



## **Spatial distribution of the socioeconomic conditions of dairy cattle farmers in Mliwis Village, Cepogo, Boyolali**

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### **Abstract**

Desa Mliwis, Cepogo District, is one of the centers for dairy cattle production in Boyolali Regency. This research aims to analyze the spatial distribution of the socio-economic conditions of dairy cattle farmers in Mliwis Village, Cepogo, Boyolali. It is a quantitative study with a survey design. The research instrument used was a questionnaire. The data analysis technique used descriptive statistics and nearest neighbor analysis. The results of the study indicate that dairy farms in Mliwis Village are spread across 6 hamlets, namely Ngledok, Karanganyar, Bulukerto, Tlogomuncar, Tegalsari, and Geneng. The Nearest Neighbor value is 0.609900, indicating a clustered pattern. Farmers with income less than Rp. 2,000,000 have a value of 0.792268, indicating a clustered pattern, while those with income more than Rp. 2,000,000 have a value of 17.118163, indicating a dispersed pattern. Farmers with an education level below elementary school (SD) have a value of 6.610683, indicating a dispersed pattern, while those with an elementary school education level have a value of 0.9100336, indicating a clustered pattern. The distribution pattern of the education levels of dairy cattle farmers in Mliwis Village, based on the Nearest Neighbor results, shows that farmers with an education level below elementary school (SD), junior high school (SMP), and high school (SMA) have a dispersed pattern, while farmers with an elementary school education level have a clustered pattern. Farmers with 1-5 cows have a value of 0.543374, indicating a clustered pattern, while farmers with 6-10 cows have a value of 2.396315, indicating a dispersed pattern. Farmers who sell milk to agents have a value of 1.021488, indicating a dispersed pattern, while those who sell milk to cooperatives have a value of 0.581348, indicating a clustered pattern.

Keywords: spatial distribution; social economy; dairy farmers.

### **Introduction**

Indonesia is an agrarian country with abundant natural resource potential (Anindyasari et al., 2016). This natural resource potential can be utilized by the majority of the population as a source of livelihood in various sectors, such as agriculture, plantations, and livestock farming. The

livestock sector is one of the choices for the Indonesian people to make use of natural resource potential (Hadinata, 2015). Dairy cattle farming is one of the livestock sector businesses that thrives in environments with the right altitude and abundant resources to maximize potential. Mountainous areas at an altitude of 750 meters above sea level, with an average temperature of 13°C – 18°C, provide an ideal environment for dairy farming. These conditions support the growth of lush grass, an abundant water supply, moderate temperatures, and high rainfall, all of which are essential factors in producing high-quality milk (Herawati, 2013).

The benefits of dairy cattle farming can enhance the community's income in terms of the economy (Rusdiana & Soeharsono, 2019). The utilization of dairy cow manure waste can help preserve the environment by producing by-products such as organic fertilizer, which is beneficial for soil fertility (Huda & Wikanta, 2016). Processed dairy products, such as yogurt, are fermented milk products that can be made in various flavors. Processing dairy milk into yogurt is a form of product diversification, with the primary goal of preserving the milk to extend its shelf life (Sawitri et al., 2018). Another processed dairy product is cheese. Cheese is made by separating the solid and liquid components of fresh milk through a coagulation process with the help of protease enzymes (Riwayati et al., 2018). The marketing of dairy milk is carried out by dairy farmers who deliver the milk to the Dairy Processing Unit of the Village Cooperative (KUD).

Dairy farming in Indonesia is predominantly dominated by small-scale dairy farming. Smallholder dairy farming refers to dairy farms run by farmers with small ownership scales, typically owning 1 to 4 cows, with relatively low milk production, averaging around 10 liters per cow per day (Rahayu, 2017). The dairy farming industry in Indonesia has seen continuous development over the years. However, smallholder dairy farms are still managed using traditional methods, and the ownership scale remains economically inefficient. Over time, there has been a shift in farming techniques, and small farmers are increasingly able to access information to improve their practices (Purnomo et al., 2017). The economic challenges of dairy farming in Indonesia are influenced by factors such as the capital available to farmers and the availability of forage feed. Dairy farming remains highly concentrated on the island of Java, where around 97% of the country's dairy farming activities take place (Nurtini & Anggriani, 2018).

Boyolali is one of the regions in Central Java Province, known as the "City of Milk" because it has the potential to be a productive dairy milk producer and the largest in Central Java (Aini, 2015). Most of Boyolali's area consists of highlands with cool air, making it an ideal place for dairy farming, with altitudes ranging from 75 to 1,500 meters above sea level and an average annual rainfall of around 2,000 mm (Parmawati et al., 2019). One of the subdistricts in Boyolali Regency with potential for dairy cattle farming development is Cepogo Subdistrict, which consists of 15 villages. Among these, 5 villages have dairy farming activities, namely Mliwis Village, Genteng Village, Jelok Village, Cepogo Village, and Paras Village.

