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Ethnobotany of wild edible plants by the community of Cijambu Village, Sumedang District, West Java, Indonesia

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Abstract. *Alfinandah A, Irawan B, Iskandar J. 2025. Ethnobotany of wild edible plants by the community of Cijambu Village, Sumedang District, West Java, Indonesia. Biodiversitas 26: 2235-2252.* Wild plants that can be consumed have been widely utilized as food and medicine by communities in various regions in Indonesia. The utilization by the Sundanese community in West Java may differ from other regions due to variations in Traditional Ecological Knowledge (TEK) and diverse traditions. This research was conducted in Cijambu Village, Tanjungsari Sub-district, Sumedang District, West Java, Indonesia. This study employs a mixed qualitative and quantitative method with an ethnobotanical approach. The results of this study show that 48 species, belonging to 31 families, with the most commonly found family being Asteraceae. The results of the analysis included Use Value (UV), with *Bambusa vulgaris* having the highest value at 0.08. *Amaranthus viridis* has the highest Relative Frequency Citation (RFC) value of 0.8. A total of 18 species of Wild Edible Plants (WEPs) are used as food sources, while 20 types of diseases are reported to be treated using WEP. Twelve species of WEP were specifically used for medicinal purposes, the results of the Informant Consensus Factor (ICF) analysis showed the highest value of 0.2 for *Blumea balsamifera*. Eighteen species are used both as food and medicine, often consumed simultaneously. The most widely used part of WEP is the leaves, followed by flowers, fruits, roots, stems, shoots and bulbs. The traditional processing of WEP by the community is vegetables (*angeun*), salad (*lalap*), stir-fry (*oséng*), steamed (*seupan, urap, botok, karédok, buntil, lompong*) and herbal tea. Therefore, WEP in rural areas can play a role in supporting SDGs programs, such as ending poverty in all forms everywhere (SDGs No. 1), ending hunger, achieving food security and improving nutrition as well as promoting sustainable agriculture (SDGs No. 2) and ensuring healthy lives and supporting welfare for all ages (SDGs No. 3).

Keywords: Ethnobotany, mixed methods, traditional ecological knowledge, wild edible plant

Abbreviations: ICF: Informant Consensus Factor; RFC: Relative frequency of citation; SDG: Sustainable Development Goals; TEK: Traditional Ecological Knowledge; UV: Use Value; WEP: Wild Edible Plants

INTRODUCTION

Wild Edible Plants (WEPs) are uncultivated plants that grow spontaneously in the wild. These plants have long been utilized by rural communities as food sources, nutritional supplements, traditional medicine and can be a source (Ojelel et al. 2019; Adnan et al. 2023). WEPs can be found in various natural habitats, such as forests, agricultural lands, abandoned areas, and roadsides, as well as appearing as weeds in agricultural fields (Mulyanto et al. 2018; Dema and Dolkar 2022; Yangdon et al. 2022). People typically use of wild plants growing near their homes as an alternative source of food and medicine (Panjaitan et al. 2021). WEPs are also known as *"*vegetables plant wild*"* and "edible weeds*"* (Dop et al. 2020).

Researches on WEPs have been conducted in several countries, such as India, Bhutan, Ethiopia, particularly in West Java and Kalimantan and all parts of Indonesia such as West Java and Kalimantan (Berihun and Molla 2017; Silalahi and Nisyawati 2018; Mishra et al. 2021; Jigme and Yangchen 2023; Tahir et al. 2023; Aulia and Mulyanto 2024). These studies show that WEPs are deeply embedded in the culture and traditions of various indigenous communities. They play a significant role in providing nutrition and diversifying traditional diets (Mishra et al. 2021). WEPs not only serve as nutritional sources and components of traditional diets but also provide additional household income in rural areas (Ghanimi et al. 2022; Asfaw et al. 2023). In addition to being a source of nutrition, WEPs also offer rural households opportunities for additional income due to their market value (Cruz-Garcia and Howard 2013; Badimo et al. 2015; Kebebew and Leta 2016; Borelli et al. 2020).

Besides being used as food, WEPs have been recognized by ethnobotanists for their medicinal properties. Some WEPs are known to treat various ailments such as digestive issues, fever, and infections (de Medeiros et al. 2021). However, modernization and globalization have led to the declining use of WEPs. Changes in cultural and economic practices have resulted in a significant loss of knowledge about these plants, especially among younger generations (Aryal et al. 2018; Ojelel et al. 2019). The degradation of natural habitats

and changes in land use have further reduced WEP availability (Iskandar et al. 2023). With the rise of the agricultural industry and global food supply chains, it is now easier to access cultivated foods year-round (Kodirekkala 2017), which diminishes the reliance on wild plants. Traditional knowledge of WEPs, usually passed down orally in local languages, is increasingly at risk of disappearing due to the dominance of national languages and the erosion of local dialects. This reduces traditional knowledge and weakens the cultural practices associated with WEPs (Iskandar 2018; Wulandari et al. 2019; Tahir et al. 2023).

WEPs play a vital role in ensuring food security as an alternative source of nutrition, especially when access to commercial food is limited. Several species of WEPs are highly nutritious, providing protein, vitamins, minerals, and fiber that contribute to better health. Their consumption supports food diversification, prevents malnutrition, and ensures the availability of accessible food for rural communities (Schunko et al. 2022). Apart from being food sources, WEPs are also used in traditional medicine. Some wild plants contain anti-inflammatory, diuretic, and antimicrobial properties that have been proven beneficial in traditional treatments. Herbal decoctions made from leaves, roots, or stems are commonly used to treat digestive issues, fever, and urinary tract infections (de Medeiros et al. 2021). Thus, WEPs play a crucial role in supporting rural community health, especially in areas with limited access to modern healthcare.

This study aims to explore the Traditional Ecological Knowledge (TEK) of the Sundanese people in Cijambu Village, West Java, regarding the diversity, utilization, and processing of WEP as food and traditional medicine. The research is essential for documenting the various WEP species still used by the community and identifying their roles in supporting food security and public health.

The findings of this study are expected to promote the preservation of local knowledge and raise awareness about the potential of WEPs as alternative food sources and traditional medicine. Furthermore, the study contributes to achieving the Sustainable Development Goals (SDGs), particularly in ending hunger (SDG 2) and improving health and well-being (SDG 3).

MATERIALS AND METHODS

Study area

This research was conducted in Cijambu Village, Tanjungsari Sub-district, Sumedang District, West Java Province, Indonesia (Figure 1). Intensive field research was carried out from March to September 2024. Geographically, Cijambu Village is located at 6°50'38.43"S and 107°47'34.67"E. It is a mountainous village located at an altitude of 1,193 meters above sea level, with an average temperature of 25°C-30°C. This village has an area of 1.365 hectares. The land use system by the Cijambu community consists of 55.25 hectares of settlements, 5.64 hectares of yards, 73.12 hectares of rice fields, 154.81 hectares of terraces/fields, 1040.3 hectares of forests, and 36.63 hectares of open land. The population in 2022 was recorded at 4,515 people, consisting of 2,345 men and 2,170 women. The main livelihood of the people of Cijambu Village is farmers, while other livelihoods are traders, breeders, civil servants, local food makers and workers (BPS 2016). Based on landscape ethnoecology (Iskandar et al. 2023), Cijambu Village has five main types of landscapes: homegardens, vegetable gardens, rice fields, agroforestry, and forests (Figure 2).

Cijambu Village is an agrarian village where the majority of residents work as farmers, focusing on food crops such as rice, secondary crops, horticulture, and other crops (BPS 2016). The land characteristics in Cijambu include irrigated rice fields, rain-fed rice fields, and moorlands. The rice fields in Cijambu, located on mountainous terrain, are traditionally terraced to prevent landslides. The drylands, situated outside residential areas, are planted with secondary crops and bamboo on a rotational basis, with grass planted as boundaries. Secondary crops include vegetables such as tomatoes, chilies, oranges, corn, cabbage, and cucumbers (Figure 2).

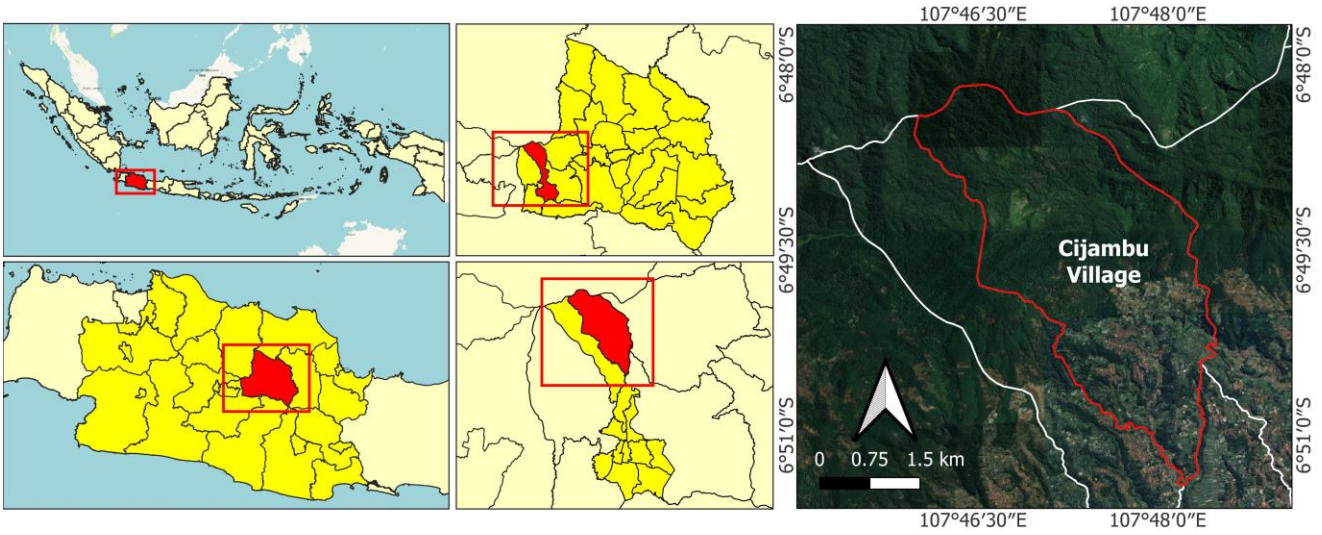

Figure 1. The location of the research, Cijambu Village, Tanjungsari Sub-district, Sumedang District, West Java, Indonesia

