

POTENTIAL FOR DEVELOPING COFFEE PLANTATION IN GAYO LUES REGENCY

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Abstract

Gayo Lues Regency is one of the regencies in Aceh Province. Gayo Lues Regency is strategically located to be developed into a key area in the upstream part of Aceh, supporting the growth of the eastern and western regions of Aceh. This district has great potential for developing coffee commodities. The Director General of Horticulture of the Ministry of Agriculture has proposed 3 (three) approaches to address the problem of climate change in coffee cultivation, namely, one of which is a strategic approach (regional identification), in the form of an inventory of data and information related to areas that cultivate coffee. This study aims to identify and analyze the potential of land that can be developed into coffee plantations based on the suitability of regional spatial patterns. The method used is spatial analysis with an overlay approach between existing coffee plantation maps, spatial patterns, slope maps, and elevation maps. The results of the study show that from the total area of Gayo Lues Regency, the land that has the potential to be developed as a coffee plantation is 57,521.66 hectares. This area, based on spatial analysis is in accordance with the designation of spatial patterns based on the RTRW of Gayo Lues Regency. The sub-district with the greatest development potential is Terangun Sub-district, while Blangpegayon Sub-district is the sub-district with the smallest potential of all the sub-districts in Gayo Lues Regency. The results obtained can be the basis for determining priority areas for development and planning more targeted and effective coffee cultivation programs.

Keywords: *coffee, Gayo Lues, land potential, spatial analysis, spatial pattern.*

INTRODUCTION

Gayo Lues Regency is one of the regencies in Aceh Province, which was formed from the expansion of Southeast Aceh Regency with the Legal Basis of Law No. 4 of 2002. According to the 2005-2025 Gayo Lues Regency Long-Term Regional Development Plan (RPJPD), Gayo Lues Regency is strategically strategic to be built and developed into a development area in the upstream part of Aceh and a supporter of the development of the eastern and western regions of Aceh. The integrated operational form is expressed through a spatial approach through a comprehensive and hierarchical Regional Spatial Planning Plan (RTRW). The problem faced in regional development is that resources are limited, but development needs are many, therefore, space to meet needs and limitations must be planned carefully. The geographical similarities and regional characteristics in Gayo Lues Regency result in uniformity of natural resource potential.

Coffee plants are plantation crops that have long been cultivated in Indonesia. Two species of coffee plants are generally known and cultivated by the people of Aceh, namely Arabica coffee (*Coffea arabica*) and Robusta coffee (*Coffea canephora*). Arabica coffee is widely planted in highlands such as the Gayo Highlands, which include Central Aceh, Bener Meriah and Gayo Lues Districts. Coffee is one of the commodities from the plantation sub-sector that plays an important role in the national economy, especially as a source of foreign exchange, a provider of employment, and as a source of income for farmers and other economic actors involved in the cultivation, processing and marketing of coffee products. In general, people's coffee plantations have not been managed as well as large plantations, but have continued to grow

over time, so that various problems have arisen, one of which is the problem of productivity. High productivity will be achieved if all production factors are allocated optimally (Wahyudi et al., 2018).

This phenomenon has encouraged most farmers, especially in Gayo Lues Regency, to switch to and develop coffee cultivation. The switch is generally carried out on private land that is considered to have the potential to be used as agricultural. However, most farmers do not have an adequate understanding regarding land suitability, so even though the land is privately owned, not all of it is suitable for use as a coffee cultivation area, especially on a large scale. Local communities generally depend on the agricultural sector as their main source of livelihood. With the increasing population, the intensity of control and use of agricultural land has also increased significantly. The Director General of Horticulture at the Ministry of Agriculture has proposed three approaches to address the problem of climate change in coffee cultivation, namely, one of which is a strategic approach (regional identification), in the form of an inventory of data and information related to areas that cultivate coffee. Based on the description above, it is necessary to conduct research on indications of land that has the potential to be developed into coffee plantation in Gayo Lues Regency based on spatial patterns.

LITERATURE REVIEW

According to FAO (1976) in Djaenudin et al. (2011), land is part of the natural landscape that includes the physical environment, including climate, topography/relief, soil, hydrology and even the condition of natural vegetation which can potentially influence land use. Every living creature needs land to grow and develop; various human activities on this earth cannot be separated from the different functions of land in land use. Land use is all human intervention, whether permanent or migratory, towards a group of natural resources and artificial resources, which are collectively called land, to fulfil both material and spiritual needs, or both Kusri (2011). Therefore, by looking at the land use in the field directly, it is possible to determine land that has the potential to be developed for coffee plants without having to convert the land.

The potential for developing coffee plantations can be seen through height, slope, spatial patterns, and land use. Karim et al. (1996) states that the altitude of a place will determine climate variables, while the slope determines the chemical properties of the soil. The altitude of a place determines the high and low temperatures of the air and soil, air humidity and in certain places will be closely related to rainfall (Hifnalisa and Karim, 2008).

