



Reasons for consuming *rasi* as a staple food for the Cireundeu indigenous people: a qualitative study

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Rasi (made from cassava) is used as a staple food by the Cireundeu indigenous people. This food culture is considered different from Indonesian culture, which uses rice as the staple food. Therefore, this study aimed to show the reasons Cireundeu indigenous people consume *rasi* as their staple food. This qualitative research was conducted in Cireundeu Village, Cimahi City, West Java Province, Indonesia. The data was collected from the Cireundeu indigenous people through in-depth interviews (and participant observation). The data of nutrients in *rasi* were calculated through laboratory tests. The average recommended dietary allowances of Indonesian society (10–80+ years) were obtained through study literature. The notes are analysed by content analysis. The Cireundeu indigenous people consume *rasi* for six reasons: efforts to respect ancestral struggle, to undergo ancestral revelation, to physical and psychological independence, to obtain a source of strength/carbohydrate/energy, to obtain a source of energy-saving and preserve tradition. The reason for consuming *rasi* as staple food comes from within themselves. All of that is supported by the existence of cassava production activities in the Cireundeu Village environment. This food culture can be used as a reference of the importance of the uniqueness of agricultural activities, food culture, and ethnic food in the development of culinary tourism potential, food security, values and socio-cultural life for the society and sustainable intercultural relations (based on local knowledge).

1. Introduction

What is eaten and how to eat something is influenced by religion, traditional knowledge, economy (income) and culture (Atkins & Bowler, 2001; Alonso, 2015; Chang *et al.*, 2018; Diana *et al.*, 2018; Shipman & Durmus, 2017). Jewish and Muslim communities cannot eat pork because it is haram (Atkins & Bowler, 2001). West African residents are accustomed to eating cassava (*Manihot esculenta*) as a staple food (Montagnac

et al., 2009). A Madurese pregnant woman may not consume *kedondong*, pineapple, shrimp, squid, instant noodles, cabbage and cold water for herself and her fetus (Diana *et al.*, 2018). The low-income Chinese population chooses sorghum, corn and potatoes, even though corn and sorghum are used as animal feed (Chang *et al.*, 2018). These examples of food choice are the embodiment of food culture.

The food culture is a nonmaterial culture with its authenticity value (Zeng *et al.*, 2014; Mardatillah *et al.*, 2019). Understanding it can be used as a reference in food systems policy and sustainable intercultural relations (Ishak *et al.*, 2019; Chen & Antonelli, 2020; Karaosmanoğlu, 2020). On the other hand, this cannot be separated from regions, staple food productivity, cultural, social systems, and perceptions (Song & Cho, 2017; Yamane *et al.*, 2018; Atungbou, 2020; Masters, 2021). Therefore, in-depth research related to food culture is needed.

Part of the food culture of the Indonesian people is to consume rice (*Oryza sativa*) as a staple food (Panuju *et al.*, 2013; Ahadiyat *et al.*, 2014; Rachmat *et al.*, 2014; Shiotsu *et al.*, 2015; Nurlaili *et al.*, 2016; David *et al.*, 2020), even though its productivity is greatly influenced by climatic conditions (Bantacut, 2014). The average consumption reached 130 kg/person/year in 1993 and 115 kg/person/year in 2012 (Saediman *et al.*, 2016). Consumption was not only realised in the form of cooked rice but also made into *kupat tahu* in West Java Province, *ketupat sumpil* in Central Java Province, *orem-orem* in East Java Province, *tipat* in Bali Province, *ketupat bareh* in West Sumatra Province, and *ketupat kandangan* in South Kalimantan Province (Rianti *et al.*, 2018). In other words, Indonesian people's food patterns are highly dominated by rice because they are spread across various provinces and islands.

Java Island has 56 quintals/hectare rice productivity, whereas Indonesia has 52 quintals/hectare (BPS-Statistics Indonesia, 2019). In other words, Java Island

has higher rice productivity than Indonesia's average rice productivity. However, rice is not used as a staple food for the Cireundeu indigenous people who live in Java Island, more precisely in Cireundeu Village, Cimahi City, West Java Province, Indonesia. Therefore, Cireundeu indigenous people are known as indigenous peoples who are unique in terms of food culture.

The food culture of the Cireundeu indigenous people is to consume *rasi* as their staple food, which is made from cassava (*Manihot esculenta*). Therefore, the research aimed to show why the Cireundeu indigenous people consume *rasi* as their staple food.

