like a top
Taleus jepang	Less tasty, sticky tuber	Dark brown color of tuber	Round, long tuber
Taleus bogor	Good tasting, tender tuber	Yellow color of tuber	Round, long tuber
Taleus biasa	Good tasting tuber	White color of tuber	Rather round shape of tuber, and smaller than of **taleus bogor**
Taleus bentul	Good tasting, sticky tuber	Yellowish color of tuber Bluish color of stem	Oval shapeed tuber and larger than that of **taleus bogor**

Table 6. Characteristics of three variants (landraces) of cassava /**sampeu** (*Manihot esculenta* Crantz) traded in the traditional market of Ujung Berung, Bandung, West Java, Indonesia

Variations (landraces) of cassava/*sampeu*	Culinary characteristics	Color	Morphological form
Sampeu mentega	Good tasting, sticky tuber	Yellowish butter color of tuber	Tuber fairly large with a long tuber shape
Sampeu manihot	Soft tuber, and sweeter than that of sampeu mantega	White color of tuber	Roundish shape of tuber, rounder than that of **sampeu mentega**
Sampeu pete	Good tasting tuber, and soft when fried	White tuber with a reddish outer skin	Rather round tuber

Table 7. Characteristics of four variants (landraces) of potatoes//**hui jerman** (*Solanum tuberosum* L) traded in the traditional market of Ujung Berung, Bandung, West Java, Indonesia (Yardenia 2011)

Variations (landraces) of potato/*hui jerman*	Culinary characteristics	Color	Morphological form
Hui jerman dieng	Tasteless and dry tuber	Yellow tuber with a brown skin	Rather round tuber, bigger than that of **hui jerman mata merah**
Hui jerman mata merah	Rather sweet tasting tuber with a wetter texture	Yellow tuber with a reddish takin	More oval tuber
Hui jerman atlantik	Good tasting and drier tuber	White tuber with a yellow skin	Round tuber, and rather rough, thin tuber skin
Hui jerman granola	Good tasting and a rather wet tuber	Yellow tuber with a yellow skin	Round and rather flattened tuber, bigger than that of **hui jerman atlantik**

Table 8. Characteristics of five variants (landraces) of onion/**bawang beureum** (*Allium cepa* L *var ascalonicum* L) traded in traditional market of Ujung Berung, Bandung, West Java, Indonesia (Sidik 2012; Yustiadi 2012)

Variations (landraces) of onion/*bawang beureum*	Culinary	Color	Morphological form
Bawang beureum Filipina	Less fragrant aroma, bulbul if sliced does not cause pain to the eyes, rather dry when fried	Brownish bulbul	Oval bulbul, and equal in size to that of the other onion variants
Bawang beureum batu karet	Less fragrant aroma, bulbul if sliced does not cause pain to the eyes, rather dry when fried	Dark reddish bulbul	Oval bulbul, and bigger than that of **bawang berebes**
Bawang beureum batu	Less fragrant aroma, bulbul if sliced does not cause pain to the eyes, rather dry when fried	Dark reddish bulbul	Oval bulbul, and equal in size to that of the other onion variants
Bawang beureum berebes	Quite fragrant aroma, bulbul if sliced causes pain to the eyes, when dried flabby	Bulbul color is rather similar to that of **bawang beureum sumenep**	Round bulbul, and relatively equal in size to that of the other variants
Bawang beureum sumenep	The most flagrant aroma, dry when fried	Bright blueish bulbul	Oval bulbul, and relatively equal in size to that of the other variants

Figure 4. Varieties of hulled rice commonly traded in the traditional market of Ujung Berung, Bandung, West Java, Indonesia

Figure 6. The local fruit of rambutan is often traded in the traditional market of Ujung Berung, Bandung, West Java, Indonesia

Figure 5. Various spices and vegetables commonly traded in the traditional market of Ujung Berung, Bandung, West Java, Indonesia

Figure 7. Various local fruits are commonly traded in the traditional market of Ujung Berung, Bandung, West Java, Indonesia

As can be seen from Table 4 to 8, the folk classification of rice, taro, cassava, potato, and onion are similar to other ethnic classification systems in various culture of the tropical world. The intra-species variants are categorized not only on the basis of their morphology, but also on other characteristics, such as culinary taste, color and fragrance of cooked hulled rice, tubers, and bulbuls (cf. Brush 1992; Iskandar and Ellen 1999; Ellen and Hermien 2012).

