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Identification of Plants That Compile The Vegetation Structure of The Critical Land Ecotourism Area of Ngargoretno Village, Magelang, Central Java

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ABSTRACT

Each region has a different ecosystem. Land is an environmental condition that greatly influences the biodiversity of plants that live in an area. The critical land contained in the Ngargoretno Ecotourism Area, Magelang, Central Java, has various types of plants that have never been identified. The condition of the soil, which is prone to landslides, makes the presence of vegetation in the area important as a landslide barrier. This makes plant conservation efforts important and necessary. One of the conservation efforts that can be made is by identifying plants. This research was conducted to identify various types of plants found in the ecotourism area of Ngargoretno, Magelang, and Central Java. Data collection is carried out by means of exploration throughout the region. The results of the study revealed 70 types of plants, consisting of 37 types of families. The most commonly found plant species belong to the families Asteraceae (7 types), Fabaceae (7 types), and Euphorbiaceae (7 types).

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Introduction

Indonesia is one of the countries that has very high biodiversity ¹. In the world ranking, Indonesia is ranked second only to Brazil ². The high level of biodiversity that exists should make the Indonesian people proud and more concerned. The form of concern can manifest itself in conservation behavior towards all aspects of abiotic and biotic life, especially plants ³.

Plants have a very important role in the order of life, both as food providers and sources of oxygen, and they are utilized by the community ⁴. Forms of plant utilization carried out by the community include, for example, greening, silencers, carbon dioxide gas absorbers, dust retardants, and landslide arrestors ⁵.

The potential of plants as landslide barriers is widely recognized by communities whose land has steep soil contours or slopes ⁶. This is like what happened in the Ngargoretno Critical Land Ecotourism Area, Magelang, Central Java. Ngargoretno Magelang Ecotourism Area is a tourist area that began to be pioneered in 2015 ⁷. This village has very interesting village potential, such as the existence of marble hills, the beauty of the surrounding nature, the community's goat livestock business, and local wisdom ⁸. This ecotourism area has the character of hilly land, with cliffs or slopes that are quite steep; the soil is less dense; and some areas have the potential for landslides ⁹. This condition makes the community take the initiative to plant plants that can help the soil withstand the potential landslide.

Coffee has a good ability to protect the soil so that landslides do not occur. In addition to coffee plants, there are also many other types of plants that grow around the area and have the ability to withstand landslides. The activities of community residents do not carry out illegal logging of plants and instead tend to participate in maintaining the existence of existing plants. The community understands the importance of the role of plants in holding the soil so that there is no landslide disaster that can hit residents' homes.

Ngargoretno Critical Land Ecotourism Area has a variety of plant species ranging from grass to shrubs and trees. Some of these plants are deliberately planted by residents, and some are growing wild. The types of plants in the area have never been studied in terms of their types. Therefore, this research is important to do in order to know the various types of plants found in the Critical Land Ecotourism Area. So that with the results of this study, the community can find out the types and make a strategic effort to conserve existing plants.

Method

The method used in this study is purposive sampling, which involves determining the sample according to certain objectives or considerations. Plant sample data were collected using exploratory techniques. The stages of research conducted are:

1) Determination of the direction of exploration

The exploration path is determined based on the presence of plants in the research area by combing each area to find new plant species.

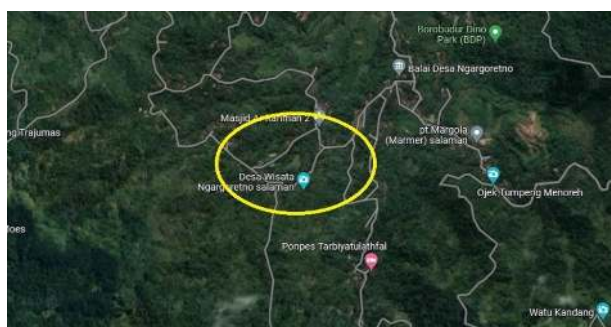


Figure 1. Research Location of Ngargoretno Village, Salaman, Magelang

2) Abiotic Factor Measurement

Abiotic factors are also measured to determine their possible effects on vegetation, including soil moisture, pH, soil temperature, air temperature, and light intensity.

3) Plant Identification

All plants obtained or encountered during exploration are identified by observing the morphology of plant parts and comparing with literature.