2. Material and Methods

2.1. Material and key informants

Rasi was used as a topic of discussion. Data were obtained from key informants who consume *rasi* as a staple food, both in the Cireundeu village environment and outside their territory (they depend on *rasi*). The selection of key informants was determined based on the structure of the Cireundeu indigenous people (*seseput*, *ais pangampih*, *Panitén*, *nonoman*, and other Cireundeu indigenous people) (Figure 1) so that the relevant data could be obtained according to their structure. Informed consent was obtained from all key informants. The data were collected through open, in-depth interviews (and participant observation began from 1 October 2018 – 31 March 2019). Data regarding the categories and number of key informants interviewed can be seen from the following Table 1.

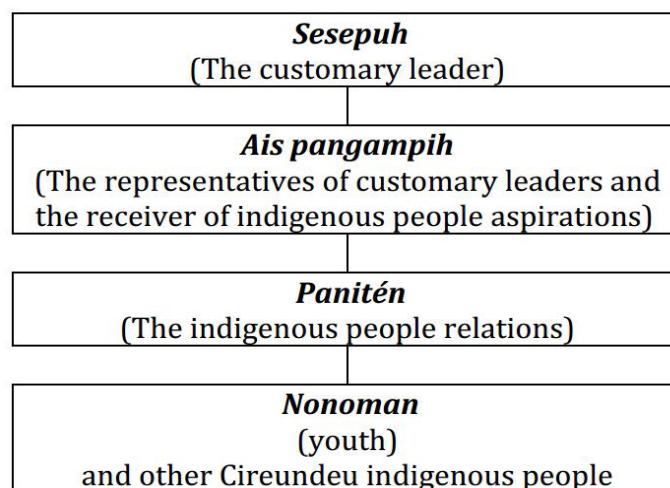


Figure 1. The structure of the Cireundeu indigenous peoples

Table 1. The key informant's data

No.	The key informants		Name initial (age (years))
	Category	The number of people	
1.	<i>Sesepuh</i> (the customary leader)	1	ES ₁ (82)
2.	<i>Ais pangampih</i> (the representatives of customary leaders and the receiver of indigenous people aspirations)	1	W ₁ (57)
3.	<i>Panitén</i> (the indigenous people relations)	1	AW (52)
4.	<i>Nonoman</i> (youth)	8	SH (12), SS (19), K (21), TS (35), OS (39), S ₁ (40), ES ₂ (41), Y (42)
5.	Other Cireundeu indigenous people	11	RMK (27), RS (32), NS (38), S ₂ (38), E (44), SW (46), M (49), EN (57), C (61), T (66), W ₂ (76)
Total		22	-

2.2. Data collection

Data collection on the consumption of *rasi* as staple food was done through in-depth interviews (and participant observation). In-depth interviews were conducted in the Sundanese language—one of Indonesia's regional languages, namely in the Provinces of West Java and Banten. Notes of the results of in-depth interviews were translated into English.

The nutritional data for *rasi* were calculated by using the Kjeldahl method (for protein), the direct extraction method (for fat), the Luff Schoorl method (for carbohydrates), the gravimetric method (for fibre and moisture), the spectrophotometric methods (for phosphorus), the atomic absorption spectroscopy (AAS) method (for sodium, magnesium, potassium, calcium, manganese, iron ⁽²⁾ and zinc ⁽³⁾) and the calculation method (for calories). The calculation was carried out at the Testing and Calibration Laboratory, Institution of Research and Standardization of Industry – Surabaya, Agency of Research and Development of Industry, Ministry of Industry, Republic of Indonesia. Furthermore, the average recommended dietary allowance values of Indonesian society (10–80+ years)

were obtained from Peraturan Menteri Kesehatan Republik Indonesia Nomor 28 Tahun 2019 tentang Angka Kecukupan Gizi yang dianjurkan untuk Masyarakat Indonesia (Regulation of the Minister of Health of the Republic of Indonesia Number 28 the Year 2019 about Recommended Dietary Allowances that Apply to the Indonesian Society) (Moeloek, 2019).

2.3. Data analysis

The notes were analysed by content analysis. This analysis was used because the sampling was carried out in a detailed and structured manner, and the data was in the form of written answers to open-ended questions (Elo *et al.*, 2014; Diana *et al.*, 2018).

2.4. Study site

This research was conducted in Cireundeu Village, Cimahi City, West Java Province, Indonesia (Figure 2). The geographical location is between 06°54'32" S – 06°55'16" S and 107°31'15" E – 107°31'37" E. The research took place between 1 October 2018 – 31 March 2019.