Parts of the plants

On the basis of the survey of the 120 species of plants, products of which are commonly traded in the Ujung Berung market, we have recorded nine plant parts that are commonly used as edible commodities, namely fruits; leaves; seeds; tuberous roots; rhizomes; caliginous tubers; bulbs; stems; and flowers (Table 9; Figure 5,6,7).

As is shown in Table 9, the parts of the plants that are predominantly traded as food items are the fruits, recorded as edible commodities for 90 of the species (75.0%) identified in the Ujung Berung market. Other parts of the plants, include leaves from 41 species (34.2%), seed from 27 species (22.5%), and root tubers from 20 species (16.7%). Various traded vegetables species , such as **bawang daun** (*Allium fistulosum* L), **bayam** (*Amaranthus hybridus* L), **eceng** (*Monocharia vaginalis* (Burm.f) Presl), **genjer** (*Limnocharis flava* (L) Bunchenau), **salada** (*Nasturtium officinale* R.Br), **salada bokor** (*Lactuva sativa* L), and **sawi** (*Brassica juncea* (L) Czern) are mainly traded for their in edible leaf parts. From this research, it can be concluded that not only is there a high diversity of plants species and intra-species variants sold in the Ujung Berung markets, but also there is significant diversity in the particular parts of the plants that appear in the market as tradable commodities .

The result of this research is comparable with that of Yurlisa et al. (2017) who carried out research on various vegetable plants commonly traded in the traditional markets of the district and municipality of Kediri, East Java. Yurlisa et al. (2017) recorded 28 species of vegetables commonly traded in the traditional markets of Kediri. Of those vegetable species, 36% were used for their leaves, 25% for their fruits, 22% for their stems, 6% for their pods and 6% for their seeds.

Trade chains for the edible plants

Most traders of edible plant commodities in the Ujung Berung market, source their supplies of staple carbohydrate foods, spices, vegetables, and fruits from retailers. The traders access these supplies from different sources, including the central markets of Caringin, Gede Bage, and Andir, in Bandung City (Figure 9).

In addition, various edible plant commodities are supplied directly from middlemen who reside in the villages in the area surrounding Ujung Berung, and from other villages in West Java. For example, various vegetables commodities in the Ujung Berung market are sourced from the Palintang area (Figure 8). Some village middlemen from key vegetable production areas such as Lembang, Pangalengan, Ciwidey, and Garut are known as main suppliers of vegetables to the central markets and traditional markets of Bandung.

Some plant commodities, onions (**bawang merah**) for instance, are supplied from villages outside of West Java, such as from Berebes in Central Java, and from Sumenep in Madura. Potatoes (*hui* or *kentang*) are often supplied from areas of West Java such as Lembang, Majalaya and Garut, but also from further away, for example from Dieng in Central Java. Fruit commodities are mainly supplied from villages of West Java. For example, **mangga** (*Mangifera indica* L) has been supplied from Indramayu, Majalengka and Cirebon, well known areas for mango production in West Java. Another fruit commodity, **rambutan** (*Nephelium lappaceum* L) is mainly supplied from Subang. Also, some areas of West Java, such as Bogor, Subang, and are suppliers of **durian** (*Durio zibethinus* Murr), while Banjar, Ciamis and Tasikmalaya are popularly known suppliers of **kelapa** (*Cocos nucifera* L) (cf. Iskandar 2014).

Table 9. Parts of edible plants used that are commonly traded in the traditional market of Ujung Berung, Bandung, West Java, Indonesia

Part of plant used	Number of species*	Percentage of total species (%) *
Fruits	90	75.0
Leafs	41	34.2
Seeds	27	22.5
Tuberous roots	20	16.7
Rhizome	9	7.5
Caliginous tubers	2	5.8
Bulbs	6	5.0
Stems	5	4.2
Flowers	3	2.5
Total species*	120	100.0

Note: * Certain plant species have more than one part, even several parts, that are used as edible commodities.