One of the villages targeted for research, Mliwis Village, has a geographical condition with an altitude of 909 meters above sea level and andosol soil. It is located in a temperate climate zone, with an annual rainfall of 2,000 mm in 2013. The number of rainy days during the year was 176, with rain occurring on average over three months. The daily average temperature during the rainy season in Mliwis Village ranges from 18°C to 19°C, and during the dry season, it is between 22°C to 25°C. These conditions are favorable for the cultivation of horticultural plants and dairy

farming (Supriyadi, 2020). The population composition of Mliwis Village, based on livelihood, includes 581 dairy farmers (Monografi Desa Mliwis, 2013). In Mliwis Village, dairy cows are used to meet the community's needs, with the milk being collected at the Dairy Processing Unit of the Village Cooperative (KUD) Cepogo (Isna et al., 2020). On Saturday, October 26, 2019, KUD Cepogo was able to collect 12,000 liters of dairy milk daily from the area, which is then distributed to local buyers and dairy processing companies, such as PT Cita Nasional in Salatiga and PT So Good Food in Boyolali (Aini, 2015).

Geographic Information System (GIS) is a specialized information system that manages data with spatial information (geospatial references) (Kustiyo et al., 2014). Geographic information refers to information about a place or location, where an object is situated on the Earth's surface, and details about the object, including its geographic location (Sodikin & Susanto, 2021). GIS is capable of mapping social conditions, and with the development of technology, GIS has also evolved to adapt to the times. It can be used for static mapping, such as the physical condition of rocks, but can also be utilized for researching social conditions (Apriyantika, 2021). One of the fundamental concepts in geography is the concept of distribution, where overlapping distributions of phenomena can lead to regional associations. This distribution concept includes patterns (e.g., points, lines, and areas), expansion, scale, density, and trends (Susanti, 2018). As GIS continues to develop, distribution can easily be mapped, not only for physical conditions but also for the economic conditions of dairy farmers. Based on this background, the research aims to map the spatial distribution of the socioeconomic conditions of dairy cattle farmers in Mliwis Village, Cepogo, Boyolali.

## **Method**

The type of research used in this study is Quantitative Research. The population in this study consists of all members of Mliwis Village who work as dairy farmers, totaling 32 dairy farmers. Data were obtained from the records of the Mliwis Village Government. The sampling technique used is a saturated sampling technique, meaning the entire population is used as the sample. Data collection was conducted using a questionnaire, which was distributed to dairy farmers from house to house, along with recording their location coordinates. This study uses closed-ended questionnaires, where the answers are pre-provided, and respondents give alternative responses from the available options.

The data analysis techniques used in this study are descriptive statistical analysis and nearest neighbor analysis. The data analysis techniques used in this research include descriptive statistical analysis and the nearest neighbor analysis. The nearest neighbor analysis is a method used to explain the distribution pattern of location points by calculating the number of location points, the area, and the distances by determining the nearest neighbor parameters. The analysis techniques include editing, coding, and tabulating (Yusrina et al., 2018).

The nearest neighbor analysis is conducted by finding coordinate points using the Avenza Map application, which involves importing a map of Boyolali District that has been converted into a georeferenced PDF using ArcGIS. The GPS feature available in the Avenza Map application is then used to determine the location points in real-time. Factors affecting the accuracy of spatial data in nearest neighbor analysis include the quality of GPS signals, map resolution, and data collection

methods. The questionnaire data and location coordinate data from the respondents are then combined to analyze the spatial distribution of each parameter.

## Results and Discussion

The concentration of dairy farmers in Mliwis Village is focused in 6 hamlets, namely Ngledok, Karanganyar, Bulukerto, Tlogomuncar, Tegalsari, and Geneng. The distribution map of dairy farmers in Mliwis Village is presented in Figure 1.

