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## Traditional botanical and landscape knowledge of the village community of Gunung Malang, Mount Halimun Salak National Park (MHSNP)

**Budi Prasetyo\***

*Biology Study Program, Faculty of Science and Technology, Open University, Indonesia  
Cabe Raya Street, Pondok Cabe, Pamulang District, South Tangerang City,  
Banten Province, Indonesia*

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### **Abstract**

The people of Gunung Malang Village, Tenjolaya Subdistrict are traditional communities that have lived and spread for hundreds of years at the foot of Mount Salak, a buffer zone for MHSNP. Their livelihoods depend on farming and gathering forest products. The topography of Mount Halimun makes the area relatively low in biological resources. Likewise, the study of data or literature information related to research results is very rare. In fact, the MHSNP area has tremendous potential for research activities in various disciplines. The aim of this research is to reveal the traditional ecological knowledge and the use of plants by the community of Kampung Pasir Gaok, Gunung Malang Village in interacting with the environment around where they live in order to fulfill their daily needs. This research uses an exploratory method which is based on the emic and ethical approach. Ethnoecological and ethnobotany data collection was obtained through the Pebble Distribution Methods (PDM) method by scoring in a Focus Group Discussion (FGD). Analysis of the importance of each plant species related to local culture is carried out through the Index of Cultural Significance (ICS). The results showed that people's mindsets, perceptions, and conceptions in interacting with their environment resulted in five landscape units which were then grouped into two categories, namely natural and artificial landscape units. As for the use of plants in their daily life, they classify them into 12 (twelve) useful plants. The people of Kampung Pasir Gaok carry out traditional conservation to protect and care for the biological resources in the MHSNP area based on the protection of the ecosystem as a whole.

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\*Corresponding Author: Budi Prasetyo ✉ [budi-p@ecampus.ut.ac.id](mailto:budi-p@ecampus.ut.ac.id)

## Introduction

Mount Halimun-Salak National Park (MHSNP) as a nature conservation area that has a native ecosystem, is managed by a zoning system and is used for education, research, cultivation development, recreation and tourism activities. The MHSNP forest area has an area of approximately 113,357 hectares covering three districts, namely Lebak Regency, Sukabumi Regency, and Bogor Regency. (Galudra, 2005, Takahashi, 2006, Ario, 2007, Dewi *et al.*, 2007, Rinaldi *et al.*, 2008, Yumarni *et al.*, 2011, Zulkarnaen *et al.*, 2020). Topographically, Mount Halimun is located at an altitude of 500-1,929 meters above sea level (Galudra *et al.*, 2005), in the form of a series of mountains with old, hard volcanic soil, and consisting of quite steep faults, so that this area is known very poor in biological resources when compared to other forest areas in the West Java region such as Ujung Kulon and Mount Gede Pangrango (Whitten *et al.*, 1999). In addition, the ecosystem in this area has also been damaged due to deforestation, illegal mining or illegal logging (Kurniawan *et al.*, 2013). This condition has an impact on the study and information on data or literature on research results in the MHSNP area which is relatively small (Whitten *et al.*, 1999). In fact, the MHSNP area has tremendous potential for research activities in various disciplines (Supriatna, 1992).

No less than 314 villages are scattered around and even within the MHSNP area, of which 10 traditional communities live around MHSNP, and one of them is inside the national park area (Sundawati, 2013). The people of Kampung Pasir Gaok in Gunung Malang Village, Tenjolaya Subdistrict are one of 10 traditional communities that have lived and spread since hundreds of years at the foot of Mount Salak, which is a buffer area for the MHSNP Biosphere Reserve (Fig. 1). The lives of most of the people still depend on farming and gathering forest products.

The traditional communities who live around the Biosphere Reserve have a strong tradition of forest utilization (Kurniawan *et al.*, 2013). This is characterized by their perception and mindset in

shifting cultivation for long-term interests while maintaining the ecosystem from being damaged. In addition, local people also have animist beliefs that the forests in their environment are guarded by the spirits of forest guards who if they cut down or utilize existing biological resources that are not in accordance with applicable customary norms, it is believed that they will get a curse in the form of disease (Saleh and Munir, 1990). The aim of this research is to reveal the traditional ecological knowledge and the use of plants by the community of Kampung Pasir Gaok, Gunung Malang Village in interacting with the environment around where they live in order to fulfill their daily needs.

## Material and method

### *Field research*

Data were collected in Kampung Pasir Gaok, Gunung Malang Village, Tenjolaya District, Bogor Regency (Fig. 1). The reason for determining the location of the research in Kampung Pasir Gaok is because the lives of most of the people in the MHSNP buffer area still rely on farming and gathering forest products. Topographically, Gunung Malang Village is located on the slopes of Mount Salak at an altitude of 600-700 meters above sea level and at coordinates 6.39°-14.7° South Latitude and 106.42°-42.29° East Longitude. This village has an area of 345,245 hectares, two villages, 7 Rukun Warga, 25 Rukun Tetangga with a population of 5,918 people.