METHOD

The location of this research is in Gayo Lues Regency, and for spatial data analysis processing is carried out at the Remote Sensing and Cartography Laboratory, Faculty of Agriculture, Universitas Syiah Kuala. Spatially, the research location map can be seen in Figure 1.

The tools used in this study are hardware, such as handheld GPS, and a set of computers equipped with software. The software used in this study is ArGis 10.8 software for image data processing and analysis. The materials used in this study are high-resolution satellite Imagery, elevation map of Gayo Lues Regency, slope map of Gayo Lues Regency, Spatial Pattern map of Gayo Lues Regency, and administrative boundaries of Gayo Lues Regency.

This research method is a field survey method with descriptive analysis. The descriptive analysis survey method is a type of research to provides an objective description of a particular phenomenon (Purba and Simajuntak, 2011). Field survey activities were conducted to determine the location of coffee plantations and the surrounding conditions of coffee plantations in Gayo Lues Regency. To obtain land that has the potential to be developed as a coffee plantation, it was obtained by overlaying the union principle was applied between existing coffee plantations on the slope map, elevation map, and spatial pattern map of Gayo Lues Regency. From the overlay results, we can also get data in the form of land areas that have the potential to be developed and also land areas that do not have the potential to be developed as a whole.

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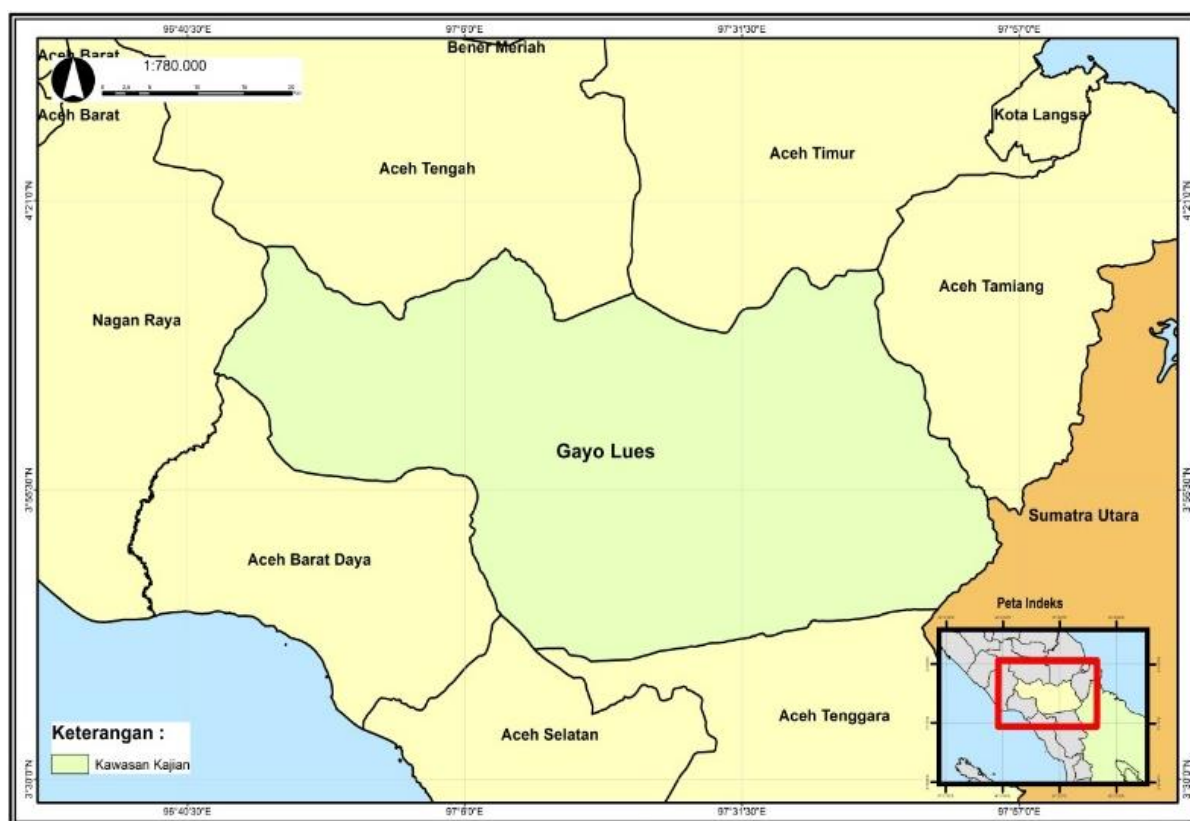


Figure 1. Research Location

RESULTS AND DISCUSSION

Regional Overview

Gayo Lues Regency is located at 03°40'26" - 04°16'55" N and 96°43'24" - 97°55'24" E, consisting of 11 sub-districts, the size of each of which can be seen in Table 1. Gayo Lues Regency has a total area of 554,057.46 hectares. The sub-district with the largest area is Pining District with a total area of 135,008.35 hectares or around 24.33% of the total area of the regency. Followed by Putri Betung District with an area of 99,686.09 hectares (17.96%) and Terangun with an area of 67,180.27 hectares (12.10%). Meanwhile, the district with the smallest area is Blangkejeren, which has an area of 16,605.63 hectares or around 2.99% of the total area of the regency.

