Analysis of Land Utilization Type and Its Relation to Farmers Welfare in Krakitan Village, Bayat District

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Abstract. Krakitan is one of the villages in Bayat District, Klaten Regency, Central Java. Krakitan Village has quite a lot of agricultural land from the moor, rice fields, and plantations. Some of the people in Krakitan Village have a livelihood as farmers. The study of Land Utilization Types as a more detailed study of land use will benefit agricultural development. This research will be related to the Land Utilization Type with the farmers’ welfare in Krakitan Village. The methods used are interviews, surveys, and observations. Interviews were conducted with farmers in Krakitan Village to determine the attributes of agricultural land and farmers’ welfare. Surveys and observations were carried out to see the land use conditions in Krakitan Village and take soil samples. Data analysis was carried out by cross tabulations Land Utilization Type and farmers’ welfare. The results of this research are soil conditions in Krakitan Village suitable for agriculture. Secondary crops farmers have the lowest level of welfare, at the level of Pre-Prosperous Family. Farmers who own their land are included in the Prosperous Family III. Farmers that have more expansive agricultural land have a higher level of farmers’ welfare.

1. Introduction

Krakitan Village located in Bayat District, Klaten Regency, Jawa Tengah Province. Krakitan Village consists of four hamlets that are Jombor, Tobong, Winong, and Duwet. The total area of Krakitan Village is about 7,99 km² or 799 ha. 2018 data shows that about 10,96 ha are used as rice fields, while 140,36 ha are used as moor and plantation [1]. Based on this, some of the people in Krakitan Village have a livelihood as farmers.

The land is a physical environment that includes soil, climate, relief, hydrology, and vegetation, affecting the potential use [2]. Land in agriculture is one of the agricultural production factors, and agricultural activities run on the ground [3]. Land that has good quality, both physical and biological characteristics, can support agricultural activities and production.

The agricultural sector, especially food crops, has a huge and strategic role in fulfilling national food needs and providing employment opportunities [4]. Agricultural development aims to improve the welfare of the community, especially farmers. Based on this, every stage of agricultural development activities has goals for the farmers’ welfare [5]. According to BKKBN, 2012 [3], prosperous conditions are conditions where humans feel safe and happy because the basic needs of life are fulfilled, that is, food, clothing, place, and obtain protection from risks that threaten their lives.

Studies on land utilization type as a more detailed analysis of land use will benefit agricultural development. Because evaluation can be carried out, and the determination of development becomes clearer and more focused. These are two final objectives to be achieved in this research. The first objective is to describe the land utilization type in Krakitan Village. The second is to analyze the relationship between land utilization type and farmers’ welfare.
2. Method

This research was conducted in Krakitan Village, Bayat District, Klaten Regency. The data used in this study is primary data. Data collection is done using interviews, surveys, and observation. The sampling method used is purposive random sampling. The sample was selected based on the land use in Krakitan Village that its moor, rice field, and plantation.

Interviews were conducted to obtain the attribute data of land utilization type and farmers' welfare. Attribute data for land utilization type includes the product, market orientation, intensity of capital use, technical knowledge, labor, technology, land status, and income level. The farmers' welfare is known by using indicators of community welfare according to the Badan Kependudukan dan Keluarga Berencana Nasional (BKKBN), the stages of a prosperous family. The indicators used in this research are 17 indicators from 21 indicators from BKKBN. Based on this indicator, a prosperous family can be determined in five stages, which are Pre-Prosperous Family, Prosperous Family I, Prosperous Family II, Prosperous Family III, dan Prosperous Family III Plus. The numbers of respondents who were interviewed were nine respondents.

Surveys and observations were carried out to obtain data about land and soil conditions in Krakitan Village. Soil conditions are known by taking soil samples on agricultural land cultivated or owned by the respondent. Soil samples were tested with a quick test using a soil test kit to determine soil characteristics such as acidity (pH), CO₃ content, and organic matter content.

Data analysis was carried out using quantitative descriptive analysis with cross tabulation. Cross tabulation is used to calculate the frequency and percentage of two or more variables by crossing the variables that are considered related so that the meaning of the relationship between two variables is easy to understand descriptively [6]. In this research, cross tabulation is used to explain the relationship between land utilization type and the farmers' welfare in Krakitan Village, Bayat District.

