



## **Geospatial-Based Mapping of Socio-Economic Conditions and Potential of Bulangan Barat Village, Pegantenan Sub-District**

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### **Abstract**

Bulangan Barat Village, located in Pegantenan District, has rich natural and agricultural potential, as well as adequate land and water resources. However, the utilization of this potential has not been maximized due to several factors, including educational trends, technology utilization, community involvement, and social and economic factors. This community service activity aims to map the socio-economic conditions and potential of the village community and identify problems and needs based on the results of mapping using geospatial technology. The method used is Asset-Based Community Development (ABCD), which focuses on community empowerment through the identification and utilization of local assets, such as natural resources, individual skills, and social networks, to improve social and economic conditions sustainably. The findings show that the socio-economic conditions of the community include an even distribution of agricultural land in each hamlet, adequate distribution of road networks, and relatively good infrastructure. Most of the community are elementary school graduates, with farmers as the most common occupation. The village's main potential lies in the agricultural sector, which produces durian and cassava processed products. However, there are problems such as declining durian quality and production, a lack of innovation and branding for MSME products, and limited marketing. Socialization and assistance to optimize the village's potential have also not been fully maximized. This finding underscores the need for a more effective strategy to overcome these challenges and to explore the potential of existing varieties, especially durian.

**Keywords:** Asset-based community development; Bulangan Barat village; Geospatial technology; Social-economic mapping.

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## 1. Introduction

Bulangan Barat Village is located in the highlands of Pegantenan Sub-district, Pamekasan Regency. Like the surrounding villages, it is an agricultural and natural resource center. The availability of land and water is a key factor behind this natural potential. In addition to staple food crops such as rice and corn, the residents frequently cultivate cassava, tobacco, certain fruits or vegetables, and medicinal plants.

In addition, Bulangan Barat Village has remarkable durian potential, with nearly every household in the village owning at least one durian tree. However, according to the village head and several local officials (*pamong*), durian production has declined in recent years, both in quantity and quality. Many durian trees fail to reach their productive stage, and numerous flowers fall off before they develop into harvestable fruits. As a result, the yield from a single tree is very small. Moreover, the quality of the durians has declined; some fruits lack sweetness and are not fully ripe. This issue has raised concerns among the service team, as durian is a valuable asset for the village that is not found in other nearby villages.

Ironically, despite its rich and abundant natural resources, some residents of Bulangan Barat have chosen to migrate to other regions, including abroad. Such migration is relatively common, as village residents leave for various reasons. For example, younger generations (Hidayat et al., 2023) tend to migrate because they show limited interest in agricultural activities in rural areas (Rigg, 2004; Rigg et al., 2020; Tadele & Gella, 2012; White, 2012). Moreover, migration is not limited to residents of less developed areas; individuals from wealthier countries also choose to migrate (Aziz et al., 2022; Hou et al., 2025). This common problem, which is not unique to Bulangan Barat, can be attributed to a variety of possibilities, ranging from the underutilization of local resources (Gao et al., 2022), the lack of awareness and preference among residents to develop their region (Jones & Zannaras, 1978), the temptation to seek income elsewhere (Anggara et al., 2024), and other structural socio-economic factors (Baite & Panda, 2025; L. Wang et al., 2019).

Nevertheless, the number of Bulangan residents who migrate as laborers is relatively low. This can be seen from the lively and dynamic activities in the village and the fact that there are not many empty houses. With five hamlets within the village, residents are seen doing their daily activities. They have also adapted to recent advancements in agricultural processing techniques, although still in a reasonably simple way. Through a community concerned with TOGA (*Tanaman Obat Keluarga*, or family medicinal plants), residents have made lactation

candy to help smooth breast milk flow for nursing mothers. In addition, they also processed cassava into chips.

From a social perspective, the Bulangan Barat community is relatively homogeneous in terms of ethnicity and religion. The level of education among the local population is also not highly diverse, with a dominant preference for Islamic educational institutions. Recently, however, awareness of the importance of education has been increasing within the community, encouraging many young people in Bulangan Barat to pursue higher education, including at the university level. This shift has been identified as a key factor behind the various developments and advancements the village has experienced across multiple aspects.

Against this background, geospatial technology is considered a relevant tool for mapping and optimizing existing resources to enhance the autonomy of Bulangan Barat Village. In some respects, several milestones previously achieved by the village have been poorly maintained and sustained, such as the village's official website, which no longer operates optimally.

In addition, Geographic Information Systems (GIS) can also be utilized to monitor and evaluate the outcomes of development efforts, enabling more appropriate strategies and interventions to be adjusted (Kochanek et al., 2025; Scotch et al., 2006; Su et al., 2017; Vinueza-Martinez et al., 2024; Weng, 2009). With a deep understanding of local conditions and potential, the village government, in collaboration with the community, can develop sustainable strategies to achieve the status of an independent village, focusing on economic autonomy and social and cultural independence. The independent village is projected to maximize local potential through a data-based approach and accurate information towards inclusive and sustainable development.

Therefore, the purpose of this community service and mentoring program is to identify the village's socio-economic conditions and local potential and subsequently analyze them using a geospatial approach. The goal is not only to build a strong technological infrastructure but also to educate and train the community and government of Bulangan Barat Village in managing and utilizing geospatial technology for their welfare.

