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Diversity of Garden Plants That Have Potential as Food in Sawahan Village

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ABSTRACT. Sawahan village has increased its population because this area is undergoing many transformations which were originally rice fields into residential areas.Not only being a residential area, some of the rice fields are also converted into the Solo-Kertosono toll road. Its strategic location encourages many people who move to build houses in Sawahan village. This study aims to determine the diversity of plant species that have the potential as a food source in Sawahan village. The method used with quantitative descriptive approach. Data collection is done by field observation. Interviews were conducted on the survey of plant species, the name of indonesia/local, the part that is used, as well as the form of utilization. Informants were interviewed and also the location of the study was selected using random sampling techniques. Species diversity can be determined using the Shannon-Weiner Diversity Index. The evenness of each type in the community can be known by using the Evenness Evenness Index (E) or using the equity formula. The results showed that there are 30 types of plants. Other results are Sawahan village air temperature around 29-34 degrees Celsius. Then, a relatively normal pH ranges from 5 to 6. As well as soil moisture that ranges from 8%-18%. The conclusions obtained are the results of the Diversity Index which is classified as moderate, namely 3.1968101 and the plant evenness index which is classified as high, namely 0.939907262. Both indices can be influenced by Sawahan village environmental factors such as temperature, soil moisture, and pH.

Keywords: diversity, food, fruit, plant, yard.

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1. Introduction

Sawahan village is one of the villages in Ngemplak District, Boyolali regency. Along with the Times, Sawahan village has increased its population because this area is undergoing many transformations from rice fields to residential areas. It cannot be denied that land conversion occurs every year. Not only being a residential area, the rice field area is also converted into a Solo-Kertosono toll road. Its strategic location encourages many people who move to build houses in Sawahan village.

Most residents of Sawahan village have very narrow to narrow yards that range from 70-300 square meters. This is due to the large number of housing built in Sawahan village in recent years. The yard consists of a house building surrounded by a yard, the yard can be used for cultivation. The yard can be used to plant various types of plants ranging from vegetable crops, medicinal plants, fruit plants to ornamental plants. The Yard has economic value for humans to be planted with various types of useful plants. In addition to having economic value, one of the functions of the yard is the preservation of soil and Water Resources, which includes maintaining soil fertility, protecting the soil against erosion and playing a role in the hydrological cycle (Irwan et al., 2018). The yard is also useful in fulfilling life, and also aesthetic functions and comfort (Solihah, 2020).

The shape and pattern of garden plants vary, depending on the environmental conditions of the area. Environmental factors such as temperature, pH, and humidity also play a major role in determining the types of plants that can live (Gelyaman, 2018). Sawahan village is a lowland tropical area with temperatures ranging from 29-33 during the day which has fertile soil so that there are various types of plants that can thrive in the area. Plant species diversity can create a sustainable living environment (Manoppo et al., 2017). Therefore, this study aims to determine the diversity of plant species that have the potential as a food source in Sawahan village.

2. Materials and Methods

Data collection was carried out by field observation to determine the research point and interviewed informants. Interviews were conducted on the survey of plant species, the name of indonesia/local, the part that is used, as well as the form of utilization (personal consumption or sale). Informants interviewed were selected using random sampling techniques (random samples). This technique is a way of random sampling (random) by actually providing the same opportunities (Darmawati *et al*., 2015). Likewise, the research point was determined using random sampling technique. This research point is used to collect data on environmental factors such as temperature, pH, and soil moisture in Sawahan village.

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The research produced primary data. Primary Data can be defined as resources obtained directly from the original source (Saputra *et al.*, 2018). Sample data collection includes documentation in the form of photos of organs/parts of plants for further identification purposes based on the knowledge of the author and supported by the information contained in identify.plantnet.org. in addition, data were also obtained from secondary data or literature studies that support this study. Secondary Data is a type of data obtained from a reference that is the same as what the researcher is researching (Sari and Zefri, 2019

2.2 Data Analysis

The approach method used is quantitative descriptive method. Species diversity can be known by using the Shannon-Weiner Diversity Index (Krebs, 1989) with the formula:

$$H' = Pi \ln Pi$$

The Diversity Index (H') is influenced by ni, which shows the total number of individuals of Type I and Pi, which shows the proportion of type I. The Pi is obtained from the result of dividing the total number of individuals of the I-th type (ni) by the total number of its types (N). The Shannon-Weiner Diversity Index can be categorized into: (1) H ' <1.5 indicates a low level of diversity, (2) 1.5 chernobh3. 5 indicates a moderate level of diversity, and (3) H ' > 3.5 indicates a high degree of diversity.

