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Ethnoecology of home garden landscapes on Seliu Island, Belitung District, Indonesia

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Abstract. *Efendi D, Chikmawati T, Sulistijorini, Djuita NR. 2024. Ethnoecology of home garden landscapes on Seliu Island, Belitung District, Indonesia. Biodiversitas 25: 1304-1319.* Seliu Island, Belitung District, Indonesia, once famous for its copra production, is now a popular tourist destination for its mangoes. People on this island use many plants from their home gardens, but more information about the diversity of plants in the landscape needs to be presented. This study explored the ethnoecology of the home garden landscape on Seliu Island to determine vegetation cover and its role. Research methods include interviews, cruising, and purposive sampling for vegetation inventory to calculate the Importance Value Index (IVI). The research results showed that 119 species belonging to 58 families were identified as growing in Seliu Island home gardens. Based on the habit type, herbaceous plants are the mostly found. Based on the aspect of utilization, medicinal plants are the most found plants. *Ananas comosus* (L.) Merr. had the highest IVI (14.65). People use seven parts of plants for medicinal purposes, and the leaves are the most widely used part. Home gardens on Seliu Island have social, economic, cultural, and ecological functions. Plant diversity in home gardens on Seliu Island must be preserved and improved, considering that Seliu Island is separated from the main island, Belitung Island, so plants' availability must be maintained.

Keywords: Importance value index, island tourism, medicinal plants, purposive sampling, vegetation inventory

INTRODUCTION

The interaction between local communities and the surrounding natural environment has a long history, especially since humans began to settle and cultivate food and medicinal plants (Santos et al. 2022). This interaction produces various types of landscapes, including home gardens, gardens, rice fields, and forests (Henri et al. 2022). A home garden is a landscape formed from human interaction with their environment, which is considered a small cultivated valuable area for plant domestication and conservation (Avilez-López et al. 2020). Home gardening is a land-use practice involving the deliberate preservation of multipurpose vegetation in intimate association with crops and livestock within the complex of individual houses (Patel et al. 2022). Home garden systems intentionally combine forest plant species with crops and mostly semi-domesticated plant species (Moreno-Calles et al. 2016). Additionally, home gardens combine managed agricultural and forestry landscapes representing agroforestry landscapes (Bantihun 2019).

Home gardens are important in various aspects, including economic, ecological, social, and cultural (Igwe et al. 2014). Economically, home garden plants are a source of multiple ingredients for medicine, ceremonial materials, and food security (Whitney et al. 2017; Ngcaba and Maroyi 2021; Hanun et al. 2023), for example in the people of Sumedang, West Java (Suwartapradja et al. 2023), and communities in Keeriyagasweva Village, Pethiyagoda Village, and Siwalakulama Village in Sri Lanka (Weerahewa et al. 2012). Therefore, the home garden becomes a valuable source of income both directly and indirectly for the owner. Ecologically, the home garden functions as a planting site for ornamental plants as well as providing shade and preventing erosion (Ramli et al. 2021; Larios et al. 2013), conserving biodiversity (Alcudia-Aguilar et al. 2018) and carbon absorbers (Wiryono et al. 2023). Home gardens have three leading roles: providing socio-economic impacts, ecological services, and representing the cultural values of community identity (Wakhidah et al. 2020).

Seliu Island is an island that is administratively included in the Seliu Island Village area, Membalong Sub-district, Belitung District, Bangka Belitung Islands Province, Indonesia. Most of the people of Seliu Island make their living as fishers. Seliu Island was once the largest copra-producing island in the Bangka Belitung Islands Province, as evidenced by the award given to Seliu Village by the Governor of South Sumatra and the Minister of Cooperatives in 1983. Now, Seliu Island is known as a tourist destination, such as Marang Bulo Beach, Tajur Beach, and Purun Lake, and it produces various commodities such as chips from *Gnetum gnemon* seeds, mangoes, and small crabs sold outside the island.

Apart from that, on Seliu Island, various unique plants also grow, such as *Hoya coronaria* and *H. verticillata*, whose habitats are in bushes and agroforestry (Rahayu et al. 2018). According to local community beliefs, Seliu Island also has six types of riding forests or forbidden forests, namely *Inding*, *Ibul*, *Lais*, *Mengkuang*,

Gelanggang, *Kebang*, and *Mawai*, which function as crossing places for supernatural spirits and wild animals (Henri et al. 2022). The Malay community in Belitung District uses 181 species of plants as food, most of which are wild plants (59%). People obtain these food plants from 5 types of landscapes: forests, *kelekak*, gardens, rice fields, and home gardens (Chikmawati et al. 2023). Home gardens contain the highest diversity of species after forests. Still, there has yet to be any data collection on plant inventories in the home gardens of the Seliu Island community, even though Seliu Island has a variety of natural richness in the form of various plants that form vegetation in its different kinds of landscapes. This research aimed to describe the profile of home garden vegetation and assess the benefits of plant diversity benefits and the value of home garden plants in different use categories on Seliu Island. This research is also expected to help determine the direction of policymaking on Seliu Island related to the importance of maintaining and increasing crop production in the home garden and space management on Seliu Island.

MATERIALS AND METHODS

Study area

This research was conducted on Seliu Island, Membalong Sub-district, Belitung District, Indonesia, with coordinates 3°13'24"S and 107°32'2"E (Figure 1). Data collection in the field was carried out from January 2023 to October 2023.

Procedures

Data collection

Data were collected using the interview method. Interviews were conducted by interviewing Key Informants (KI) and common informants. The key informant's selection was performed using a snowball sampling technique to determine informants based on instructions or initial informants considered more capable of providing information according to research needs. Key informants are local experts with a broader knowledge than others, selected based on data from village heads, traditional elders, farmers, traders, shamans, and birth attendants (Vogl et al. 2004). The key informants in this study consisted of two traditional elders, a village head, and a shaman. Common respondents are natives of Seliu Island who are at least 17 years old, healthy, communicative, and understand the utilization and management of biological resources and the environment, selected based on purposive sampling techniques. Interviews with informants were conducted to collect accurate data on the function of the home garden, the species of plants grown in the home garden, and the various categories of plant utilization in the home garden, such as food, spices, vegetables, cosmetics, ornamental, fruit, and medicine. A total of 9 people were successfully interviewed, consisting of one man and eight women aged 19-70 years. A total of 4 people became key informants, composed of one man and three women, while the other 5 were general informants. The number of female informants is higher than male informants because men work as fishers, while women primarily work as housewives, making chips, trading, and gardening. Therefore, local knowledge about the species and utilization of plants in the home garden of Seliu Island is mainly by women.

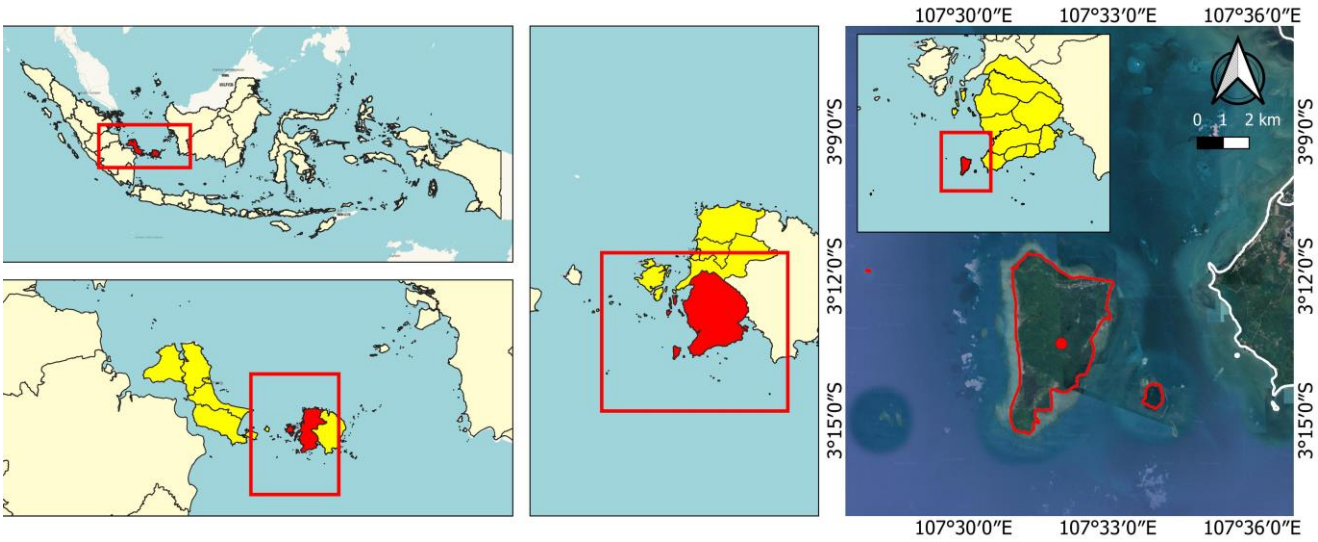

Figure 1. Research location on Seliu Island, Belitung District, Indonesia

Inventory of plants in the home garden and measurement of environmental factors

Determining the home garden whose vegetation will be inventoried was done using cruising and purposive sampling. The selected home gardens with a high level of diversity among others, such as herbaceous plants, climbers, shrubs, and trees, are preferred; the home garden is not disturbed by other activities such as road access, irrigation formation, and reservoirs. Home gardens that meet the criteria were measured in their area and then analyzed for vegetation. All plant species growing in the home garden were photographed, identified, and inventoried to determine their identity, number, and habit types (herbaceous, climber, shrub, or tree).