Figure 2. Various types of landscapes in Cijambu Village, Sumedang District, Indonesia: A. Rice Field area; B. Vegetable garden area; C. Residential area; D. Stopover (*Gubug*) to rest in the garden; E. Forest area (*leweung*); F. Social activities in the forest

The home gardens consist of plots of land around houses where various seasonal and perennial plants are grown, including flowers, climbing plants, seedlings, and timber trees for nursery purposes. Home gardens often host chicken coops or cattle sheds, and several species of wild plants also grow there. The forests (*leuweung*) managed by State Forestry Public Company serve as production forests for pine wood and its resin, coffee, and *Altingia excelsa*. Through a partnership between State Forestry Public Company and the local community, these forests are cultivated using an agroforestry system, combining forestry trees with vegetable crops under the Community Forestry Management Program. The intercropping of coffee plants in this agroforestry system is expected to enhance the economic income of the villagers. The stratification of coffee agroforestry includes the upper layer of *Pinus merkusii* and *Gigantochloa apus*, the middle layer of *Musa* × *paradisiaca*, and the lower layer of *Brassica juncea* (Suroso et al. 2023). Additionally, the forest provides hunting grounds for various wildlife species such as birds, wild boars, civets, and pangolins (*careuh*). Villagers also utilize the forest to collect orchids as ornamental plants and bamboo for construction materials, kites, and bamboo shoots as food. Other uses include collecting firewood, grass for livestock feed, mushrooms (*lémér*) for trade, and pine resin for sale to State Forestry Public Company.

Data collection

The research method used in this study was mixed methods by combining qualitative and quantitative methods with an ethnobotanical approach (Albuquerque et al. 2014; Iskandar 2018). The ethnobotanical approach emphasizes the complex interaction between humans, communities, food, and the environment (Pieroni et al. 2016). Qualitative data collection techniques were carried out by field observation, semi-structured interviews, and participant observation (Iskandar 2018).

Before the intensive study was carried out, the first activity we carried out was to obtain permits from the village head and Sub-district Head, by submitting a research permit from the University. For verbal consent to individuals, we always ask the informants/respondents' permission before interviewing them. For interviews with informants we use interview guidelines. Meanwhile, for interviews with respondents, we used a questionnaire.

The selection of informants for qualitative research is carried out in a purposive manner that is considered competent using the snowball technique method, starting by asking the base informants, such as village head, and other informants are selected based on the base informants (Iskandar et al. 2023). In addition, based on information from the initial informants, it can be known that several competent informants in the study area (Ihsan et al. 2023). The informants in this study, such as formal village figures, farmers, gardeners, farmer women groups, farmers who like to go to the forest, vegetable sellers, stall workers and housewives who process WEPs. A total of 20 informants were obtained based on the snowball sampling technique which was selected purposively who were considered to understand WEP. Informants were interviewed with semi-structured interviews. The informants responded extensively to a series of common questions about WEPs, some pre-prepared and some that came naturally during interviews.

The total population of Cijambu Village is 4.515 people (1.640 heads of families). Based on the calculation of these statistics, it can be stated that the number of respondents is 86 individual heads of families. Furthermore, each respondent was interviewed by the researcher directly with a

questionnaire guide, in the form of several questions related to various Wild Plants (WEPs) that can be used as food ingredients, how to utilize and process them.

Field observation is aimed at understanding the condition of the local environment, such as the condition of villages, home garden, forests, gardens, rice fields, rivers, roads, open land and abandoned land. Meanwhile, participation observation is carried out by asking questions and being actively involved in the work done by the informant such as harvesting wild plants for consumption, for sale and how to process them. Quantitative data collection was carried out by interviewing the respondents. The number of respondents was determined on a representative basis of the total population of local household heads in Cijambu Village. The number of respondents was determined using the Lynch (Iskandar 2018) statistical formula, namely:

$$N = \frac{N.Z2.P\,(1-P)}{N.d2 + Z2.P.(1-P)}$$

Where:
N : Number of respondents
N : Number of heads of households (800)
Z : Normal variable value (1.96)
P : Largest possible proportion (0.50)
d : Sampling error (0.1)

Data analysis

The data from qualitative research collected from semi-structured interviews, participatory observations, various reports and statistical data were analyzed in a descriptive analysis. Some of the stages are cross checking, summarizing, synthesizing and making a narrative in a descriptive analysis (Iskandar 2018). Data from these various sources are analyzed in a systematic, logical, and complementary manner (Utami et al. 2019).

Next, the data are also analyzed by calculating the index of Use Value (UV). The index determines which wild plants are regarded essential based on the unique uses of each plant used by the community.. The greater the UV value, the more it indicates that the plant is widely used for various purposes by local populations communities (Sujarwo and Caneva 2016). Calculate the value (UV) using the following formula:

$$UV = \frac{Ui}{N}$$

Where:
UV : Use value
Ui : The many specific uses of a species of plant
N : Total respondents

We also evaluated our data using Relative Frequency of Citation (RFC) fromTardío and Pardo-de-Santayana (2008) using the following equation:

$$RFC = \frac{FC}{N}$$

Where:
RFC : Relative Frequency Citation (Usage value)
FC : Excessive use of Wild Edible Plant species (WEP)
N : Total respondents who mentioned a specific species

The RFC is used to determine the frequency of local knowledge and to find out the degree of agreement of respondents regarding each category of Wild Plant species (WEPs) used. RFC is used to calculate the value of variability in the use of Wild Plants (WEPs) with a value range from 0.00-1.00. If the number is 0, no respondents use the plant; if the value is 1, the plant is commonly used by the local community (Syahputra et al. 2021). A high RFC score means that the community agrees to utilize certain Wild Plants (WEPs) as food ingredients that have many specific properties. The RCF value can be used as an indicator for food plant conservation priorities as well as conserving cultural values and the RFC can be used to describe the distribution of local community knowledge in utilizing plants (Sujarwo and Caneva 2016).

Informant Consensus Factor (ICF) is used to describe the effectiveness of wild plants used by the community for the treatment of certain diseases (Martin 2014), with the formula:

$$ICF = \frac{n - nt}{n - 1}$$

Where:
ICF : Informant Consensus Factor (ICF)
n : Total individual reports of plant use for a specific disease
nt : Number of species used by all informants for the disease

RESULTS AND DISCUSSION

Local knowledge about wild plants

The people of Cijambu have a traditional plant classification known as folk classification. This system reflects local knowledge that has been passed down from generation to generation and depth about the flora in their environment. The people of Cijambu know three levels of plant taxonomy, namely life form, generic/genera, specific/species. At the highest level, with level 0 or called unique beginners, the residents of Cijambu Village can distinguish very well between plants and animals. Animals are usually called by local terms as *sato* (animals), while plants are usually called *tutuwuhan* (plants). The plant group itself, if it has been cultivated, is called *pepelakan* (plant) (Table 1).

Table 1. Folk taxonomy of wild edible plant according to the Cijambu people (emic) and botanical scientific (ethic)

Level	Class based on botanical scientific (ethic view)	Class based on local terms of Cijambu people (emic view)	Rank of botanical scientific*)
0	Plant	*tutuwuhan*	Unique beginner
1	Tree, shrub, grass	*tatangkalan, rungkun, jukut*	Life form
2	Grass, tubers, liana, bush, wood, ferns, aqua plants and bamboo	*jujukutan, beubeutian, aareuyan, rurungkunan, kakayon, papakisan, tutuwuhan cai and awi-awian*	Generic/ genera
3	Various spesies of bamboo	*awi haur, awi bitung, awi temen*	Spesific/species

Note: *: Iskandar 2018; Irawan et al. 2024

At Level 1, known as the life form, the people of Cijambu can distinguish plant life forms, such as grasses (*jukut*), tubers (*beubeutian*), climbing plants or lianas (*areuy*), shrubs (*rungkun*), trees (*kai* or *kakayon*), ferns (*pakis*), aquatic plants (*tutuwuhan cai*), and bamboo (*awi*). At Level 2, the generic or folk genus level, the residents differentiate various plant categories, including grasses (*jukut*), tubers (*beubeutian*), lianas (*areuy*), shrubs (*rungkun*), woody plants (*kai/kakayon*), ferns (*pakis*), aquatic plants (*tutuwuhan cai*), and bamboo (*awi*). Meanwhile, at Level 3, the species level, the community recognizes various grass species (*jujukutan*), such as *jukut eurih* (cogon grass), *sintrong* (thickhead), and *hareuga* (beggar tick), among others. According to the local people of Cijambu, Wild Edible Plants (WEPs) serve as both food sources and medicinal ingredients.

The Sundanese people use the term *tutuwuhan* as a unique word to refer to plants in a biological context. This term originates from the reduplication of the first syllable of *tuwuh*, with the suffix "-an" added. Etymologically, the word *tuwuh* means growth from the ground, so *tutuwuhan* can be interpreted as everything that grows from the soil, referring to plants. There are five primary terms representing different life forms within the *tutuwuhan* category: *tatangkalan* (trees), *rungkun* (shrubs), *aareuyan* (climbing plants or lianas), *jujukutan* (grasses), *beubeutian* (tubers). The term *beubeutian* derives from the Sundanese word *beuti*, which translates to tubers in Indonesian (Irawan et al. 2024). The folk classification of the people of Cijambu is in line with the people of Cireundeu Village, recognizing 3-4 levels of taxonomy (Irawan et al. 2024). Based on the opinions of the informants of Cijambu Village, they refer to wild plants as *tutuwuhan* and *jukut.* The function of WEPs is different between Cijambu and outsiders/agricultural people and others, according to the local people of Cijambu, WEPs can be useful as food and medicine. Meanwhile, another opinion states that there are also wild plants that play a role as weeds because they are considered to directly or indirectly interfere with plants that are deliberately cultivated by farmers (Nurcahyati 2022). However, on the other hand, weed plants also have several benefits for human life, one of which is as a producer of delicious food ingredients and has nutritional requirements (Paiman 2020).