Figure 8. Vegetable gardens planted by farmers in the Palintang upland area of Bandung, West Java, Indonesia

From knowledge of these trade chains, it can be deduced that the development of trade in edible plant commodities like staple foods, spices, vegetables, and fruits, via the traditional market of Ujung Berung, can provide benefits to many groups of people, such as village farmers, collectors, village wholesalers, urban central market traders, small shop retailers and end consumers (Figure 9).

The traditional market and biodiversity conservation

On the basis of this research, it can be seen that there is high diversity in the range of edible plants commodities, including staple carbohydrate foods, spices, vegetables, and fruits, commonly traded in the Ujung Berung traditional market of Bandung. These traded edible plant commodities are predominantly supplied from villages of West Java and of provinces neighboring West Java. Some rural village areas of West Java are major production centers for vegetables and fruits traded in the market. The traditional urban markets of Bandung, such as Ujung Berung, are therefore very important outlets for these village farming communities. Traditional markets are considerably less selective regarding minor blemishes in the plant commodities from village farmers compared to modern retail supermarkets. Thus the supply of agricultural products from these village farmers to the traditional markets is greater than to the modern markets. It is widely believed that such traditional markets serve a wider diversity of ethnic communities, both as traders and consumers, than is served by modern market retail outlets. Paralleling the increase in demand for various agricultural products, there is an increase in diversity in the supply of agricultural plant products on offer in the traditional markets. For example, the vegetable commodities commonly traded in the traditional market of Ujung Berung, exhibit a high diversity due to high demand of the local Sundanese people. Based on their long-held traditions, the Sundanese people happily consume both fresh and cooked vegetables in their daily household menus (Suriawiria 2006).