Figure 2. Cirendeude indigenous people live in Java Island, Cirendeude Village, Cimahi City, West Java Province. Cirendeude Village is southeast of Jakarta, the Capital City of Indonesia and west of Bandung City, the Capital City of West Java Province (Google, 2019).

3. Results

3.1. History of *rasi* in Cirendeude Village

Omoh Asnamah pioneered the consumption of *rasi* as

a staple food (Figure 3) in 1924 after she was detained by the Dutch for 100 days at the Banceuy Penitentiary. The idea was a revelation in anticipation of a food crisis (especially the rice crisis) due to the increasing population and increasingly narrow agricultural land.



Figure 3. *Rasi*, the cassava (*Manihot esculenta*) processed products from Cireundeu Village, Cimahi City, West Java Province, Indonesia. The processing process is done through *nyampeu* (*rasi* processing method which Omoh Asnamah spearheaded since 1924).

During this time, Asnamah introduced *nyampeu*, the *rasi* processing method. *Nyampeu* consists of eleven stages. The stages starting from *ngerik* (scraping), *ngupas* (peeling), *ngabilas* (washing), *marud* (grating), *meres* (wetting, stirring, swinging, pressing and sedimentation), *moé* (sun drying), *nutu* (pounding), *ngayak* (sieving), *nyaian* (moistening), *nyeupankeun* (steaming) and *ngakeul* (cooling and stirring).

Eating *rasi* is an example of a nonmaterial culture from Cireundeu Village, Cimahi City, West Java Province, Indonesia. They carry out the manufacturing process of *rasi* through *nyampeu*. Production is done every month because they plant cassava with different planting periods so that the needs of cassava (as a raw material of *rasi*) can be fulfilled every month.

3.2. Respect ancestral struggle

The Cireundeu indigenous people's ancestors lived during the Dutch colonial period (19th and 20th centuries). They began to switch food patterns from rice to non-rice in 1918 and made cassava a staple food

starting in 1924. The transition impacted weight loss and was a struggle of the ancestors of the Cireundeu indigenous people. The next generation used the ancestral struggle as a reflection to appreciate their hardships with complete self-awareness and without coercion. The Cireundeu indigenous people made three statements,

“The struggle of previous ancestors were so heavy. Ancestors were asked in the period between 1918 and 1924 [6 years of transition from rice to cassava], ‘For what do you [Mamah Ali] suffer and fatigue like this [body changes from fat to thin, because it changes patterns food from rice to non-rice for 6 years]?’ The question was answered, ‘Uh, I love my children and grandchildren (descendants).’ I contemplated that answer to mean my ancestors loved me too ... So, what does it mean for the previous ancestors to be like that if I [as their descendants] consume rice? It’s like not respecting the struggle of the previous ancestors [who switched food patterns from rice to cassava]” (TS, 35 years old).

“... If my parents eat cassava [as material of rasi] but I don’t like them, how?” (SW, 46 years old).

“I imagine the condition of the ancestors who had fought during the Dutch colonialism... If [the culture of eating cassava] was not continued by us, who else would continue it?” (EN, 57 years old).

3.3. Undergo ancestral revelation

The shift in food patterns was used to guide the Cireundeu indigenous people to adjust to the times (population growth and narrowing of rice fields) and not dependence on rice. The Cireundeu indigenous people made four statements,

“There is a prophecy [of ancestors] that rice will run out” (RS, 32 years old).

“Yes, there is an ancestral mandate that I must carry out ... Rice is likely to run out in the future. Running out means rice fields [as a rice-producing land resource]... Land conversion from rice fields to settlements is also unstoppable, resulting in an imbalance between needs and production. The population is increasing, while rice fields are decreasing. Indeed, there will automatically be a shortage of food ... If we focus on rice, it will be like that” (AW, 52 years old).

“Ancestors have the insight to stop from rice. It was made as a guide [for us]. What is the guidance?... In my imagination, the condition of the land for farming [rice] is almost exhausted at this time, even more so in the city, while we eat it every day, at breakfast, lunch and dinner. That is the shadow of insight from previous ancestors applied by their descendants. It turns out, it becomes a guide [for us] not to depend [on rice]” (W1, 57 years old).

“Eating cassava is the result of the revelation of Omoh Asnamah [ancestor of the Cireundeu indigenous people] in 1924. She was detained for 100 days at the Bancuey Penitentiary. The discovery was obtained while she was detained there. Her revelation was that rice would be lacking in the future ... Therefore, the ancestors have stopped eating rice since 1924” (ES1, 82 years old).