Some people mention that wild plants that can be consumed are considered weeds or plants that interfere with cultivated plants, which interfere with the growth of cultivated plants or harm human interests so that humans try to control them (Kilkoda et al. 2015). However, there are still people who think that wild plants (*tutuwuhan*) can also be used for various purposes such as food such as *lalaban*, vegetables, medicines and also animal feed. So that wild plants are not completely considered as useless weeds. Aulia and Mulyanto (2024) also stated that knowledge about the use of wild plants obtained from parents was called wartime food (*emameun jaman perang)* or (*emameun jaman kalaparan*) which at that time did not have enough food so wild plants were used instead. In addition, wild plants that can be consumed are considered to have a low social status; this consumption is decreasing, especially among young people because it is related to the famine period.

Diversity of wild plant species as food and traditional medicine

The results of field observations and direct interviews with respondents were obtained from 31 families and 48 species of Wild Edible Plants (WEP) that are used by the Cijambu Community as food and medicine (Table 2, and Figure 3). The most plant families found in this study are Asteraceae (9), followed by Poaceae (3), Solanaceae (3), Myrataceae (2), Pleurotaceae (2) and Urticaceae (2), these families account for 40% of the total number of plant species used by the community. The most numerous plants in the Asteraceae family exhibit the highest number of species that are utilized as vegetables and fruits, including *Acmella paniculata, Blumea balsamifera, Chromolaena odorata, Cosmos caudatus, Crassocephalum crepidioides, Emilia sonchifolia, Erigeron sumatrensis* and *Sonchus arvensis.* Furthermore, plant species from the Solanaceae family among the most commonly used are *Physalis angulata, Solanum nigrum* and *Solanum torvum.* Solanaceae is one of the families whose species is important as the main and additional food source, as many as three species that are widely used are *leunca* (*S. nigrum*), this species is widely found in gardens and homegardens, not maintained and usually easily harvest for consumption as *lalaban* as well as various processed vegetables by the people of Cijambu Village. While the most widely used species from the Poaceae family is bamboo shoots (*Dendrocalamus asper*), this species is widely used by the community because it is a substitute for carbohydrates during the diet program of the local community, and this bamboo shoot is the most often sought after when going to the garden or forest. While the other families consist of one species each, including Alliaceae, Apiaceae, Auricalaceae, Convolvulaceae, Marsileaceae, and Zingiberaceae.

The results of this study are similar to other studies in various regions in Indonesia, one of which is in Bandung District (Aulia and Mulyanto 2024), and in Tasik (Hernawati et al. 2022), that the Asteraceae family has the highest number of species among other species. The Asteraceae family is widely used by the public as a medicinal and food ingredient, without the public knowing what compounds are contained in the species. Commonly analyzed species of this family contain components of bioactive compounds, such as sesquiterpenes, lactones, pentacyclic triterpenes, alcohols, alkaloids, tannins, polyphenols, saponins, and sterols (Wegiera et al. 2012). The content of this compound is useful as an antioxidant, anti-inflammatory, anti-microbial, prebiotic activity, antiplatelet, diuretic, and hepatoprotector, and contains protein from 0.4 to 6.13 g per 100 g, and fiber from 2.55 to 13.44 g (Rolnik and Olas 2021). The Solanaceae family has economic value, both living in the wild and as a weed, and other uses as culture, medicine, ornamental plants and pharmacology (Samuels 2015).

Figure 3. Species of WEPs used by the people of Cijambu Village, Sumedang District, Indonesia: A. *Limnocharis flava*; B. *Ipomoea aquatica*; C. *Bidens pilosa*; D. *Amaranthus viridis*; E. *Crasssocephalum crepidioides*; F. *Colocasia esculenta*; G. *Pilea melastomoides*; H. *Solanum torvum*; I. *Hydrocotyle sibthorpioides*; J. *Urtica dioica*; K. *Blumea balsamifera*; L. *Plantago major*

The species of WEPs obtained in West Java is different from other provinces of Indonesia such as Central Java, Kalimantan and others. In the Central Java, as many as 56 species of Wild Edible Plants (WEPs) were obtained, there is a difference in knowledge from the use of WEPs consumed by the Javanese and Sundanese people (Triyanto et al. 2024). The research of Hernawati et al. (2022) discussed 86 species of wild plants found in eastern Priangan, Aulia and Mulyanto (2024) discussed 88 species of wild plants that can be consumed in southern West Java. Meanwhile, in Sumatra, there are 26 species of wild plants that can be consumed. However, there are similarities between several species of wild plants in Central Java, West Java and Kalimantan, such as the pegagan (*Centella asiatica*) found in almost all provinces of Indonesia (Nurhidayah et al. 2017). In Central Java and Kalimantan, there are many species of fruits obtained, while in West Java there are at least the species of fruits used by the community. Some of the same species of WEP are *Colocasia esculenta* (*taleus*), *Cymbopogon citratus* (*seréh*), *Diplazium esculentum* (*pakis hayam*), *Leucaena leucocephala* (*sélong*), *Moringa oleifera* (kelor) and *Muntingia calabura* (*kérsén*) (Nasution et al. 2023).

Gender differences affect local knowledge about the use of wild plants. The number of respondents in this study is dominated by women. This is related to the knowledge possessed by women more and richer than men, usually knowledge is obtained from their parents through their mother tongue or *bahasa indung* conveyed through stories, or conversations conveyed directly to their children.

Table 2. Species of Wild Edible Plants (WEPs), Relative Frequency of Citation (RFC), and Use Value (UV) in Cijambu Village, Sumedang District, Indonesia

Family	Scientific name	Local name	Habitat	Parts used	UV	RFC
Alismataceae	*Limnocharis flava* (L). Buchenau	*Ecéng/genjér*	Paddy	L, P	0.012	0.395
Amaranthaceae	*Amaranthus viridis* L.	*Bayem*	Homegardens and garden	L, P	0.012	0.605
Anacardiaceae	*Mangifera foetida* Lour.	*Manggah hutan*	Forest	Fu, L	0.012	0.860
Apiaceae	*Oenanthe javanica* (Blume) DC.	*Téspong*	Moist soil and abandoned land	L	0.012	0.349
Araceae	*Colocasia esculenta* (L.) Schott	*Taleus*	Plantation outskirts, gardens and abandoned land	B	0.012	0.372
Araliaceae	*Hydrocotyle sibthorpioides* Lam.	*Antanan leutik*	Roadside and garden	L	0.012	0.267
Asteraceae	*Ageratum conyzoides* L.	*Babadotan*	Open land, rice fields, fields, homegardens, and roadsides	L, R	0.012	0.395
Asteraceae	*Acmella paniculata* (Wall. Ex DC.) R.K. Jansen	*Jotang*	Open land, roadsides, gardens and forests	L, Fl	0.023	0.407
Asteraceae	*Bidens pilosa* L.	*Hareuga*	Roads, open land	L, R	0.012	0.081
Asteraceae	*Blumea balsamifera* (L.) DC.	*Ki Sembung*	Open land, roadsides and gardens	L, R	0.023	0.477
Asteraceae	*Chromolaena odorata* (L.) R.M. King & H.Rob.	*Ki Rinyuh*	Open land, gardens and roadsides	L, R	0.012	0.372
Asteraceae	*Cosmos caudatus* Kunth.	*Kenikir*	Open land	L	0.023	0.640
Asteraceae	*Crassocephalum crepidioides* (Benth.) S.Moore.	*Sintrong*	Open land, gardens and roadsides	L	0.023	0.663
Asteraceae	*Emilia sonchifolia* (L.) DC. ex Wight	*Jongé*	Open land, gardens and roadsides	L, Fl, R	0.023	0.244
Asteraceae	*Erigeron sumatrensis* Retz.	*Jalantir*	Homegardens, gardens and rice fields	L, Fl	0.012	0.198
Asteraceae	*Sonchus arvensis* L.	*Jawér kotok*	Homegardens, roadside	L, R	0.012	0.186
Athyriaceae	*Diplazium esculentum* (Retz.) Sw.	*Pakis hayam*	Forests and wetlands	L	0.012	0.407
Brassicaceae	*Nasturtium officinale* R.Br.	*Saladah*	Wetlands	L, P	0.012	0.407
Cyperaceae	*Cyperus rotundus* L.	*Rumput teki*	Gardens and roadsides	R	0.012	0.733
Convolvulaceae	*Ipomoea aquatica* Forssk.	*Kangkung*	Wetlands	L, P	0.012	0.512
Fabaceae	*Leucaena leucocephala* (Lam.) de Wit	*Pété cina/sélong*	Open land	Fu	0.012	0.721
Lamiaceae	*Orthosiphon aristatus* (Blume) Miq.	*Kumis ucing*	Gardens, homegardens, forests and open land	L	0.012	0.500
Mackinlayaceae	*Centella asiatica* (L.) Urb.	*Antanan/tapak kuda*	Open land, roadsides, and wet areas	L	0.023	0.663
Malvaceae	*Sida rhombifolia* L.	*Sadagori*	Open land and roadside	L, R, Fl	0.012	0.372
Meliaceae	*Lansium domesticum* Corrêa	*Dukuh*	Forest	L, Fu	0.012	0.349
Marsileaceae	*Marsilea crenata* C. Presl	*Semanggi*	Wetlands	L	0.012	0.337
Menispermaceae	*Tinospora crispa* (L.) Miers ex Hook.fil. & Thomson	*Brotowali*	Forests, roadsides, and open land.	L, S	0.012	0.256
Moringaceae	*Moringa oleifera* Lam.	*Kélor*	Homegardens, forests, open land	L, Fu, S	0.023	0.372
Muntingiaceae	*Muntingia calabura* L.	*Kérsen*	Forests, roadsides and open land.	Fu	0.012	0.709
Musaceae	*Musa* × *paradisiaca* L.	*Cau*	Forest	Fu, Fl	0.035	0.430
Myrataceae	*Psidium guajava* L.	*Jambu*	Forest	L, Fu	0.012	0.349
Myrataceae	*Syzygium aqueum* (Burm.fil.) Alston	*Jambu air*	Forests and abandoned lands	Fu	0.012	0.349
Passifloraceae	*Passiflora foetida* L.	*Ki leulue'eur*	Forests and abandoned lands	Fu, R	0.012	0.395
Phyllanthaceae	*Breynia androgyna* (L.) Chakrab. & N.P.Balakr.	*Katuk*	Forests and wetlands	L	0.023	0.442
Plantaginaceae	*Plantago major* L.	*Kiurat*	Roadsides, gardens and open land	L	0.012	0.372
Poaceae	*Bambusa vulgaris* Schrad. ex J.C.Wendl.	*Iwung haur konéng*	Forest, garden	P	0.081	0.372
Poaceae	*Cymbopogon citratus* (DC.) Stapf	*Séreh*	Gardens, forests, abandoned land	L	0.023	0.407
Poaceae	*Dendrocalamus asper* (Schult.f.) Backer	*Iwung Bitung*	Forest, garden	P	0.081	0.407
Poaceae	*Gigantochloa atter* (Hassk.) Kurz ex Munro	*Iwung temén*	Forest, garden	P	0.081	0.209
Poaceae	*Gigantochloa verticillata* (Willd.) Munro	*Iwung surat/gombong*	Forest, garden	P	0.023	0.012
Poaceae	*Imperata cylindrica* (L.) Raeusch.	*Jukut eurih*	Open land, garden, abandoned land	R	0.012	0.419
Pontederiaceae	*Pontederia vaginalis* Burm.f.	*Écéng leutik*	Rice fields and wetlands	L	0.012	0.209
Solanaceae	*Solanum nigrum* L.	*Leunca*	Open land, gardens and abandoned land	Fu	0.012	0.419
Solanaceae	*Solanum torvum* Sw.	*Takokak*	Open land, gardens and abandoned land	Fu	0.012	0.802
Solanaceae	*Physalis angulata* L.	*Ciplukan*	Open land, gardens and abandoned land	Fu	0.012	0.442
Urticaceae	*Pilea melastomoides* (Poir.) Wedd.	*Pohpohan*	Gardens, roadsides and open land	L	0.012	0.407
Urticaceae	*Urtica dioica* L.	*Beunying*	Forests and wetlands	L	0.023	0.419
Zingiberaceae	*Etlingera elatior* (Jack) R.M.Sm.	*Honjé*	Gardens and abandoned land	Fl, P	0.023	0.186