Several initiatives have been implemented to leverage the potential of village assets using GIS (Geographic Information Systems) technology across various villages. First, Latifah et al. (2023) conducted mapping and development of precision village data for a mobile WebGIS-based tourist route in the Rinjani Geopark Circle, which produced precision village data information that can be accessed via Android using a barcode. Secondly, Ramadhan and Arfiani (2024) conducted a service titled "Development of Geographic Information Systems in Mapping Village-Owned Enterprises in Sleman Regency," which employed the Scrum methodology to map the locations of BUM Desa and provide a detailed classification. Although both activities provide valuable information from GIS results, this community service project takes a more focused approach. The information provided by this analysis not only delivers data but also explicitly highlights the village's key potential. Through this approach, our research can deliver more comprehensive and sustainable benefits to the village community's economic development.

Considering this background, the service team has outlined two main objectives. First, an initial mapping of the socio-economic conditions and potential of the Bulangan Barat community will be conducted using geospatial technology. This mapping aims to provide a comprehensive understanding of the village's current social and economic situation and available resources. Second, based on the mapping results, the team will identify the issues and needs of the community. This approach is expected to highlight residents' challenges and pinpoint urgent areas for development, ultimately supporting the creation of more effective and targeted intervention strategies.

## **2. Methods**

The service method used is Asset-Based Community Development (ABCD). ABCD is an asset-based development approach aimed at empowering communities by identifying and utilizing existing local assets (Green & Haines, 2016; Mathie & Cunningham, 2003). In the context of Bulangan Barat Village, this method can be applied to map the village's socio-economic conditions by exploring its potential and addressing existing challenges.

The ABCD approach empowers communities by utilizing existing assets (National Volunteer and Philanthropy Centre, 2021; Wajdi, Ekaningsih, Rizal, & Fathurrohman, 2024). This aligns with the principle of active community participation in development, where community members are seen as the subjects, not objects, of development. This method will identify and maximize assets such as natural resources, individual skills, social networks, and local institutions in Bulangan Barat Village to enhance social and economic well-being.

Through the ABCD method, Bulangan Barat Village can optimize its local resources to improve social and economic conditions. For instance, fertile agricultural land can be developed using environmentally friendly and sustainable organic farming technologies. The villagers' expertise in livestock farming can be enhanced through training and expanded market access. Additionally, the village's strong social networks can serve as a foundation for creating local financial institutions to support the growth of microenterprises. This approach also fosters a sense of ownership among villagers, encouraging active participation in addressing challenges such as unemployment, poverty, and access to essential services. With the ABCD approach, Bulangan Barat Village has the potential to become more self-reliant in addressing its socio-economic challenges. Therefore, the ABCD method is highly relevant for Bulangan Barat Village, as it helps explore and utilize local potential to improve the village's socio-economic conditions sustainably.

### **2.1. Identification of Community Assets**

The first stage in implementing ABCD is to identify the assets of Bulangan Barat Village. These assets include:

- a. Individual Assets: The skills, abilities, and knowledge of the village residents.
- b. Social Assets: The relationships and networks among residents that can be used for collaboration.
- c. Physical Assets: The village's infrastructure, land, and natural resources.

- d. Economic Assets: The potential of small businesses, agriculture, and other local economic activities.

## **2.2. Asset Mapping**

After identifying the assets, the next step is to create a socio-economic map of the village using Geographic Information Systems (GIS). The integration of geospatial technology, along with supporting software such as Google Earth and QGIS, facilitates inclusive and sustainable development planning, as decisions are based on thorough, evidence-driven data analysis. With GIS, the village can optimize existing resources, plan necessary infrastructure, and optimize public services according to community needs. In the case of Bulangan Barat Village, this mapping includes:

- a. Identification of community groups based on economic aspects.
- b. Mapping of natural resources, including agricultural land, plantations, and livestock.
- c. Identification of local institutions, such as cooperatives, religious organizations, and other social groups.

## **2.3. Asset Mobilization**

Once the assets are identified, the community is encouraged to collaborate to use these resources for development. For example, the potential of agriculture and livestock can be maximized with the support of existing microfinance institutions in the village. The strong social networks can also be harnessed to establish a mutual cooperation-based economic system.

## **2.4. Planning for Collective Actions**

Various communities come together to design strategies and plans for utilizing the mapped assets to improve the economic and social well-being of the residents. The active involvement of the community at every stage ensures that the development is sustainable and aligned with local needs and potential.

## **2.5. Monitoring and Development**

Once the action plan is implemented, regular monitoring and evaluation are essential to ensure that the set objectives are met. In the long run, the success of ABCD is measured by the community's ability to sustain and enhance its socio-economic well-being independently, without relying on external support.

# **3. Results and Discussion**

## **3.1 Results**

The community service activities or *Pengabdian Kepada Masyarakat* (PKM) were conducted in Bulangan Barat Village, Pegantenan District, Pamekasan Regency. The program began with a request for permission from the Head of Bulangan Barat Village to secure support and ensure the smooth implementation of the project. During the activities, the community service team actively involved the local community in various activities aimed at enhancing their knowledge and skills.