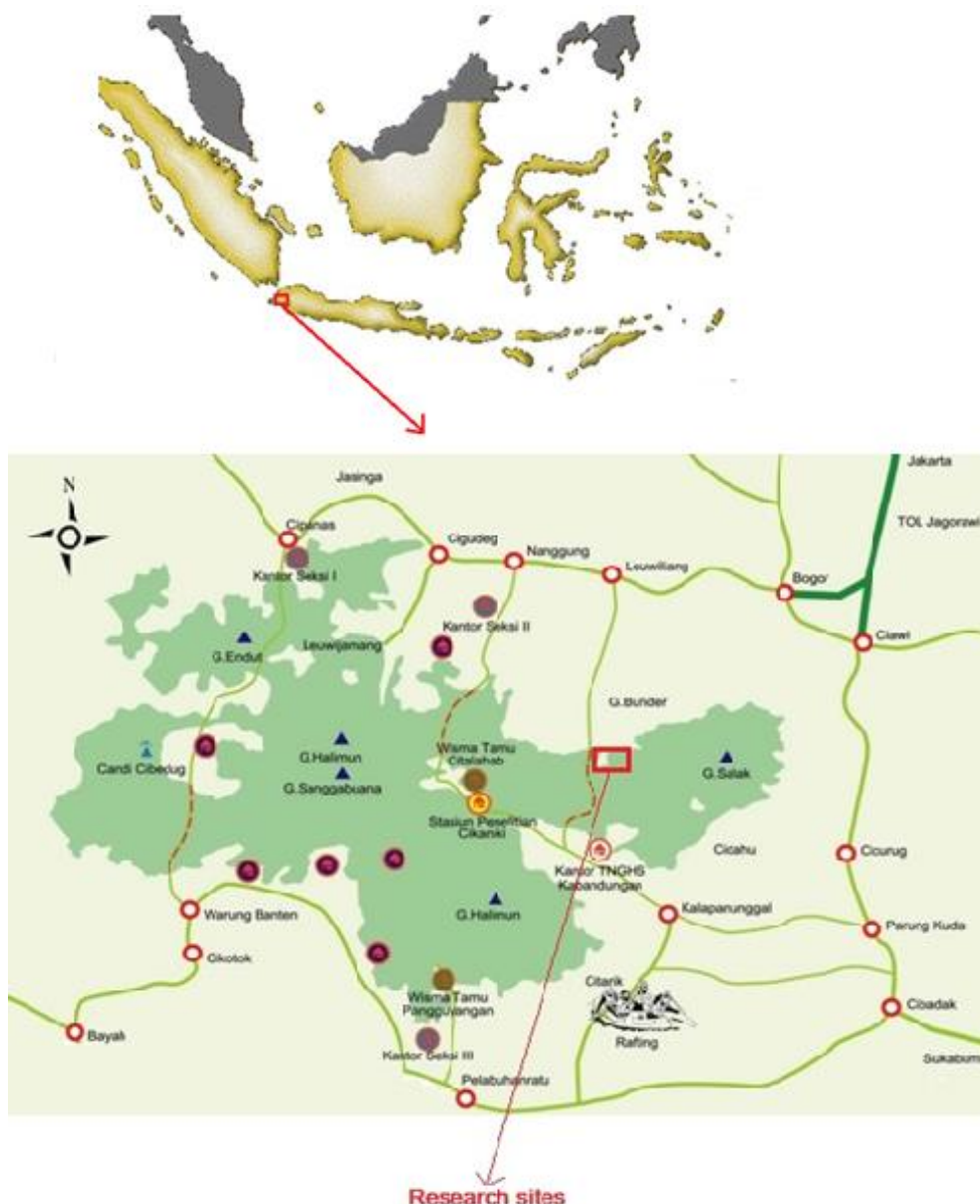
### *Data sampling*

This research uses an exploratory method based on an emic and ethical approach (Rosa and Orey, 2012). Ethnoecological and ethnobotany data collection was obtained by using the Pebble Distribution Methods (PDM) method by scoring in a Focus Group Discussion (FGD) (Sheil *et al.*, 2002). In addition, data collection was also carried out through unstructured interviews with key informants and respondents (Silva and Andrade, 2006). The determination of the criteria for key informants and respondents is more based on the researcher's need for valid and correct data sources related to the

research topic (Bernard, 2002, Lewis and Sheppard, 2006). The key informant is a community Fig. or someone in Kampung Pasir Gaok who has correct and accurate understanding and information about the history of civilization which includes a) history of settlement, b) recognized land types and their characteristics and functions, c) types traditional ceremonies and their meanings, d) have valid knowledge of the general description of the village

being the research site. Respondents are the general public in Kampung Pasir Gaok who have a correct understanding of the use and management of living natural resources and their environment.

Informants and respondents were selected based on purposive sampling technique (Neuman, 2003, Tongco, 2007). The number of respondents was 36 people and the number of key informants was 2 people.



**Fig. 1.** Research location map in Gunung Malang Village, Tenjolaya District, Bogor Regency

*Data analysis*

To analyze ethnobotany data about the value of the benefits of each plant species related to the culture of

the people of Kampung Pasir Gaok, it was carried out using the Index of Cultural Significance (ICS) formula (Turner, 1988).