Environmental factors, which included humidity, air temperature, wind speed, and light intensity, were measured for each home garden using the BGLM-8000A multiparameter measuring instrument. Data collection using a multiparameter tool was carried out at chest level. Another environmental factor, soil temperature, is measured using a soil thermometer. Next, soil moisture and pH are calculated using a soil tester. The position for collecting data on soil temperature, moisture, and pH was carried out around the vegetation. The environmental factors collected were not only obtained during research; they were also taken from the Meteorology, Climatology, and Geophysics Council of the Bangka Belitung Islands Province, and satellite data was accessed from the Accu Weather website. The coordinates of each home garden are determined using Global Positioning System (GPS).

Herbarium preparation and identification

For further observation, plants with unknown identities are made into dry or wet herbarium samples. Plant samples were identified using three related reference books, namely the Flora of Java (Backer and Bakhuizen van den Brink 1968), World Spice Plants (Seidman 2005), and the Potential Plants of Belitung Island book (Sulistyaningsih et al. 2019). Plant identifications were also verified using herbarium specimens from the virtual herbarium (http://apps.kew.org/herbcat/ navigator.do and https://plants.jstor.org/partner/NHN). The scientific names of plants used refer to the Accepted Names of The Plantlist (http://www.theplantlist.org/) and Plant of the World online (http://powo.science.kew.org/.org/).

Data analysis

Data on the structure of the home garden, the category of plant utilization, and the role of the home garden were analyzed using a qualitative approach and presented in descriptive form, tables, or diagrams. The composition of home garden plant diversity was analyzed qualitatively, presented in tables and graphs, and analyzed quantitatively using the following formula:

The dominant plant species successfully inventoried from the home garden is known by the IVI calculation, the sum of RD and RF, and the maximum IVI is 200 (Odum 1993). The IVI can provide an overview of the sociological characteristics of a plant species in a community,

$$\text{Absolute Density (AD)} = \frac{\text{Number of individuals in the sample plot}}{\text{The total area of the sample plot}}$$

$$\text{Relative Density (RD)} = \frac{\text{Density of a species}}{\text{Density of all species}} x\ 100$$

$$\text{Absolute Frequency (AF)} = \frac{\text{The number of sample plots containing a species}}{\text{The number of all sample plots observed}}$$

$$\text{Relative Frequency (RF)} = \frac{\text{The absolute frequency of a species}}{\text{The sum of the absolute frequencies of all species}} x\ 100$$

$$\text{Importance Value Index (IVI)} = \text{RD} + \text{RF}$$

The homegarden species richness was calculated using Margalef Index (D_{Mg})

$$D_{Mg} = \frac{(S-1)}{ln\ N}$$

Where: S is the number of taxon and *N* is total of all taxon (Magurran 1988).

The homegarden plant diversity was analyzed using the Shannon-Wiener Index *(H')* (Magurran 1988),

$$H' = -\sum \frac{ni}{N} ln\left(\frac{ni}{N}\right)$$

Where: *ni* is the number of taxon *i*, and *N* is the total number of taxon *I*.

The level of evenness of species in Seliu Island village was calculated using the Pielou Evenness Index (*J'*) (Magurran 1988),

$$J' = \frac{H'}{lnS}$$

Where: *H'* is the result of the Shannon-Wiener index and *S* is the sum of all taxon.

RESULTS AND DISCUSSION

Description of the home garden

The area of Seliu Island is 1.499 ha, consisting of 500 ha of residential land, 115 ha of plantation land, 750 ha of forest, 2 ha of government offices, 2 ha of sports fields, 5 ha of educational areas, 2 ha of public cemeteries and 123 ha of others. The population in Seliu Village in 2021 was 1,034 people, divided into 349 families, and the number of community houses on Seliu Island is 300 (pers. comm. to the Seliu Island Village head). Thirty-two home gardens in Pulau Seliu village were successfully inventoried. Home gardens on Seliu Island are traditional landscapes in the form of land around the community houses. Home gardens on Seliu Island are in front of the house, beside the house, and behind the house (Figure 2). Home gardens are bordered by cement, wooden fences, and live plants such as *Ixora coccinea*; some houses do not have barriers between home gardens. Home gardens on Seliu Island vary in size between dwellings (Figure 2). Based on home garden size, Seliu Island has three categories: narrow with a size of <100 m^2 (10 home gardens), medium with a size of 100-200 m^2 (11 home gardens), and a broad category with a size of >200 m^2 (11 home gardens). Variations in home garden size are common worldwide, including in the

Vindhyan Plateau, India; their home garden size is divided into three categories: large size (> 650 m^2), medium (400-650 m^2), and small (< 400 m^2) (Patel et al. 2022). In addition, in Eastern Cape Province, South Africa, the average size of home gardens is 288 m^2 (Ngcaba and Maroyi 2021); Western Kenya varies from 0.25 ha to 1 ha (Hansen et al. 2023).

The size of the garden on Seliu Island is influenced by the family's land inheritance, economic factors, and a need to understand the importance of home gardens or green open spaces. People who receive a large inheritance of houses and home gardens from their families will also have a large land area. Likewise, people who receive a small inheritance of houses and home gardens will also have a small area of land around the house. People can increase the size of their garden by buying land from others if someone is willing to sell their land, so economic factors affect the size of the home garden. However, even if the community has a large home garden land and has a good economic ability to buy home garden land, if the awareness of the importance of green open space around the house is low, their home garden has a narrow size because almost all the land around the house is used. In addition, there is still a lack of understanding about the importance of home gardens or green open spaces, even though home gardens help mitigate environmental change, enable farmers to ensure food availability, protect the origin of species, and improve biogeochemical processes (Hu et al. 2023), and improve aesthetics. A recent study reported that home garden owners have significantly higher life satisfaction and mental well-being than non-home garden owners due to intergroup differences in sociodemographic factors (e.g., higher income), time spent outside the home (e.g., longer working hours), and personality traits (e.g., less neuroticism) (Lehberger and Sparke 2023).

The size of the home garden on Seliu Island does not affect the number of plants and plant species in the home garden of the Seliu Island community. A Previous study shows that the size of home gardens in the Vindhyan Plateau, India, also does not significantly affect plant diversity in home gardens (Patel et al. 2022). On Seliu Island, some houses have large areas of land around the house with few plants, while narrow houses have more diverse plants. People with small home gardens would prefer to plant shrubs, bushes, and climbing plants rather than trees. If they plant tree crops on a small plot of land, they will prune branches above the roofs of private houses, neighboring land, and branches leading to roads commonly passed by the community. The pruning of branches is done because the branches can cause damage to the roof of the house, such as rusting, falling fruit, and falling leaves, which can pollute the environment. The community also maintains a distance between the coconut trees and the house so as not to be hit by falling fruit.

