

The Diversity of Food Plant Species in Cirahab, Curuggoong Village, Padarincang District, Serving as a Food Source for the Local Community

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Received : 05 June 2026

Accepted : 29 June - 2026

Published online : 02 July - 2026

Abstract

Plants play a vital role for humans, particularly food crops. These plants are widely utilized by the community for daily needs, including as sources of food and health-promoting beverages. This study aimed to determine the species diversity level of food crops in the Cirahab Bathing Area. Sampling was conducted by mapping the area using a 20 x 20-meter transect method. Environmental conditions including temperature, humidity, light intensity, wind speed, soil pH, and soil moisture were also measured. The plants identified included 5 jackfruit trees, 20 banana trees, 2 breadfruit (*sukun*) trees, 2 stink bean (*jengkol*) trees, 2 bitter bean (*petai*) trees, 5 red chili plants, 3 ginger plants, 1 bamboo clump, 10 taro plants, 5 fern plants, and 7 coffee plants. These plants were found within the Cirahab Bathing Area. Measurement results indicated environmental conditions of 32°C temperature, 90% air humidity, 89% light intensity, 0.75-5.8 m/s wind speed, a soil pH of 7, and soil moisture levels of 4-8. The plant diversity index value was 2.441, which, based on the diversity index formula, indicates a “moderate” level of diversity.

Keywords: Cirahab Bathing Area, Food Crops, Species Diversity.

1. Introduction

Plant diversity is vital for human life on Earth. The presence and abundance of plants enable humans to breathe oxygen, utilize plant materials for construction, and secure the food sources necessary for survival. Furthermore, this diversity maintains ecological balance, ensuring that animals and other organisms can thrive. Plants also play a crucial role in absorbing carbon and harmful airborne toxins, thereby sustaining the lives of humans, animals, and microorganisms. Indeed, plants offer numerous benefits to living beings by providing food, medicines, and a wide range of other essential resources. Plants play a vital role in human life and serve as a valuable resource for the surrounding community. Plants are organisms that can grow and develop both vegetatively and generatively (Tjitrosoepomo, 2002).

Nurohman (2011) defines plants as anything that grows, lives, has a stem, roots, leaves, flowers, and so on in nature. Biodiversity is a term used to describe the variety of life on Earth including plants, animals, fungi, and microorganisms as well as the genetic material contained within them and the ecological factors that influence them (Sriastuti et al., 2018). Plants offer various benefits, including as food and medicine (Salsabila et al., 2014). Food derived from plants is particularly beneficial for the health of the human digestive system. Plants used as



food are essential for human health, particularly for the health of human organs, including the digestive system, kidneys, stomach, and other internal organs.

The Cirahab Bathing Area is an ecotourism destination used by the community and is also home to a variety of edible plants, including trees, stink bean (*jengkol*), bitter bean (*petai*), jackfruit, melinjo (*gnetum gnemon*), breadfruit (*sukun*), banana, durian, and other edible trees. These trees serve as food reserves for future needs. This is a fertile area widely used by the local community for cultivation, whether for rice or other food crops.

Species richness refers to the total number of species, whereas evenness refers to the distribution of abundance for example, number of individuals, biomass across those species (Nahlunnisa et al., 2016). The concept of species diversity stems from the broader concept of biodiversity, which encompasses the diversity of life in all its forms and levels of organization, including structures, functions, and ecological processes at every level.

Species distribution is indirectly influenced by interactions among the vegetation itself, temperature, air humidity, and soil physicochemical properties; these factors create specific environmental conditions that determine the presence or absence of a species and its distribution based on varying levels of adaptation (Nahdi et al., 2014). This subject has also been investigated by previous researchers, who obtained positive results regarding the fertility levels of the food crops they studied.

Plant diversity in the area is notably high, given that the majority of the existing plants are food crops. This study aims to determine the diversity of plants that serve as potential food sources for the local community in Cirahab Bathing Area. Furthermore, it seeks to inform the general public about plants that can be utilized for food and cultivated elsewhere. Additionally, this research serves as a reference for other researchers identifying plants suitable for consumption and provides a foundation for future studies on the food crops found in Cirahab Bathing Area.