## Result and discussion

### *Local knowledge of landscape units*

The people of Kampung Pasir Gaok in Gunung Malang Village, Tenjolaya District are traditional community who in their daily life still rely on farming and gathering forest products. This community has long lived and is scattered in the buffer zone of the MHSNP Biosphere Reserve, they are very familiar with the character of the surrounding environment. The results of field observations show that the patterns of thought, perceptions, and conceptions of these traditional communities regarding the use of agricultural landscape units in their environment are divided into two categories, namely natural landscapes and artificial landscapes. The entire agricultural landscape unit in question includes: yard and residential, paddy field, gardens, forests, and agroforestry. The following describes in detail the agricultural landscape units that are well known and utilized by the traditional community of Kampung Pasir Gaok, namely:

### *Yard (Buruan) and residential*

The understanding of the community of Kampung Pasir Gaok about their yard land is a piece of land that is not too wide ranging from below 100 square meters, generally in the form of dry land, on the land stands a house as a settlement, planted with several species of cultivated plants but also growing wild plants. sometimes also kept various species of domestic animals. The community's yards are not too wide because the village is located in a hilly area under the foot of Mount Salak at an altitude of 500-2,211m above sea level. (Supriatna, 1992) so it is relatively difficult to obtain flat and even land. In general, plants that grow in yards do not get water supply, such as in irrigation systems in paddy fields. On homestead land the water supply depends on how much and how little rainfall falls.

Similar to ownership of yards in other areas, ownership of yards in this community also has clear land boundaries. The land divider can be in the form of concrete stakes or some in the form of live plants such as Tetehan/shrubs (*Acalypha sinensis*), Sampeu (*Manihot esculenta*), but there is also a species of

perennial tree with large trunk as boundary markers. This condition is similar to the yard divider owned by the Osing tribe in Banyuwangi (Prasetyo, 2019).

Some of the cultivated plant species that are often planted by homeowners are Cau (*Musa paradisiaca*), Jambu aer (*Syzygium aqueum*), Jambu batu (*Psidium guajava*), Balingbing (*Averrhoa carambola*), Gedang (*Carica papaya*), Nangka walanda (*Annona muricata*), Nangka (*Artocarpus heterophyllus*), Rambutan (*Nephelium lappaceum*), Cabe (*Capsicum annum*), Ranti (*Solanum lycopersicum*), Koneng (*Curcuma longa*), Laja (*Alpinia galanga*), Jahe (*Zingiber officinale*), Sereh (*Cymbopogon citratus*) ornamental plants such as Kacapiring (*Gardenia jasminoides*), Kembang wera (*Hibiscus rosa-sinensis*), Ki hanjuang (*Pleomele fragrans*), Puring (*Codiaeum variegatum*) and Kembang soka (*Ixora coccinea*).

### *Paddy field (Sawah)*

The communities of Kampung Pasir Gaok recognize paddy fields as a plot of wet agricultural land with a size of 112-300 square meters, on which there are no permanent buildings, generally have a good irrigation system with a water supply that is evenly distributed to each owner of the paddy fields. This is similar to the water management system in paddy fields owned by the Osing tribe (Prasetyo, 2019).

The paddy fields in this village are rainfed, the water supply used for the growth of rice plants is very dependent on the amount of rainfall that falls. Thus, in the dry season farmers no longer plant rice seeds but change to secondary crops such as Jagong (*Zea mays*), Kacang tanah/suuk (*Arachis hypogaea*), Terong (*Solanum melogena*), or Kacang kedele (*Glycine max*).

Similar to ownership of homestead land, ownership of paddy fields also has clear land boundaries. The boundaries of the paddy fields can be in the form of concrete stakes, in the form of large trunked perennial plant. In general, the paddy field structure consists of a paddy plot which is an area for planting Pare seeds (*Oryza sativa*), a paddy embankment which is a

barrier between paddy fields and is sometimes used as a path for the owner when monitoring rice growth, and a small gap in the area. The end of the embankment is used as a way out and in and out of the water supply into the plot, usually directly connected to the ditches around the paddy fields.

The process of cultivating paddy fields in Kampung Pasir Gaok begins with seeding activities, then irrigation is carried out, then connected with soil hoeing so that the soil in the lowest layer will be lifted to the surface, making it easier for soil plowing activities. Then proceed with the activity of harrowing the soil, namely leveling the soil so that it is easy to plant rice, followed by irrigating the plot again, pulling seeds, planting seeds, weeding wild plants that have grown, fertilizing, and finally harvesting yellow rice. The processing of paddy fields for secondary crops, begins with the activity of hoeing to turn the soil, followed by leveling the soil with a hoe, then planting seeds, and after a few days fertilization is carried out with manure or chemical fertilizers, sometimes watering is carried out on young plants, and the last is harvesting.

As with the traditions and beliefs of local communities in other areas, the communities of Kampung Pasir Gaok also carry out salvation (hajjat) when they start planting rice seeds, they believe that with this traditional ritual it is hoped that the planted rice will grow well and be fertile, avoiding plant pests. In addition to this, the people of this village also perform prayers when they start the rice harvest, with the aim of expressing their gratitude for the gift of fortune they receive.