Figure 2. Profile of a home garden on Seliu Island, Belitung District, Indonesia with one to several mango trees in almost every house. A. No fence, B. Plant fence, C. Cement fence, D. Home garden at the back of the house

Figure 3. The Seliu Island environment, Belitung District, Indonesia. A. Street view in front of community house, B. Medicinal plants in home gardens

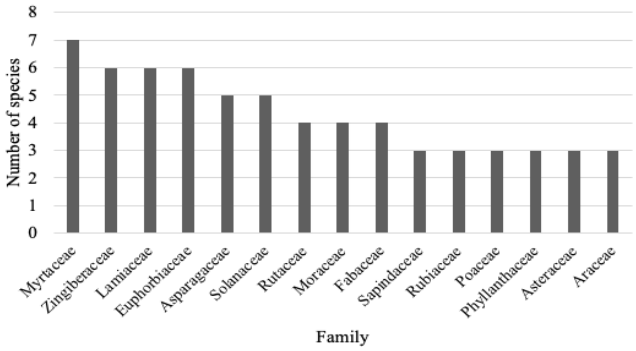

Figure 4. Plant families found in the home gardens of Seliu Island, Belitung District, Indonesia

The community uses the home garden on Seliu Island for gardening and various activities such as raising livestock, caring for children, playing or recreating, socializing with neighbors, and drying marine products, agriculture, and clothing. In every house, almost everyone plants mango trees around the home garden, either at the front, side or back of the house (Figure 2). In addition, if we walk around Seliu Island, the branches of mango trees will dangle above the road (Figure 3.A); these branches can ecologically reduce the sun's heat so that residents or tourists feel comfortable walking around on Seliu Island. Medicinal plants were also found in one of the houses of a resident who serves as the head of the neighborhood association on Seliu Island (Figure 3.B). These family medicinal plants show that the community on Seliu Island cares about health because they have alternative medicinal materials by utilizing plants in their home garden, even though there is an official health center on Seliu Island that operates from Tuesday to Friday.

Diversity of plants in the home garden

Based on our study, 119 plant species belonging to 58 families were collected from Seliu Island's home garden (Table 1). The six most dominant families were Myrtaceae (7 species), Zingiberaceae (6 species), Euphorbiaceae (6 species), Lamiaceae (6 species), Asparagaceae (5 species), and Solanaceae (5 species) (Figure 4). The composition of home garden plant diversity on Seliu Island is different compared to the composition of home gardens in other areas, such as in the Baiku Yao region, South China, which found that there were 213 species belonging to 80 families, the most common family composition was Poaceae (15 species) (Hu et al. 2023). Meanwhile, Zingiberaceae and Asteraceae have the highest number of species in home gardens in Way Jambu Village and Labuan Mandi Village, Lampung Province, Indonesia (Wakhidah et al. 2020). Therefore, socio-cultural and geographical differences in a region influence the composition of home garden plant diversity. In addition, variations in species richness in home gardens are closely related to household land ownership, income, home garden size, and time spent gardening (Kabir et al. 2016).

The most common family in Seliu Island home gardens is Myrtaceae, which is found inside and back home gardens. The fruit, such as *Syzygium aqueum*, *Psidium guajava*, and *Syzygium malaccense*, is usually used for consumption. Some are found in front home gardens, such as *Syzygium myrtifolium*, an ornamental plant. Zingiberaceae is found in the front home garden and used as medicinal plants and spices such as *Curcuma longa*, *Kaempferia galanga*, and *Zingiber officinale*. Euphorbiaceae are commonly found in front home gardens such as *Euphorbia milii*, *E. bracteata*, and *Codiaeum variegatum*, and are used as ornamentals. *Manihot esculenta* is a species of the Euphorbiaceae family found in the side home garden and is used as a food crop. Species from the Asparagaceae family are found in the front home garden and are used as ornamentals, such as *Agave amica*, *Dracaena trifasciata*, *Cordyline fruticosa*, and *Dracaena angustifolia*.

People need to plant some species in their home gardens. However, many plants, such as *Phyllanthus urinaria*, *Lantana camara*, and *Mimosa pudica*, still grow in house yards on Seliu Island. These plants grow predictably because the seeds are brought down by wind, rainwater, and animals and accidentally brought down by

humans. The number of these plants was not found in many Seliu Island home gardens because the people who own the home gardens have the authority to manage the number and species of plants in their home gardens, so these plants are often cleaned or destroyed because they consider that these plants do not have high beneficial values. However, we include *L. camara* as a medicinal plant because, based on the research results, the plant can potentially be an anti-cancer drug. After all, it contains alkaloids, phenolics, flavonoids, steroids, and terpenoids (Arbiastutie et al. 2017), although the community on Seliu Island does not use it as a medicine. Meanwhile, in eastern Nepal, especially in the Tarai, Siwalik, and Central Mountain regions, *L. camara* is included in the list of Invasive Alien Plant Species (IAPS) that have negative ecological impacts, especially agricultural production (Shah et al. 2020). IAPS causes long-term damage by disrupting the balance between local flora and soil microbes (Wang et al. 2022). In the Seliu Island home garden, *L. camara* is not yet an invasive alien plant species (IAPS) because its presence can still be controlled. The presence of IAPS must be controlled so that it does not cause damage to the ecosystem, considering that islands such as Seliu Island, inland waters, and coastal areas are often particularly at risk (Luo et al. 2022). Therefore, IAPS needs to be anticipated by prioritizing prevention and early detection efforts, applying integrated management approaches, exploring biological control options, focusing on habitat restoration and rehabilitation, and strengthening policy and legal frameworks (Yadav et al. 2024) so that the plant composition of the Seliu Island home garden is maintained including the composition of its habitat structure.

The plants that grow in the gardens of Seliu Island have four habit categories: trees, shrubs, herbs, and climbers (Figure 5). Based on our results, herbaceous species are the most common habits found in Seliu Island home gardens (45 species), followed by shrubs (37 species), trees (28 species), and climbers (9 species). The combination of plant habits forms a multi-layered canopy configuration structure in the home garden (Pamungkas et al. 2013). Herbs, shrubs, and climbers make up the soil layer (0-2 m), such as *K. galanga, Z. officinale, Ananas comosus, Melastoma malabathricum, Breynia androgyna, Hibiscus rosa-sinensis, Anredera cordifolia, Selenicereus monacanthus,* and *Cucumis sativus*. Herbs, shrubs, and climbers are also located in the lower canopy layer (>2-7 m), such as *Musa acuminata* × *balbisiana*, *Rhodomyrtus tomentosa*, *Muntingia calabura, Punica granatum, Citrus* × *aurantiifolia*, *Moringa oleifera*, and *Tinospora crispa*. The middle canopy layer (>5-14 m) and upper canopy layer (>14-21 m) consisted mainly of woody plants and annual fruit plants. The species composition in the middle canopy layer includes *Persea americana*, *Mangifera indica, G. gnemon, Averrhoa bilimbi, S. aqueum, S. malaccense, Pometia pinnata*, and *Artocarpus heterophyllus*. Meanwhile, most species found in the upper layer (>15-21 m) on Seliu Island have similarities with species in the middle layer, such as *M. indica*, *G. gnemon*, and *Cocos nucifera*. The composition of families, species, and habit types forming the structure of a multi-layered canopy configuration of plants in the Seliu Island home garden plays an important role in ecological aspects such as carbon sequestration, as a source of oxygen, erosion prevention, shade canopy, and can be utilized as an additional source of food for the community.

Based on the local knowledge of the Seliu Island community, plants are grouped into eight categories based on their utilization (Figure 6). This number is less than that found in the Donorejo Village community in Menoreh Karst Area, Purworejo, Central Java, Indonesia (12 categories of utilization) (Sholekha et al. 2023); and Way Jambu Village and Labuan Mandi Village, Lampung Province, Indonesia (16 utilization categories) (Wakhidah et al. 2020). Medicinal materials are the utilization category with the highest number of species (30%), followed by ornamentals (26%), fruits (24%), spices (8%), vegetables (6), carbohydrate sources (3%), cosmetic (2%), and hedgerow (1%). Medicinal plants on Seliu Island have the highest utilization percentage, showing that people care about their health. This condition also benefits the community because they have an alternative source of treatment besides seeking treatment at the Community Health Center on Seliu Island, especially since Seliu Island is also separated from the main island (Belitung Island), which requires time if they want to buy medicines from outside the island. This condition can also encourage the community to continue cultivating plants, thus allowing the formation of a sustainable conservation cycle for plants in the Seliu Island home garden.