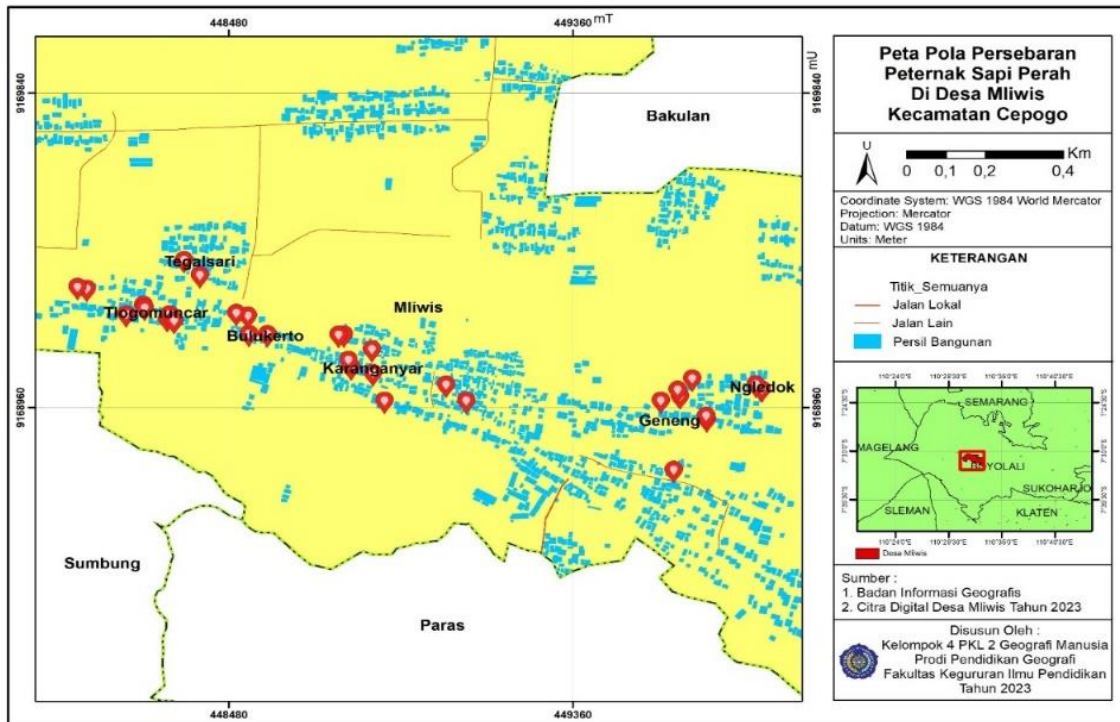


Figure 1. Map of the Distribution of Dairy Cattle Farming in Mliwis Village

Based on the analysis of the Nearest Neighbor Ratio presented above, with 32 dairy cattle farmer respondents concentrated in 6 hamlets, namely Ngledok, Karanganyar, Bulukerto, Tlogomuncar, Tegalsari, and Geneng, it was found that the Nearest Neighbor Ratio value is 0.609900. This indicates that the distribution of dairy cattle farming in Mliwis Village has a clustered pattern. This clustered pattern influences several livestock policies, such as the development of infrastructure, the enhancement of cooperation and synergy among farmers to interact and collaborate with one another, training and extension programs by the government or institutions to assist with livestock management activities, and supervision and regulation through the implementation of regulations for the welfare of livestock farming.

### *Income of Dairy Cattle Farmers*

Income is one of the essential elements for a farmer in managing their farming business. The income of dairy farmers is the difference between revenue and expenses over a specific period (Bitu et al., 2021). This study focuses on the income generated from dairy cattle farming, which includes the production costs incurred, feed costs, supplementary feed costs, as well as maintenance and medication expenses. Graph of dairy cattle farmers' income can be seen in Figure 2.

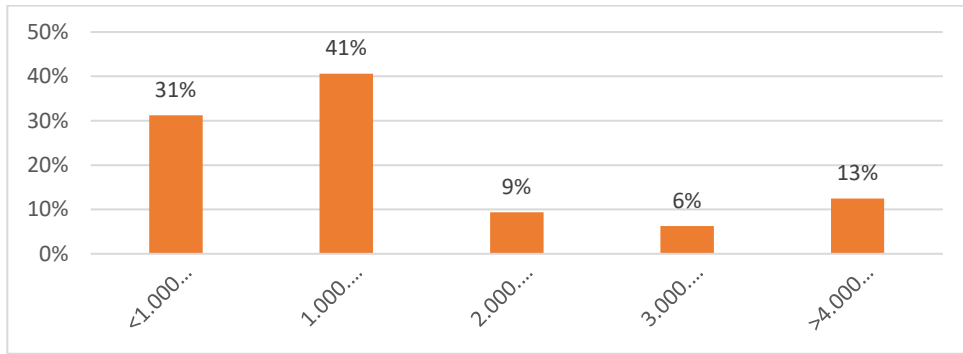


Figure 2. Graph of Dairy Cattle Farmers' Income

In the figure above, the majority, namely 10 individuals (31 percent), have an income of less than Rp. 1,000,000. Meanwhile, 13 individuals (41 percent) have an income between Rp. 1,000,000 and Rp. 2,000,000. There are 3 individuals (9 percent) with an income between Rp. 2,000,000 and Rp. 3,000,000, and 2 individuals (6 percent) have an income between Rp. 3,000,000 and Rp. 4,000,000. Lastly, there are 4 respondents with an income of more than Rp. 4,000,000 representing 13 percent. The results of the nearest neighbor analysis on dairy farmers' income distribution are presented in Table 1, while the spatial distribution of dairy farming income is illustrated in Figure 3.

Table 1. Results of the Nearest Neighbor Analysis of Dairy Farmers' Income Distribution

No.	Class	Nearest Neighbor Index Value	Category
1.	<Rp. 1.000.000	0.792268	Clustered
2.	Rp. 1.000.000-Rp. 2.000.000	0.73934	Clustered
3.	Rp. 2.000.000-Rp. 3.000.000	16.342483	Dispersed
4.	Rp. 3.000.000-Rp. 4.000.000	17.118163	Dispersed
5.	>Rp. 4.000.000	3.722059	Dispersed