The implementation of the PKM activities is outlined in detail in Table 1, including the types of activities, the number of participants, and the results achieved.

**Table 1.** Schedule of Community Service Activities in Partner Village

| No  | Subject                                                                                                     | Date              |
|-----|-------------------------------------------------------------------------------------------------------------|-------------------|
| 1.  | Confirmation and permission from the Village Head to hold community service in the village                  | 27 July 2024      |
| 2.  | Coordination with KKN students about Survey Result Data                                                     | 30 July 2024      |
| 3.  | Data processing with GIS (mapping the social and economic conditions of the villagers)                      | 03 August 2024    |
| 4.  | Interviews with village officials and owners of MSMEs utilizing <i>Tanaman Obat Keluarga</i> (TOGA)         | 11 August 2024    |
| 5.  | Interviews with the cassava processing community                                                            | 31 August 2024    |
| 6.  | Interview with the owner of a wood-processed MSME (Furniture)                                               | 08 September 2024 |
| 7.  | Interview with a resident who owns a durian plantation                                                      | 21 September 2024 |
| 8.  | Interviews with owners of rubber sandal MSMEs, owners of mukenah (veil), and clothing embroidery businesses | 19 October 2024   |
| 9.  | FGDs with communities, MSMEs, and village officials                                                         | 26 October 2024   |
| 10. | Reporting                                                                                                   | 29 October 2024   |

The community service schedule is structured to ensure that all key aspects of the PKM implementation are appropriately addressed. The process begins with obtaining confirmation and permission from the Village Head, which is crucial to securing local support. Next, coordination with KKN students and data processing using GIS are conducted to analyze the social and economic conditions of the community, providing important insights for formulating effective interventions. Interviews with various stakeholders, including village officials, MSME owners, and community members, offer valuable information about the community's potential and challenges. Finally, Focus Group Discussions (FGDs) with stakeholders are held to discuss and plan the next steps.

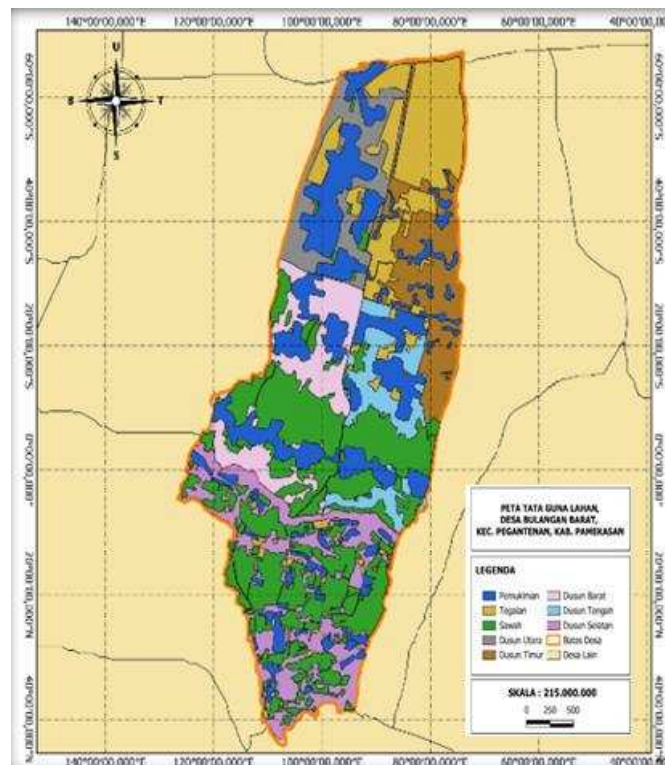
The results of the community service are presented in three sections. The first section focuses on data processing through geospatial mapping. The second section provides a needs analysis of Bulangan Barat Village's potential from both social and economic perspectives. The third section highlights the outcomes of the Focus Group Discussions (FGD), outlining the development direction based on the identified needs and potential of the village.

### **Geospatial Mapping**

Geospatial mapping is the process of presenting information about the Earth's surface in the form of digital or visual maps. Through geospatial mapping, various types of data such as location, distance, regional distribution, land use, environmental conditions, and human activities can be analyzed more easily. This technology is highly important in geography, regional planning, disaster mitigation, transportation, agriculture, and natural resource management. By understanding geospatial mapping, we can clearly and systematically

observe the relationship between space, location, and phenomena that occur on the Earth's surface.

