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Land Distribution and Identification of Types of Mount Ungaran Arabica Coffe as Strengthening of Geographical Indication Protection in Ngesrepbalong Village, Limbangan, Kendal

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Abstract

The existence of coffee cultivation has the potential to pioneer the Geographical Indication Protection Society/Masyarakat Perlindungan Indikasi Geografis (MPIG) as an effort to increase legal protection for brands and competitive advantage. One of the positive impacts of having geographical indications is that the product has a brand image that can be identified by potential consumers in the form of information regarding the advantages and benefits of the product. The service is carried out using a participatory method involving partners as the main actors with activity steps including: 1) Socialization, 2) Participatory coffee land mapping, 3) Identification of superior Arabica coffee clones, 4) Rebranding of Endemica coffee packaging, 5) Evaluation, and 6) Mentoring. The development of geographical indications for Mount Ungaran coffee was carried out through coffee land mapping, identification of superior clones of Arabica coffee and rebranding of Endemica coffee packaging. Method used Based on the results of participatory land mapping, there are 8 blocks of coffee land with both robusta and arabica types. Meanwhile, in the identification of superior Mount Ungaran Arabica coffee, there are types of Arabica coffee clones consisting of Kartika 1, Sigarar Rutang, and Lini S 795. Meanwhile, the packaging rebranding is carried out through changes to the packaging to strengthen the identity of the Endemica coffee product.

Keywords: coffe, arabica, mapping, ungaran, endemica

INTRODUCTION

Kendal Regency is the region with the third highest coffee commodity production in Central Java Province with a harvest of 2,009.90 tons in 2023, an increase of 0.8% from the harvest in 2022 (Badan Pusat Statistik Kabupaten Kendal, 2024). One of the producing areas is Limbangan District with a productivity level reaching 0.8 tons/ha in the 2023 harvest season, higher than national coffee productivity of 0.7 tons/ha. Among the coffee producers in Limbangan District, there is Ngesrepbalong Village which is one of the coffee producers with the types of coffee cultivated being arabica and robusta.

Most of the coffee commodities in Ngesrepbalong Village are cultivated in the production forest and limited production forest areas of Mount Ungaran at an altitude of 400-1300 meters above sea level/MASL. The rest, coffee plants are cultivated on community-owned lands around the Ngesrepbalong Village settlement with Arabica and Robusta types. Coffee cultivation activities in Ngesrepbalong Village are supported by agro-climatic conditions that are suitable for the cultivation of Robusta and Arabica coffee plants that are cultivated organically by the community.

The existence of coffee cultivation has the potential to pioneer the Geographical Indication Protection Society/Masyarakat Perlindungan Indikasi Geografis (MPIG) as an effort to improve legal protection for brands and competitive advantages. One of the positive impacts of geographical indications is that products have a brand image that can be identified by potential consumers in the form of information in the form of product advantages and benefits (Pardono et al., 2022). The

development of geographical indications can be done by strengthening product identity and developing various derivative products of a product that characterizes the indication of a geographical area (Aziz et al., 2023; Mustaidah & Waspiah, 2024; Sumarjo et al., 2020).

Strengthening of geographical indications The preparation of baselines that have been carried out include harvest results, land area, types of commodities and cultivation techniques in 2023, but not all land managed by farmers has been mapped. In addition, there has been no identification of the type of Arabica coffee typical of Mount Ungaran.

In the post-harvest processing aspect, there are processed coffee products with the brand 'Endemica' with variants of Arabica and Robusta coffee products with various processing processes. In the protection of geographical indications, there is no packaging with information about the product, such as aspects of information on product types, packaging, production locations, raw materials and serving techniques.

The development plan for the protection of geographical indications is a follow-up to the community service program in 2023 with a focus on land mapping, identification of superior coffee clones and rebranding of coffee packaging produced by farmers in Ngesrepbalong Village.

METHODS

The methodology used in community service is carried out with a participatory method involving partners as the main actors. The methods applied include information on product types, packaging, production locations, raw materials and presentation techniques.

1. **Socialization and coordination programme**

   Coordination is carried out to involve partners in planning, activities and evaluation of community service programs to be carried out.

2. **Participatory Coffee Land Mapping**

   Participatory land mapping was carried out as a baseline data for the distribution of coffee cultivation with farmers.

3. **Identification of Mount Ungaran Arabica Coffee**

   Identification was carried out to determine the morphology and characteristics of the superior Gunung Ungaran Arabica coffee.

4. **Rebranding Coffee Packaging**

   Packaging rebranding was carried out to strengthen the brand through packaging to strengthen the protection of the geographical indication of Gunung Ungaran coffee.