Figure 5. Comparison of the number of species based on habit types in Seliu Island, Belitung District, Indonesia

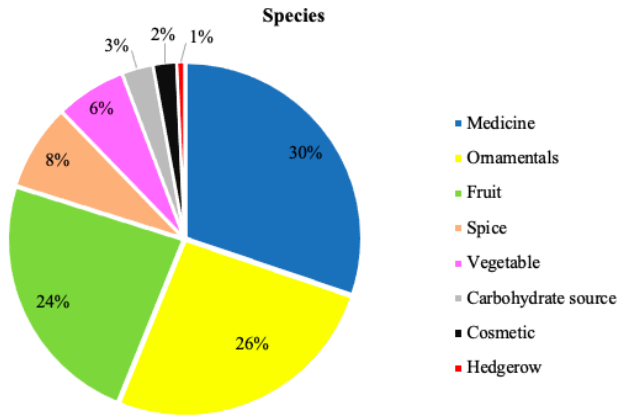

Figure 6. Comparison of plant species percentages based on utilization categories in Seliu Island, Belitung District, Indonesia

Table 1. List of plant species recorded from the home gardens of Seliu Island, Belitung District, Indonesia

Habits	Local Name	Scientific Name	Family	Utilization Category	IVI
Climbers	*Binahong*	*Anredera cordifolia* (Ten.) Steenis	Basellaceae	Medicinal	0.73
	Buah naga	*Selenicereus monacanthus* (Lem.) D.R.Hunt	Cactaceae	Fruit	1.20*
	Janda bolong	*Monstera adansonii* Schott	Araceae	Ornamental	0.60
	Kacang betor	*Psophocarpus tetragonolobus* (L.) DC.	Fabaceae	Vegetable	0.60
	Melati	*Jasminum fluminense* Vell.	Oleaceae	Ornamental	0.30
	Nona makan sirih	*Clerodendrum thomsoniae* Balf.f.	Lamiaceae	Ornamental	0.30
	Sirih	*Piper betle* L.	Piperaceae	Medicinal	0.60
	Terong ali	*Tinospora crispa* (L.) Hook.f. & Thomson	Menispermaceae	Medicinal	1.20*
	Timun	*Cucumis sativus* L.	Cucurbitaceae	Fruit, vegetable	0.30
Herbaceous	*Adam hawa*	*Tradescantia pallida* (Rose) D.R.Hunt	Commelinaceae	Ornamental	2.84
	Anggrek kupu-kupu	*Platanthera bifolia* (L.) Rich.	Orchidaceae	Ornamental	0.30
	Ati-ati	*Coleus scutellarioides* (L.) Benth.	Lamiaceae	Ornamental, medicinal	3.75
	Bawang dayak	*Eleutherine bulbosa* (Mill.) Urb.	Iridaceae	Medicinal	0.60
	Bunga sedap malam	*Agave amica* (Medik.) Thiede & Govaerts	Asparagaceae	Ornamental	0.37
	Bunga tai ayam	*Tagetes erecta* L.	Asteraceae	Ornamental	0.30
	Cabe merah	*Capsicum annuum* L.	Solanaceae	Vegetable	1.08
	Ciplukan	*Physalis angulata* L.	Solanaceae	Fruit, medicine	0.30
	Daun sop	*Apium graveolens* L.	Apiaceae	Spice	0.96
	Euphorbia/bunga duri	*Euphorbia milii* Des Moul.	Euphorbiaceae	Ornamental	0.73
	Ganyong	*Canna indic*a L.	Cannaceae	Ornamental	0.60
	Iding-iding	*Stenochlaena palustris* (Burm.f.) Bedd.	Aspleniaceae	Vegetable	2.28
	Jahe	*Zingiber officinale* Roscoe	Zingiberaceae	Spice, medicinal	1.81
	Kapulaga	*Wurfbainia compacta* (Sol. ex Maton) Škorničk. & A.D.Poulsen	Zingiberaceae	Spice, medicinal	0.57
	Keladi hias	*Caladium bicolor* (Aiton) Vent.	Araceae	Vegetable	2.68
	Kelemimit	*Phyllanthus niruri* L.	Phyllanthaceae	Medicinal	0.37
	Kembang kerokot	*Portulaca grandiflora* Hook.	Portulacaceae	Ornamental	0.30
	Kembang pukul empat	*Mirabilis jalapa* L.	Nyctaginaceae	Ornamental	1.01
	Kembang taruk/ anggrek merpati	*Dendrobium crumenatum* Sw.	Orchidaceae	Ornamental	3.14
	Kemih kucing	*Tridax procumbens* L.	Asteraceae	Medicinal	1.88
	Kencur	*Kaempferia galanga* L.	Zingiberaceae	Spice	2.56
	Kulit sutong	*Spermacoce remota* Lam.	Rubiaceae	Medicinal	1.28
	Kumis kucing	*Orthosiphon aristatus* (Blume) Miq.	Lamiaceae	Medicinal	0.60
	Kunyit	*Curcuma longa* L.	Zingiberaceae	Spice, medicinal	1.95
	Lengkuas	*Alpinia galanga* L.	Zingiberaceae	Spice	7.95
	Lidah buaya	*Aloe vera* L.	Asphodelaceae	Cosmetic, medicine	3.52
	Lidah mertua	*Dracaena trifasciata* (Prain) Mabb.	Asparagaceae	Ornamental	3.62
	Lili	*Chlorophytum comosum* (Thunb.) Jacques	Asparagaceae	Ornamental	0.37
	Nanas	*Ananas comosus* (L.) Merr.	Bromeliaceae	Fruit	14.65*
	Paku sarang burung	*Asplenium nidus* L.	Aspleniaceae	Ornamental, medicinal	0.37
	Paku daun kepala tupai	*Drynaria quercifolia* (L.) J.Sm.	Polypodiaceae	Ornamental	0.37
	Paku tanduk rusa	*Platycerium bifurcatum* (Cav.) C.Chr.	Polypodiaceae	Ornamental	0.30
	Pecut Kuda	*Stachytarpheta cayennensis* (Rich.) Vahl	Verbenaceae	Ornamental	2.56
	Pisang	*Musa acuminata* × *balbisiana* Colla	Musaceae	Fruit	6.50
	Punggur bedaun	*Euphorbia bracteata* Jacq.	Euphorbiaceae	Ornamental	1.90
	Sabun bulu	*Miconia crenata* (Vahl) Michelang.	Melastomataceae	Medicinal	0.37
	Sambiloto	*Andrographis paniculata* (Burm.f.) Wall. ex Nees	Acanthaceae	Medicinal	0.71
	Selasih	*Ocimum basilicum* L.	Lamiaceae	Medicinal	0.78
	Serai	*Cymbopogon citratus* (DC.) Stapf	Poaceae	Spice, medicinal	4.65
	Strawberry	*Fragaria vesca* L.	Rosaceae	Fruit	0.30
	Talas wangi	*Colocasia esculenta* (L.) Schott	Araceae	Food	0.57
	Temulawak	*Curcuma zanthorrhiza* Roxb.	Zingiberaceae	Spice, medicinal	0.67
	Terong panjang	*Solanum melongena* L.	Solanaceae	Vegetable	2.18
	Terus dingin	*Kalanchoe pinnata* (Lam.) Pers.	Crassulaceae	Medicinal	4.25
	Tila	*Ipomoea batatas* (L.) Lamb.	Convolvulaceae	Food	2.54