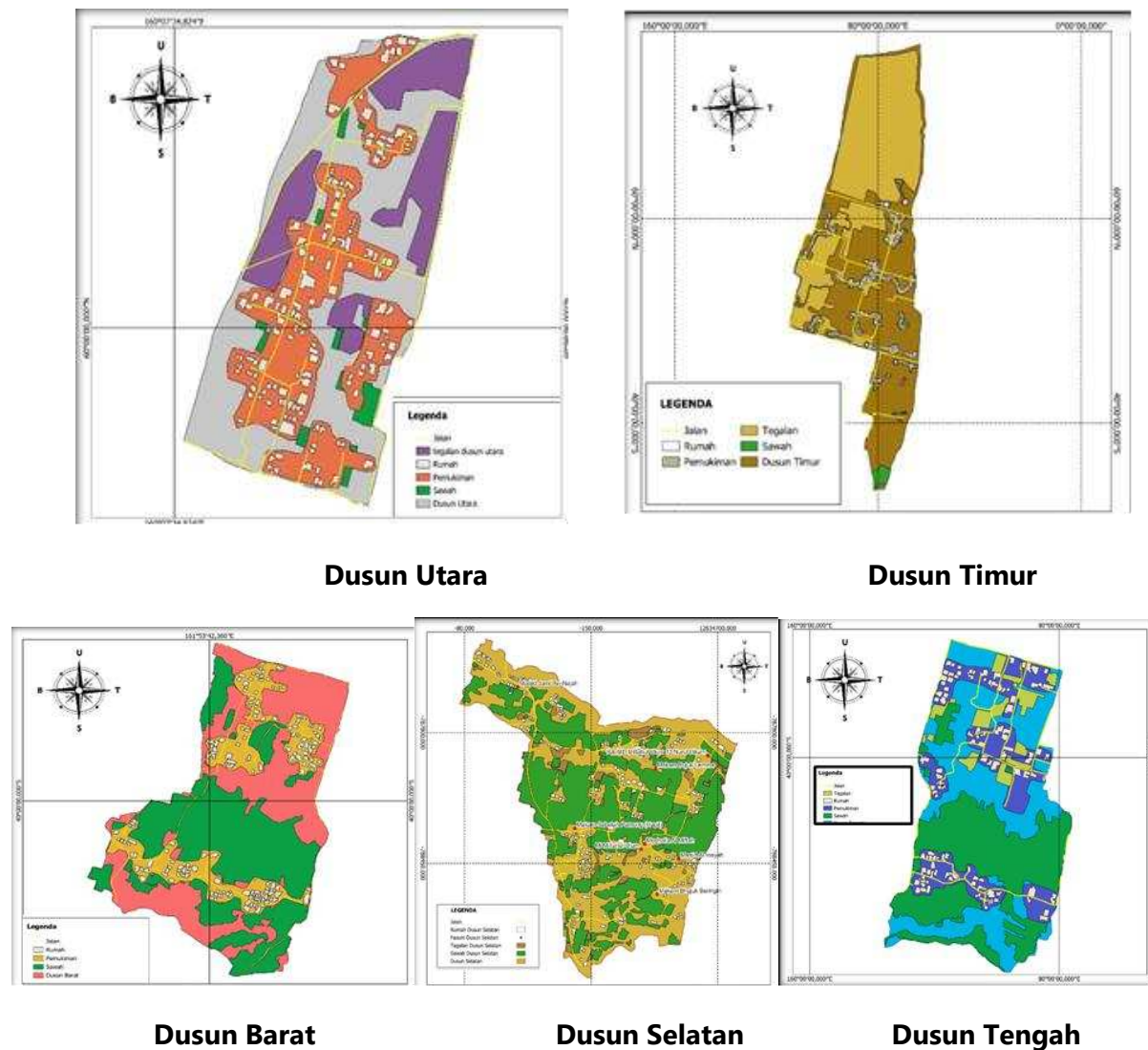
Figure 1 presents the land use distribution in Bulangan Barat Village. The map illustrates how different areas within the village are utilized, including settlements, agricultural land, plantations, open land, and other land-use categories. This information is important for understanding the spatial pattern of village development, natural resource management, and the relationship between human activities and the surrounding environment.



**Figure 1.** Land Use of Bulangan Barat Village

Based on the land use map, Bulangan Barat Village shows a variety of land utilization patterns that reflect both residential and productive activities. The distribution of land use can serve as a basis for planning, environmental management, and sustainable village development. Therefore, the map provides valuable spatial information to support better decision-making in managing the village area.

Figure 2 shows the distribution of land use in each dusun of Bulangan Barat Village, including Dusun Utara, Dusun Timur, Dusun Barat, Dusun Selatan, and Dusun Tengah. This figure helps illustrate how land is utilized across different village sections and provides a clearer understanding of the spatial characteristics of each dusun. The information is useful for identifying land-use patterns, comparing area functions, and supporting village-level planning.