3.4. Physical and Psychological Independence

The Cireundeu indigenous people consume *rasi* as an effort to be independent physically and mentally from various issues regarding rice, such as rising rice prices (high rice prices), rice imports from other

countries to Indonesia, the problem of white rice, as well as queuing activities in purchasing *raskin* (short for “*beras miskin*” or “rice for the poor” sold cheaply by the government to poor people). Consuming *rasi* gives them pride and independence from the government. The Cireundeu indigenous people made four statements.

“We eat rasi to be free, independent both physically and mentally [not dependent on rice]. We have felt the pleasure of being independent in both body and mind” (TS, 35 years old).

*“I imagine that if ancestors did not switch to eating cassava, maybe other residents and I would be in line every time there was a *raskin* program. That can be equated with a life of dependence on the government. In other words, life is not independent” (S1, 40 years old).*

*“I have felt the benefits of eating *rasi*. Other people are busy about the price of rice, while I don't think about rice” (ES2, 41 years old).*

“We want independence in both physical and mental aspects. If there is a rise in rice's price, import of rice, or use bleach, uh, we take it easy” (Y, 42 years old).

3.5. Obtain a source of strength/carbohydrate/energy

The Cireundeu indigenous people believe that sources of strength, carbohydrates, and energy do not have to be obtained exclusively through rice. *Rasi* is valued as a source of strength, carbohydrates, and energy for them. The Cireundeu indigenous people made three statements,

“Rasi is a source of strength” (OS, 39 years old).

*“The source of carbohydrates is not only rice but there are also others [such as *rasi*]” (AW, 52 years old).*

*“Our strength [of the Cireundeu indigenous people] comes from cassava [*rasi*]” (T, 66 years old).*

3.6. Obtain a source of energy-saving

Rasi is not consumed in large quantities to meet energy needs. Less than 1 kg of constituents can be cooked into a *rasi* for eight people in one day. *Rasi* often remains until the next day without expiration. In oth-

er words, *rasi* is consumed by Cireundeu indigenous people in minimal amounts, resulting in savings in raw materials to meet energy needs. The Cireundeu indigenous people made three statements,

“Rasi is consumed twice a day. It can make the stomach feel full. Rasi is consumed in small amounts” (OS, 39 years old).

“Cooking rasi is not more than one kg since the last time. It is cooked for eight people in one day. Even the rest is often left until the next day [without expiration]. Indeed, more efficient. Very economical” (S1, 40 years old).

“[Raw material of rasi] is of little use” (ES2, 41 years old).

3.7. Preserve tradition

The consumption of *rasi* as a staple food has become a tradition for the Cireundeu indigenous people. This tradition was taught and imitated to them from their childhood. The main characters are the mother, father, grandmother and grandfather. This tradition is also carried out as a form of self-awareness to preserve the culture of eating *rasi* and maintain the ethics of eating in an indigenous environment with joy, peace, comfort and without coercion. The Cireundeu indigenous people made thirteen statements.

“[Eating rasi] has become a [tradition] for generations” (SH, 12 years old).

“[I] have been given rasi since my childhood. Mother, father and grandmother consume cassava” (SS, 19 years old).

“This [culture of eating rasi] is self-awareness to continue customs” (K, 21 years old).

“I followed the direction of mother and father. This [culture of eating rasi] is a tradition. There's no way I'm different [from them]” (RMK, 27 years old).

“I was introduced to [rasi] since childhood by mother, father and grandmother” (RS, 32 years old).

“This [culture of eating rasi] has been done since childhood (from the age of zero months). It has become a tradition for generations” (S2, 38 years old).

“This [culture of eating rasi] has become a tradition and custom for generations. If I don't, who will do it? If it stops (no one continues), then it will no longer exist” (NS, 38 years old).

“This has been a tradition for generations. I am used to [eating rasi]” (E, 44 years old).

“My mother consumed cassava from childhood until her death. So, I also consume cassava [rasi]” (M, 49 years old).

“I do not consume rice not because I cannot, but I live in a customary environment [which consumes rasi as staple food]. Ethics must be maintained. Do I have to eat certain foods carelessly? Of course, I cannot do that” (W1, 57 years old).

“I have been used to [eating rasi] since my childhood” (C, 61 years old).

“[I eat rasi] to carry on the traditions of grandfather and ancestors” (T, 66 years old).

“[I eat rasi] because I am a descendant of my father [who consumes rasi]” (W2, 76 years old).