Shrubs	*Belimbing hutan*	*Phyllanthus urinaria* L.	Phyllanthaceae	Fruit	0.30
	Betadin	*Jatropha multifida* L.	Euphorbiaceae	Medicinal	0.30
	Bunga terompet	*Brugmansia* × *candida* Pers.	Solanaceae	Ornamental	0.30
	Cekok manis	*Breynia androgyna* (L.) Chakrab. & NP.Balakr.	Phyllanthaceae	Vegetable	4.83
	Ceri	*Muntingia calabura* L.	Muntingiaceae	Fruit, medicinal	0.73
	Delima	*Punica granatum* L.	Lythraceae	Fruit	0.30
	Jeruk kunci	*Citrus* × *aurantiifolia* (Christm.) Swingle	Rutaceae	Fruit	0.60
	Jeruk lemon	*Citrus* × *limon* (L.) Osbeck	Rutaceae	Fruit	0.37
	Jeruk manis	*Citrus* × *aurantium* L.	Rutaceae	Fruit	1.26
	Jeruk purut	*Citrus hystrix* DC.	Rutaceae	Spice	0.60
	Kamboja	*Plumeria obtusa* L.	Apocynaceae	Ornamental, medicinal	4.29
	Keletaan	*Melastoma malabathricum* L.	Melastomataceae	Medicinal	2.26
	Kelingkaan	*Callicarpa longifolia* Lam.	Lamiaceae	Medicinal	1.28
	Kelor	*Moringa oleifera* Lam.	Moringaceae	Vegetable	1.61
	Kembang kertas	*Bougainvillea spectabilis* Willd.	Nyctaginaceae	Ornamental	4.20
	Kembang merak	*Caesalpinia pulcherrima* (L.) Sw.	Fabaceae	Ornamental	0.37
	Kembang sepatu	*Hibiscus rosa-sinensis* L.	Malvaceae	Ornamental, medicinal	1.17
	Keramunting	*Rhodomyrtus tomentosa* (Aiton) Hassk.	Myrtaceae	Ornamental, medicinal	2.30
	Ketapang	*Terminalia catappa* L.	Combretaceae	Medicinal	0.30
	Ketepeng	*Senna alata* (L.) Roxb.	Fabaceae	Medicinal	0.30
	Lantana camara	*Lantana camara* L.	Verbenaceae	Medicinal	0.30
	Mahkota dewa	*Phaleria macrocarpa* (Scheff.) Boerl.	Thymelaeaceae	Medicinal	0.30
	Mali-mali	*Leea indica* (Burm.f.) Merr.	Leaceae	Medicinal	0.37
	Mangkokan	*Polyscias scutellaria* (Burm.f.) Fosberg	Araliaceae	Cosmetic, ornamental	1.26
	Menggale	*Manihot esculenta* Crantz	Euphorbiaceae	Food	1.51
	Menggale jepan	*Cnidoscolus aconitifolius* (Mill.) I.M.Johnst.	Euphorbiaceae	Medicinal	2.33
	Murbei	*Morus alba* L.	Moraceae	Fruit	0.37
	Njuang merah	*Cordyline fruticosa* (L.) A.Chev.	Asparagaceae	Fruit	2.64
	Palem tupai	*Wodyetia bifurcata* A.K.Irvine	Arecaceae	Ornamental	0.30
	Pandan wangi	*Pandanus amaryllifolius* Roxb. ex Lindl.	Pandanaceae	Spice, medicinal	2.13
	Puring	*Codiaeum variegatum* (L.) Rumph. ex A.Juss.	Euphorbiaceae	Ornamental	1.90
	Putri malu	*Mimosa pudica* L.	Fabaceae	Medicinal	0.30
	Sembung cina	*Blumea balsamifera* (L.) DC.	Asteraceae	Medicinal	0.90
	Soka	*Ixora coccinea* L.	Rubiaceae	Ornamental, fence	7.21*
	Suji hias	*Dracaena angustifolia* (Medik.) Roxb.	Asparagaceae	Ornamental	1.67
	Tapak darah	*Catharanthus roseus* (L.) G. Don	Apocynaceae	Ornamental, medicinal	4.92
	Tekokak	*Solanum torvum* Sw.	Solanaceae	Vegetable	0.37
Trees	*Alpukat*	*Persea americana* Mill.	Lauraceae	Fruit	0.60
	Baguk	*Gnetum gnemon* L.	Gnetaceae	Food	1.81
	Bambu kuning	*Bambusa vulgaris* Schrad. ex J.C.Wendl.	Poaceae	Ornamental	0.30
	Bambu pagar	*Bambusa multiplex* (Lour.) Raeusch. ex Schult.f.	Poaceae	Ornamental	0.30
	Belimbing wuluh	*Averrhoa bilimbi* L.	Oxalidaceae	Fruit	1.63
	Beringin	*Ficus benjamina* L.	Moraceae	Ornamental	0.30
	Daun pacar	*Lawsonia inermis* L.	Lythraceae	Cosmetic	0.60
	Daun salam	*Syzygium nervosum* DC.	Myrtaceae	Spice	0.90
	Jambu air	*Syzygium aqueum* (Burm.f.) Alston	Myrtaceae	Fruit	2.39
	Jambu Biji	*Psidium guajava* L.	Myrtaceae	Fruit, medicinal	1.63
	Jambu bol	*Syzygium malaccense* (L.) Merr. & L.M.Perry	Myrtaceae	Fruit	1.84
	Katis	*Carica papaya* L.	Caricaceae	Fruit	5.85
	Kelapa	*Cocos nucifera* L.	Arecaceae	Fruit	7.34
	Kelebantuian	*Syzygium racemosum* (Blume) DC.	Myrtaceae	Fruit, medicinal	0.30
	Kelengkeng	*Dimocarpus longan* Lour.	Sapindaceae	Fruit	0.30
	Kiras	*Garcinia celebica* L.	Clusiaceae	Fruit	0.37
	Kurma	*Phoenix dactylifera* L.	Arecaceae	Fruit	0.60
	Leban	*Vitex pinnata* L.	Lamiaceae	Medicinal	0.37
	Mangga	*Mangifera indica* L.	Anacardiaceae	Fruit	13.03*
	Matoa	*Pometia pinnata* J.R.Forst. & G.Forst.	Sapindaceae	Fruit	0.30
	Mengkudu	*Morinda citrifolia* L.	Rubiaceae	Medicinal	0.96
	Nangka	*Artocarpus heterophyllus* Lam.	Moraceae	Fruit	0.30
	Pucuk merah	*Syzygium myrtifolium* Walp.	Myrtaceae	Ornamental	0.67
	Rambutan	*Nephelium lappaceum* L.	Sapindaceae	Fruit	0.30
	Sawo	*Manilkara zapota* (L.) P. Royen	Sapotaceae	Fruit	0.60
	Sirsak	*Annona muricata* L.	Annonaceae	Fruit	1.33
	Sirsak belanda	*Annona squamosa* L.	Annonaceae	Fruit	0.30
	Sukun	*Artocarpus altilis* (Parkinson) Fosberg	Moraceae	Fruit	0.60

Table 2. Five plant species with the highest Important Value Index of each plant habit in Seliu Island, Belitung District, Indonesia

Habitus	Local Name	Scientific Name	Family	Utilization Category	IVI
Herbaceous	*Nanas*	*Ananas comosus* (L.) Merr.	Bromeliaceae	Fruit	14.65
Tree	*Mangga*	*Mangifera indica* L.	Anacardiaceae	Fruit	13.03
Shrub	*Soka*	*Ixora coccinea* L.	Rubiaceae	Ornamental	7.21
Climber	*Buah naga*	*Selenicereus monacanthus* (Lem.) D.R.Hunt	Cactaceae	Fruit	1.20
Climber	*Terong ali*	*Tinospora crispa* (L.) Hook.f. & Thomson	Menispermaceae	Medicinal	1.20

There are 42 species of plants with potential as medicinal plant materials found in the home gardens of Seliu Island. However, only 30 species are used by the Seliu Island community (Table 3). Of the 30 medicinal plant species used, 22 were successfully inventoried in home gardens (Tables 2 and 3). The other eight plants were found in other traditional landscapes, such as gardens, forests, and *kelekak* (Henri et al. 2022). There are 20 plant species found in Seliu Island home gardens that have multiple functions, including medicinal plants such as *M. calabura*; in addition to being a fruit-producing plant, it also functions as a diabetes medicine (Tables 1 and 3). Meanwhile, *Coleus scutellarioides* is an ornamentals and ulcer medicine (Table 1). The people of Tsang-la (Motuo Menba) in Yarlung Tsangpo Grand Canyon, Southwest China, utilize plants with two or more uses. For example, *Dendrobium nobile* is a medicinal and ornamental plant, and *Z. officinale* is a vegetable, spice, and medicine (Zhang et al. 2020).

The second highest category of plant utilization after the medicine category is the ornamentals (36 species) (Figure 6). The most common species of ornamentals on Seliu Island are *I. coccinea* and *Plumeria obtusa*. Meanwhile, the most common families of ornamentals are Asparagaceae and Euphorbiaceae, primarily located in the house's front home garden. Ornamentals in home gardens create beauty in their homes, so home gardens on Seliu Island also function as a place for family recreation. The next category of plant utilization is the fruit category (33 species). Myrtaceae, such as *S. aqueum, P. guajava, S. malaccense,* and *R. tomentosa*, are the most widely used fruit. Based on the Importance Value Index (IVI), the fruit plant is also the most common plant found in each type of habit except in the shrub habit, and the most common fruit plant is *A. comosus* (14.65) (Table 1).

Plants that have the highest IVI in shrub habit are *I. coccinea* (7.21) as an ornamental plant, followed by *Catharanthus roseus* (4.92) as an ornamental plant, and *B. androgyna* (4.83) as a vegetable. In the tree habit type, fruit plants have the highest IVI, namely *M. indica* (13.03), *C. nucifera* (7.34), and *Carica papaya* (5.85). The most common fruit plants vary among locations. Differences in plant species diversity are also thought to be influenced by differences in local knowledge (Akerreta et al. 2007). In Way Jambu Village and Labuan Mandi Village, Lampung Province, Indonesia, the most common fruit trees were *Durio zibethinus, P. americana,* and *Passiflora edulis* (Wakhidah et al. 2020). The most abundant plant found in home gardens in Legambo District (Chiro Kebele), South Wollo, Ethiopia, is *Hagenia abyssinica*, which is used as a medicinal plant, followed by *Solanecio gigas* which is used to treat dysentery in sheep (Habtemariam and Belay 2019). *H. abyssinica* is commonly found, possibly due to the agroecology suitable for where it grows, and is also used by the community as a medicinal plant.