Several species of cultivated plants planted in paddy fields include: pare (*Oryza sativa*) is planted during the rainy season, while in the dry season the farmers plant several species of crops such as Jagong (*Zea mays*), Kacang tanah/suuk (*Arachis hypogaea*), Kacang kedele (*Glycine max*), Terong (*Solanum melongena*), Ranti (*Solanum lycopersicum*), Kacang panjang (*Vigna unguiculata*) and Cengek (*Capsicum frutescens*).

#### *Gardens (Kebun)*

According to the community's understanding of Kampung Pasir Gaok, the garden is a plot of dry agricultural land with an area of around 200-450 square meters, located not too far from the settlement, on which does not stand a permanent building. As with other dry agricultural lands, the supply of water for plant growth needs only comes from rainfall, so that plant species suitable for this ecological condition are plants that do not require much water. According to the community's understanding of Kampung Pasir Gaok, the garden is a plot of dry agricultural land with an area of around 200-450 square meters, located not too far from the settlement, on which does not stand a permanent building. As with other dry agricultural lands, the supply of water for plant growth needs only comes from rainfall, so that plant species suitable for this ecological condition are plants that do not require much water. The boundaries of the ownership of garden land in this village community are quite clear, some use boundaries in the form of live hedges such as cassava plants, but some use boundaries made of concrete. The process of managing the garden land by the community is relatively intensive due to its proximity to settlements. The system of planting crops is carried out over the mounds of land. This is done so that the rainwater flows through the lower soil between the mounds, then the water flows into small trenches along the side of the garden.

The initial activity for cultivating the garden land is to dig the land so that the soil in the lower layer is lifted up. The next activity was leveling the land using hoes, preparing and planting seeds that were physically looking good and healthy.

Then when the plants appear to be growing well, which is around the age of 1 month, fertilization is carried out with manure or chemical fertilizers, and if the plant conditions require water, sometimes watering is carried out on the young plants. Sometimes weeds are also cleaned (weed) so that the plants get sufficient soil nutrition and are not disturbed, and finally harvesting the results is done according to time.



The communities of Kampung Pasir Gaok cultivate several species of plants on garden land, with the hope that they can be used as a source of additional food, or as medicinal plants, animal feed, or for construction materials. Some plant species that are useful as additional food include tubers (*Taleus*, *Colocasia esculanta*, Kumeli, *Solanum tuberosum*, and Huwi boled, *Ipomoea batatas*) and fruits such as manggu (*Garcinia mangostana*), Gedang (*Carica papaya*), Nangka walanda (*Annona muricata*), Jambu batu (*Psidium guajava*), Cau (*Musa balbisiana*), Jambu aer (*Syzygium aqueum*), Nangka (*Artocarpus heterophyllus*), Balingbing (*Averrhoa carambola*), Rambutan (*Nephelium lappaceum*). In addition, the annual plant species grown for preparation are used as building construction materials, namely Jeungjing (*Albizia chinensis*), Mahoni (*Swietenia mahogany*), Mindi (*Melia azedarach*) and Peuteuy (*Parkia speciosa*).

#### Forests (Hutan)

Most of the community of Kampung Pasir Gaok understand forest land as dry land, located far from settlements (within 6-10 kilometers), overgrown by various plant species that live in tropical climates, and have hilly land contours with slopes ranging from 25-65%. Geographically this forest is located in the MHSNP area, so the management system is regulated by the Government through the supervision of the Directorate General of Nature Protection and Conservation, Ministry of Forestry and Plantation, Ministry of Environment and Forestry of the Republic of Indonesia.

The office of the Director General of Nature Protection and Conservation has clear forest land boundaries so that local community does not want to harvest the biological resources in it at will. The communities in this village are prohibited from cutting down trees or bringing back dead tree trunks, *l et al.* one living tree trunks. The communities are only allowed to take what they need, such as cutting bamboo for woven handicraft materials, taking dried tree branches for firewood, taking plant leaves for animal feed consumption.

The dependence of the life of this village community on the existence of the forest is quite high, because most of the population works as craftsmen of woven bamboo. It is natural, if the community is very protective of the existence of bamboo plants in the forest so that they do not run out or burn by human activity. The local communities also believe that the forests at the foot of Mount Salak are guarded by supernatural beings as forest dwellers, so that if they take bamboo excessively it is certain that they will receive a curse in the form of disease.

#### Agroforestry (Kebun talun)

The communities of Kampung Pasir Gaok understand that agroforestry land is dry land located close to forest land and is still included in the MHSNP area. As with forest land, ownership and management of agroforestry land falls under the administration of the Directorate General of Nature Protection and Conservation. The local community are only allowed to cultivate crops on this land, but are not allowed to build buildings on it *let alone* own the land.

Most of the communities of Kampung Pasir Gaok depend for their livelihood from cultivating agroforestry land; they plant a large number of Cau (*Musa balbisiana*) to take the leaves because these leaves have a promising sale value. *Musa balbisiana* leaves are widely used in restaurants as a wrapper for processed foods such as wrapping rice and side dishes. In addition, the community also grows a lot of Poh-pohan (*Pilea melastomoides*) which is often used as fresh vegetables during lunch or dinner events. The community in this village harvest the leaves of the Poh-pohan every 2 weeks to sell them to the nearest town.