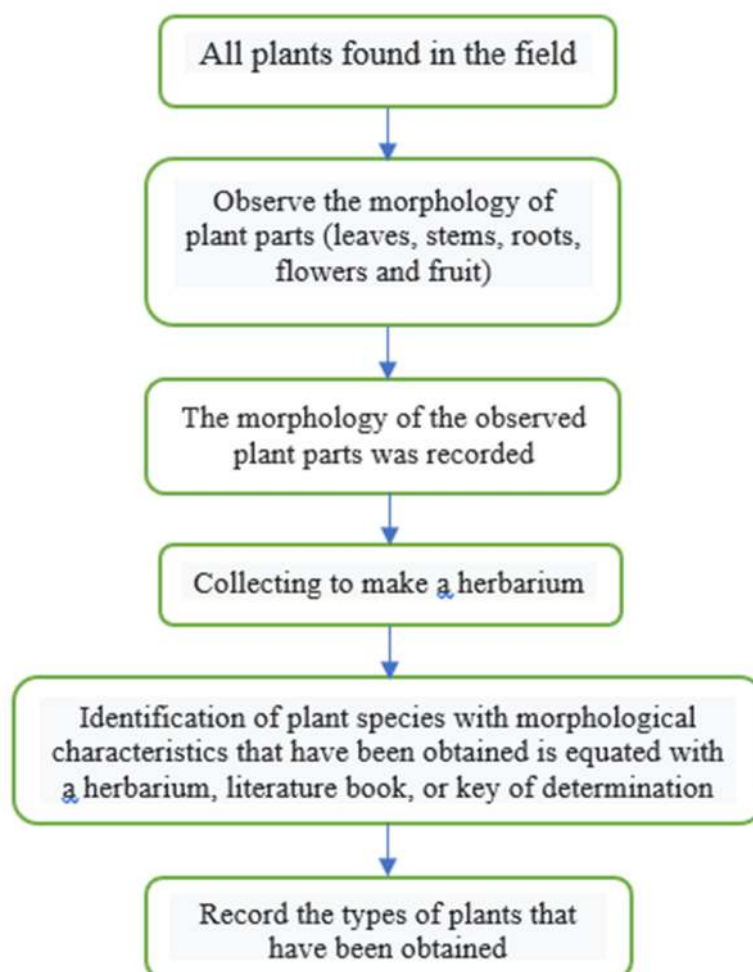


Figure 2. Identification flow chart

4) Data Analysis Techniques

The vegetation data obtained was analyzed using qualitative descriptive techniques by describing plant morphology data.

Results and Discussion

Based on the research that has been carried out, the results obtained for the measurement of abiotic factors including soil temperature, environmental temperature, pH, and soil moisture can be seen in Table 1.

Table 1. Results of measurement of abiotic factors

No	Abiotik	Result
1	Kelembaban tanah	72
2	pH	6
3	Suhu tanah	28°C
4	Suhu udara	30°C
5	Intensitas cahaya	880 x 10 Lux

From the results of abiotic factors, it can be seen that these conditions are quite supportive of a plant being able to grow properly. Air and soil temperatures are ideal enough to support plant growth. This is also clearly seen with the large number of plants that grow in the Ngargoretno Critical Land Ecotourism area, Magelang, Central Java.

The results of plant identification that have been carried out have obtained a fairly large number of plants. Different types of plants have been identified, which can be seen in Table 2.