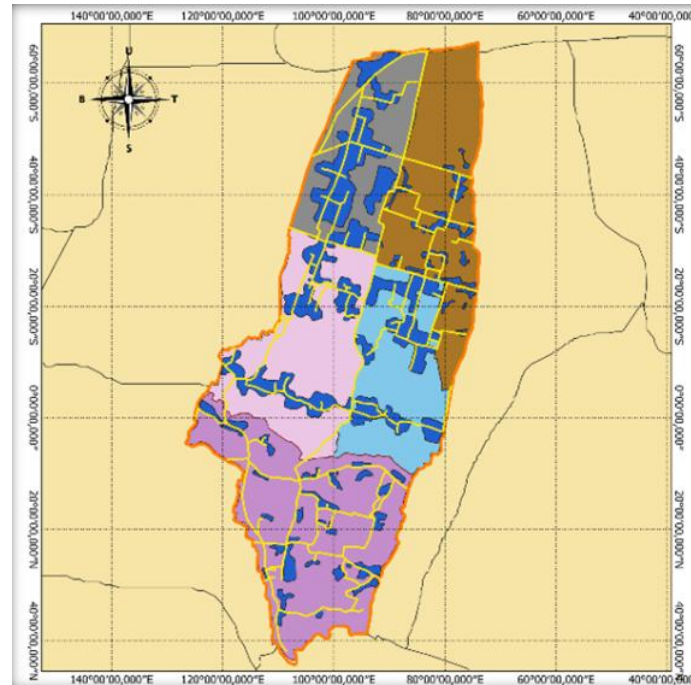


**Gambar 2.** Land Use per *Dusun*

Many things can be observed from the general village land use map. One is the even distribution of agricultural land in all hamlets (*dusun*), including dry fields and rice paddies. This agricultural land is spread evenly across residential areas and larger uninhabited spaces, such as the rice fields in Dusun Barat and the dry fields in Dusun Timur. Additionally, agricultural land can be found interspersed within residential areas, such as in Dusun Selatan, Dusun Tengah, and Dusun Barat. This demonstrates that land, as a natural resource, is the primary wealth of Bulangan Barat Village, distributed across all of its hamlets.

### Road Map Distribution

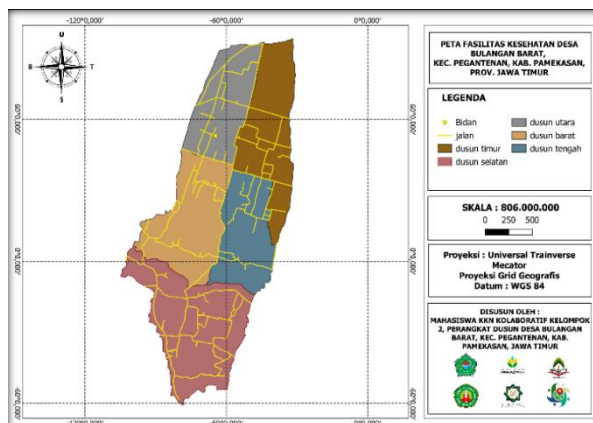
Figure 3 presents the village road map distribution, showing the road network that connects different areas within the village. This map provides an overview of road accessibility, transportation routes, and spatial connectivity between settlements, public facilities, agricultural areas, and other land-use zones. The road distribution information is important for understanding mobility patterns, supporting infrastructure planning, and identifying areas that may require road improvement or better access.



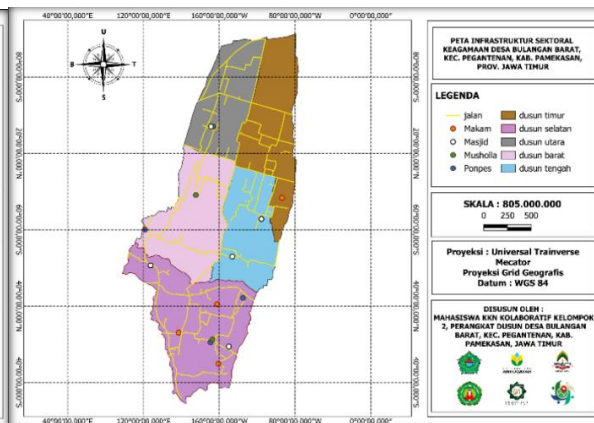
**Figure 3. Village Road Map**

As shown in Figure 3, the road access in Bulangan Barat Village is quite adequate, allowing residents to move easily and providing access to and from the village. This is a significant factor in fostering development and economic growth in the area. While the quality and width of the roads may not match those of provincial or regency roads, the infrastructure is still suitable and safe for the community's needs. In addition to the main village roads, smaller roads leading to residents' homes are also paved and funded through local community efforts or village programs. This highlights the strong social cohesion among the residents, as they work together to build infrastructure for the collective good, contributing both materials and physical labor for paving the road.