Note: L: Leaf; P: Petioles; S: Stem; Fu: Fruit; R: Root; B: Bulb; and Fl: Flower. Highest analytical values*: UV: *Bambusa vulgaris*; RFC: *Amaranthus viridis* and *Solanum nigrum*

In addition, women have more time to gather or *ngarumpi* so that knowledge about the use of wild plants is obtained during conversations at that time. The use of wild plants for medicinal materials is also mastered by women. This is related to the fact that usually a mother is more proficient in processing wild plants for medicinal materials, especially for her sick child such as fever, cough, lowering blood pressure and various other diseases. While men have knowledge about wild plants for treatment in the event of an accident in the garden or forest is called *raheut* (wounds on the outside).

Traditionally, women were recognized as housekeepers with greater knowledge of medicinal plants and daily food. They know more species and have used them differently for centuries. In addition, older women share more information with each other (da Costa et al. 2021). A woman generally knows more about medicinal plants, women are more often struggling with homegardens and household needs such as kitchen needs, so they know about the benefits and properties of wild plants used. Some male respondents have knowledge of wild plants in their homegardens because they have experience using these plants to treat health (Igustita et al. 2023).

Our study is similar to the study (Jammu et al. 2014), that wild plant knowledge is more dominant by women. Gender aspects in plant knowledge vary depending on the cultural context. These differences are not innate or natural, but are influenced by the norms and cultural values of each society. In some cultures, health care is considered a female domain, while in others, health care is divided or split between genders. The transmission and learning of plant knowledge also varies according to gender roles and relationships. Such as knowledge and practices of medicinal foods for postpartum mothers are seen as the female domain. This knowledge has been transmitted from midwives to interns or from mothers to their daughters (Mulyanto et al. 2018).

Source of wild plants

Based on the source, wild plants as food and medicine are obtained from various habitats: homegardens, vegetable gardens, rice fields, forests, open land, roadsides, wetlands (moist), and abandoned land (Figure 4). The process of harvesting wild plants in the dry season (*halodo*) is only obtained in small quantities and while in the rainy season (*ngijih*) more is obtained, especially mushrooms in the forest. According to farmers, who still adhere to the belief of their parents, it is forbidden to go to the forest on Saturday, Monday, and Friday. Because, Friday is a big day for Muslims, namely the obligation for men to perform Friday prayers in congregation, and Saturday is forbidden to go to the forest. Meanwhile, the ban on harvesting bamboo on Tuesdays. This is in line with Kuswati and Adi (2021) that wild plants are a species of plant that is not cultivated at all and lives naturally around gardens, homegardens, roadsides, and around cultivated plants as weeds in rice fields.

Wild plants can be easily found in watery lands such as rice paddies and fields that are in a state of waterlogging, such as *E. sonchifolia*, *I. aquatica*, *L. flava*, and *Pontederia vaginalis*. Wild plants can be easily found in wetlands because they have abundant water availability, affecting soil fertility which promotes ideal conditions for WEPs growth.

These species thrive in forest ecosystems due to favorable environmental conditions that support the growth and sustainability of Wild Edible Plants (WEPs). WEPs are not only a source of food and animals around the forest, but also important in maintaining food security and supporting the local ecosystem of rural communities. As Utami et al. (2019) stated that the community's knowledge in recognizing wild plants as food comes from heritage or previous generations or the habit of eating wild animals in the forest. Aulia and Mulyanto (2024) stated that some types of wild plants in the forest are not all cultivated specifically and to collect them, one must go to the edge of the forest or forested valleys.

In open areas, various Wild Edible Plants (WEPs) are utilized, including *Bidens pilosa*, *C. asiatica*, *C. caudatus*, *C. crepidioides*, *Imperata cylindrica*, and *Plantago major*, which typically grow in humid tropical forests. These WEPs, which are safe for consumption, originate from unmanaged resources such as shrubs and forest lands commonly used by local communities. According to Putri (2022), WEPs can also serve as alternative medicinal resources during disease outbreaks.

Poorly maintained farmland (abandoned land): Some species of wild plants, such as *Amaranthus viridis*, *C. odorata*, *C. esculenta*, *C. crepidioides*, and *Cyperus rotundus* often grow in fields or homegardens that are not well cared for or maintained. WEP vegetables that are consumed as wild growing vegetables usually grow in the wild, such as mountains or forests, rice fields, gardens, or grasslands (Hernawati et al. 2022). Edible plant species are diverse and highly variable in terms of habitat preferences, succession patterns, and resistance to disturbances (Granath and Strengbom 2017). Wild plants for the Sundanese people are not just vegetation that grows uncontrollably, but have an important meaning in daily life. The use of wild plants reflects the local wisdom of the community in the Sundanese cultural tradition which is used as a source of food, medicinal materials economic value to traditional rituals.

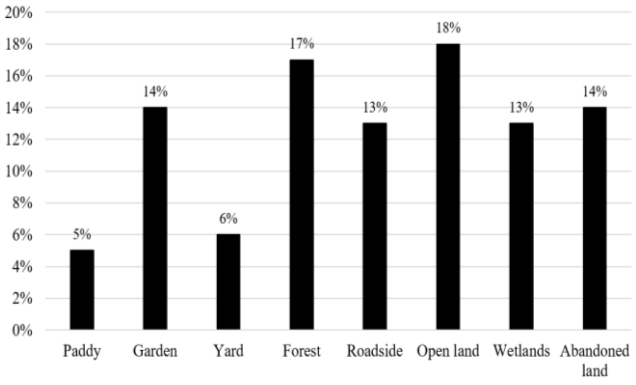

Figure 4. The place where the WEPs are found in Cijambu Village, Sumedang District, Indonesia

Use value

Based on the results of interviews with informants and respondents, the community has used wild plants not only as an alternative food source but also as a traditional medicine. This utilization is a form of local wisdom based on ethnobotanical knowledge that has been passed down from generation to generation. Based on the UV (Use Value) analysis, the highest value of 0.081 (Table 2) was recorded for the *Bambusa vulgaris* species. This indicates that the species holds significant ethnobotanical value, serving multiple purposes such as food, traditional medicine, construction material, livestock feed, and components in ritual practices among the people of Cijambu. As a food source, the edible part is the young bamboo shoot, which is commonly prepared by stir-frying or processed into bamboo chips. In addition to its culinary use, *B. vulgaris* is utilized by the Cijambu community as a traditional remedy to help reduce blood sugar levels in individuals with diabetes. Its consumption is preferred due to its health safety, particularly for individuals managing diabetes, gout, or cholesterol-related conditions.