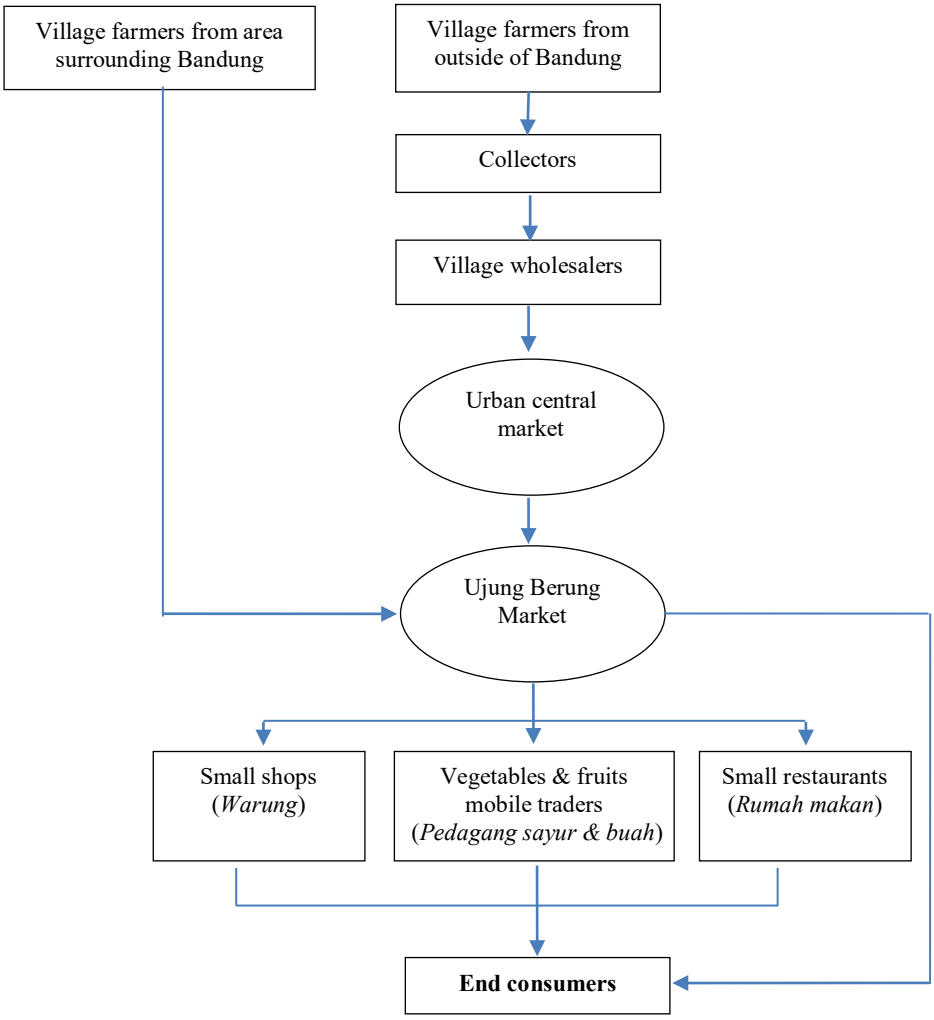

Figure 9. Trade chain for edible plant commodities commonly traded in the traditional market of Ujung Berung, Bandung, West Java, Indonesia

Traditional urban markets, like the Ujung Berung market, play an important role in trading in a diversity of local agricultural products. Much of the agricultural produce traded in the Ujung Berung market, for example the hulled rice known as **pandan wangi** (*Oryza sativa* L), is predominantly supplied by village farmers of West Java. This popular hulled-rice is mainly supplied by farmers and traders from Cianjur, in West Java. In addition, another popular local rice variety, **jembar wangi**, is mainly supplied by farmers from Sumedang (Iskandar 2014). Likewise, the supply of **talas bogor** (*Colocasia esculenta* School) to the market comes from the main taro production center of Bogor and surrounding areas.

As for vegetables, the local fruits such as **rambutan** (*Nephelium lapaceum* L) and **mangga** (*Mangifera indica* L) that are sold in Ujung Berung market are predominantly supplied by farmers in Indramayu and Subang of West Jawa. This tendency for fruits to be supplied to traditional markets from local sources has also been observed in the traditional markets of Pontianak, in West Kalimantan (cf. Arman 1996; Uji 2007; Widjaja et al. 2014). In the research studies conducted there, a total of 38 species of fruits, such as **campedak** (*Artocarpus integer* (Thunb) Merr), **durian** (*Durio zibethinus* Murr) and **rambutan** (*Nephelium lappaceum* L) are recognised as local products derived from the forest and traditional agroecosystems of the local farmers of West Kalimantan. Furthermore, in the districts and municipality of Kediri, East Java, the survey of traditional markets by Yurlisa et al. (2017) has recorded the trade in 28 vegetable species representing 16 families and some vegetable of the species that predominate in that trade, such as **kenikir** (*Cosmos caudatus* Kunth), **kacang panjang** (*Vigna ungulata* L), **kangkung** (*Ipomoea aquatica* Forssk) and **kemangi** (*Ocimum americanum* L), are recognized as local production from home gardens and from gardens of village farmers in the Kediri district (Yurlisa et al. 2017).

To summarize, the traditional market of Ujung Berung, Bandung, has long served and continues to serve the local urban communities of the area, as an important trading outlet, providing local foods that fulfill daily needs. It has been recorded that these commodities are from 120 plant species (or a total of 188 edible variants (i.e. including different cultivars and landraces of the species), representing 44 families, traded in the market. Most of the edible plant commodities that are commonly traded in the Ujung Berung market have been supplied from villages surrounding the market and from other villages of West Java and of provinces neighboring West Java. In other words, the traditional market of Ujung Berung promotes the trading of a wide diversity of edible plants produced by village farmers. Moreover, it plays a role in conserving the agricultural biodiversity of plants grown by village farmers of the region. If there is a demand for local edible plant commodities by consumers shopping in these traditional markets, then there is an incentive for village farmers to continue to cultivate the crops that produce them, and this in turn provides an incentive for local farmers to conserve the biodiversity of their farming systems.

In conclusion, the traditional market of Ujung Berung, Bandung, has maintained an important role as a place for the trading activities of sellers and buyers in the small-scale economic sector. Any decline in the status of such traditional markets is likely to have a deleterious effect on the socio-economic circumstances of these small-scale traders, and also a negative impact on the biodiversity in the cropping systems of the village farmers who produce the commodities traded in the markets.

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