#### a. Village Infrastructure

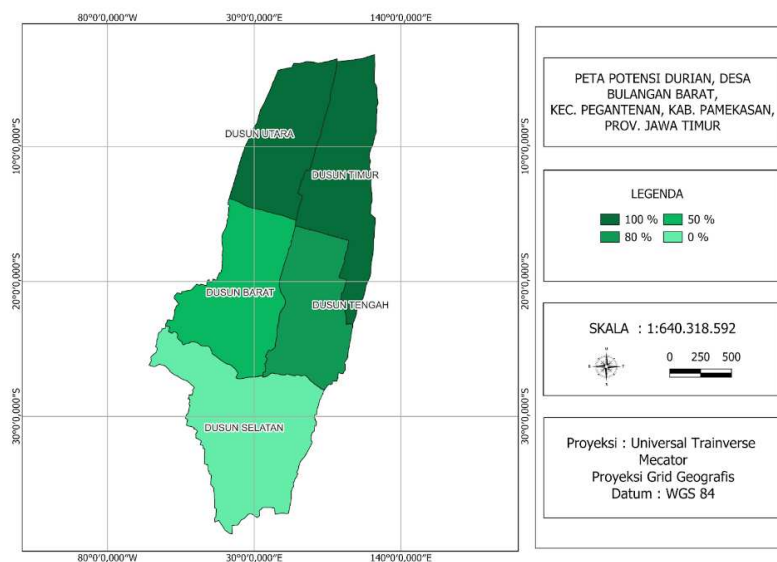


**Figure 4. Map of Religious Facilities**



**Figure 5. Map of Health Facilities**

## b. Data of Village Potential

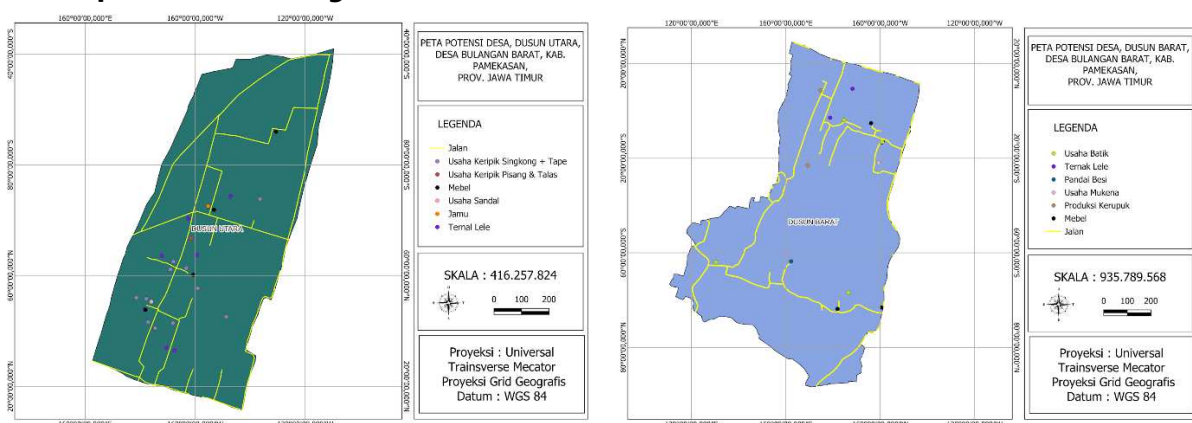


**Figure 6.** Map of Durian Ownership Distribution in Bulangan Barat Village

Figure 6 illustrates the distribution of durian potential in Bulangan Barat Village. The map shows that areas with a concentration of durian trees are found in nearly all of the village's hamlets. The highest concentration of durian trees is in Dusun Utara and Dusun Timur, where 100% of the land is covered. Dusun Tengah has a durian potential of 80%, while Dusun Barat has a potential of 50%. Dusun Selatan is the only hamlet with minimal durian potential, at 0%. These variations in durian potential across the hamlets influence the opportunities for developing and marketing durian in each area.

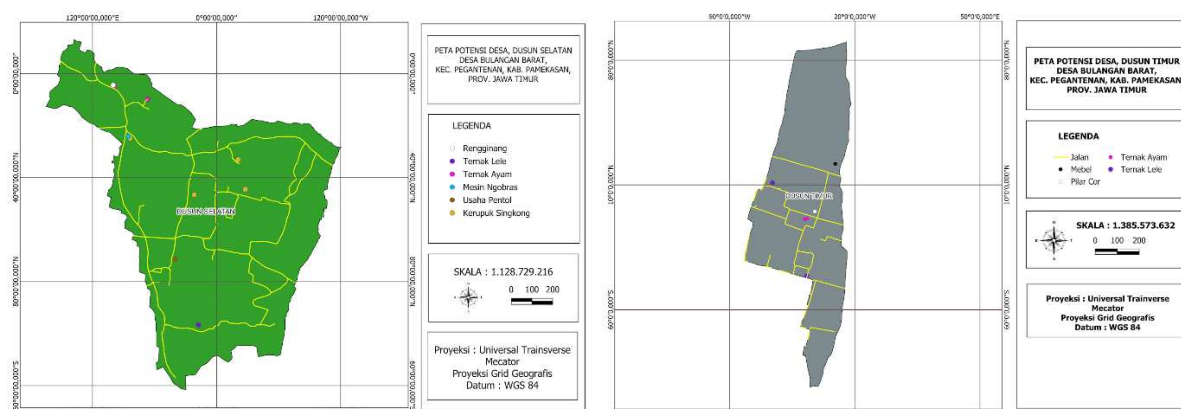
Figure 6 also reveals that Bulangan Barat Village is an ideal location for business development, including durian processing, as well as for market expansion for both local sales and international exports. By analyzing this map, farmers in Bulangan Barat can be encouraged to improve the productivity and care of their durian trees and to develop more focused marketing strategies to enhance durian sales.

## c. The potential of Village MSMEs



**Potential of MSMEs in Dusun Utara**

**Potential of MSMEs in Dusun Barat**



Potential of MSMEs in Dusun Selatan

Potential of MSMEs in Dusun Timur

Figure 7. MSME Potential in the Village

Figure 7 highlights the diverse potential of Micro, Small, and Medium Enterprises (MSMEs) in each hamlet. In Dusun Utara, there are businesses such as cassava chips and tape, banana and taro chips, furniture, sandals, and catfish farming. Dusun Barat is known for its Muslim garment embroidery, including *mukena* (veil) and *taqwa* clothing, cracker production, furniture, catfish farming, and batik. In Dusun Selatan, the main potential lies in *rengginang* production, catfish farming, sewing services, and the sale of meatball skewers and cassava chips. Meanwhile, Dusun Timur has poultry and catfish farming, as well as concrete pillar production and furniture, spread across various areas of the hamlet.