Meanwhile, the smallest UV value of 0.012 for 13 species (Table 2). This shows that the limited use by the community in daily life, such as the species above is only used one use value such as food/medicine/or economic value. Limited availability because the knowledge is not popular among the community so that the value of use is not widely known to the public. Therefore, although this plant has great potential for its use, it is necessary to develop and introduce traditional knowledge globally. This is in line with Ihsan et al. (2023) research on the diversity of bamboo use by the people of Cijambu, including bamboo as a raw material for making kites, household appliances, building construction, agricultural needs, and foodstuffs that are preferred by the local community.

Food

The use of wild plants as food is important for rural Sundanese communities. Wild plants are an alternative source but are also rich in nutritional value, such as protein, fiber, vitamins and minerals. Traditionally, the habit of the people of Cijambu to consume various species of wild plants in the form of vegetables as food is very good to support the health and food sovereignty of the village community. There are 18 species that are used as food only by the community (Table 3), including *A. viridis, Lansium domesticum, L. flava, Muntingia calabura* and *S. nigrum*. People consume these species with the aim of being an ingredient in vegetables, and fruits. According to the community, consuming these plant species can replace vegetable food because it is considered to have a nutritional content similar to cultivated vegetables, even such as fruits and mushrooms are considered to have a lot of protein and vitamins, so that when taken in the forest, it is the most sought-after species by the people who harvest. The nutritional content of each species of wild plant can be seen in Table 3.

Table 3. Species of WEPs as food along with the nutritional content in Cijambu Village, Sumedang District, Indonesia

Species of WEPS	Local name	Nutritional content						
		Energy (kcal)	Protein (g)	Carbo-hydrates (g)	Calcium (mg)	Phosphorus (mg)	Iron (mg)	Vitamin
Amaranthus viridis L.	*Bayem*	36	3.5	6.5	267	67	3.9	C, A
Diplazium esculentum (Retz.) Sw.	*Pakis*	35	4.5	6.9	136	159	2.3	A
Ipomoea aquatica Forssk.	*Kangkung*	29	2.5	3.9	1.9	34	2.5	A, C, B-complex
Lansium domesticum Corrêa	*Dukuh*	63	1.0	16.1	18	9	0.9	C, B1, B2, B3
Leucaena leucocephala (Lam.) de Wit	*Pété cina/sélong*	367	46	32	5,400	300	4,5	A, B1, C
Limnocharis flava (L.) Buchenau	*Génjér*	39	1.7	7.7	62	33	2.1	A, C, B1, B2, B3
Mangifera foetida Lour.	*Buah leuweng*	57-70	0.5 - 1	15	11	12	0.3	C, A, B1, B2, B3
Marsilea crenata C. Presl	*Semanggi*	35	3	10	25,000	35,000	2	A, C, B1, B2, B3
Muntingia calabura L.	*Kérsen*	100	2	21.6	104	52	0.3	C, A, B2, B3
Nasturtium officinale R.Br.	*Selada*	22	20	2.5	150	40	1.5	A, C, K, B1, B2, B3, folat, E
Oenanthe javanica (Blume) DC.	*Téspong*	22-25	1,5-2	3,5	80	50	3	A, B, C
Physalis angulata L.	*Cécéndet*	74	2.6	15.68	13	56	1.4	C, A, B1, B2, B3
Pilea melastomoides (Poir.) Wedd.	*Poh pohan*	35	1,2	5	80	70,000	4,000	B, C, A
Psidium guajava L.	*Jambu*	68	2.6	14.3	18	40	1.1	C, A, E, K, Folate, B1, B2, B3
Pontederia vaginalis Burm.f.	*Écéng*	30	2,5	4	80	40	2,5	A, C, B
Solanum nigrum L.	*Leunca*	40	5.2	11	192,000	68,200	24	C, B-carotene
Solanum torvum Sw.	*Takokak*	70	5.2	11	192,000	68,200	24	C, B- carotene
Syzygium aqueum (Burm.fil.) Alston	*Jambu*	55	0.6	14	15	15	0.4	C, A, B complex

Note: Source: Ministry of Health of the Republic of Indonesia (2018)

Medicinal ingredients

A total of 12 species obtained from 48 species of wild plants used by the people of Cijambu are used as medicines separately, these plants are only used for the treatment of several categories of diseases (Table 4). Like a *ki sembung* (*Blumea balsamifera*) is widely used for various kinds of treatment such as diabetes, inflammation, respiratory, reproductive problems. *Ki sembung* is also called a miraculous plant according to the community, because it is easy to obtain and its benefits for various kinds of disease complaints. *Ki urat* (*Plantago major*) is used as a treatment to overcome digestive problems such as diarrhea, ulcers, infections or internal heat, and is considered to be able to lower blood sugar levels (diabetes), high blood pressure (hypertension) and diuretic problems. However, the generation that still makes the most use of *ki sembung* is the parents' generation, while the younger generation in Cijambu is less familiar with the types of plants that are used as medicine. This is in line with Mulyanto et al. (2018) that the Sundanese people named *B. balsamifera* as *sembung* recorded in ancient texts from the 15th century (Mulyanto et al. 2018). As Benítez et al. (2017) researched, there is a separation between plant species as functional foods and those used as drugs in different processing methods because certain organs and processing can affect the content of bioactive compounds contained in certain species.

Food and medicine

The Sundanese people in Cijambu Village, in addition to using wild plants as food and medicine, are simultaneously used as vegetables, and snacks. There are 18 species of plants that are used as medicinal and food ingredients at once, including *B. androgyna*, *C. asiatica, C. esculenta, C. crepidioides* and *M. oleifera* (Table 5). Cijambu people usually consume these species of plants to be consumed with the aim of treating certain diseases such as *C. crepidioides* which is believed to be able to treat diabetes and hypertension, consuming it as a medicine with the aim of treating the disease. Another example is that Cijambu people consume *C. esculenta* tubers by steaming or *seupan*. It can be an alternative carbohydrate as well as a diet and is believed to be able to lower blood sugar levels.

Community knowledge in the use of wild plants as a source of food as well as medicine will increase food diversification to meet people's daily nutrition. Pawera et al. (2020) revealed that wild plants as a food source provide essential micronutrients (minerals, vitamins) and phytochemicals (antioxidants). Vitamins and minerals play a wide role in the body's metabolic processes, while antioxidants are important to fight free radicals. Other nutrients are carbohydrates and fats as energy sources, and proteins that function in cell growth and maintenance (Khan et al. 2017). Without knowing the meaning of secondary metabolites, the habit of consuming fresh vegetables requires local people to cultivate food crops as plants by planting them around their homes or villages to meet their daily food needs (Hernawati et al. 2022).

Table 4. Species of WEPs that are used as medicinal materials in Cijambu Village, Sumedang District, Indonesia

Species of WEPs	Local name	Uses of treatment	Bioactive content*
Ageratum conyzoides L.	*Babadotan*	Fever, cough and cardiovascular	Flavonoids, alkaloids and essential oils
Blumea balsamifera (L.) DC.	*Ki sembung*	Inflammation, respiratory, diabetes, hypertension, gout, diuretics, fever, cough, flu, reproductive problems	Flavonoids, sesquiterpenoids, essential oils and limonenes
Chromolaena odorata (L.) R.M.King & H.Rob.	*Ki rinyuh*	Digestion, respiration, fever	Flavonoids, tannins and alkaloids
Erigeron sumatrensis Retz.	*Jalantir*	Digestion, inflammation, beauty	Flavonoids, tannins and saponins**
Sonchus arvensis L.	*Jawér kotok*	Digestive, infection, respiratory, liver, diuretic	Flavonoids, phenolics, tannins and phenolic acids ***
Bidens pilosa L.	*Hareuga*	Digestion, inflammation, diabetes, fever and cough	Polyacetylene, flavonoids and alkaloids
Cyperus rotundus L.	*Jukut*	Infection, fever, antistress and reproduction	Essential oils, flavonoids and alkaloids
Orthosiphon aristatus (Blume) Miq.	*Kumis ucing*	Digestion, diabetes, hypertension, gout, liver, diuretics, fever and cough	Flavonoids, saponins, polyphenols and essential oils
Sida rhombifolia L.	*Sadagori*	Digestion, inflammation, diabetes, hypertension and kidneys	Alkaloids, tannins, saponins and flavonoids
Tinospora crispa (L.) Miers ex Hook.fil. & Thomson	*Brotowali*	Kidney, reproduction	Flavonoids, alkaloids and lignans
Plantago major L.	*Ki urat*	Digestion, infections, diabetes, respiratory, hypertension	Flavonoids, tannins and iridoid glycosides ****
Imperata cylindrica (L.) Raeusch.	*Jukut eurih*	Gastrointestinal, diabetes, hypertension, diuretics, fever, antistress and cardiovascular	Saponins, phenolic acids and tannins

Note: Source: *National Center for Biotechnology Information (2025), ** Puspa et al. (2024), *** Suwartiny et al. (2022), and **** Adom et al. (2017)

Table 5. Species of WEPs that are used as ingredients and medicinal ingredients in Cijambu Village, Sumedang District, Indonesia