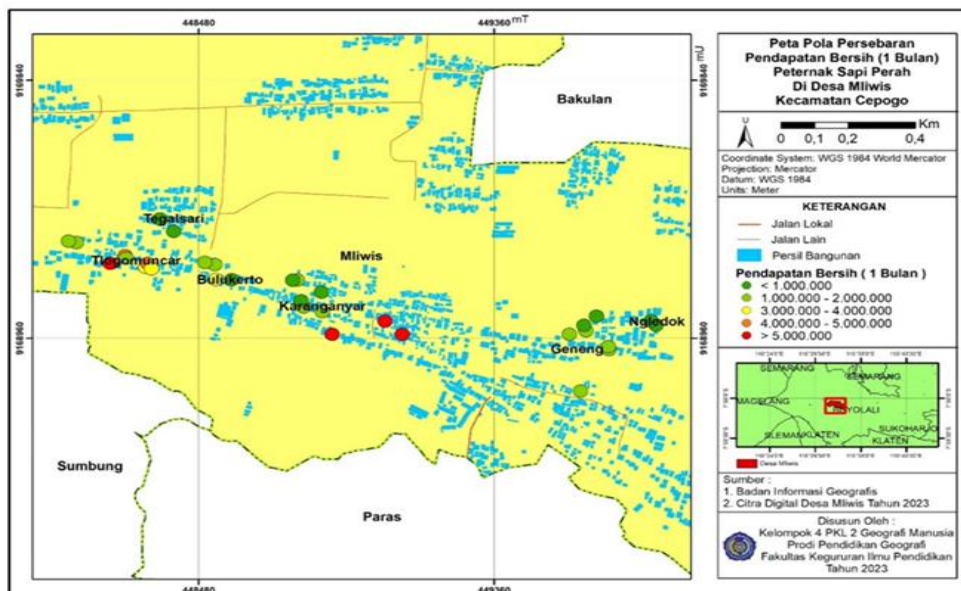


Figure 3. Map of Dairy Farming Income Distribution

Table 1 shows that in the income classes of dairy farmers in Mliwis Village, concentrated in 6 hamlets—Ngledok, Karanganyar, Bulukerto, Tlogomuncar, Tegalsari, and Geneng—the Nearest Neighbor analysis reveals the following: for the income class of less than Rp. 1,000,000,000, the Nearest Neighbor Index value is 0.792268, which falls into the clustered pattern category. For the income class of Rp. 1,000,000 to Rp. 2,000,000, the Nearest Neighbor Index value is 0.73934, also indicating a clustered pattern. In the income class of Rp. 2,000,000 to Rp. 3,000,000, the Nearest Neighbor Index value is 16.342483, which falls into the dispersed pattern category. For the income class of Rp. 3,000,000 to Rp. 4,000,000, the Nearest Neighbor Index value is 17.118163, also indicating a dispersed pattern. Lastly, for the income class of more than Rp. 4,000,000, the Nearest Neighbor Index value is 3.722059, which is categorized as dispersed.

The distribution pattern of dairy farming income in Mliwis Village, which shows clustered and dispersed patterns, influences livestock policies in the area. The clustered pattern in policy involves infrastructure development for income classes below Rp. 2,000,000, where the government can more easily plan for construction such as road access, feed facilities, and milk processing places. Additionally, enhancing cooperation among farmers to collaborate by forming farmer groups or cooperatives can help farmers access various resources.

The dispersed pattern in policy presents challenges in accessibility for income classes above Rp. 2,000,000, as farmers are not concentrated in one area. This can complicate access to essential services and infrastructure, such as extension services, marketing, and product distribution. Policies need to be established to improve accessibility for farmers located in remote areas. Furthermore, income diversification policies in livestock farming should focus on developing dairy products or side businesses.

These results align with the research by Yusrina et al. (2018), which found that the average NNR value in each village in Prambanan District is 0.555040375, indicating that Prambanan District has a clustered settlement pattern. The varying characteristics of each area, along with Tlogo Village having the highest NNR of 0.787967, suggest a dispersed settlement pattern. The differences in settlement distribution patterns, influenced by topography and accessibility in each area, impact socio-economic aspects. Areas with a dispersed settlement pattern, high accessibility, and favorable topography facilitate mobility, thereby enabling development. Conversely, areas with a clustered settlement pattern and insufficient accessibility tend to have lower socio-economic conditions.

#### ***Last Education Level of Dairy Cattle Farmers in Mliwis Village***

Education is an important criterion for enhancing the skills or competencies of farmers, particularly regarding livestock management. Formal education encompasses various levels, including preschool education, primary education, secondary education, and higher education (Aziz et al., 2019). In this study, the education level of dairy cattle farmers is assessed based on the highest level of formal education completed by the dairy farmers. The educational background of dairy farmers is illustrated in Figure 4, which presents a chart detailing their last level of education.

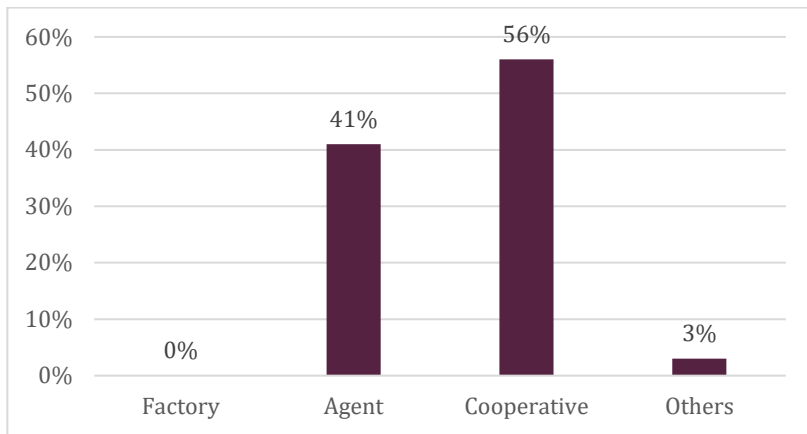


Figure 4. Chart of Dairy Farmers' Last Education Level

The figure above shows that there are 3 dairy cattle farmers (9 percent) who did not complete elementary school. Meanwhile, 16 individuals (50 percent) completed elementary school, 4 individuals (16 percent) completed junior high school, 8 individuals (25 percent) completed senior high school, and there are no individuals (0 percent) who have completed a bachelor's degree (S-1). The results of the nearest neighbor analysis on the distribution of dairy farmers' last education level are presented in Table 2.