Ecologically, the existence of forest and agroforestry land for local community life is very important because the structure and plant communities that grow in it have a strong influence on the availability of sufficient clean water sources for their daily needs. In addition, the existence of these two landscape units for the community also has very high conservation values to be maintained and preserved so that landslides do not occur in this area.

### Local community perception of the benefit of the landscape unit

In general, the understanding of the traditional community in Kampung Pasir Gaok of the importance of a landscape unit for their survival is reflected in Fig. 2. The community of this village, both men and women, understand correctly that their yards and settlements are the most important landscape units in meeting their life needs (25%). This condition is similar to the view of the Osing tribe in Banyuwangi on the benefits of the landscape unit in their environment (Prasetyo *et al.*, 2018). The paddy fields rank second, namely 23%, followed below by the garden landscape unit (22%), agroforestry land (17%), and finally forest (13%).

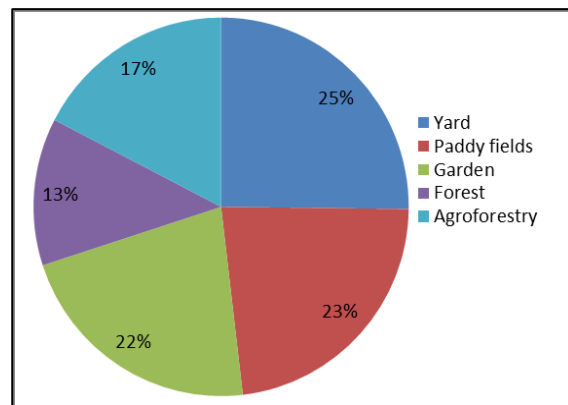
The yard and settlement landscape unit, in the social life of this village community, has a very important value because various daily household needs can be planned or fulfilled in the house which is also a permanent residence for the family. In addition, they can use the yard to plant various plants that are needed every day, such as medicinal plants, fruit plants, ornamental plants, vegetable plants, plants as cooking spices in the kitchen, and several plants that are useful for traditional ritual events. This condition is in accordance with the results of the recapitulation of the respondent's data that the use of yards and their settlements is prioritized as a source of medicinal ingredients, ornamental plants, and plants for rituals and customs.

The second order of landscape units chosen by the people of Kampung Pasir Gaok was paddy fields. Paddy fields are the place where rice plants grow, which is the staple and main food for the community of this village, so that in certain seasons such as planting and harvesting, they concentrate fully on devoting all their energy and time to the interests of these activities until they are finished and produce.

The garden has a value as the third landscape unit chosen by this village community, because in this garden land many plant species are planted which are useful as a source of additional food, so that if there is

a failure of the rice harvest, the garden harvest is used as a substitute. Sometimes several species of traditional medicinal plants are also planted as ingredients for treating minor ailments in the community due to the position of the village which is far from the community health center. In addition, several large trees were also planted for building construction materials.

Then in the order of the fourth landscape unit is agroforestry land. The community of this village choose agroforestry land next to the garden landscape unit because usually this land is planted with *cau* (*Musa balbisiana*) types which produce very strong leaves and do not tear easily to wrap various types of processed food. In addition, *poh-pohan* (*Pilea melastomoides*) are also planted with the leaves of which are often used as an ingredient in chili sauce, which is served as a complement at lunch and dinner. In general, the local people sell the two types of plant leaves to traditional markets to fulfill their family's economic needs.



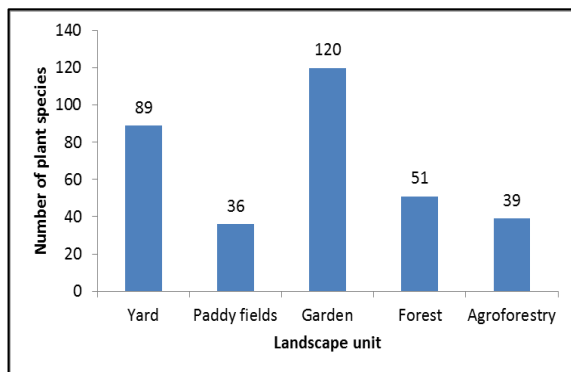
**Fig. 2.** Local communities perceptions of the benefit of the landscape unit.

The least valued choice of landscape units is forest. The rights of these village communities to utilize biological resources contained in forest land are very limited, because if they want to harvest them, they must obtain permission from officials of the Directorate General of Nature Protection and Conservation, Department of Forestry and Plantation. It is in this forest that many species of Apus bamboo grow which are widely used for plaiting various

handicraft products. Many of the handicrafts of this village community are sold in traditional markets around Tenjolaya District to meet subsistence needs. Examples of handicraft products include aseupan, boboko, tolomong, hihid, ayakan, jodang and tolok.