Species of WEPs	Local name	Types of Sundanese cuisine
Acmella paniculata (Wall. ex DC.) R.K.Jansen	*Jotang*	*Lalaban*, stir-fry, herbal tea
Bambusa vulgaris Schrad. ex J.C.Wendl.	*Iwung*	Stir-fry
Centella asiatica (L.) Urb.	*Antanan/tapak kuda*	*Lalaban* /vegetables
Crassocephalum crepidioides (Benth.) S.Moore.	*Sintrong*	*Lalaban*, stir-fry and pecel
Colocasia esculenta (L.) Schott	*Taleus*	Vegetables/*angeun, lompong, seupan*
Cosmos caudatus Kunth	*Kenikir*	*Lalaban*, vegetables/angeun, stir-fry and herbal tea
Cymbopogon citratus (DC.) Stapf	*Séréh*	Stir-fry, *lodeh*, herbal tea
Dendrocalamus asper (Schult.f.) Backer	*Iwung*	Stir-fry
Emilia sonchifolia (L.) DC. ex Wight	*Jongé*	*Lalaban* and herbal teas
Etlingera elatior (Jack) R.M.Sm.	*Honjé*	*Sambal honje, lalaban*, and stir-fry
Gigantochloa atter (Hassk.) Kurz ex Munro	*Iwung*	Stir-fry
Gigantochloa verticilata (Willd.) Munro	*Iwung*	Stir-fry
Hydrocotyle sibthorpioides Lam.	*Antanan leutik*	*Lalaban*/vegetables
Moringa oleifera Lam.	*Kélor*	Vegetables, tea/drinks
Musa × *paradisiaca* L.	*Cau*	Vegetables, stir-fry, *lodeh, botok*
Breynia androgyna (L.) Chakrab. & N.P.Balakr.	*Katuk*	Vegetables, stir-fries, dishes and drinks
Urtica dioica L.	*Beunying*	Vegetables, stir-fries, dishes and drinks
Etlingera elatior (Jack) R.M.Sm.	*Kecombrang*	*Lodeh, urap, lalap* and sambal honje

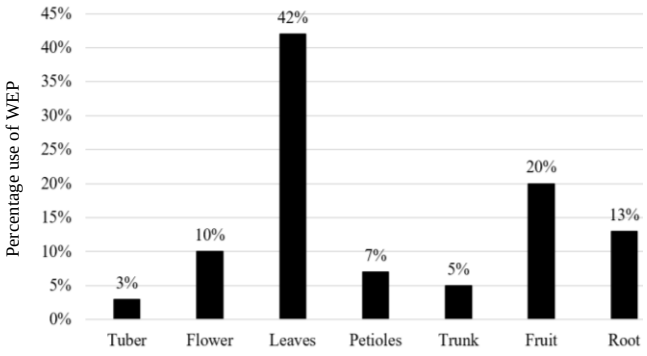

Figure 5. Types of use of WEP plant parts by the Cijambu Community, Sumedang District, Indonesia

Use of Wild Edible Plants (WEPs)

Based on the research carried out, the organ in wild plants are divided into seven parts, namely leaves, stalks, stems, fruits, roots, tubers and flowers (Figure 5) the most used is leaves (42%), the plant parts that are used for consumption in the leaves include *A. viridis, C. asiatica, C. crepidioides, D. esculentum, L. flava* and *M. oleifera*. In addition, the leaf part is the easiest to use by the community in the harvesting process and its utilization. According to the community, harvesting the leaves is a form of conservation locally, because it will not spend a large amount so that it aims to maintain the existence of the plant in a sustainable manner. In addition, the leaf part is the safest to consume because it is in the processing process such as in cleaning and cooking and does not have many side effects.

Similar researches were conducted by Liza et al. (2020), Pawera et al. (2020), Rahma et al. (2021) and Cheng et al. (2022). It shows that the parts of wild plants that can be used as food include roots, leaves, fruits, seeds, shoots, seeds, rhizomes, sap, stem and flower water as well as modified roots or stems as food reserves or tubers. Hernawati et al. (2022) also stated that the parts used as a leaf include shoots and young leaves, flowers and stalks, raw fruits, ripe fruits and seeds, tubers, bark, and bulb skins. Young leaves and stems or stalks that are usually greener and softer that can be utilized. The use of the growth leaf part is indirectly based on the fact that the leaves of the plant that are used as plants contain more essential elements such as vitamin B9 which plays a role in cell growth, prevents anemia, and helps the formation of red blood cells. In addition, green leaves also contain a sufficient amount of vitamin K which plays a role in blood clotting and preventing bleeding. Then, green vegetables contain other nutrients such as inositol (which plays a role in protecting the liver, heart, and digestive system), carotenoids, and provitamins that maintain healthy body cells and tissues (Butnariu and Butu 2015). Leaves are a place of accumulative photosynthesis which is thought to contain elements (organic) that have the property of curing diseases (Nasution et al. 2023). The use for food and medicine, the majority of leaves are safe to consume and have the most benefits. Substances that are abundant in leaves are essential oils, phenols, potassium compounds, and chlorophyll. Leaves have a high regeneration to re-sprout and do not have a major influence on the growth of a plant, even though the leaves are the site of photosynthesis (Ani et al. 2021).

The use of fruit parts in this study was 20%, including forest *Leucaena leucocephala*, *Mangifera foetida*, *Muntingia calabura* and *Physalis angulata.* According Rahmayanti and Ridwanto (2023), *L. leucocephala* usually lives in lowlands up to an altitude of 1500 meters above sea level, *L. leucocephala* seeds contain flavonoids, antioxidant compounds that are substances used to inhibit free radicals so that they can prevent various diseases. The use of the least in the bulb is as much as 3%, because the species used in the bulb are very few, only in *Gigantochloa atter*, *C. esculenta* and *honjé Etlingera elatior.* According to the community, *C. esculenta* tubers can replace as a source of carbohydrates for diet programs, as well as can control the amount of excess sugar levels in diabetics. Masithoh and

Kusumawati (2017) the potential development of tubers as a source of non-rice carbohydrates can be used to meet national food consumption and diversification recommendations. The species of plant that can be eaten in the rhizome is *E. elatior*, the rhizome is a modification of the stem of a plant that grows below the soil surface, can produce new shoots and roots from its segments, rhizomes generally have additional functions such as stems, the most common of which is the storage of certain metabolic products (Asharo et al. 2022).

Quantitative analysis RFC (Relative Frequency Citation)

In this study, wild plants as food had up to four species with high RFC values in spinach or *A. viridis*, *S. nigrum*, *Nasturtium officinale*, and *Muntingia calabura* (Table 2). A high RFC score indicates that the species is recognized and most utilized out of the total respondents. *Bayem* (*A. viridis*) and leunca (*S. nigrum*) are the most mentioned by the community because they are often consumed, leafy vegetables such as spinach are widely used by the Cijambu people because they have many benefits, and considered to reduce cholesterol risk. The high RFC score also shows that the community mentions the species the most that can be used as food. Spinach and leunca are very widely used as ingredients for vegetables and chips of processing, because the way to get them is easy and the safest to consume. Usually by the Cijambu people take young leaves and fruits of *leunca* to be used as vegetables that can be consumed directly as *lalaban* or cooked as stir-fries or *ulukuték*.

Viuda-Martos et al. (2014) mentioned spinach has high iron content. It is believed to have important nutrients and a fairly high content of vitamins A and C and beta-carotene. Nutrients in spinach can help reduce free radicals in the body (as antioxidants) so that it can help prevent oxidized cholesterol; a species of *kangkung* (*Ipomoea aquatica*) also contains vitamin A, carotenoids, and lutein. These three vitamins and minerals can help maintain eye health and in addition this substance can help prevent cataracts (Ülger et al. 2018). Sanu et al. (2023) showed that *S. torvum* and *S. nigrum* are also the most widely known and used by local communities in India. In addition, there are reducing sugars, glycosides, gum, and steroids in fruit *S. nigrum* from phytochemical screening results. They are secondary metabolites that are suspected to be efficacious as drugs. The types of alkaloids contained in *S. nigrum* fruits are solanine, solamargin, solasonin, α and β-solanigrin, and solasodin, as well as solanine in plant seeds. The RFC values are analyzed to obtain plant species that can be used as SDG strategies in food security (Putri 2022).

Meanwhile, small RFC values were found in five species of WEPs including *Acmella paniculata, Emilia sonchifolia, Erigeron sumatrensis, Sonchus arvensis, and Urtica dioica.* A small RFC value indicates that the five species are not in demand or their use and benefits as food and medicine are unknown by the people of Cijambu, in addition to being less in demand because of the limited way to obtain these species of vegetables, due to limited knowledge about these species of WEPs. This may be related to the perception of other people who think that "*Teu tiasa di emam atanapi kirang enak diemam*" or (inedible or not very tasty to eat) WEPs are not suitable for use as food or medicine, but only some use wild-growing vegetables, and the lack of knowledge about WEPs which is rich in benefits such as *jotang* and *jongé* is not in demand by the public. Banana flowers or *jantung cau* are rarely used because they are difficult to obtain, usually *jantung cau* from bananas are obtained from banana trees in the forest (*leuweung*) or come from communities in the forest. In addition to the availability factor, the frequency of plant utilization is also one of the factors that affect respondents' knowledge (Silalahi and Nisyawati 2018).

Analysis with Informant Consensus Factor (ICF)

Wild plants that are used as medicinal ingredients by the community are obtained as many as 27 species from 17 families. Igustita et al. (2023) obtained 50 species of medicinal plants, this is a difference in the number found in this study, because the species of plants used are not from wild plants, but from cultivated products or deliberately planted by the community both in the homegardens and in the garden.

The highest ICF value obtained in this study was 0.43, namely *ki sembung* (*B. balsamifera*). A high ICF value indicates that the species means that the informant has a consensus for plants that can be used for the treatment of several specific categories, in addition, a large ICF score indicates that the species is the most widely recognized and most widely used by the community as a medicinal ingredient for the treatment of various diseases by consuming it through brewing as herbal medicine or tea. According to the Sundanese people, *ki sembung* can be used as a traditional medicine in overcoming diuretic or urinary tract problems, kidney stones, overcoming sciatica or joint pain, lowering fever, lowering high blood pressure and cholesterol, can also be used to overcome female reproductive problems such as smoothing menstruation and according to the community it is good for digestion. However, according to the community, the use of *ki sembung* should not be excessive, in one day it can be consumed 2-3 times for a maximum of 10 days or can stop when the complaints have decreased or recovered. It can be consumed again if there are strong complaints. However, if after 10 days there has been no change, according to the community, they must immediately go to medical personnel to consult their complaints if they feel excessive pain. According to the community, the use of plants as medicinal ingredients is the easiest alternative in the village environment before deciding to consume modern medicines because they are easy to obtain and have few side effects. A similar study in the Philippines by Caunca and Balinado (2021) showed the use of *B. balsamifera* used as a remedy for urinary tract infections, menstrual cramps, coughs, fevers, and digestive problems.