The number of species used in each utilization category varies between ethnicities. On Seliu Island, the number of plants in categories other than medicine, ornamentals, and fruits is 11 species of spices, 9 species of vegetables, 4 species of carbohydrate sources, 3 species of cosmetics, and one species of hedgerow (Figure 6). In the Karo Batak subethnic group in North Sumatra, Indonesia, the number of spice plants growing in home gardens is almost the same as on Seliu Island (11 species). Still, there are more vegetables (20 species) and sources of carbohydrates (10 species) (Silalahi and Nisyawati 2018). When we compare to people in Labuan Mandi Village, Lampung Province, Indonesia, they utilize more spices (23 species), vegetables (23 species), and cosmetics (5 species) (Wakhidah et al. 2020). The spice plants that are widely used on Seliu Island are *Alpinia galanga, Cymbopogon citratus, K. galanga, Apium graveolens, Z. officinale,* and *C. longa* (Table 1). Plants in the vegetable category include *Solanum melongena, B. androgyna,* and *Stenochlaena palustris*. Important cosmetic plants are *Aloe vera*, which nourishes hair, and *Polyscias scutellaria*, which prevents hair loss.

Previous ethnobotanical studies reported that local markets influenced plant diversity in home gardens. Communities around the Napu Valley, specifically in Rompo Village, Central Sulawesi, and Saibatin ethnic in Labuan Mandi Village, Lampung, Indonesia, cultivate many vegetable species in their yards to meet their daily food needs due to poor market access (Kehlenbeck and Maass 2004; Wakhidah et al al. 2020). Even though Seliu Island is an island that is separate from the other islands, there is no local market, so people must go to the nearest village, such as Padang Kandis Village, or villages around Membalong District by crossing the sea riding a boat for a distance of 7 kilometers if they want to buy vegetables and rice. If they want to purchase other necessities, they go to Tanjung Pandan City, a distance of 67 kilometers and a travel time of approximately one hour.

Table 3. List of medicinal plants, their properties, parts used, and how people used them in Seliu Island, Belitung District, Indonesia

Local Name	Scientific Name	Benefit	Plant Organ Used	How to Use	Location Found
Akar lalang	*Imperata cylindrica* (L.) Raeusch.	Bladder calculi	Root	The roots are boiled together with *Orthosiphon aristatus* leaves and then drunk	Other traditional landscapes
Ati-ati	*Coleus scutellarioides* (L.) Benth.	Boils medicine	Leaves	The leaves are crushed and then placed on the boil	Home garden
Binahong	*Anredera cordifolia* (Ten). Steenis	Remedies for diabetes, hypertension, coughs, and wounds	Leaves	• To treat diabetes, hypertension, and cough, boil one glass of water, add 13 *Anredera cordifolia* leaves, wait until the water becomes one glass, cool, and drink • To treat wounds, mash enough leaves until smooth and then stick them on the wound	Home garden
Cekur	*Kaempferia galanga* L.	Improves blood flow after giving birth	Rhizome	A concoction of lemongrass, ginger, sliced *Kaempferia galanga*, add brown sugar with 3 glasses of water, boil, then drink	Home garden
Ceri	*Muntingia calabura* L.	Diabetes	Young leaves	Boil 9 leaves with 2 glasses of water until it becomes 1 glass, then drink it on an empty stomach	Home garden
Jahe	*Zingiber officinale* Roscoe	Improves blood flow after giving birth; fever medicine	Rhizome	• To improve blood flow after childbirth, brew it and add brown sugar, then drink it after giving birth; 7 days turmeric, 7 days ginger, or concoction of lemongrass, ginger, sliced *Kaempferia galanga*, add brown sugar with 3 glasses of water, boil, then drink. • For fever medicine, boil ginger concoction plus brown sugar, then drink	Home garden
Jambu biji	*Psidium guajava* L.	Stomach ache medication	Young leaves	Boil the leaves, then drink it	Home garden
Jambu monyet	*Anacardium occidentale* L.	Stomach ache medication, dyspepsia	Stem bark	Stem bark is brewed with hot water, and then drink	Other traditional landscapes
Jarak pagar	*Jatropha curcas* L.	Fever medicine, toothache medicine	Leaves, sap	The leaves are crushed and then compressed during fever; the sap is used as a medicine for toothache	Other traditional landscapes
Kamboja	*Plumeria obtusa* L.	Fever medicine, toothache medicine	Leaves, sap	The leaves are crushed and then compressed during fever; the sap is used as a medicine for toothache	Home garden
Kapuk	*Ceiba pentandra* (L.) Gaertn.	Fever medicine,	Leaves	The leaves are crushed and then compressed	Other traditional landscapes
Kayu lawang	*Cinnamomum culilaban* (L.) Presl.)	Malaria medication	Root	The roots are boiled, and the water is drunk	Other traditional landscapes
Kedondong	*Spondias dulcis* Parkinson	Sprain medication	Leaves	The herb is pounded together with *Kaempferia galanga*	Other traditional landscapes
Kelingkaan	*Callicarpa longifolia* Lam.	Fever medicine	Leaves	The leaves are pounded, brewed, filtered, then drunk	Home garden
Kembang sepatu	*Hibiscus rosa-sinensis* L.	Fever medicine	Leaves	The leaves are ground, add water, then compress it on the forehead	Home garden
Kumis kucing	*Orthosiphon aristatus* (Blume) Miq.	Bladder calculi	Leaves	The concoction is boiled with weed roots (Lalang) and then drunk	Home garden
Kunyit	*Curcuma longa* L.	Gastric medicine, postpartum blood flow	Rhizome	The rhizomes are brewed, then drunk for 7 days after giving birth	Home garden

Kunyit putih	*Curcuma zedoaria* (Christm.) Roscoe	Gastric medicine, postpartum blood flow	Rhizome	The rhizome is grated or sliced and added sugar, then drunk	Other traditional landscapes
Lidah buaya	*Aloe vera* L.	Shampoo and masker	Leaves	The leaves scraped off the gel in the leaves	Home garden
Mahkota dewa	*Phaleria macrocarpa* (Scheff.) Boerl.	Malaria medication	Root	The roots are boiled and then drunk	Home garden
Paku	*Asplenium nidus* L.	Tumor medication	Rhizome	The rhizomes are grated, add water, then drink	Home garden
Sambiloto	*Andrographis paniculata* (Burm.f.) Wall. ex Nees	Diabetes	Leaves	Nine leaves are boiled with 2 cups of water until it becomes 1 cup and then drunk when the stomach is empty	Home garden
Sembung cine	*Blumea balsamifera* L.	Diabetes	Leaves	The leaves are boiled, then drink it	Home garden
Serai	*Cymbopogon nardus* (L.) Rendl	Medicine for broken legs in chickens; postpartum medication	Leaves	Medicine for broken legs in chickens, tie it to the broken leg (broken leg in a chicken) postpartum medication, a concoction of *Cymbopogon nardus*, *Zingiber officinale*, sliced *Kaempferia galanga*, add brown sugar with 3 glasses of water, boil, then drink	Home garden
Sirih	*Piper betle* L.	Fever medicine (Covid time); medicine for eye pain	Leaves	Fever medicine: the leaves are boiled, and drink it Medicine for eye pain: the leaves are squeezed and rubbed on the eye	Home garden
Sirih merah	*Piper ornatum* N.E.Br.	Lowering high blood pressure	Leaves	The leaves are boiled, and the water is drunk	Other traditional landscapes
Temulawak	*Curcuma zanthorrhiza* Roxb.	Increases appetite	Rhizome	The rhizomes are grated, brewed with hot water, and then drunk	Home garden
Terus dingin	*Kalanchoe pinnata* (Lam.) Pers.	Medicine for eye pain; fever reducer	Leaves	1. Medicine for eye pain: the leaves are crushed and then applied/compressed to the eyes 2. Fever reducer: the leaves are crushed and then attached/compressed to the forehead	Home garden
Tila	*Ipomoea batatas* (L.) Lam.	Kambak (migraine) medication	Tubers	The Tubers is grated, *Musa acuminata* × *balbisiana* is added, then placed on the forehead	Home garden

The climate and geography of Seliu Island also influence the main livelihoods of its people. The community on Seliu Island works primarily as fishers (82%), farmers (6%), traders (3%), government employees (1%), and others (8%). Fishing is the primary occupation due to the abundant fish resources in the coastal area. Men work as fishers on Seliu Island, while women typically work as homemakers, making chips, trading, and gardening around the house. Indirectly, the community on Seliu Island has practiced family responsibility rules between men and women. The division of roles in a family between women and men is also often found in many other tribes, such as the Osing community in Banyuwangi, Indonesia. Women in the Osing societal structure control family management and maintain traditional home garden landscapes, the second most important traditional landscape after rice fields (Prasetyo et al. 2018); therefore, food resilience strategy development relies on women (Garrity 2004).