The evenness of each type in the community can be known by using the Evenness Evenness Index (E) or using the equity formula, which is as follows:

$$E = H'/\ln S$$

The evenness index (E) is influenced by the Shannon-Weiner Diversity Index (H'), ln or natural logarithm, and the number of species (S). Based on the magnitude, the evenness Index can be categorized into: (1) E < 0.4 can be categorized as low, (2) E = 0.4-0.6 can be categorized as moderate, and (3) E > 0.6 can be categorized as high.

2.3 Region Research

The study was conducted in July 2022 and was located in Sawahan village, Ngemplak District, Boyolali regency, Central Java. Based on BPS data in 2020, the area of Sawahan village is about 2.66 km2 with a male population of 5,753 people, and 5,684 women.

3. Result and Discussion

3.1 Benefits of Plants Parts

Plants that grow in the village Sawahan almost all parts can be used include fruit, leaves, flowers, stems, bulbs and other parts. Based on its utilization, the food crops grown in the yard in Sawahan village are generally as fresh vegetable and fruit food with a totalof 30million species. Based on the data we have obtained, the most commonly found food crop is chili. Chili plants are usually used as part of the fruit as vegetables or herbs in everyday cooking. Meanwhile, the least common plants are takokak, vegetable ferns and limes, where all three are used both as vegetables and as spices. The part of the plant that is used is different from each type is also different in how it is used.

Tabel 1
Types of food crops in Sawahan village

Family	Scientific name	Indonesia/english name	Category by Benefits	Used part	Amount
Anacardiaceae	*Mangifera indica*	Mangga madu (honey mango)	BS	Fruit	22
Annonaceae	Annona muricata	Sirsak (soursop)	BS	Fruit	11
Annonaceae	*Annona sguamosa*	Srikaya	BS	Fruit	16
Family	Scientific name	Indonesia/english name	Category by Benefits	Used part	Amount
Araceae	Alocasia brisbanensis	Talas (besar) (taro)	S	Tuber	7
Arecaceae	*Cocos nucifera L*	Kelapa (coconut)	BS	All parts	15
Asparagaceae	*Asparagus densiflorus (Kunth) Jessop*	Asparagus	S	Leaf	6
Athyriaceae	*Diplazium esculentum*	Pakis sayur (vegetable fern)	S	Fruit	4
Cactaceae	*Hylocereus sp.*	Buah naga (dragon fruit)	BS	Fruit	8
Caricaceae	*Carica papaya L*	Pepaya (papaya)	BS	Fruit	27
Convolvulaceae	*Ipomoeae batatas*	Ubi jalar (sweet potato)	MP	Tuber	23
Euphorbiaceae	*Manihot esculenta*	Singkong (cassava)	S MP	Leaf Tuber	27
Euphorbiaceae	*Manihot utilissima*	Ubi kayu (cassava)	MP	Tuber	5

Family	Scientific name	Indonesia/english name	Category by Benefits	Used part	Amount
Musaceae	*Musa balbisiana*	Pisang Batu (banana)	BS	Fruit	21
Moraceae	*Artocarpus heterophyllus*	Nangka (jack fruit)	S BS	Fruit and seed Fruit	5
Myrtaceae	*Psidium guajava*	Jambu biji (guava)	BS	Fruit	17
Myrtaceae	*Syzygium aquea L.*	Jambu air (water apple)	BS	Fruit	8
Oxalidaceae	*Averrhoa bilimbi L.*	Belimbing wuluh (starfruit)	BS	Fruit	25
Pandanaceae	*Pandanus amaryllifolius Roxb*	Pandan wangi (pandanus)	BD	Leaf	16
Poaceae	*Cymbopogon citratus (DC.) Stapf*	Sereh (lemongrass)	BD	Stem	17
Rubiaceae	*Morinda citrifolia*	Mengkudu (noni)	BS	Fruit	5
Rutaceae	*Citrus amblycarpa*	Jeruk Limau (lime)	BD	Fruit	4
Rutaceae	*Citrus aurantiifolia*	Jeruk Nipis (lime)	BS	Fruit	12
Rutaceae	*Citrus maxima*	Jeruk Bali (pomelo)	BS	Fruit	6
Sapindaceae	*Pometia pinnata*	Matoa	BS	Fruit	6
Sapotaceae	*Manilkara zapota*	Sawo (sapodilla fruit)	BS	Fruit	12
Solanaceae	*Capsicum spp*	Cabai (chili)	S BD	Fruit	37
Solanaceae	*Solanum torvum Sw.*	Takokak	S	Fruit and seed	2
Solanaceae	*Solanum sp.*	Terong (eggplant)	S	Fruit	31
Xanthorrhoeaceae	*Aloe vera*	Lidah buaya (aloe vera)	BD	Fruit filling	15
Zingiberaceae	*Zingiber officinale Rosc*	Jahe (ginger)	BD	Root	9