Meanwhile, a small ICF value of 0.01 indicates that the *hareuga* (*Bidens pilosa*) is not in demand or its use and benefits are unknown by the people of Cijambu as a medicinal ingredient. This is in line with Caunca and Balinado (2021) that the low ICF value reflects the reduced use of some traditional medicines. ICF values can vary from culture to culture reflecting the differences in medicinal plants found

and used in these areas, and the diseases treated with these plants. The community considers this *hareuga* (*B. pilosa*) as a wild plant that cannot be used or considered as a weed only, because *hareuga* is located on the side of the road, on abandoned land and in sewers so many consider that *hareuga* does not have an important value both for consumption and for medicine. Research on WEP as a medicine in India by Sanu et al. (2023) on *B. pilosa* also shows a lack of public knowledge about *B. pilosa* as a plant that can be used as a medicinal ingredient.

Several other species that according to the community can be used as medicinal ingredients include *Breynia androgyna, C. asiatica, C. nardus, Orthosiphon aristatus, Sida rhombifolia,* and *Urtica dioica*. This is line according to Hernawati et al. (2022), fresh vegetables have efficacy as a traditional medicine that the local community believes can treat more than one disease. The consumption of fresh vegetables by the Sundanese people is a positive habit in maintaining health through a healthy diet. Fitness supported by the consumption of fresh vegetables cannot be separated from the active ingredients of these vegetables (Hernawati et al. 2022). Plants are used as medicine by the community because they have different benefits and are considered not to have adverse side effects for their users (Mayangsari et al. 2019).

This study identified 20 ailments that may be treated with the WEPs species gathered by the Cijambu people. Digestive problems are the most complained by the community and also the traditional way of treatment by wild plants is still widely used by them with knowledge from generation to generation. Some species of wild plants that are considered effective by the community to treat digestive problems include *B. pilosa, B. androgyna, C. odorata, C. esculenta, C. caudatus, C. citratus, E. elatior, E. sumatrensis, I. cylindrica, Marsilea, M. oleifera, P. major, S. rhombifolia, S. arvensis*, and *U. dioica*. While the least common type of disease, which is gout, nervous, and reproductive diseases, shows also the use of WEPs in the treatment of these types of diseases. As in the treatment of gout, the species used are *B. balsamifera, O. aristatus, S. arvensis, S. rhombifolia*, and *T. crispa*. In reproductive medicine generally complained about by women, this is related to irregular menstruation or pain during menstruation or pain in the female reproductive organs, the species used are *Blumea balsamifera, C. rotundus, Cymbopogon citratus* and *T. crispa.*

Meanwhile, diseases that are commonly complained about by the community such as flu, cough, fever, respiratory problems, inflammation/heat and respiratory problems, commonly used plants are *A. ciliata, A. conyzoides, B. balsamifera, C. asiatica, C. odorata, C. crepidioides, C. rotundus, E. sonchifolia, H. sibthorpioides, I. cylindrica, M. oleifera, O. aristatus, P. major,* and *S. arvensis.* Diseases experienced by the community can be iduced by environmental changes (weather), wrong diets and moderate outbreaks it the countryside. This type of disease is relatively mild and usually people can do their own treatment at home. Diseases such as diabetes and high blood pressure, can be treated by utilizing a variety of Wild Plants commonly used by the people of Cijambu are *A. viridis, B. balsamifera, C. esculenta, Cosmos* sp., *C. crepidioides, I. cylindrica, M. oleifera, M. calabura, P. major,* and *S. rhombifolia*. Pelokang et al. (2018) stated that medicinal plants can cure chronic, infectious, and non-communicable diseases, as well as maintain health. The World Health Organization (WHO) recommends the use of traditional medicines including herbal medicines in maintaining public health, prevention, and treatment of diseases, especially chronic, degenerative diseases, and cancer (Setiawati et al. 2016).

How to use WEP processing by residents

The community in Cijambu processes various WEPs obtained for various purposes such as food and medicine. The processing methods are also various, including as *lalaban* (consumed directly), vegetables, *loték, lompong* and stews for medicine (Figure 6).

The way to process vegetables is with soupy dishes in the form of water/broth/coconut milk with vegetable components, functioning as a complement to rice. Wild plants that are used as vegetables with clear soup with a mixture of onions, garlic, green onions and a little salt are in the processing of spinach (*A. viridis*), *katuk* (*B. androgyna*), *jawér kotok* (*S. arvensis*), *semanggi* (*M. crenata*), *kelor* (*M. oleifera*), and *sintrong* (*C. crepidiodes*). This is in accordance with the research of Sholichah and Alfidhdhoh (2020), the young leaves can be used as clear vegetables, in the Jombang area (East Java), they are used as food and vegetables. *Amaranthus* is widely known to be a high-benefit vegetable and also has great potential to be cultivated (Pawera et al. 2020).

The next type of processing by the community is stew vegetables. *Lalaban* is a vegetable that is consumed raw or fresh vegetables. *Lalaban* is also similar to salad, but some dishes are served from the type that is consumed directly without going through cooking, some are consumed from cooking by boiling. The parts used are usually leaves, young leaves, stalks, tubers, immature fruits and ripe seeds. Examples of species used as plants are *A. paniculata, C. asiatica, C. crepidioides, I. aquatica, L. leucocephala, M. oleifera, N. officinale, P. melastomoides, S. americanum,* and *S. torvum*. According to the community, some of them are consumed directly without a mixture of similar chili sauces and some are mixed as a complement to the tradition of consuming Sundanese food such as *lotek, karedok* with a mixture of chili sauce made from various chili sauces (red chili, garlic, peanuts, tomatoes, onions, shrimp paste, palm sugar, salt, and shrimp paste) and various other chili sauces. As the research by Iskandar et al. (2023) states that the Sundanese people consume *lalaban* consisting of various kinds of chili sauce as a complement; chili paste, *sambel oncom, sambel suuk, sambel tomat, sambel muncang, sambel hejo, sambel tomat atah, sambel tomat dicook, sambel cibiuk, sambel hiris, sambel leunca, sambel bawang,* and *sambel cikur*) as well as processed in the form of *karedok, lotek,* and *pécél*. Consuming *lalaban* for the community shows a close link with the concept of diet, so it is very promising to increase the consumption of salad as part of the diet (Pieroni et al. 2016). *Lalaban* is beneficial for health and skin because it contains nutrients

including B-carotene (Amrinanto et al. 2019). This research is also in line with Hernawati et al. (2022) that the grass used is the shoots and young leaves, flowers and stalks, raw fruits, ripe fruits and seeds, tubers, bark, and bulb skin.

The next type of processing is *urap, botok* and *pepes*. Sayur urap is a type of processed boiled vegetable and then added with grated coconut that has been seasoned. Other main ingredients such as grated coconut, anchovies, tempeh, which are then wrapped in banana leaves and cooked by steaming. The species used as urap and botok are *C. caudatus, C. crepidioides, E. sonchifolia, E. sumatrensis, Marsilea, M. oleifera,* and *O. javanica. L. leucocephala* is a complement to processed urap or botok, by sprinkling the seeds or fruits at the top of the dish. Botok or urap if it is not equipped with *pété cina* (*L. leucocephala*) then it is not perfect.

Sauteed or stir-fried (*osengan*) is the most widely used processing method by the Sundanese people in processing various types of vegetables. WEPs obtained by the community in Cijambu is consumed through processing with stir-frying. The most commonly used as a stir-fry (*osengan*) are *A. paniculata, A. auricula-judae, C. crepidioides, C. caudatus, D. esculentum, G. atter, I. aquatica, L. flava, N. officinale, P. djamor,* and *P. vaginalis.* The following type is the same as the research of Triyanto et al. (2024) that this type is commonly obtained by people in Central Java and then used as the most dominant ingredient in vegetable soup and stir-fry. Food plants are a group of plants that have parts/organs that can be consumed either by processing or eating directly (Diba et al. 2021). WEPs is an organ or part that can be utilized by humans by being processed or eaten raw, contains good nutrients and is non-toxic (Prabaningrum et al. 2018). Species of plants that can be sauteed are leaves, stems, and young flowers such as *E. sonchifolia*, *L. flava*. This plant is found from the Pteridophyta group known as ferns (*Diplazium esculentum*). People in Java and Sumatra also cook young stems and leaves of WEP (Pawera et al. 2020).

A total of eight species are used as fruits by the people of Cijambu Village, including *L. domesticum, M. calabura, Musa × paradisiaca, P. foetida, P. guajava,* and *S. aqueum.* The majority of the species of fruits used by the community are obtained from forests, because the species of fruits that are considered wild or not cultivated are rarely found in homegardens or gardens, usually those in garden areas or homegardens are cultivated by accident, but if they are in pure forests they are not planted by the community. People take advantage of sweet fruits such as the species mentioned above, because they are considered to have many benefits as snacks or refrshments, other benefits as an additional source of vitamins. *M. calabura* (*kérsén*) is found on roadsides and homegardens soil. Red ripe kérsen fruit can be consumed directly and has a sweet taste can be used as a preparation in the form of jam (Laswati et al. 2017). Furthermore, there is *P. angulata* (*cécéndet*) which grows wild in rice fields as a weed for horticultural plants. The fruit is ovoid in shape, yellow when ripe. It has a sweet taste with a soft flesh texture and has many seeds (Pawera et al. 2020).