4. Discussion

The Cireundeu indigenous people maintained their diet transition from rice to cassava as a direct connection to their ancestry. Further, they understood the transitioning food culture with deep respect and self-empowerment. This culture has complemented the results of previous studies: food culture is not only influenced by religion, traditional knowledge, economy (income) or culture (Atkins & Bowler, 2001; Alonso, 2015; Shipman & Durmus, 2017; Chang *et al.*, 2018; Diana *et al.*, 2018), but also is influenced by historical factors.

The ancestors of the Cireundeu indigenous people projected that rice would experience shortages in the future. A rice shortage can occur due to decreased agricultural land (especially rice) in line with population growth, exacerbating hunger when rice is consumed as part of each meal. However, the culture of eating *rasi* has made the Cireundeu indigenous people adjust to the times (population growth and narrowing of

rice fields) and not depend on rice. This fact is considered an anticipation step on the population's principle from Thomas Robert Malthus: “population, when unchecked, increase in a geometrical ratio. Subsistence (food production) only in an arithmetical ratio” (Rutherford, 2007; Malthus, 2011; Brooke, 2020).

Anxiety about the issue of rice was also not experienced by the Cireundeu indigenous people. They are people who enjoy independence from the physical and psychological issues attached to rice. They do not experience anxiety when they hear news about the rice price, rice import, and the problem of white rice. They do not need to queue to buy *raskin* because they do not consume rice as a staple food. This makes them feel proud because consuming *rasi* plays an essential role in giving them a sense of independence. More so, they can live without government dependency. This fact shows the impact of traditional knowledge on food culture like previous research (Atkins & Bowler, 2001; Alonso, 2015; Shipman & Durmus, 2017; Chang

et al., 2018; Diana *et al.*, 2018).

The Cireundeu indigenous people also have thought that energy needs do not always have to be obtained from rice. *Rasi* provides up to 1341.2 kcal/kg, and consuming 1 kg of *rasi* does not exceed the average of recommended dietary allowances (RDA) for the people of Indonesia of 2100 kcal/person/day (Moeloek, 2019). Thus, *rasi* is safe for consumption for people with diabetes due to its low caloric value and because cases of diabetes are not found in the Cireundeu indigenous people.

Based on Table 2, if *rasi* is consumed as much as 1 kg/person/day, the recommended dietary allowances of carbohydrates, sodium, and magnesium are fulfilled. At the same time, however, the recommended dietary allowances of protein, fat, fibre, water, phosphorus, potassium, calcium, manganese, iron, and zinc is not met. To mitigate this problem, the Cireundeu indigenous people consume carrot, chicken, chilli



Figure 4. Examples of various sources of nutrition consumed by the Cireundeu indigenous people.

Table 2. Cireundeu indigenous peoples' recommended dietary allowances fulfillment

No.	Food nutrition	Average recommended dietary allowances of Indonesian society (10–80+ years) ^a	Nutrition in <i>rasi</i> ^b	Note
1.	Protein (g)	62	6.10	Not fulfilled
2.	Fat (g)	62	3.30	Not fulfilled
3.	Carbohydrates (g)	315	321.80	Fulfilled
4.	Fiber (g)	29	19.90	Not fulfilled
5.	Water (ml)	2078	381.90	Not fulfilled
6.	Phosphorus (mg)	906	30.00	Not fulfilled
7.	Sodium (mg)	1375	1900.00	Fulfilled
8.	Magnesium (mg)	294	710.00	Fulfilled
9.	Potassium (mg)	4700	600.00	Not fulfilled
10.	Calcium (mg)	1150	800.00	Not fulfilled
11.	Manganese (mg)	2	< 0.0234	Not fulfilled
12.	Iron ⁽²⁾ (mg)	11	0.62	Not fulfilled
13.	Zinc ⁽³⁾ (mg)	9	1.49	Not fulfilled

^a Moeloek (2019); ^b = Analysis results

sauce, corn, prawn crackers, snaps and tofu (Figure 4), including egg, tempeh and various types of vegetables and fruits to meet their nutritional needs. For as long as the research was conducted, not a single indigenous Cireundeu person experienced malnutrition. While three individuals were taken to a hospital, they suffered from dengue fever caused by dengue virus through the principal mosquito vector, *Aedes aegypti* (Amelia-Yap *et al.*, 2018; Kamal *et al.*, 2018; Marques-Toledo *et al.*, 2019; Powell *et al.*, 2018) and not a nutrition deficiency.