Table 2. Results of Plant Identification

No	Local Name	Scientific Name	Family
1	Keji Beling	<i>Strobilanthes crista</i>	Acanthaceae
2	Bunga lili/ bunga bakung	<i>Amaryllis sp.</i>	Amaryllidaceae
3	Sirsak	<i>Annona muricata</i>	Annonaceae
4	Suweg	<i>Amorphophallus paeoniifolius</i>	Araceae
5	Keladi	<i>Caladium sp.</i>	Araceae
6	Talas	<i>Colacasia esculenta</i>	Araceae
7	Paku Sarang Burung	<i>Asplenium nidus</i>	Aspleniaceae
8		<i>Bidens pilosa</i>	Asteraceae
9	Tapak liman	<i>Elephantopus scaber</i>	Asteraceae
10		<i>Borreria laevis</i>	Asteraceae
11		<i>Erigeron sp</i>	Asteraceae
12	Tekelan	<i>Eupatorium odoratum</i>	Asteraceae
13		<i>Porophyllum sp.</i>	Asteraceae
14	Jotang kuda	<i>Synedrella nodiflora</i>	Asteraceae
15	Bambu petung	<i>Dendrocalamus asper</i>	Bambuseae
16	Pepaya	<i>Carica papaya</i>	Caricaceae
17	Ketapang kencana	<i>Terminalia mantaly</i>	Combretaceae
18	Ubi	<i>Ipomoea sp.</i>	Convolvulaceae
19	Pacing	<i>Costus spiralis</i>	Costaceae
20	Rumput pendul	<i>Kyllinga brevifolia</i>	Cyperaceae
21	Gadung	<i>Dioscorea esculenta</i>	Dioscoreaceae
22		<i>Cystopteris fragilis</i>	Dryopteridaceae
23	Katuk	<i>Sauropus androgynus</i>	Euphobiaceae
24	Puring	<i>Codiaeum variegatum</i>	Euphorbiaceae
25	Kate mas	<i>Euphorbia heterophylla</i>	Euphorbiaceae
26	Singkong	<i>Manihot utilisima</i>	Euphorbiaceae
27	Meniran hijau	<i>Phyllanthus niruri</i>	Euphorbiaceae
28	Meniran merah	<i>Phyllanthus urinaria</i>	Euphorbiaceae
29	Teh-tehan	<i>Acalypha siamensis</i>	Euphorbiaceae
30	Kaliandra	<i>Calliandra sp.</i>	Fabaceae
31	Sonokeling	<i>Dalbergia latifolia</i>	Fabaceae
32	Petai china	<i>Leucaena leucocephala</i>	Fabaceae
33	Petai	<i>Parkia speciosa</i>	Fabaceae
34	Johar	<i>Senna siamea</i>	Fabaceae
35		<i>Desmodium triflorum</i>	Fabaceae
36		<i>Mimosa pudica</i>	Fabaceae
37	Melinjo	<i>Gnetum gnemon</i>	Gnetaceae
38	Kelapa	<i>Cocos nucifera</i>	Lauraceae
39	Alpukat	<i>Parsea americana</i>	Lauraceae

40		<i>Lycopodium sp</i>	Lycopodiaceae
41	Durian	<i>Durio sp.</i>	Malvaceae
42	Waru	<i>Hibiscus tiliaceus</i>	Malvaceae
43	Kembang sepatu	<i>Hibiscus rosasinensis</i>	Malvaceae
44		<i>Clidemia hirta</i>	Melastomaceae
45	Mahoni	<i>Swietenia mahagoni</i>	Meliaceae
46	Nangka	<i>Artocarpus heterophyllus</i>	Moraceae
47	Awar-awar	<i>Ficus septica</i>	Moraceae
48	Pisang	<i>Musa paradisiaca</i>	Musaceae
49	Cengkeh	<i>Syzygium aromaticum</i>	Myrtaceae
50	Belimbing tanah	<i>Oxalis barrelieri</i>	Oxalidaceae
51	Daun siri cina	<i>Peperomia pellucida</i>	Piperaceae
52	Alang-alang	<i>Imperata cylindrica</i>	Poaceae
53		<i>Paspalum conjugatum</i>	Poaceae
54		<i>Ischaemum muticum</i>	Poaceae
55	Krokot	<i>Portulaca sp</i>	Portulacaceae
56	Suplir	<i>Adiantum philippense</i>	Pteridaceae
57	Kopi robusta	<i>Coffea canephora</i>	Rubiaceae
58	Jabon	<i>Neolamarckia cadamba</i>	Rubiaceae
59	Jeruk purut	<i>Citrus hystrix</i>	Rutaceae
60	Jeruk lemon	<i>Citrus limon</i>	Rutaceae
61	Klengkeng	<i>Dimocarpus longan</i>	Sapindaceae
62	Rambutan	<i>Nephelium lappaceum</i>	Sapindaceae
63		<i>Hoya sp.</i>	sclepiadaceae
64		<i>Triumfetta rhomboidea</i>	Sparrmanniaceae
65	Tembelek	<i>Lantana camara</i>	Verbenaceae
66		<i>Stachytarpheta jamaicensis</i>	Verbenaceae
67	Jati	<i>Tectona grandis</i>	Verbenaceae
68	Lengkuas	<i>Alpinia galanga</i>	Zingiberaceae
69	Kunci	<i>Boesenbergia rotunda</i>	Zingiberaceae
70	Kapulaga	<i>Elettaria cardamomum</i>	Zingiberaceae