*The richness of plant species in each landscape unit*

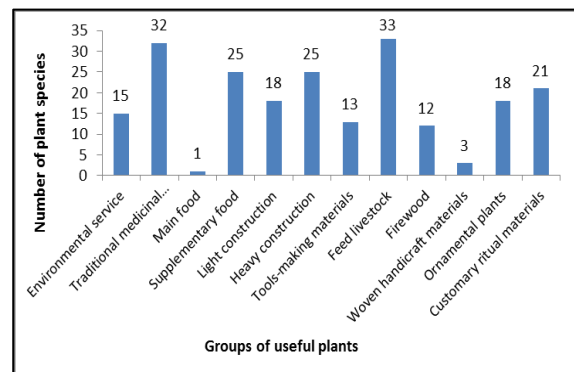
Based on the results of surveys and observations in the five landscape units, 148 plant species used by the people of Kampung Pasir Gaok have been identified. They use various plant species for various purposes, including as main food, supplementary food, medicines, ornamental plants, heavy and light construction materials, firewood, woven handicraft materials, customary ritual materials, tool-making materials, feed livestock, and environmental services such as providing clean water sources and holding back soil erosion. The number of plant species identified in each agricultural landscape unit is presented in Fig. 3.



**Fig. 3.** Number of plant species by landscape unit

Fig. 3 explains that of the 148 plant species known to the people of Kampung Pasir Gaok, eight of them are found in all landscape units, namely Babandotan (*Synedrella nodiflora*), Jambu batu (*Psidium guajava*), Jukut bau (*Ageratum conyzoides*), Manii (*Maesopsis emini*), Mindi (*Melia azedarach*), Nampong (*Siegesbeckia orientalis*), and Nangka (*Artocarpus heterophyllus*). Meanwhile, among the five landscape units, it is known that gardens have the highest number of plant species, namely 120 species, and paddy fields are the landscape units with the smallest number of plant species (36 species). The high number of plant species in the garden is due to

the intervention of the owner of the garden to meet the various needs of life so that it affects the number of plant species they plant. It is normal for the smallest number of species to be found in the paddy field landscape unit because not many plant species are able to adapt to grow well in muddy soil conditions. Based on the results of ethnobotany data collection in the field, researchers classified the various kinds of plants needed in the life of traditional communities in this village into 12 groups categories of useful plants. The twelve benefit groups are useful plants for environmental services, traditional medicinal ingredients, main food, supplementary food, light construction, heavy construction, tools-making materials, feed livestock, firewood, woven handicraft materials, ornamental plants, and customary ritual materials. The number of plant groups used is slightly higher than that of the Osing tribe, namely 10 groups (Prasetyo *et al.*, 2019). Of the 12 groups of useful plants, plants that are useful as fodder have the largest number of species, namely 33 species (Fig. 4).



**Fig. 4.** Number of plant species based on benefit groups

Fig. 4 explains that there are 33 plant species that are useful as animal feed at the research location; some of the plant species in question include Babandotan, Bayonan, Boled, Jukut Pait, and others. The distribution of these plant species is fairly even in the five landscape units except the yard. This is possible because most of these plant species are classified as wild plants, so it is only natural that their presence is not found in the yard because in general, home gardens are intensively managed and cared for so that they are clean and free from wild plants (weeds).



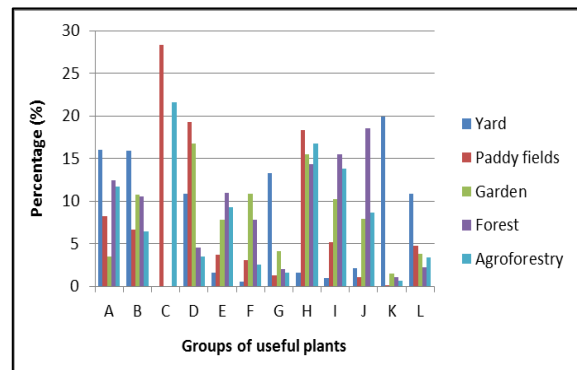
The second highest number of species used by the traditional community of Kampung Pasir Gaok is the category for traditional medicinal ingredients, namely 32 plant species. The distribution of this plant species is mostly found in yard landscape units. The existence of a yard that is integrated with the owner's settlement makes the land management system more intensively cared for, so it is natural that the needs and tastes of the owner of the plot have a strong influence on the many species of medicinal plants. The least number of species used by this village community is in the category to meet their main food needs. The paddy species (*Oryza sativa*) is a type of plant as the staple food for the people in this village and only grows in the paddy field landscape unit (Fig. 4).

Fig. 5 shows a general illustration of the meaning of the results of the choice of landscape units believed by the traditional community of Kampung Pasir Gaok for all the necessities of life of the community which have been grouped into 12 groups of useful plant categories. The paddy landscape unit scores 23% and ranks second after the yard landscape (Fig. 2), and has a richness of 36 species (Fig. 3). This means that paddy fields as a landscape unit have a role not only as a provider of the main food source, but also as a place for plants to grow which are useful as additional food in the form of fruits and tubers, and also as a source of animal feed.

Yards and their settlements have an important value for the community so that they get the highest score among the 5 landscape units, namely 25% (Fig. 2), and have a wealth of 89 plant species (Fig. 3). This condition means that the yard serves as a provider of various species of ornamental plants, a place for plants to grow as an environmental service in the form of soil erosion control, sometimes as a place for growing plants whose stems produce light wood to make household utensils, such as trowel handles, sickles, knives, and machetes; a place for growing types of medicinal plants and plants that function as materials for traditional rituals. The choice of this village community for the garden landscape unit was 22% (Fig. 2) while the richness of plant species in this

garden land had the highest number of the five landscape units, namely 120 species (Fig. 3). This means that the garden is implemented by the local community as a place for growing various types of plants that are useful for additional food sources, animal feed, heavy construction of buildings, materials for traditional medicines, fuel wood, light building construction materials, and woven materials bamboo. The forest unit received an option value from the community of 13% (Fig. 2) and the plant species richness in this forest land was 51 species (Fig. 3).