Table 2. Nearest Neighbor Results of Dairy Farmers' Last Education Level Distribution

No	Class	Nearest Neighbor Index Value	Category
1.	Not graduated from elementary school	6.610683	Dispersed
2.	Elementary school	0.9100336	Clustered
3.	Junior high school	2.911849	Dispersed
4.	Senior high school	1.418101	Dispersed

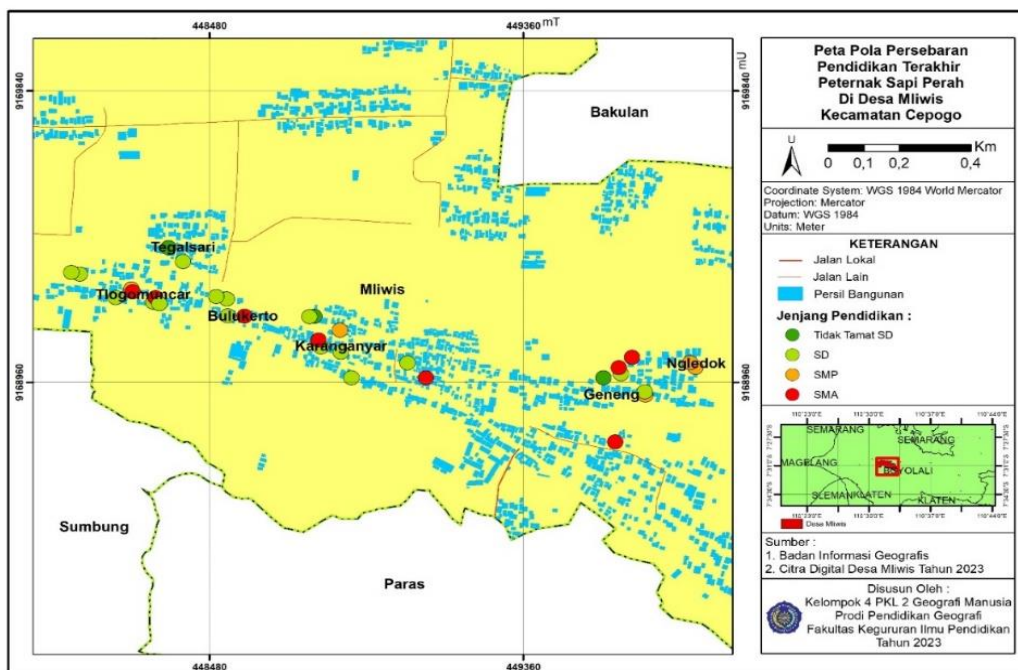


Figure 5. Map of Dairy Farmers' Last Education Level Distribution

Table 2 shows that in the education levels of dairy cattle farmers in Mliwis Village, concentrated in 6 hamlets—Ngledok, Karanganyar, Bulukerto, Tlogomuncar, Tegalsari, and Geneng—the Nearest Neighbor analysis reveals the following: for the education level of those who did not complete elementary school, the Nearest Neighbor Index value is 6.610683, which falls into the dispersed pattern category. For the education level of elementary school graduates, the Nearest Neighbor Index value is 0.9100336, indicating a clustered pattern. In the education level of junior high school graduates, the Nearest Neighbor Index value is 2.911849, which also falls into the dispersed pattern category. Lastly, for the education level of senior high school graduates, the Nearest Neighbor Index value is 1.418101, indicating a dispersed pattern as well.

The distribution pattern of the last education level of dairy farmers in Mliwis Village, which shows clustered and dispersed patterns, influences livestock policies in the area. The clustered pattern can affect policies related to extension services and training for farmers with a maximum education level of elementary school (SD). Policies can be focused on providing extension services and training programs that enhance knowledge and skills in farming. Additionally, policies for developing cooperatives by forming cooperatives or farmer groups can assist in accessing various resources, markets, and technology.

This dispersed pattern can influence policies by presenting challenges in extension services for those with higher education levels (junior high school and senior high school). Policies need to consider innovative ways to reach farmers by utilizing information technology and communication to facilitate distance training. Furthermore, policies should promote sustainable resource management.

This aligns with the research by Vallery (2022), which states that the distribution pattern is determined in the research area using Geographic Information System (GIS) technology. The main function of GIS analysis, used for data processing in this study, includes the Nearest Neighbor analysis. The Nearest Neighbor Index value obtained is 1.233328, indicating that junior high schools in Klaten Regency have a dispersed distribution pattern, meaning they are spread out evenly. Factors influencing the distribution pattern of junior high schools in Klaten Regency include slope gradient, location, and accessibility. The slope gradient in Klaten Regency is predominantly flat, with a gradient of 0-5%, except for the areas around the slopes of Mount Merapi.

### ***Number of Cattle Ownership***

In this study, the number of dairy cattle owned is examined in relation to the ownership of dairy cattle that supports the economic well-being of dairy farmers in Mliwis Village. Figure 6 presents a chart illustrating the ownership distribution of dairy cattle among farmers.