2. Methods

This research was conducted in Cirahab Bathing Area. The tools and materials used were as follows: stakes, raffia rope, writing utensils, a camera, a mobile phone, a tape measure, a pH meter, a lux meter, a soil meter, and an anemometer. These tools were used to measure environmental conditions in the Cirahab Bathing Area. The materials used were plants found in the area. This research employed a multiple plot method, or plots, to measure tree vegetation in the area (Fachrul, 2007). Observations were then made, beginning with transects, mapping and counting the number of trees classified as food crops within the plots, and recording the trees and their numbers.

Environmental conditions that could influence plant growth were then measured in each plot. Furthermore, calculations and identification of food crops were conducted. Finally, documentation and recording of necessary actions were conducted to achieve optimal results. Subsequent data analysis employed both quantitative and qualitative descriptive methods. The qualitative analysis involved describing the food crops found at the research site and presenting the findings, while the quantitative data were analyzed using the Shannon-Wiener diversity index (H') to determine the diversity of food crops in Cirahab Bathing Area.

The formula used in this data analysis is as follows:

Diversity or (H') for each plot:

$$H = -\sum (n_i/N) \log (n_i/N)$$

Where:

H' = Diversity Index.

n_i = Number of individuals of each species.

N = Number of individuals of all species.

$\ln$ = Natural Logarithm

The Shannon-Winner diversity index is as follows:

H' value > 3 = High species diversity

H' value $1 < H' < 3$ = Moderate diversity

H' value < 1 = Low diversity

3. Results and Discussion

3.1. Environmental Conditions in Cirahab Bathing Area

Environmental assessments in Cirahab Bathing Area revealed the following conditions: air temperatures ranged from 30-32°C (considered normal), relative humidity was between 90% and 92%, average light intensity was around 900, and wind speed was 5.8. Soil measurements showed a pH of 7 and a moisture level of 4-8. These measurements aimed to determine the suitability of the environment for the plants growing in Cirahab Bathing Area, particularly the food crops cultivated by the local community. The results of the study regarding environmental conditions in the Cirahab Bathing Area include the following:

Table 1. Environmental Conditions

No.	Environmental Factor and Parameter	Value
1.	Climatic Factors	
	Temperature (°C)	30 - 32
	Air Humidity (%)	90 - 92
	Light Intensity	898 - 900
	Wind Velocity (m/s)	0.75 - 5.8
2.	Edaphic Factors	
	Soil pH	7
	Soil moisture	4 - 8

3.2. Types of Food Plants Obtained in the Cirahab Bathing Area

Food plants are one of the basic ingredients for humans' daily needs. Food is also divided into two categories: animal and plant. Animal sources naturally come from animals such as goats, fish, buffalo, cows, or other animals that can be consumed by humans. Meanwhile, plant sources include green vegetables, jackfruit, bananas, durian, and other plants that can be consumed for their benefits. After conducting various observations and recordings in the field, the research results obtained in the form of food plants in the Cirahab Bathing Area, including the following:

Table 2. Food Plant Categories

No.	Plant Name	Plant Photo	Scientific Name	Amount	Benefits of Plant
1.	Jackfruit		<i>Artocarpus heterophyllus</i>	5	Used as a vegetable ingredient
2.	Banana		<i>Musa Balbisiana</i>	20	Consumed as a fruit
3.	Breadfruit		<i>Artocarpus altilis</i>	2	Consumed as a boiled or fried food
4.	Stink Bean (Jengkol)		<i>Pithecellobium jiringa</i>	2	Used as a side dish
5.	Bitter Bean (Petai)		<i>Perkia Speciosa</i>	2	Used as a side dish

No.	Plant Name	Plant Photo	Scientific Name	Amount	Benefits of Plant
6.	Red chili		<i>Capsicum Annuum</i>	5	Used as a seasoning
7.	Ginger		<i>Zingiber Officinale</i>	3	Used as a seasoning and traditional herbal medicine
8.	Bamboo		<i>Bambusa Vulgaris</i>	1	Young shoots are consumed as food
9.	Taro		<i>Colocasia esculenta</i>	10	Used as a food source and vegetable
10.	Fern		<i>Diplazium Esculentum</i>	5	Used as a vegetable
11.	Coffee		<i>Coffea Arabica</i>	7	Used as a beverage ingredient