### Need Analysis

The geospatial mapping results indicate that, in terms of land use, each hamlet in Bulangan Barat Village has a significant area of rice fields, consistent with the majority of the local population being farmers. The main agricultural products cultivated are tobacco and rice, which are the primary commodities in the region. Additionally, cassava and durian are the most widely cultivated crops in the plantation sector.

Data confirmation was conducted through interviews with various village stakeholders and community members to provide a more contextual understanding of the conditions on the ground. These interviews were also conducted to gather qualitative information on the experiences, needs, and challenges residents of Bulangan Barat Village face in realizing their potential. Through this process, the community service team actively identifies specific issues and local solutions based on their years of experience.

The following key points were derived from interviews with village stakeholders and community members, as presented in the interview results below:

**Table 2.** Interview Results with Village Stakeholders and Community Members

| No. | Respondent                              | Interview Results                                                                                                                                                                  |
|-----|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.  | Carek (village official representative) | a. The majority of the village population are farmers who cultivate both agricultural crops and plantation products.<br>b. The most commonly harvested crops are rice and tobacco. |

| No. Respondent                               | Interview Results                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                              | <p>c. The most prevalent plantation products are cassava and durian, each household typically owning at least one durian tree. However, the quality of durian has been declining over the years.</p> <p>d. The village has previously received support for durian tree care from a university in Bangkalan. However, the program did not have a long-term impact due to the community's limited purchasing power for the necessary treatments.</p> <p>e. Bulangan Barat Village is home to various MSMEs, including household furniture producers, herbal medicine made from family medicinal plants (TOGA), and rubber sandals.</p> <p>f. The village also has a community that processes cassava into ferments and chips. The local government has even provided equipment for tape production.</p> <p>g. The local community seeks immediate results and is often unwilling to engage in product packaging or branding for the products.</p> |
| 2. Durian plantation owners in the community | <p>a. The quantity of durian has been declining each year. Initially, the durian trees bloomed abundantly, but as the harvest season approached, the flowers fell off, and many of the durian fruits either dropped prematurely or were of poor quality, making them unsellable.</p> <p>b. The durian trees, over 50 years old, were once the largest in the area, but their fruit size has decreased over time.</p> <p>c. There has been no research or assistance to improve the quality or quantity of durian.</p> <p>d. The care for the durian trees is minimal, with occasional watering and manure application as fertilizer.</p>                                                                                                                                                                                                                                                                                                        |
| 3. Furniture MSME owners                     | <p>a. Furniture production is marketed traditionally with the market share of existing customers, the surrounding community, or extended family, including acquaintances.</p> <p>b. Furniture-making skills are not obtained from training but are self-taught.</p> <p>c. The availability of raw timber in the local village, as well as <i>somel</i>/cutting services, is quite helpful in the process of making furniture items;</p> <p>d. Furniture items have peak sessions during the wedding season.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 4. Cassava processing community members      | <p>a. Cassava is traditionally processed and marketed using conventional methods;</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| No. Respondent                                        | Interview Results                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                       | <ul style="list-style-type: none"> <li>b. One producer of cassava chips is aware that their product is resold by a third party, who rebrands and repackages it, but does not see this as a concern;</li> <li>c. Cassava chips from Bulangan Barat are made using various types of cassava without a specific focus on any particular variety.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 5. Owners of the TOGA (family medicinal plants) MSMEs | <ul style="list-style-type: none"> <li>a. Products are made from local herbs and plants in the Bulangan Barat - Pegantenan area;</li> <li>b. These include lactation candies, reproductive health powders, appetite-enhancing capsules, appetite-suppressing capsules, and sinom drinks;</li> <li>c. Production is managed by members of the PKK in Dusun Utara, with tasks such as cleaning and drying the herbs distributed among the group.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 6. Owners of the sandal MSMEs                         | <ul style="list-style-type: none"> <li>a. The sandal MSMEs are the creativity of Bulangan Barat's residents;</li> <li>b. Sandal MSME products have been marketed outside the city;</li> <li>c. Sandal products are of high quality and competitively priced;</li> <li>d. However, branding and marketing strategies are not fully optimized.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 7. Owners of the embroidery businesses                | <ul style="list-style-type: none"> <li>a. The embroidery business produces in-demand items such as <i>mukena</i> and <i>taqwa</i> clothing, which are particularly popular among Muslim consumers.</li> <li>b. This business has shown long-term sustainability, demonstrating its ability to adapt and thrive despite market challenges;</li> <li>c. Its customer base extends beyond the local area, with clients from other cities, thereby increasing its market reach and revenue potential;</li> <li>d. The business's strength lies in its high-quality, tightly woven embroidery, offering a superior alternative to mass-produced products;</li> <li>e. Marketing and promotion largely rely on word-of-mouth and personal networks, indicating strong customer trust in the products;</li> <li>f. Although the business has substantial potential, its online and digital marketing strategies remain underutilized, presenting an opportunity to expand its visibility and attract a larger audience.</li> </ul> |

### 3.2 Discussion

These community services are conducted to reveal two main objectives: the first objective is to do initial mapping of the socio-economic conditions and potential of the Bulangan Barat community, which will be conducted using geospatial technology, and second, based on the mapping results, the team will identify the issues and needs of the community.