Figure 6 shows that 25 dairy farmers (81 percent) own between 1 to 5 cattle. Meanwhile, 5 farmers (16 percent) own between 6 to 10 cattle. There are no farmers (0 percent) who own between 11 to 25 cattle, 16 to 20 cattle, or 21 to 25 cattle. However, there is 1 farmer (3 percent) who owns between 26 to 30 cattle. This is consistent with the findings of Hastuti et al. (2018), which state that the number of lactating cattle significantly affects the farmers' operations, as it determines the amount of milk produced. Ownership of 1 to 3 lactating cattle can only meet daily

needs and operational costs. Table 3 presents the results of the nearest neighbor analysis on the distribution of dairy cattle ownership, while Figure 7 visually illustrates these findings.

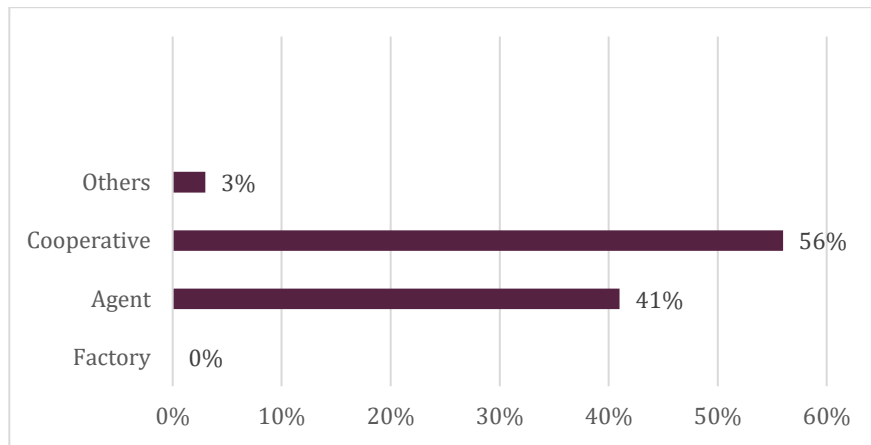


Figure 6. Chart of Dairy Cattle Ownership

Table 3. Nearest Neighbor Results of Dairy Cattle Ownership Distribution

No	Class	Nearest Neighbor Index Value	Category
1.	1 – 5 cattle	0.543374	Clustered
2.	6 – 10 cattle	2.396315	Dispersed
4.	26 – 30 cattle	-	-

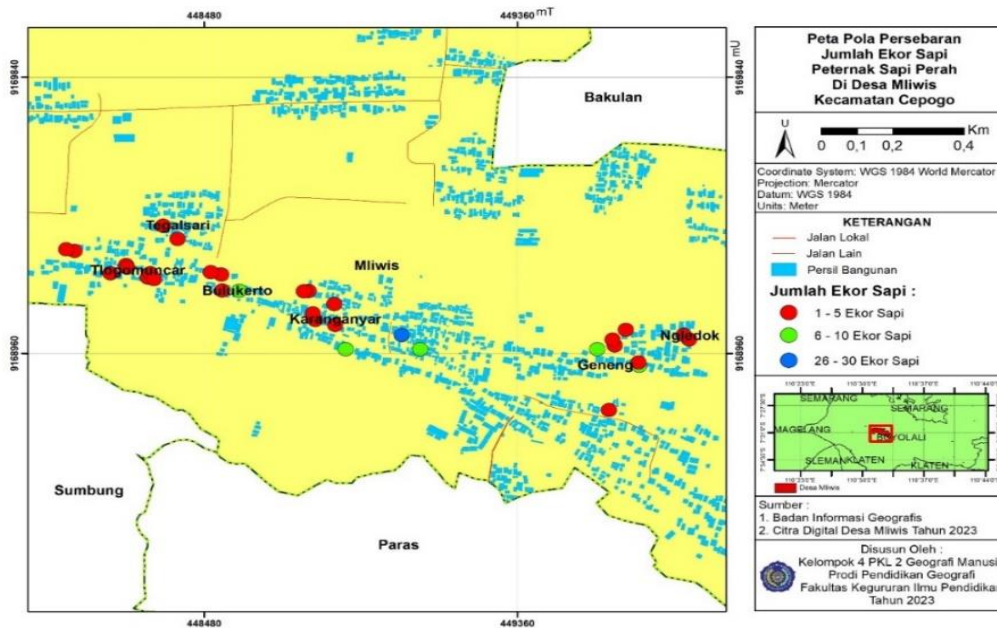


Figure 7. Nearest Neighbor Results of Dairy Cattle Ownership Distribution

Table 3 shows that in the ownership classes of dairy cattle in Mliwis Village, concentrated in 6 hamlets—Ngedok, Karanganyar, Bulukerto, Tlogomuncar, Tegalsari, and Geneng—the Nearest Neighbor analysis reveals the following: for the ownership of 1 to 5 cattle, the Nearest Neighbor Index value is 0.543374, which falls into the clustered pattern category. For the ownership of 6 to 10 cattle, the Nearest Neighbor Index value is 2.396315, indicating a dispersed pattern. In this study, there is only 1 data point for the ownership of 26 to 30 cattle.