Table 1. Area per Sub-District in Gayo Lues Regency

No	Sub-district	Area (Ha)	Percentage (%)
1.	Blangkejeren	16,605.63	2.99
2.	Kutapanjang	26,952.72	4.86
3.	Terangun	67,180.27	12.10
4.	Rikit Gaib	26,407.84	4.76
5.	Pining	135,008.35	24.33
6.	Blangjerango	38,241.70	6.89
7.	Blangpegayon	27,218.19	4.90
8.	Dabun Gelang	44,471.13	8.01
9.	Putri Betung	99,686.09	17.96
10.	Pantan Cuaca	29,506.51	5.32
11.	Tripe Jaya	43,722.73	7.88
Amount		554,057.46	100%

Condition of Existing Coffee Plantations in Gayo Lues Regency

The existence of coffee plantations in Gayo Lues Regency continues to grow and is spread evenly across every sub-district in Gayo Lues Regency, except for the Pining sub-district. Coffee plantations in Gayo Lues Regency do not have the same land area in each sub-district because the priority of farming communities is not only focused on coffee plants, because the agricultural potential in Gayo Lues Regency is very large to be developed. The area of coffee plantations in Gayo Lues Regency, based on sub-district can be seen in Table 2.

Table 2. Coffee Land Area in Gayo Lues Regency

No	Sub-district	Area (Ha)	Percentage (%)
1.	Blangjerango	119,735	6.00
2.	Blangkejeren	688,971	34.00
3.	Blangpegayon	114,740	6.00
4.	Dabun Gelang	124,960	6.00
5.	Kutapanjang	22,645	1.00
6.	Pantan Cuaca	738,362	37.00
7.	Putri Betung	164,242	8.00
8.	Rikit Gaib	1,045	0.10
9.	Terangun	0.147	0.01
10.	Tripe Jaya	40,859	2.00
Amount		2.015,71	100%

Table 2 shows that the area of existing coffee plantations in Gayo Lues Regency is 2,015.71 Ha, the distribution of coffee plantations in Pantan Cuaca District is the largest area in Gayo Lues Regency at 38,362 Ha and followed by Blangkejeren District at 688,971 Ha. The sub-district with the smallest coffee plantation area is Terangun Sub-district with an area of 0.14 Ha.

Potential for the Development of Existing Coffee Plantation in Gayo Lues Regency

Based on the analysis of the distribution of existing coffee plantations in Gayo Lues Regency with spatial patterns, three areas can be developed for coffee plants in Gayo Lues Regency. The area that can be developed can be seen in Table 3.

Table 3. Area of land that can be developed into coffee plantations in Gayo Lues Regency

No	Development	Area (Ha)	Percentage (%)
1.	Area that can be developed	58,619	11
2.	Cannot be developed	495,509	89
Amount		554,128	100%

Based on the results of the analysis of spatial patterns and distribution of coffee plantation areas in Gayo Lues Regency, three areas were identified that could be developed for coffee plants, namely plantation areas, horticultural areas, and food crop areas. The total area that can be developed reaches 58,619 Ha or around 11% of the total area of Gayo Lues Regency, as seen in Table 3. The remaining 89% or 495,509 Ha are areas that cannot be developed such as protected areas, settlements, water bodies, conservation areas, or areas with technical limitations or other spatial planning policies.

To obtain areas that can be developed, an analysis was carried out using the overlay method between existing coffee plantation maps and spatial pattern maps, especially those designated for agricultural and plantation activities. The results of the analysis show that most of the existing coffee plantations are located in areas that are in accordance with their designation in Gayo Lues Regency, but there is still quite large development potential in areas that have not been optimally utilized.

The results of further analysis conducted on the area of existing coffee plantations located in the cultivation area designation showed a reduction in the previous area. The area of land that really has the potential to be developed after further analysis is 57,521.66 Ha. Details can be seen in Table 4.

Table 4. Potential Land that Can be Developed Based on Spatial Patterns

No	Development	Area (Ha)
1	Potentially Developed Area	57,521.66

Despite the reduction in area, the results provide more accurate information in planning coffee plant development strategies in Gayo Lues Regency. The area of 57,521.66 Ha, whose spatial verification has been carried out is an area that has real potential to be developed in accordance with spatial planning policies, while still supporting the principles of sustainable development and environmental preservation.

CONCLUSION

Based on the analysis results, it was found that the land with the potential to be developed into a coffee plantation in Gayo Lues Regency reaches an area of 57,521.66 hectares. The sub-district with the greatest development potential is Terangun Sub-district. Meanwhile, Blangpegayon District is the district with the smallest development potential compared to other districts in Gayo Lues Regency. The results obtained can be the basis for determining priority areas for development and planning more targeted and effective coffee cultivation programs.

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