Women manage home gardens more on Seliu Island, so the management of placement, selection of planted species, number of plants planted, and benefits of cultivated species are more known by women. Therefore, we conducted more interviews with women because they are more involved in managing home garden plants while men work as fishers. However, men on Seliu Island still manage home gardens by assisting in caring for the gardens by harvesting coconuts and mangoes. According to Partasasmita et al. (2019), generally, the division of labor between men and women in agricultural systems is that men are involved in various tasks requiring considerable physical strength, such as digging and plowing, while women are engaged in tasks requiring agility and patience, such as selecting seedlings. Another reason men play a lesser role in managing and utilizing home gardens is that Seliu Island is located in a coastal area, making fishing the primary occupation suitable for men on Seliu Island.

On the other hand, the soil condition on Seliu Island has a characteristic feature of sandy fractions, which are less supportive of cultivation, even though the people of Seliu Island consume rice as their staple food. If the community wishes to plant crops in their home gardens on Seliu Island, special treatment is needed for the sandy clay soil medium. At the surface of the home garden, about 3-5 cm consists of sand, so if people want to plant crops, most planting areas need to be supplemented with a mixture of organic media such as soil from the forest, ash residues, or purchasing organic planting media to help fertilize the soil. Due to the geographical conditions on Seliu Island, there are no rice fields, so the rice they consume comes from outside Seliu Island, such as Padang Kandis Village (the nearest village, but on a different island), which is part of the main island (Belitung Island) or they can buy rice from other regions. Although there are no rice fields and the number of vegetable category plants found in home gardens on Seliu Island is limited, the home gardens there have several fruit-bearing plants, medicinal plants, and abundant spices.

According to Magurran (1998), there are three criteria for species richness: $DMg < 3.5$ means low species richness, $3.5 < DMg < 5$ means moderate species richness, and $DMg > 5$ means high species richness. Therefore, based on the analysis results, home gardens on Seliu Island have a high species richness index ($DMg = 16.19$). The evenness index value (J') is 0.82, indicating that the community in home gardens on Seliu Island has a high level of evenness and a stable community. These results suggest the species distribution is even because the evenness index value is close to 1 (Magurran 1988). The richness index and species evenness results influence the relatively high diversity of plant species in home gardens on Seliu Island ($H' = 3.93$). The value of the species diversity index (H') can range from 0 to 7; if the value is >3 then the diversity of an area is considered high (Barbour et al. 1987). Moderate species diversity index values are generally caused by the dominance of certain species in the area. Conversely, higher values are usually caused by the larger sampling area and the more significant number of encountered species (Strong 2016).

Based on our research on the utilization categories of plants in home gardens by the people of Seliu Island, there are at least four important roles of home gardens in terms of social, economic, cultural, and ecological values. Regarding social aspects, home gardens on Seliu Island produce medicinal herbs, spices, vegetables, and fruits, thus contributing to maintaining their owners' nutritional and health needs. The community shares the fruits produced by fruit-bearing plants such as *Manilkara zapota, Annona muricata, P. guajava, C. nucifera, A. comosus*, and *M. indica* with their neighbors. For instance, during the mango season, many residents share and sell their fruits to their neighbors, thereby experiencing the social benefits of home gardens through sharing and interaction. Similarly, in Zimbabwe, mango production in home gardens is for personal consumption, sharing with relatives, and sale in local informal markets (Musvoto and Campbell 1995). The exchange of home garden products is an important socio-economic benefit of home gardening activities. It allows households to share local knowledge related to home gardening activities. Thus, it is strengthening family relationships. Home gardens, as simple spaces, support social and ecological components by providing a wide range of diverse goods and services to meet the needs of the increasing population (Gbedomon et al. 2017; Santos et al. 2022). Home gardens are used as recreational and social interaction spaces among the people of Seliu Island. The relatively spacious home garden and ornamental plants create a comfortable space for interacting among household members and the community. Interactions such as conversing in the morning or evening after returning from fishing at sea while accompanying children playing in the home garden can enhance the sense of belonging among community members.

Home gardens can serve as an additional source of income for property owners. For example, the fruits can be sold during the mango season, providing extra income for home garden owners. Another economically valuable plant is *C. nucifera*, which once made Seliu Island a copra-exporting island. The seeds of *G. gnemon* planted in home gardens are also utilized by the community to create economically valuable chips. The dissemination of knowledge about its benefits and conducive environmental

conditions has led many people to plant it for consumption and economic enhancement (Prihatini et al. 2018). Fruits produced from home gardens on Seliu Island can also attract tourists to visit the island, thus creating new business opportunities such as home garden agritourism, which can drive economic growth (Rifa and Hossain 2022).

The concept of agritourism on Seliu Island utilizing home gardens has already begun, particularly during the mango season. When the mango season arrives, people from other areas visit Seliu Island to enjoy the delicious mangoes. According to information from the community, the mango season on Seliu Island occurs from October to November each year. In addition to mangoes, the culture of the people of Seliu Island, which makes chips from *G. gnemon* seeds, is also an attraction for tourists visiting the island. Besides tasting the chips, tourists can also participate in making chips from *G. gnemon* seeds with the guidance of the Seliu Island Agritourism Community Group. With the significant growth of nature-based tourism in recent years, agritourism has also developed and become an important support for broader tourism destinations such as culture and beaches on Seliu Island. It has spurred creative ideas from small entrepreneurs and households to add value to tourist destinations on Seliu Island. Banyuwangi District, Indonesia, is one area that utilizes home gardens as tourist destinations, thus contributing to household income and food security through its production (Trisnanto et al. 2023). However, the owners of home gardens, village governments, and relevant stakeholders need to consider the negative impacts of economic interests on plant biodiversity and environmental conditions, including on Seliu Island. Seliu Island is currently being heavily promoted as a tourist destination, offering the beauty of its beaches, Purun Lake, and culture of making chips and mangosteen fruit. The development of tourist support facilities such as the entrance gate of Seliu Island, accommodations, and the rehabilitation of tourist areas has been driven by the government and investors, leading to gentrification. Efforts to attract tourists to Seliu Island will undoubtedly increase the income of the island's residents. However, the development does not consider environmental ethics. In that case, it may damage the environment by eroding the land where various plants grow, ultimately reducing plant diversity on Seliu Island.

The project will likely require a large amount of land clearance, which may result in the forced displacement of local communities from their traditional homes and lands. This forced displacement can have wide-ranging social impacts, including loss of livelihoods, disruption of social networks, and erosion of cultural practices and traditions. Disproportionate displacement will affect marginalized populations, who may already be excluded from decision-making processes (Syaban and Appiah-Opoku 2023). Therefore, it is crucial to ensure that these communities are adequately consulted and that their rights and interests are protected in the development process. An interesting example is the Qhapaq Ñan project in Peru, which addresses the rights of indigenous communities in the context of protecting and managing their biocultural heritage by proposing public policies; these proposals arise from new indigenous activism in Latin America (Kania 2019). The Qhapaq Ñan project in Peru demonstrates efforts to align development and environmental, social, and cultural damage risks for indigenous communities around the project to minimize or eliminate adverse impacts. On Seliu Island, tourism infrastructure development that opens the floodgates for investors must consider environmental ethics that prioritize common interests rather than maximizing profits so that ecological damage such as land degradation, reduction of plant diversity, temperature rise, and other adverse impacts can be prevented and addressed.