The distribution pattern of dairy cattle ownership in Mliwis Village, which shows clustered and dispersed patterns, influences livestock policies in the area. The clustered pattern can affect policies related to extension services and training for farmers who own 1–5 dairy cows. Policies can be focused on providing programs for livestock management, animal health, and maintenance techniques. Additionally, policies should ensure access to resources and capital through assistance programs and subsidies to support farmers in this area, enabling them to increase their dairy cattle ownership.

The dispersed pattern can influence policies by presenting challenges in extension services for those with 6-10 dairy cows. Policies need to consider innovative ways to reach farmers by utilizing information technology and communication to facilitate distance training. Furthermore, policies should promote sustainable resource management.

This is consistent with the research by Fitriani (2023), which analyzed the distribution pattern of high schools in Karawang Regency using Nearest Neighbor analysis. The study showed that the distribution of high schools can form various patterns, categorized into clustered, random, and dispersed patterns. The determination of these distribution patterns can be conducted using the Nearest Neighbor analysis model by calculating the magnitude of the nearest neighbor parameters. The results of the high school distribution analysis in Karawang Regency indicated a clustered pattern with an NN Ratio of 0.821246, demonstrating that the distribution of high schools in Karawang Regency is clustered.

**Objectives of Dairy Milk Sales in Mliwis Village**

Partnership is understood as a form of collaboration between two or more parties that establishes a cooperative bond based on mutual agreement and a sense of interdependence, aimed at enhancing capacity and capability in a specific business field or for a particular purpose, thereby achieving favorable results (Dewi et al., 2013). In this study, the objectives of dairy milk sales are examined through the lens of dairy milk sales among dairy farmers in Mliwis Village. Figure 8 presents a chart illustrating the distribution of dairy milk sales objectives.

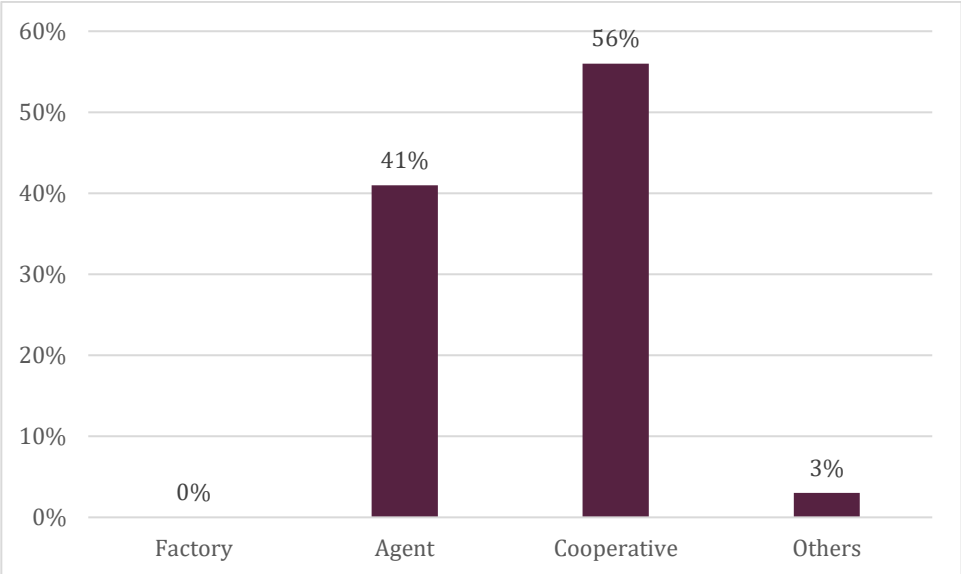


Figure 8. Chart of Dairy Milk Sales Objectives

Figure 8 shows that there are no sales of dairy milk to factories (0 percent). The sales of dairy milk to agents or collectors account for 13 individuals (41 percent), while the most significant sales of dairy milk, at 56 percent, are made to cooperatives. Additionally, there is 1 individual (1 percent) who sells dairy milk to other parties.

This aligns with the opinion of Mandaka (2015), which states that sales of milk to cooperatives are predominantly carried out by dairy farmers in Mliwis Village. This is because the agricultural cooperatives consist of dairy farmers who specialize in collecting and marketing the milk produced by their members, as well as managing and developing dairy farming businesses in accordance with the economic potential of rural communities. Table 4 presents the results of the nearest neighbor analysis on the distribution of dairy milk sales objectives, while Figure 9 provides a map illustrating this distribution.

Table 4. Nearest Neighbor Results of Dairy Milk Sales Objectives Distribution

No	Class	Nearest Neighbor Index Value	Category
1.	Factory	-	-
2.	Agent	1.021488	Dispersed
3.	Cooperative	0.581348	Clustered
4.	Others	-	-