5. **Mentoring**

   The assistance provided is in the form of monitoring and collecting input during the community service activities and providing support to partners after the training and empowerment activities have taken place.

6. **Evaluasi**

   Evaluation is carried out before and after the activity to determine the magnitude of the impact of the community service program that has been carried out.

RESULTS AND DISCUSSION

Socialization and coordination programme

Coordination activities and program socialization were carried out on Friday, February 23, 2024 at 19.00 – 23.00 WIB involving a service team from LPPM UNNES and involving 15 members of the Berkah Wana Lestari Farmers Group. Coordination activities include (a) routine monitoring of farmer group activities, (b) delivery of programs that will be carried out together with the Berkah Wana Lestari Farmers Group and Endemix Coffee UMKM.

Coordination is carried out with the aim of obtaining input from partners regarding the level of coffee productivity and to achieve a good and efficient coffee cultivation system in order to achieve the goals of the Berkah Wana Lestari Farmers Group.

Based on the results of coordination and socialization, the follow-up plan that will be carried out with partners is (a) Increasing the marketing of endeavour coffee products, (b) developing the potential geographical indication of Gunung Ungaran Coffee through identification of coffee clones.

Fig. 1. Programme Socialization with partner

Coffee Land Mapping

Coffee land mapping is an important step in efforts to increase coffee productivity and quality, in the context of geographical indications of this activity as baseline data. This land mapping activity was carried out on July 1-July 3, 2024, which was carried out by the service team and involved members of KT Berkah Wana Lestari.

On the first day, the team conducted a field survey to identify the areas to be mapped. Using GPS devices and topographic maps, they mapped each coffee plot, recording coordinates and elevations. During the mapping activity, the team also interacted directly with coffee farmers, sharing knowledge about sustainable farming practices and effective land management techniques. The involvement of farmers in this process is very important, because they are the main guardians of the land and have valuable experience that can enrich the mapping results.

Fig. 2. Coffe Land Mapping

The end result of this coffee land mapping activity is a detailed digital map, which depicts each plot of land with comprehensive data. This map not only makes it easier for farmers to manage their land, but also becomes an important tool in long-term planning to increase productivity and sustainability of coffee production.

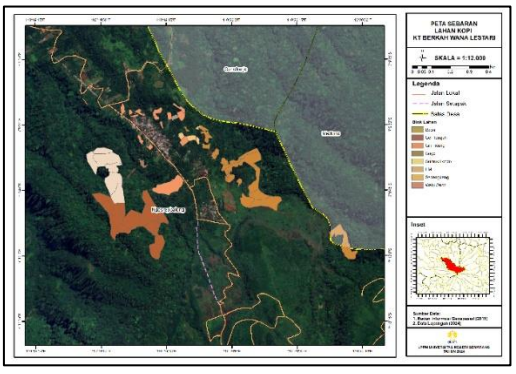

Fig. 3. Coffe Land Distribution Map

Coffee land mapping is an important tool in the process of obtaining geographical indication status. By providing accurate and detailed data on production areas, land mapping helps maintain the authenticity, quality and sustainability of coffee protected by Geographical Indication.

Identification of Superior Arabica Coffee from Mount Ungaran

Kegiatan pengembangan potensi indikasi The geographical identification of Gunung Ungaran Coffee was carried out by identifying Arabica coffee clones that were considered to have advantages in terms of productivity, distance between fruits and plant conditions. Identification of coffee clones was carried out on Sunday, May 20-22, 2024 with land owners, members of KT Berkah Wana Lestari and servants from LPPM Unnes.

Data collection was carried out by purposive sampling with samples of Arabica coffee plants that have a planting age of more than 5 years. Coffee plants with this category are located in Bukit Sikendil, Ungaran which is an area owned by PT Perkebunan Nusantara IX, while those owned by the Gunung Sari Village community, Limbangan are still less than 5 years old. Each clone of Arabica coffee plants was identified morphologically. The morphological characteristics observed were divided into two, namely qualitative and quantitative characters. Qualitative characters include plant stature, leaf shape, leaf tip shape, stipules shape, young and old leaf color, leaf tip color, petiole color, fruit shape (cherry), fruit color, seed shape, and seed color. Quantitative characters include internode length, leaf length, leaf width, petiole length, fruit length and width, fruit thickness or diameter, and seed length and width.