No.	Plant Name	Plant Photo	Scientific Name	Amount	Benefits of Plant
12.	Durian		<i>Durio Zibethinus</i>	3	Consumed as a fruit
13.	Lemongrass		<i>Andropogan Nardus</i>	5	Used as a traditional herbal medicine
14.	Melinjo		<i>Gnetum Gnemon</i>	5	Used as a vegetable
15.	Papaya		<i>Carica Papaya</i>	7	Used as a vegetable and fruit
Amount				82	

The research results above indicate that several trees fall into the food tree category, including 5 jackfruit trees, 20 bananas, 2 breadfruit, 2 stink bean (*jengkol*) trees, 2 bitter bean (*petai*) trees, 5 red chilies, 3 ginger, 1 bamboo, 10 taro, 5 fern trees, and 7 coffee trees. These plants are found in the Cirahab Bathing Area. These plants are widely used by the local community for their own food needs. These plants also thrive in the area because the area

offers a favorable environment for them to grow. The results of calculations using the Shannon-Wiener formula can be seen in Table 3 below.

Table 3. Calculation Results Using the Shannon-Wiener Formula

No.	Plant Name	Scientific Name	Amount	H'
1.	Jackfruit	<i>Artocarpus heterophyllus</i>	5	-0.170565935
2.	Banana	<i>Musa Balbisiana</i>	20	-0.344143164
3.	Breadfruit	<i>Artocarpus altillis</i>	2	-0.090574928
4.	Stink Bean (<i>Jengkol</i>)	<i>Pithecellobium jiringa</i>	2	-0.090574928
5.	Bitter Bean (<i>Petai</i>)	<i>Perkia Speciosa</i>	2	-0.090574928
6.	Red chili	<i>Capsicum Annuum</i>	5	-0.170565935
7.	Ginger	<i>Zingiber Officinale</i>	3	-0.121028303
8.	Bamboo	<i>Bambusa Vulgaris</i>	1	-0.053740479
9.	Taro	<i>Colocasia esculenta</i>	10	-0.256601726
10.	Fern	<i>Diplazium Esculentum</i>	5	-0.170565935
11.	Coffee	<i>Coffea Arabica</i>	7	-0.210069069
12.	Durians	<i>Durio Zibethinus</i>	3	-0.121028303
13.	Lemongrass	<i>Andropogan Nardus</i>	5	-0.170565935
14.	Melinjo	<i>Gnetum Gnemon</i>	5	-0.170565935
15.	Papaya	<i>Carica Papaya</i>	7	-0.210069069
Amount			82	2.441

Table 3 above shows the results of the Diversity Index for food-grade plants in the Cirahab Bathing Area, Padarincang District, Serang-Banten Regency, which shows a value of 2.441. This value, when combined with the diversity index formula, indicates a “Medium” diversity. The food-grade plant species in Cirahab Bathing Area indicate a high population density and are still utilized by the local community for food without damaging the environment.

4. Conclusion

Research on food crop diversity in the Cirahab Bathing Area located in Curuggoong Village, Padarincang District, Serang Regency reveals an abundance of various plant species, particularly banana and taro (with 20 plants of each type), while other crops are present in more limited numbers. The specific plants identified at the site include 5 jackfruit trees, 20 banana plants, 2 breadfruit trees, 2 stink bean (*jengkol*) trees, 2 bitter bean (*petai*) trees, 5 red chili plants, 3 ginger plants, 1 bamboo clump, 10 taro plants, 5 fern plants, and 7 coffee plants. These findings indicate good soil fertility, allowing the crops to thrive in the Cirahab soil. The results also underscore the principle that flourishing crops require high-quality soil and adequate or abundant water supplies, thereby ensuring successful cultivation and beneficial yields for the local community.

5. References

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