Based on the GIS analysis, the general village land use map indicates a relatively even distribution of agricultural land across all hamlets (*dusun*), encompassing both dry fields and rice paddies. These agricultural areas are not only located in larger, uninhabited zones—such as expansive rice fields and dry cultivation areas—but are also interspersed within residential areas. This pattern suggests a spatial integration of agricultural and residential land uses, reflecting a mixed rural landscape structure in which farming activities remain closely connected to everyday community life (Y. Wang et al., 2025). The road conditions in Bulangan Barat Village demonstrate that infrastructure adequacy in rural areas is closely linked to functional accessibility rather than formal road classification standards. As (Saragih et al., 2025) notes that the development of village roads increases the accessibility of villages and community mobility.

Although the roads are not equivalent to provincial or regency roads in quality and width, they effectively support daily mobility and local economic activities, thereby contributing to rural development. Some studies support this, as they have evidenced that the development of rural roads and other infrastructure projects in villages has facilitated various economic changes, increased agricultural productivity and market access, economic diversification, and quality of life (Gebresilasse, 2023; Kebede, 2024; Shamdasani, 2021; Zulham et al., 2025). Bulangan Barat village has significant potential and a distribution of durian trees. It is concentrated in specific hamlets, particularly Dusun Utara and Dusun Timur. These two areas have the greatest potential to become centers of durian production and processing not only within the village but also at the subdistrict (Palengaan) level. Dusun Tengah also has considerable potential, although not as strong. In contrast, Dusun Barat has moderate potential, while Dusun Selatan has none in durian, meaning it should not rely on durian-based development.

Data confirmation was also conducted through interviews with village stakeholders and community members to address the second objective: identifying the community's issues and needs. Several issues and needs were discovered at this stage. Most residents rely on agriculture, particularly rice, tobacco, cassava, and durian; however, durian productivity and quality have declined significantly due to aging trees, minimal maintenance, and the absence of sustained technical assistance. In the MSME sector, although the village has diverse businesses—such as furniture production, cassava processing, herbal (TOGA) products, sandals, and embroidery—most operate using conventional production and marketing methods. The skills development is also limited, branding and packaging are underdeveloped, and digital marketing remains underutilized. Some products are even rebranded by third parties, indicating weak market positioning at the producer level. Some studies notes that the branding capacity and digital branding strategies impacts product visibility, competitiveness,

and overall sales performance (Abimbola, 2010; Ghasempour Ganji & Kazemi, 2024; Jung & Shegai, 2023; Shams et al., 2024; Sujaka et al., 2025). Additionally, community members tend to prioritize immediate sales results over investing in long-term strategies such as product development, quality standardization, and brand building. These findings highlight the need for sustainable technical assistance in agricultural management, product quality improvement, value-added processing, and capacity building in branding and digital marketing to strengthen the village's economic competitiveness.

The community services indicate that Bulangan Barat Village requires an integrated, sustainable development strategy. As this village has strong durian potential, particularly in several hamlets, long-term preservation efforts are essential through structured training programs and continuous assistance in durian tree maintenance, fertilization, and productivity improvement. At the same time, the identified challenges among MSMEs—such as limited branding, conventional marketing practices, and weak digital presence—must be addressed through capacity-building initiatives focused on product standardization, packaging, and market expansion. Broadly, this suggests that optimizing the village's economic potential cannot rely solely on natural resource availability, but must be supported by sustained institutional support, skills development, and strategic market orientation to ensure long-term competitiveness and economic resilience.

#### **4. Conclusion**

The findings and data analysis lead to the following conclusions. First, the mapping of the socio-economic conditions and potentials of the Bulangan Barat Village community has been systematically conducted for each hamlet using geospatial technology. Overall, the economic and social potential within Bulangan Barat is substantial and varied. Most of the local population are farmers, with durian cultivation being prominent across all hamlets except Dusun Selatan. The identified challenges and needs, based on the social-economic mapping, indicate that the village's existing potential is not fully optimized. There is a need to shift the local mindset towards entrepreneurship and the empowerment of locally-produced goods. This shift should focus on leveraging effective marketing strategies, quality packaging, and powerful branding. Specifically, regarding the durian commodity, there is a vital need for comprehensive support and guidance on durian tree maintenance to improve both the quality and quantity of the harvests. This would ensure a sustainable increase in production and contribute to the village's overall economic development.

The community service aimed at collaborating with the residents of Bulangan Barat Village, Pegantenan, needs to be conducted periodically. This is due to the wealth of potential that can still be developed through regular education and mentoring to advance the local economy. The village's strategic location and rich natural resources are key assets in driving it towards becoming a prosperous and progressive area. Support from academics and government institutions needs to embrace and nurture the growth of the village.

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