Table 2
Diversity Index and evenness Index

H'	3.1968101
E	0.939907262

Table 3
Parameter measurement results

Zone	pH	Soil temperature (Celcius)	Humidity (%)
Zone 1	5	28	10
Zone 2	5	32	8
Zone 3	5	29	15
Zone 4	5	27	18
Zone 5	6	26	15

3.2 Types of Utilization

Categories of benefits in Table 1. it consists of herbs (BD), fresh fruit (BS), staple food (MP), and vegetables (S). The types of spices found in the yard in Sawahan Village include ginger, lemongrass, chili, and lime. Usually this material is used by the surrounding community to make dishes in the form of lodeh

vegetables, clear vegetables, and tamarind vegetables as an amplifier and taste of vegetables.

The category of fruits in the yard of Sawahan Village is classified as high with plants such as orange, guava, rambutan, mango and papaya. Based on Table 1. there are about 17 types of fruit, with many types of fruit that exist and consumed by the public will add to the healthy body because the fruit contains many minerals, sugar, vitamins, fats and other ingredients. Papaya plant itself can be used almost all parts include vitamin-rich fruit and leaves to be used as vegetables. In addition, plants that are used as vegetables are also not less because some residents in Sawahan Village are still traditional, so their yard is also used to grow plants that will be used in side dishes at home. Most vegetable ingredients are cooked and stewed in different ways so that there is a different and unique taste.

Other types of plants that are used as alternative food sources also grow in Sawahan village such as tubers. This Meal is usually used as a substitute for the staple food of rice. Tubers are rich in carbohydrates and fiber, so they make you full and practical in serving. However, this tuber must be cooked properly because if it is wrong or directly raw, it is feared that it will make itching on the part of the body affected by the SAP.

Based on the results of our research, Sawahan village is a lowland in Boyolali regency which certainly has a tropical climate with an air temperature of 29-34 during the day has some of the same plant properties as other lowlands that are common in Indonesia. This causes a variety of tropical plants that are suitable for growing in Sawahan areas. Supported by a relatively normal pH ranging from 5 to 6 makes the soil easily overgrown by plants because it does not need extreme adaptation for plants. In the calculation of our data, the results obtained are classified as moderate Diversity Index is 3.1968101 and plant evenness index is classified as high is 0.939907262.

Environmental factors greatly affect the diversity of plant species in an area. Soil temperature, pH, and humidity affect the type of plant because each plant species has a certain tolerance limit. The normal soil temperature of the tropical Plains ranges from 29 degrees Celsius during the day, producing types of plants that are tolerant of soil temperatures around 29 degrees Celsius as well. In contrast to the Highlands whose soil temperatures range from 22 degrees Celsius during the day, overgrown with plants that can tolerate that temperature as well. Similarly, soil moisture ranges from 8% -18%. Of course, in one coverage area has an average of environmental conditions such as pH, temperature, and soil moisture are relatively the same, so that in one area overgrown with relatively similar types of plants.

4. Conclusion

Based on research that has been done, it can be concluded that the diversity of food crops in the yard in the village sawahan classified as moderate diversity with diversity index reached 3.1968101. While the level of evenness is relatively high with the evenness index reaching 0.939907262. The highest food species in the yard in Sawahan village is Capsicum spp or chili and the lowest is Solanum torvum Sw. or takokak. Both indices can be influenced by Sawahan village environmental factors such as temperature, soil moisture, and pH. Based on the research, the air temperature of Sawahan village is around 29-34 degrees Celsius. Then, a relatively normal pH ranges from 5 to 6. As well as soil moisture that ranges from 8% -18%.

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