Based on ethnic cultural values, home gardens represent the cultural identity of specific ethnic communities. Based on informant statements, the native inhabitants of Seliu Island are Malay people. Subsequently, settlers from outside, namely Chinese and Europeans, arrived, whose historical traces can be seen in traditional wooden house architecture characteristics, indicating the acculturation of native (Malay), Chinese, and European cultures on Seliu Island. The owners' concepts, cultures, and knowledge greatly influence the diversity of plants in home gardens, thereby providing a unique cultural identity, and specific ethnic communities also seem to reflect the structure and composition of home garden plants (Galluzzi et al. 2010). The characteristic plant of Seliu Island home gardens is *M. indica*, which is present in almost every observed home garden. The *M. indica* is found in home gardens' front, side, and back. In the Batak Karo home gardens in North Sumatra, Indonesia, the most commonly found family is Solanaceae, while on Seliu Island, it is Myrtaceae (Silalahi and Nisyawati 2018). In the Donorejo Village home gardens in the Menoreh Karst Area, Purworejo, Central Java, there are *D. zibethinus* plants, whereas there are none in Seliu Island home gardens (Sholekha et al. 2023). In the Baiku Yao community in South China, *Zea mays* is the most common plant found in home gardens, which illustrates that this plant is essential (Hu et al. 2023). Home gardens on Seliu Island also serve as providers of traditional medicinal ingredients and dishes for the Seliu Island community. For example, forming the habit of utilizing certain plants species in their home gardens to treat various illnesses, the habit of cooking traditional dishes like fish soup (*gangan*), using *A. comosus* fruit grown in home gardens, and culture-making chips from the seeds of the *G. gnemon* plant. Because the availability of traditional medicinal ingredients and dishes is maintained, these cultural practices can continue.

The ecological value of Seliu Island home gardens serves as a conservation site and provides environmental services. Home gardens on Seliu Island serve as habitats for many species. These species are cultivated for various purposes, such as ornamentals, medicines, carbohydrate sources, spices, and additional sources of income for their owners. As providers of ecosystem services, home gardens in West Coast District reduce soil erosion, supply organic fertilizers, and contribute to the energy cycle. In Seliu Island, where the sandy soil structure, plant roots help reduce soil erosion due to rainwater runoff. Plants in home gardens also serve as food sources for livestock and other wild animals, and their waste serves as fertilizer for plants

in home gardens. The canopy of plants in Seliu Island home gardens also provides shade from sunlight, allowing people to engage in creative activities and socialize in home gardens comfortably. Plants in Seliu Island home gardens also serve as sources of oxygen and carbon absorption. As a result, home gardens can provide sustainable environmental services for their owners and the whole ecosystem.

Parts of plants used as medicinal ingredients

Local people on the island use seven parts of the plant to treat various diseases. Leaves are the most widely used part of the plant (18 species), followed by rhizome (6 species), root (3 species), sap (2 species), tuber (1 species), fruit (1 species), and bark (1 species) (Figure 7). The parts used are less than those used by the people of Jambur Labu Village, East Aceh, Indonesia, who use eight parts of the plant, the most used being the leaves (38%) (Elfrida et al. 2021). Previous ethnobotanical research also reported that the most widely used part of the plant is the leaves (Adam et al. 2020; Suwardi et al. 2021). People prefer leaves as a raw material for traditional medicine because harvesting the leaves does not cause too much harm to the plants. The leaves are also easy to collect, have good medicinal properties compared to other parts, and do not depend on the season (Elfrida et al. 2021).

The leaves of plants are utilized to treat various ailments on Seliu Island. For instance, *Jatropha curcas* alleviates fever by crushing its leaves and applying them to the forehead. Additionally, leaves of *Andrographis paniculata* and *M. calabura* are boiled to create a decoction for managing diabetes, consumed on an empty stomach or before meals (Table 3). Meanwhile, the rhizomes of *Z. officinale* are employed to treat fever and facilitate postpartum blood flow, while *C. longa* rhizomes address stomach ailments and promote postpartum blood flow. *Curcuma zanthorrhiza* rhizomes stimulate appetite by drinking a decoction made from grated rhizomes. The roots and leaves of *Imperata cylindrica* are boiled to alleviate kidney stone issues. Sap from *J. curcas* and *P. obtusa* is utilized for toothache relief. *Ipomoea batatas* tubers are combined with *M. acuminata* × *balbisiana* fruits to address migraines, while *Anacardium occidentale* stem bark is used for stomach pain and dyspepsia treatment.

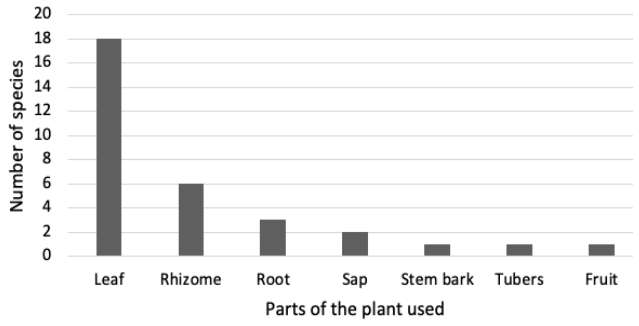

Figure 7. Parts of plants used as medicinal ingredient in Seliu Island, Belitung District, Indonesia

Meanwhile, *J. curcas* is used for bloating in Jambur Labu Village, East Aceh, Indonesia. They also utilize *C. longa* for typhoid, *A. galanga* for skin ailments, *Morinda citrifolia* for hypertension, and *K. galanga* for sprains (Elfrida et al. 2021). Among the Subethnic Batak Karo community in North Sumatra, *C. longa* is used for diarrhea, and *Z. officinale* rhizomes for wound care, fever, coughs, concoctions, and rheumatism (Silalahi and Nisyawati 2018). Ecosystem type diversity affects plant diversity, species count (Vockenhuber et al. 2011), and the diversity of bioactive substances with potential medicinal use in plants in each ecosystem. Plants produce these bioactive substances through secondary metabolites. Typically, each organism produces different secondary metabolites; sometimes, a secondary metabolite is only found in one species (Verpoorte and Alfermann 2000). The compounds within a plant illustrate that each plant growing in an ecosystem can produce different bioactive substances that influence the species and methods of medicinal plant utilization within each ethnic group.

The local knowledge of the Seliu Island people regarding types of medicinal plants and their uses has been passed down from generation to generation through oral tradition. However, the new plant is also used as medicine and is cultivated on Seliu Island. For example, in *M. calabura* and *A. cordifolia*, knowledge about their use was obtained from the internet or from families outside Seliu Island. The *A. cordifolia* was only planted on Seliu Island in 2022 in one of the home gardens on the island. We observed the positive impact of online information dissemination on the appropriate use of medicinal plants. Technological advances are also beneficial for preserving biodiversity in Indonesia and improving and preserving culture, thereby providing a positive impact. However, technological penetration reduces people's ability to practice their culture, resulting in negative impacts (Zulfadrim et al. 2021).

Medicine can also incentivize their cultivation, creating a sustainable plant conservation chain. Local and regional governments have also promoted plant preservation in home gardens, including resilience strategies, local biodiversity action plans, and food or health agendas (Larder et al. 2014; McClintock et al. 2016; Gbedomon et al. 2017). Šiftová (2021) states that expanding home gardens to create more sustainable urban housing or community sites is feasible and desirable. However, communication strategies must involve top-down and bottom-up approaches, utilizing sensitive tools for diverse populations that maintain home gardens. Nonetheless, communication and activation efforts should vary depending on the target group of gardeners to address various management approaches, knowledge, preferences, values, ideas, personal attributes, aesthetic preferences, and financial possibilities (McClintock et al. 2016; Burgin 2018).

Efforts are needed at all levels of Seliu Island society to improve spatial planning and the utilization of green open areas (home gardens), so their positive values can be better utilized. Home gardens on Seliu Island also demonstrate good agroforestry value as communities manage land to address land conversion issues and become alternative food

sources and medicinal plant producers. Therefore, plant diversity on Seliu Island must be maintained and enhanced by selecting superior seeds, planting techniques, maintenance methods, and harvesting times, considering Seliu Island's separation from Belitung Island. Hence, plant food and medicinal security are vital for the community's food and medicinal independence.

In conclusion, home gardens on Seliu Island vary in size and plant composition, but size does not affect plant diversity. The diversity of plants in Seliu Island gardens is relatively high, with the most significant use of plants as medicinal ingredients, followed by ornamental and fruit plants. The sandy environment in Seliu island's home gardens challenges farmers to cultivate plants. The characteristic plant of home gardens on Seliu Island is *M. indica*, found in almost all of the island's home gardens. Besides its fruit, this plant also serves as a shade from the sun and has economic value. Agricultural yields such as fruits from home gardens have social impacts on the community due to interactions involving shared garden products, trading, and social interactions exchanging information in home garden areas. Therefore, home gardens on Seliu Island generally serve social, economic, cultural, and ecological functions. We recommend analyzing plant importance levels from the community's perspective to determine which plants are most important to them. Additionally, a vegetation analysis of plants throughout traditional Seliu Island landscapes is necessary to understand better and preserve plant diversity there.

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