This study also found that making *rasi* did not require many essential ingredients. Eight people can consume 1 kg of it in one day. Leftovers often remain until the next day without expiration. *Rasi* also provides a sense of fullness that allows the Cireundeu indigenous people to consume it sparingly. This is not in line with Chang *et al.* (2018) and Alonso's (2015) research, which states that economic factors influence food selection: the higher the income, the wider the food affordability.

The last and foremost reason that the Cireundeu indigenous people consume *rasi* as a staple food is that consuming a *rasi* has become a tradition. This tradition is preserved based on self-awareness and

the importance of maintaining ethical eating in an indigenous environment. This awareness arises because of the enculturation of eating *rasi* passed down from parents and grandparents to the following generations. This finding aligns with previous research, which states that cultural factors (especially tradition) also influence what and how something is eaten (Atkins & Bowler, 2001; Alonso, 2015; Shipman & Durmus, 2017; Diana *et al.*, 2018).

All of that is supported by the existence of cassava production activities in the Cireundeu Village environment. Cassava is obtained from production in the Cireundeu Village environment itself, agriculture, and processing. The farmers have just harvested cassava in *leuweung baladahan* (Figure 5), an area of land used for cassava agricultural activities (primary) and various other consumption crops. Cassava seeds are not planted simultaneously in *leuweung baladahan*. Thus, there is no term for cassava harvest season in *leuweung baladahan*.

Rasi production is done every month as cassava is planted during different planting periods in *leuweung baladahan*. The needs of cassava as a constituent base can be met every month. The processing is directly carried out after cassava harvest. The processing

is done through the process of *nyampeu*. The result (raw *rasi*) can be stored for months in a clean and dry place. This aligns with previous research, which states that climate does not significantly affect cassava productivity (Bantacut, 2014) and that staple food choice is influenced by local production and people's livelihoods (Alonso, 2015; Chang *et al.*, 2018).

However, the life of the Cireundeu indigenous people cannot be categorised as isolated social life because the Cireundeu indigenous people constantly carry out social interactions with other outside communities. The interaction is carried out through the socialisation of food security education to tourists to the Cireundeu Village environment (Figure 6). Part of the education material included the reasons for consuming *rasi* as a staple food in the region. *Rasi* is also consumed by tourists who visit there. Thus, edu tourism can be developed in the Cireundeu Village environment due to the uniqueness of agricultural activities, food culture, and local food that the Cireundeu indigenous people have realised. This fact can be used as a reference of the importance of the uniqueness of agricultural activities, food culture and ethnic food in development

culinary tourism potential, food security, values and socio-cultural life for the society and intercultural relations in a sustainable (Chairy & Syahrivar, 2019; Rachão *et al.*, 2019; Wijaya, 2019; Wibisono *et al.*, 2020; Karaosmanoğlu, 2020; Camanzi & Troiano, 2021; Dehrashid *et al.*, 2021; Kidane & Kejela, 2021).

5. Conclusions

The reason for consuming *rasi* as staple food comes from within the Cireundeu indigenous people itself. *Rasi* is consumed for six reasons: efforts to respect ancestral struggle, undergo ancestral revelation, physical and psychological independence, as a source of strength, carbohydrate, and energy, energy-saving, and preserve tradition. The effort to preserve traditions is considered the most common reason to consume *rasi* as a staple food. All of that is supported by cassava production activities in the Cireundeu Village environment (*leuweung baladahan*), Cireundeu Village, Cimahi City, West Java Province, Indonesia. Besides that, this food culture can be used to reference the importance of the uniqueness of agricultural activities, food culture, and ethnic food in the devel-



Figure 5. Cassava farming activities carried out by Cireundeu indigenous people in *leuweung baladahan*, Cireundeu Village, Cimahi City, West Java Province, Indonesia. *Leuweung baladahan* is land used for cassava agricultural activities (primary) and various other consumption crops.



Figure 6. Food security education to tourists in the Cireundeu Village environment.

opment of culinary tourism potential, food security, values and socio-cultural life for the society and intercultural relations in a sustainable. The government can develop a national food security education curriculum based on local knowledge.

Since this study's limitation is that there is no test for vitamins in *rasi*, further research suggests that testing *rasi's* micronutrients is necessary. If this has been done, the publication is needed to add to the value in local knowledge-based food security research, especially for the Cireundeu indigenous people. The hope is that the government can support sustainable and contextual national food security based on local knowledge.

Conflict of interests

The authors declare no conflict of interest. The funders had no role: in the design of the study; in the collection, analysis, or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.

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