This means that the existence of forests is prioritized for providers of types of plants as a source of bamboo woven, plants whose stems are used as firewood, plants for fodder, plants as providers of environmental services, and plants as materials for lightweight building construction.



**Fig. 5.** Local community's perceptions of the use of landscape units based on 12 groups of useful plant categories

Caption:

- A. Environmental service
- B. Traditional medicinal ingredients
- C. Main food
- D. Supplementary food
- E. Light construction
- F. Heavy construction
- G. Tools-making materials
- H. Feed livestock
- I. Firewood
- J. Woven handicraft materials
- K. Ornamental plants
- L. Customary ritual materials

The results of the assessment of the village community for the agroforestry unit were 17% (Fig. 2) and the species richness value in this land was 39 species (Fig. 3). This condition means that because there is extreme weather in Indonesia, sometimes in the prolonged rainy season, agroforestry land is processed and used as paddy field, but when the dry season arrives, the land function returns to its original state, namely as agroforestry land. This condition makes agroforestry land a place for plants to grow as a main food producer, plants as fodder for livestock, plants as fuel wood, and plants as a provider of environmental services. Specifically, the meaning of Fig. 5 can state that, all the necessities of life of this village community can be fulfilled from the types of plants that grow in the five familiar units,

including for paddy plants that will never be obtained in yards, gardens and forests.

Empirical experience and the wealth of knowledge of a person, both women and men in social life, also give color and have a positive effect on differences in views in decision-making or judgment on a problem (Somnasang *et al.*, 2000). Likewise, in interpreting the designation of landscape units in the vicinity of their environment as support for their daily needs, women and men in the traditional village communities have different results of assessments and decisions. The following shows the results of men's and women's assessments of the usefulness of 5 landscape units based on categories of useful plant groups (Table 1).

**Table 1.** Gender perceptions in local communities of use of landscape units based on groups of useful plant categories.

No	Landscape units	Categories of useful plant groups	
		Men	Women
1	Yard and residential	ornamental plants	tool-making
2	Paddy field	the staple food	the staple food
3	Gardens	woven handicraft	additional food
4	Forests	woven handicraft	woven handicraft
5	Agroforestry	animal feed	additional food

Table 1 provides data information that there are slight differences between women and men in Kampung Pasir Gaok in understanding the benefits of all landscape units in their environment. However, it is also found that there are fundamental similarities between the two in understanding the function of these landscape units. The difference in understanding referred to is that men argue that the benefits of their yards and settlements are more likely to provide ornamental plants, while women are of the opinion that the providers of tools for making tools. The same is true for garden landscape units and agroforestry lands. Meanwhile, the basic similarities between the two are paddy fields as the main staple of food and the provider of woven handicraft materials in the forest. Overall, these differences and similarities can be understood because men as heads of households have an important role and are fully obliged to earn a living for the family. The natural environment in which they live conditions the people to work hard in order to survive.

This condition triggers men to work more agile and be able to generate money to meet the needs of their families. In the traditional community life of Kampung Pasir Gaok, some of the men work as farmers or farm laborers, some are made of woven bamboo, and some work as traders of *poh-pohan* (*Pilea melastomoides*) leaves or stone banana leaves. Meanwhile, the position of women as wives, there is no obligation to earn a living, they just work part time just to earn extra money so that they can reduce the economic burden on the family.

*The importance of plants in the culture of the traditional community of Kampung Pasir Gaok*

Most of the traditional communities of Kampung Pasir Gaok depend for their livelihood on the wealth of biological resources that exist in all the landscape units in their environment. They use these biological resources wisely and measured as needed and they rarely take excessively. The community is very aware and understands that this wealth of biological

resources needs to be cared for and preserved so that its use can still be continued. Some of the plants around their residence have beneficial values in cultural life for the people of this village. Following are the results of the ICS assessment of several important plant species, which are most often used by the community in this village in their daily life (Table 2).