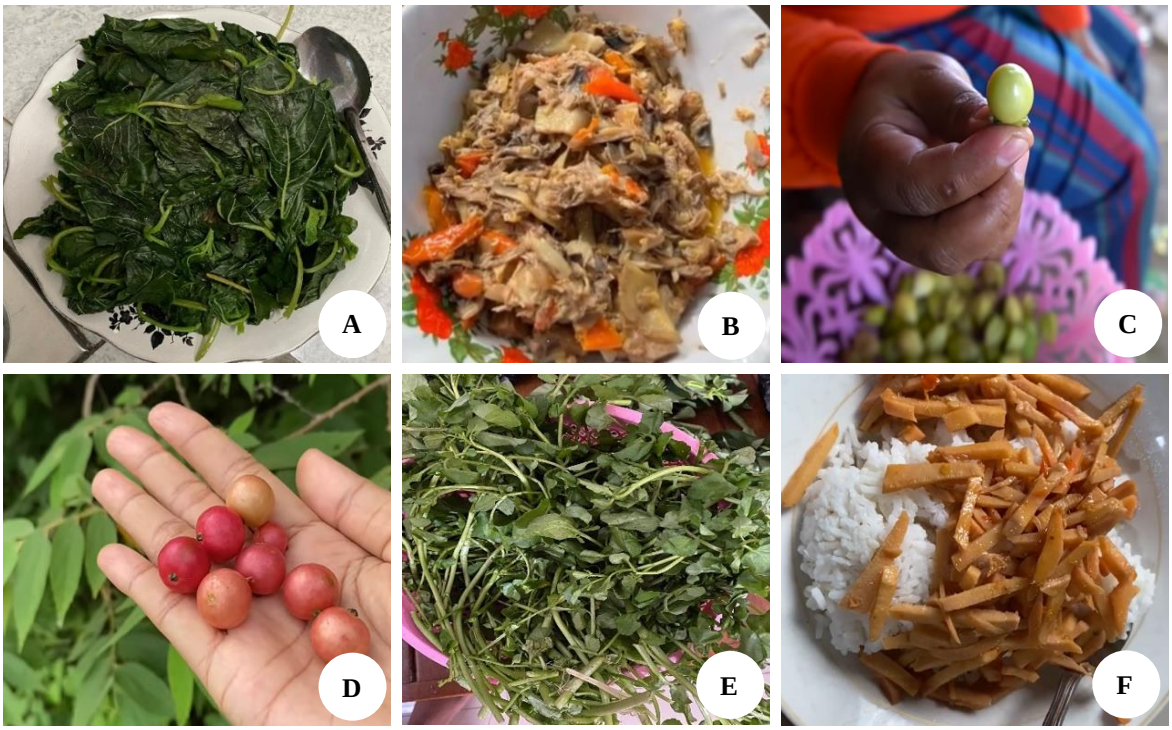

Figure 6. Processing WEPs by the local community. A. Spinach (*Amaranthus viridis*) as *lalaban* (boiled first); B. *Iwung* (*Gigantochloa atter*) as a *lompong*; C. *Cécéndét* (*Physalis angulata*); D. *Kérsén* (*Muntingia calabura*); E. *Eceng* (*Nausturtim officinale*), and *Oseng iwung* (*Dendrocalamus asper*)

Vegetables and fruits are a source of vitamins, minerals, and dietary fiber. The Indonesian Ministry of Health (2018) states that the daily requirement for fruit is 150g/person/day and vegetables 250 g/person/day. There are 13 types of vitamins that the body needs, namely vitamins A, C, D, E, K, and B complex consisting of eight types. The function of vitamins in the body is very varied, including as coenzymes, antioxidants, maintaining healthy eyes, bones, skin, and playing a role in cell metabolism. Minerals are inorganic elements, directly involved in the body's physiological processes so they must always be available in food. Macro minerals include calcium, sulfur, phosphorus, magnesium, while micro minerals include iron, zinc, copper and also iodine (Atikah et al. 2020).

Consumption of vegetables and fruits can meet the body's balanced nutritional needs, and can reduce risk factors for chronic non-communicable diseases such as high blood pressure, heart disease, obesity, type 2 diabetes mellitus, and cancer (Pawera et al. 2020). WEPs also contain bioactive or phytochemical compounds that can function as medicines. Wild plants found as a food source in this study, many of which were also identified as medicinal plants such as in the book Rachman and Siarudin (2016) and the CCRC (Cancer Chemoprevention Research Center, UGM) website, the plant species are sintrong (*C. crepidioides*), *semanggi* (*M. crenata*), *leunca* (*S. nigrum)*, and *cecendet* (*P. angulata)*. In addition, wild plants that are found also gradually become cultivated plants with economic value such as *genjer* (*L. flava*) and spinach (*A. viridis*). The availability of wild plants that are natural, fresh, free and highly nutritious can support public health and maintain the culture and heritage of the community (Kuswati and Adi 2021).

The next processing is as an herbal drink, the community processes the species of WEPs as an herbal drink for treatment and as a drink to maintain health. The parts that are usually used include leaves, stems, roots and fruits. The leaves are usually taken 2-5 pieces and then boiled as much as 500 mL of boiling water until 200 mL of water remains, but the leaves used can be boiled directly or dried first. Meanwhile, the root part used must be dried first, according to the community, the goal is to reduce the moisture content so that the active substances contained in it can easily dissolve in the cooking process. The amount of water used is the same as mentioned above, but in its presentation it can be mixed with a little honey, brown sugar, lemon or soy sauce to add flavor

Community knowledge in the use of wild plants as a food source will increase food diversification for the fulfillment of people's daily nutrition. Pawera et al. (2020) revealed that wild plants as a food source provide essential micronutrients (minerals, vitamins) and phytochemicals (antioxidants). Vitamins and minerals play a wide role in the body's metabolic processes, while antioxidants are important to fight free radicals. Other nutrients are carbohydrates and fats as energy sources, and proteins that function in cell growth and maintenance (Khan et al. 2017). Without them knowing the meaning of secondary metabolites, the habit of consuming fresh vegetables requires the local community to cultivate wild plants as plants by planting them around houses or villages to meet daily food needs (Hernawati et al. 2022).

Sustainability of the use of WEPs by the Cijambu community

Currently, certain forest leftovers with many wild plants that can be consumed in the study area are being deforested. This is mainly due to the population pressure of the community and the associated impacts. The expansion of agricultural land, the use of land for commercial tourism by major investors from the city, overgrazing and overharvesting are the main reasons for the destruction of wild edible plants. Wild plants used as food and medicine by the community in Cijambu Village are not sold to people outside the village. They only harvest on a small scale for personal consumption or are distributed to neighbors in need with a barter system. Most species of food plants that have a secondary function as traditional medicine are planted and cultivated in gardens and homegardens. The planting of useful species of plants in the homegardens is based on their function, for example as a source of carbohydrates, proteins, vitamins and minerals, and medicinal plants. This action is a form of conservation carried out by the local community which leads to natural stimulation, namely cultivation derived from wild plants that are consumed as a source of vegetables and medicine.

A participatory approach by involving local communities in plant conservation activities is an excellent supporting factor (Ulian et al. 2017). Academics and stakeholders are increasingly emphasizing the importance of local wild foods to evaluate and assess local biocultural heritage (Pieroni et al. 2016). For prospects, it is very important to make efforts to obtain the primary data necessary for the preservation of plant utilization potential, both in terms of bioecology and cultivation techniques as well as the exploration of useful active compounds. Another function related to the preservation of native vegetables is to protect flora (Uchiyama et al. 2017). For example, people in West Java, are familiar with the leaves, because their ancestors inherited the tradition of eating fresh vegetables since ancient times. The life of this classical society has been closely interacted with resources and the environment for generations, inheriting the traditional lifestyle lived by their ancestors. This conventional lifestyle then forms traditional wisdom as a form of local community strategy in utilizing natural resources sustainably (Amrinanto et al. 2019).

The status of wild plants changes to cultivated plants when people deliberately plant them in their homegardens. The good practice of the local community is family cooperation, sharing the harvest both in the garden, forest and in the homegardens. Each family makes it a habit to plant various species of plants in the homegardens or homegardens of the house to complement the needs of various plants so as to support the habitat for the growth of wild plants around it. In addition, they get used to sharing information when they have experience gained through trial and error, such as experience about how to process, benefits, and prescriptions of plants used for treatment. Based on the interviews, most of the informants gave a positive response to edible wild plants as a healthy and safe

food, which is part of traditional food culture. Sujarwo et al. (2016) classified edible plants into wild edible plants, semi-wild edible plants, and cultivated edible plants. Traditional knowledge of the Kaghan Valley; Mansehra, Pakistan, where the community believes that plants are essential to their lives (Jamal et al. 2012).

The use of wild plants by the people of Cijambu Village is a form of strategy in overcoming food insecurity that occurs, with regular harvesting patterns such as regulating the time to go to the forest and hunting, showing a form of conservation or sustainable use of wild plants by the community. The use of wild plants as medicine is also a form of local community strategy in an effort to maintain health traditionally, the use of modern medicine which is considered to have sustainable side effects, but by consuming wild plant materials has good suggestions to maintain the health of the local community. This knowledge is still obtained from the generation of parents; this knowledge is very valuable because it contributes 80% of the lifestyle of the local community in a healthy diet. In addition, it encourages household income that is quite good in meeting the needs of people's households.

In conclusion, wild edible and medicinal plants play a vital role in supporting the food and health needs of the Cijambu community, particularly in rural areas with limited access to commercial food and medicine. These plants are used as part of the community's adaptation strategies to ensure food security and maintain health through traditional ecological knowledge. The use of wild plants is not only practical but also sustainable, as harvesting is done periodically and responsibly. This research highlights the importance of preserving and promoting local plant knowledge and biodiversity as a contribution to achieving the Sustainable Development Goals (SDGs), especially SDG 2 on zero hunger and SDG 3 on good health and well-being. Future efforts should focus on further research, community education, and policy support to integrate this traditional knowledge into broader development and conservation initiatives.

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