Table 1. Results of Ungaran Arabica Coffee Clone Identification

No	Tree Code	Klon
1	P 1	Kartika 1
2	P 2	Sambung Sigarar utang
3	P 3	Lini S 795
4	P 4	Kartika 1

From the identification results, 4 Arabica coffee clones were obtained, namely Kartika 1, Sigarar Utang, and Lini S 795. The Kartika 1 clone has a short stature with horizontal and dense branches. The length of the segment is 3-5 cm. The characteristics of the leaves are elliptical with flat edges and tapering leaf tips (acuminatus), leaf length ± 9.5 cm and width ± 3.5 cm and short petiole, which is ± 1 cm. The leaf surface is shiny where the leaves are light-dark green while the leaf tips are light green. Stipules or supporting leaves on the Kartika 1 clone are ovule-shaped. The fruit is round and oval with a fruit length of ± 1.5 cm and a width of ± 1 cm. The thickness of the fruit can be said to be thick, which is ± 1 cm. The coffee beans on the Kartika 1 clone are yellowish brown and oval in shape with a bean length of ± 1.3 cm and a width of ± 0.9 cm. The morphological characteristics of the Kartika 1 clone can be seen in the image below.

Fig. 4. Morphological Characteristics of Arabica Coffee Clone Kartika 1

Then there is a grafted clone of Sigarar Hutang which has a medium stature and dense branching with a branch length of 4 cm. The leaves are elliptical, the tips of the leaves are pointed, the edges of the leaves are wavy, the color of the young leaves is light green while the old leaves are dark green and the tips of the leaves are reddish brown. The length of the leaves is ± 14.2 cm, the width of the leaves is ± 6.3 cm and the length of the petiole is ± 1.1 cm and has triangular stipules. The Arabica coffee fruit of Sigarar Hutang has a wide round shape that is large, namely a length of ± 1.4 cm, a width of ± 1.2 cm and a diameter of ± 1.2 cm, when ripe it is yellowish red to red. The coffee beans are elliptical and yellowish brown, the length of the beans is ± 1.2 cm and a width of ± 0.7 cm. The morphological characteristics of Sigarar Hutang can be seen in the following picture.

Fig. 5. Morphological Characteristics of Arabica Coffee Clone Grafting Sigarar Utang

The next clone is the S 795 Line. It has a medium stature with curved, wide and irregular branches so that it looks dense. The length of the segment is 4-7 cm. The leaves are elliptical (ellipticus) with pointed leaf tips (acuminatus) and wavy leaf edges. S795 Arabica coffee has large leaves, namely leaf length ± 13.5 cm, leaf width ± 5.8 cm and petiole (leaf stalk) ± 1 cm. The surface of the leaves is smooth and shiny, the leaves are dark green with greenish brown leaf tips and ovule-shaped stipules. The fruit is round when ripe and red, while when it is still raw it tends to be elliptical and light green. The shape and size of the fruit on the S 795 clone are not uniform, the average fruit length is ± 1.3 cm, the width of the fruit is ± 1.1 cm, and the diameter is ± 1 cm. Coffee beans are yellowish brown, oval in shape, ± 1.1 cm long and ± 0.8 cm wide. The morphological characteristics of S 795 Arabica coffee can be seen in the following image.

Arabica coffee planting generally has a planting distance of 2 m with a total land area of 80 Ha at an altitude of more than 1400 meters above sea level. The method of propagating coffee plants is done by grafting and cuttings. The cutting technique is carried out on the Kartika and S795 clones, while the grafting technique is carried out on the Sigarar Hutan clone which is connected to the Kartika clone.

In general, Arabica coffee plants experience fruit ripening that is not simultaneous, so that harvesting is done in stages (can take up to 1 month). The Kartika 1 clone on each branch can have 9 clusters of fruit and each tree can produce 2 kg of fresh fruit, the sigararwenang grafted clone can reach 20 clusters of fruit and produce 5 kg of fresh coffee fruit (cherry), while the S 795 Line is the same as Kartika, which is around 2 kg of fresh fruit per tree. The existing Arabica coffee plants are 25 years old, planted since 1999. The sigararwenang grafted clone was only done about 2 (two) years ago, grafted with the Kartika 1 clone coffee plant which produces more coffee than other clones.

Kartika 1 clone has a perspective that is somewhat susceptible to leaf rust and has a good or delicious taste even though the size of the fruit and seeds is small and productivity is low. S795 clone is somewhat resistant to leaf rust and has a good taste. Then, Sigarar clone is resistant to leaf rust but is somewhat susceptible to Nematode attacks, for the taste of the coffee produced is generally good.

Fig. 6. Morphological Characteristics of Arabica Coffee Clone Lini S 795

Arabica coffee planting areas are in open areas, stands or shade around the coffee plants in the form of *Maesopsis eminii* (African wood), *Leucaena sp* (lamtoro), and *Macadamia integrifolia* (macadamia). Shade also affects the growth and productivity of coffee. The presence of shade plants can reduce direct sunlight intensity and affect temperature and soil and help improve soil quality (Tyasmoro & Sinaga, 2020).