Table 2 shows that there are 70 plant species that have been identified. The plants were further grouped so that 37 types of families were obtained. There are 3 types of families that are most commonly found in the Ngargoretno Critical Land Ecotourism Area, Magelang, Central Java, namely the first Asteraceae Family with 7 identified plant species, namely *Elephantus scaber*, *Borreria laevis*, *Erigeron sp.*, *Eupatorium odoratum*, *Porophyllum sp.*, and *Synedrella nodiflora*. The two families Euphorbiaceae found 7 types of plants, namely *Sauropus androgynus*, *Codiaeum variegatum*, *Euphorbia heterophylla*, *Manihot utilisima*, *Phyllanthus niruri*, *Phyllanthus urinaria* and *Acalypha siamensis*. The third is the Fabaceae family which is also identified as 7 types, namely *Calliandra sp.*, *Dalbergia latifolia*, *Leucaena leucocephala*, *Parkia speciosa*, *Senna siamea*, *Desmodium triflorum* and *Mimosa pudica*.

All the plants found basically help in preventing soil erosion (landslides), but there are several types of plants that have a big role in preventing landslides. As for landslide barrier plants that are known to play a major role, they include *Artocarpus heterophyllus*, *Terminalia montaly*, *Dendrocalamus asper*, *Coffea canephora*, *Durio sp.*, *Hibiscus tiliaceus*, *Swietenia mahagoni*, *Syzygium aromaticum*, *Neolamarckia cadamba*, *Dimocarpus longan*, *Nephelium lappaceum*, *Tectona grandis*, and so on¹⁰. Apart from being useful as a landslide barrier, these

plants can also be used economically to serve as building materials and manufacture various kinds of furniture.

Plants are able to withstand landslides by reducing the speed of water falling from rain so that the soil exposed to rainwater is not easily eroded by landslides. In addition, the presence of roots is able to absorb water that falls and grip the soil so that it does not experience movement easily¹¹.

Many types of plants planted by residents are found in this area. The plant is deliberately grown for fruits, such as *Annona muricata*, *Carica papaya*, *Cocos nucifera*, *Durio* sp., *Artocarpus heterophyllus*, *Moses paradisiaca*, *Citrus* sp., *Dimocarpus longan*, and *Nephelium lappaceum*. Of the many plants identified, there are several types of plants that are quite interesting because of their extraordinary potential as herbal remedies including Soursop Leaves (*Annona muricata*) with potential as cancer drugs, Keji Beling (*Strobilanthes crispus*) for the treatment of diabetes mellitus¹², and Tapak Liman (*Elephantopus scaber*) used to treat dysentery, cough and inflammation in the kidneys¹³, Avocado Leaves (*Persea americana*) as antibacterial¹⁴ and maintain heart health¹⁵, Katuk leaves (*Sauropus androgynus*) are used to increase breast milk production¹⁶, Reed Root (*Imperata cylindrica*) is used as herbal and antibacterial ingredients^{17,18}, Cardamom (*Elettaria cardamomum*) is used as a medicine or antibacterial^{19,20} and several other types of plants.

In addition to functioning for landslide relief, fruit retrieval, treatment is also known to be used for spices or food making ingredients including Yam (*Ipomoea* sp.), Gadung (*Dioscorea esculenta*)²¹, Cassava (*Manihot utilisima*), Melinjo (*Gnetum gnemon*)²², Galangal (*Alpinia galanga*), Kunci (*Boesenbergia rotunda*) and Cardamom (*Elettaria cardamomum*)²³.

Conclusion

There are 70 types of plants identified from the exploration of the Ngargoretno Critical Land Ecotourism area, Magelang, Central Java, which are included in 37 families. Many of the plants identified are the result of plants grown by the community. The existence of these plants can help withstand the potential for landslides in the area. In addition, the identified plants also have other functions, namely producing fruit, furniture, treatment, and food ingredients or seasonings.

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