**Table 2.** Derived ICS values for each plant species across landscape units.

No	Plant name	ICS value
1	<i>Oryza sativa</i>	58
2	<i>Gigantochloa apus</i>	40
3	<i>Manihot esculenta</i>	20
4	<i>Albizia chinensis</i>	18
5	<i>Artocarpus altilis</i>	16
6	<i>Artocarpus elasticus</i>	16
7	<i>Artocarpus heterophyllus</i>	16
8	<i>Coffea arabica</i>	16
9	<i>Durio zibethinus</i>	16
10	<i>Ficus benjamina</i>	16
11	<i>Garcinia mangostana</i>	16
12	<i>Lansium domesticum</i>	16
13	<i>Musa balbisiana</i>	16
14	<i>Nephelium lappaceum</i>	16
15	<i>Sandoricum koetjape</i>	16
16	<i>Syzygium cumini</i>	16
17	<i>Baccaurea racemosa</i>	14
18	<i>Albizia chinensis</i>	12
19	<i>Antidesma bunius</i>	12
20	<i>Capsicum frutescens</i>	12
21	<i>Ceiba pentandra</i>	12
22	<i>Curcuma longa</i>	12
23	<i>Kaempferia galanga</i>	12
24	<i>Melia azedarach</i>	12
25	<i>Pangium edule</i>	12
26	<i>Parkia speciosa</i>	12
27	<i>Solanum tuberosum</i>	12
28	<i>Swietenia mahagoni</i>	12
29	<i>Swietenia mahoni</i>	12
30	<i>Zingiber officinale</i>	12
31	<i>Zingiber zerumbet</i>	12
32	<i>Glycine max</i>	11
33	<i>Zea mays</i>	11
34	<i>Arachis hypogaea</i>	11
35	<i>Cananga odorata</i>	9
36	<i>Amaranthus gracilis</i>	8
37	<i>Annona muricata</i>	8
38	<i>Averrhoa carambola</i>	8
39	<i>Carica papaya</i>	8
40	<i>Gnetum gnemon</i>	8
41	<i>Mangifera indica</i>	8
42	<i>Hibiscus similis</i>	8
43	<i>Manilkara zapota</i>	8
44	<i>Pilea melastomoides</i>	8
45	<i>Psidium guajava</i>	8
46	<i>Salacca zalacca</i>	8
47	<i>Solanum melongena</i>	8
48	<i>Syzygium aqueum</i>	8
49	<i>Pterocarpus indicus</i>	6
50	<i>Amomum dealbatum</i>	4
51	<i>Bougainvillea glabra</i>	4
52	<i>Cocos nucifera</i>	4
53	<i>Codiaeum variegatum</i>	4
54	<i>Myrsine fragrans</i>	4
55	<i>Leucaena leucocephala</i>	3
56	<i>Hibiscus rosa-sinensis</i>	2
57	<i>Ixora coccinea</i>	2
58	<i>Mirabilis jalapa</i>	2

In TABLE 2, the plant species that obtained high ICS values were *Oryza sativa* (ICS = 58) and *apus bamboo* (*Gigantochloa apus*), namely ICS = 40. Paddy (*Oryza sativa*) is a staple food for the community of Kampung Pasir Gaok, usually used in a dish called white rice. In the life of the community of this village, the serving of rice as the main food is always complemented by vegetables with soup and side dishes. Apart from being served as the main meal of the day, white rice can also be used for several ceremonial ceremonies (*salametan*), such as salvation for starting rice planting, salvation for building a house, salvation for circumcision, and others. The profession of making woven bamboo for the villagers is a job that is seriously pursued because it can support the economic needs of the family, so the intensity of its utilization is quite high. Various kinds of household utensils that are used daily in the kitchen are obtained from the skilled hands of the bamboo weaving craftsmen in this village. This condition makes *apus bamboo* have a high ICS value. Meanwhile, *poh-pohan* (*Pilea melastomoides*) and *cau* (*Musa balbisiana*), which economically have a good selling value in traditional markets, only get a relatively low value, namely ICS = 8 and ICS = 16. This shows that the calculation of the ICS value based on community culture does not accommodate the importance of the economic values of a plant species.

*Traditional conservation by the local community of Kampung Pasir Gaok*

The results of field observations obtained data that local conservation carried out by the traditional communities of Kampung Pasir Gaok, Gunung Malang Village who live in the MHSNP Biosphere Reserve tends to be based on ecosystem conservation. The community does not recognize species conservation, for example through certain ways a plant species is protected (*dikeramatkan*) because it is widely used for the benefit of customary rituals.

These traditional communities carry out ecosystem conservation by protecting good plants that are useful as environmental services, medicines, main food, supplementary food, up to customary rituals in the

form of ecosystem protection (yards, paddy fields, gardens, forests, and agroforestry). Traditional conservation they do is by taking the existing biological resources in moderation, maintaining soil erosion by caring for several plant species whose roots have the function of resisting erosion such as bamboo plants. Apart from that, the villagers of this village also routinely maintain and care for clean water sources that are located far above their residence so that they do not experience drought and damage. Other things that support traditional conservation activities in this community include customary traditions that are strong enough to protect forest ecosystems from damage. In addition, the community also has the belief that the forests around where they live are always guarded by the spirits of forest guards, if there is a violation in utilizing the biological resources in it, they will get a curse in the form of disease.

### Conclusion

Referring to the results and discussion of the research, it can be concluded that the life of the traditional community of Kampung Pasir Gaok, Gunung Malang Village is very dependent on the biological resources in the five landscape units it is familiar with. They have sufficiently good traditional ecological knowledge of the five landscape units that they group them into two categories, namely natural and artificial landscape units. This traditional community uses plants for the purposes of their daily life by grouping them into 12 groups of useful plant categories. Traditional conservation carried out by the community of Kampung Pasir Gaok in protecting and caring for the biological resources in the MHSNP area tends to be based on ecosystem conservation. This activity is also supported by strong customary beliefs and traditions to protect the forest ecosystem from damage.

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