The presence of many lamtoro trees planted as shade or shade can add nitrogen elements, because the tree belongs to the Fabaceae family which has a symbiotic relationship with nitrogen-fixing bacteria and can affect soil microbes. The pH of the soil in the Arabica coffee planting area shows a figure of 6.5 - 6.6 with a light intensity of 1535 lux. Arabica coffee will grow well in slightly acidic soil with a pH of 5.5 – 6.5. If the soil pH is too acidic (below 5) it will result in poisoning of Arabica coffee plants. To prevent this, liming the soil can be done to increase the soil pH (Siahaan, 2018).

Fig. 7. Sampling Activity for Identification of Superior Arabica Coffee

Rebranding Endemic Coffee Packaging

In an effort to strengthen identity and competitiveness in the market, the UNNES LPPM Service Team encouraged the rebranding of Endemica coffee packaging from UMKM Endemix which aims to refresh the appearance while reflecting the premium quality of the product.

This coffee packaging rebranding is not only about changing the external appearance, but also reflects the evolution of the Endemica Coffee brand towards something more sustainable, authentic, and in line with the expectations of modern consumers. Through the new packaging, it is hoped that it can build a stronger connection with coffee lovers and strengthen the product's position in an increasingly competitive market.

On August 30, 2024, the printing of 200 pieces of Endemica coffee packaging for the 250 g size was facilitated, consisting of 100 pieces of robusta product packaging and 100 pieces for the Arabica coffee packaging variant.

Fig. 8. Packaging Before Rebranding

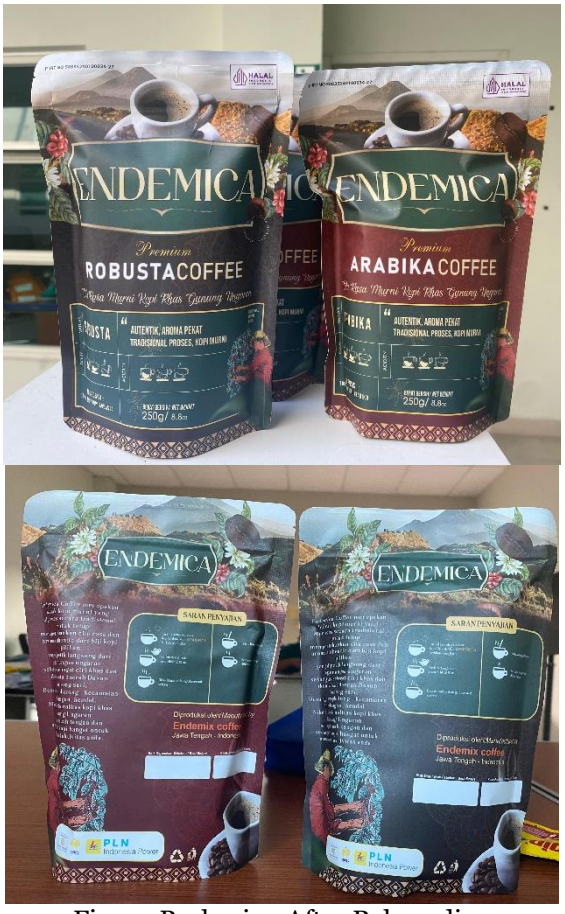

Fig. 9. Packaging After Rebranding

CONCLUSION

The existence of coffee cultivation is a potential in pioneering the Geographical Indication Protection Society/Masyarakat Perlindungan Indikasi Geografis (MPIG) as an effort to improve legal protection for brands and competitive advantages. One of the positive impacts of geographical indications is that the product has a brand image that can be identified by potential consumers in the form of information in the form of product advantages and benefits. The development of the geographical indication of Mount Ungaran coffee is carried out through mapping coffee fields, identifying superior clones of Arabica coffee and rebranding Endemica coffee packaging.

Based on the results of participatory land mapping, there are 8 blocks of coffee land with both robusta and arabica types. Meanwhile, in the identification of superior Arabica coffee from Mount Ungaran, there are types of Arabica coffee clones consisting of Kartika 1, Sigarar Rutang, and Lini S 795. Based on land identification, there are stands or shade around the coffee plants in the form of Maesopsis eminii (African wood), Leucaena sp (lamtoro), and Macadamia integrifolia (macadamia). The presence of many lamtoro trees planted as shade or shade can add nitrogen elements, because these trees belong

to the Fabaceae family which have a symbiotic relationship with nitrogen-fixing bacteria and can affect soil microbes. The pH of the soil in the Arabica coffee planting area shows a figure of 6.5 - 6.6 with a light intensity of 1535 lux. Meanwhile, the rebranding of the packaging is carried out through changes in packaging to strengthen the identity of the Endemica coffee product.

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