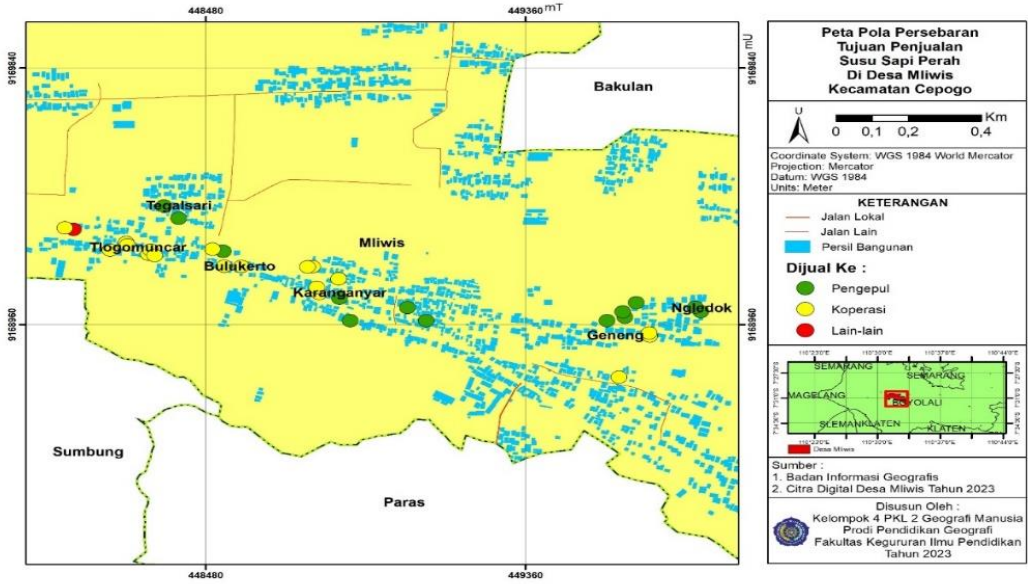


Figure 9. Map of Dairy Milk Sales Objectives Distribution

Table 4 shows that in the sales objectives of dairy milk among dairy farmers in Mliwis Village, concentrated in 6 hamlets—Ngledok, Karanganyar, Bulukerto, Tlogomuncar, Tegalsari, and Geneng—the Nearest Neighbor analysis reveals the following: for the sales of dairy milk to agents or collectors, the Nearest Neighbor Index value is 1.021488, which falls into the dispersed pattern category. For the sales of dairy milk to cooperatives, the Nearest Neighbor Index value is 0.581348, indicating a clustered pattern. Additionally, there is only 1 data point for the sales of dairy milk to other parties in this study.

The distribution pattern of the sales destinations for dairy milk in Mliwis Village, which shows clustered and dispersed patterns, influences livestock policies in the area. The clustered pattern can affect policies related to strengthening cooperatives by providing support in the form of cooperative management training, access to capital, and milk processing facilities to enhance the cooperatives' capacity to manage and market dairy products. Policies should also focus on improving market access by directing distribution networks and marketing dairy products. The government can assist cooperatives in establishing partnerships with larger markets or supermarkets, enabling farmers to obtain better prices.

The dispersed pattern can influence policies by presenting challenges in extension services for those selling milk to agents or collectors. Policies need to consider innovative ways to reach farmers by utilizing information technology and communication to facilitate distance training. Additionally, policies should promote sustainable resource management. Policies for managing relationships with collectors should include providing training programs on negotiation and relationship management, which can help farmers secure better agreements in milk sales.

This is consistent with the research by Rohsulina et al. (2018), which states that spatial analysis can be used to observe the distribution patterns of a group of objects in a given area, one of which can be conducted through Nearest Neighbor analysis. This analysis is used to determine whether the distribution pattern of a group of objects in an area follows a random, clustered, or uniform pattern, as indicated by the NN value. The Nearest Neighbor analysis considers three aspects: distance, the number of location points, and the area size. The analysis of the distribution of basic education service locations in Nguter District showed a clustered pattern with an NN value of 0.790610.

## **Conclusions**

Based on the results and discussions above, it can be concluded that the distribution pattern of the socio-economic conditions of dairy farmers in Mliwis Village, concentrated in 6 hamlets—Ngledok, Karanganyar, Bulukerto, Tlogomuncar, Tegalsari, and Geneng—with 32 respondents, shows that the Nearest Neighbor Ratio value is 0.609900, indicating that the distribution of dairy farming in Mliwis Village has a clustered pattern. The distribution pattern of dairy farmers' income in Mliwis Village, based on the Nearest Neighbor analysis, shows that those with an income of less than Rp. 2,000,000 falls into the clustered category, while those with an income of more than Rp. 2,000,000 falls into the dispersed category. The distribution pattern of the last education level of dairy farmers in Mliwis Village, according to the Nearest Neighbor analysis, indicates that farmers with the last education level of not completing elementary school, junior high school, and senior high school fall into the dispersed category, while those with the last education level of elementary school fall into the clustered category. The distribution pattern of cattle ownership among dairy farmers in Mliwis Village, based on the Nearest Neighbor analysis, shows that those with 1 to 5 cattle fall into the clustered category, while those with 6 to 10 cattle fall into the dispersed category. Finally, the distribution pattern of the sales objectives of dairy milk among dairy farmers in Mliwis Village, according to the Nearest Neighbor analysis, indicates that sales to agents or collectors fall into the dispersed category, while sales to cooperatives fall into the clustered category.

### **Data Availability**

The results of this study are supported by data from the Boyolali District government and the Dairy Installation of the Village Cooperative Unit (KUD) Cepogo, by analyzing the responses of the respondents according to the established methodology.

### **Conflicts of Interest**

All authors in this publication declare no conflict of interest regarding the title, data, location, and results of the research.

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### **Supplementary Materials**

This study does not include any supplementary materials.

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