3. Result and Discussion

3.1. Land Utilization Type

Krakitan Village consists of several land uses, swamps, moor, rice fields, plantations, settlements, and shrubs. Swamp in Krakitan Village is the Rawa Jombor on the south side and has the dominant area in Krakitan Village. Around the swamp, there are many settlements, and some of them are moors. There are rice fields in the south of Rawa Jombor, and the east side of Krakitan Village uses moor and plantation. Based on the composition of land use in Krakitan Village, people in Krakitan Village have a dominant livelihood that is an entrepreneur because many people have Floating Restaurant in Rawa Jombor and its surrounding. People in Krakitan Village also have a livelihood as farmers.

Land use in Krakitan Village, used for agricultural land is moor, rice fields, and plantation. The land uses different detailed characteristics in management, input, and output, the level under the general land use category or Land Utilization Type. Attributes to determine detailed characteristics are product, market orientation, the intensity of capital use, technical knowledge, labor, technology, supporting infrastructure, land status, and income level.

Land Utilization Type can be determined by conducting interviews with farmers regarding the attributes of agricultural land. Interviews were conducted with nine respondents, who are farmers working on agricultural land in Krakitan Village. Based on the land use, the sample point map is shown in the Figure 1.
Figure 1. Sample Point Based on the Land Use

Based on Table 1a, the area of agricultural land in Krakitan Village that farmers cultivate has a variety of areas. The interview result shows that of the nine respondents, the lowest area is around 150 m², and the highest is 2000 m². Farmers in Krakitan Village own their land, while others work on leased rice fields, auctions, or the government. Based on nine farmers, two of nine farmers own their agricultural land. Other farmers work on other people's agricultural land or village treasury land and government. There are agricultural lands in Krakitan Village that have had an auction system for several years. Farmers who can auction will use agricultural land for a certain period. Most of the agricultural land in Krakitan Village is done by farmers themselves, but several farmers do some if the agricultural land is large enough.

| Land Use  | LUT        | Area (m²) | Land Status | Product      | Labour   | Market Orientation |
|-----------|------------|-----------|-------------|--------------|----------|--------------------|
| Plantation| Secondary Crops | 800 m²   | Government  | Cassava, Corn, Peanut | Self-made | Local              |
| Plantation| Farm       | 1000 m²   | Right of Ownership | Egg       | Self-made | Local              |
| Moor      | Banana     | 150 m²    | Government  | Banana      | Self-made | Local              |
Rice fields in Krakitan Village are usually planted with rice twice and then once for other crops such as chili and eggplant. However, there is also agricultural land where rice is planted three times during planting and harvesting. Other than that, on the moor, corn is usually planted. In the plantation, cassava, corn, and peanut are usually planted on the land's surface, while the plantation has been planted with tall trees. Agricultural products from Krakitan Village are usually sold in the local market or brought to the city.

Table 1b. Land Utilization Type

| Land Use   | LUT         | Capital          | Technology | Water Resources | Physical Barriers |
|------------|-------------|------------------|------------|-----------------|------------------|
| Plantation | Secondary Crops | Seeds, fertilizer | Traditional | Rain            | Landslide        |
| Plantation | Farm        | Feed             | Traditional | Rain            | Fallen tree      |
| Moor       | Banana      | Seeds, fertilizer | Traditional | Rain            | Flood            |
| Rice Field | Rice Field  | Seeds, fertilizer | Tractor    | Irrigation      | Flood            |
| Rice Field | Rice Field  | Seeds, fertilizer | Tractor    | Irrigation      | Flood            |
| Rice Field | Rice Field  | Seeds, fertilizer | Tractor    | Rain            | Flood            |

Source: Data processing, 2021
Based on Table 1b, most of the capital from agricultural land comes from the farmers themselves, but there is also capital from farmer groups. Farmer groups usually provide agricultural seeds. Most agricultural technology used is still traditional in plantations and moors and the rice fields using tractors. Water resources used for irrigating crops on agricultural land rely on rainwater, except for rice fields where the water source is irrigation. Agricultural land in Krakitan Village in a relatively flat area has a physical barrier that is flooding. However, in relatively high areas, it has physical barriers such as landslides and fallen trees. During the rainy season, physical barriers like floods and landslides often occur, such as the landslide in February 2021 and the floods that submerged several villages in Bayat District [7].

A soil survey was also carried out on the agricultural land with a quick test using a soil test kit. The soil survey was carried out by taking a small amount of soil on the land's surface and testing the level of acidity, both actual and potential, CO₃ content, and organic matter. With this survey, it can be seen the condition of the soil in Krakitan Village for agriculture. The result of the quick sample test is shown in Table 2.

| No | Sample | Indicator        | Value |
|----|--------|------------------|-------|
| 1  | Sample 1 (respondent 3) | pH actual | 6     |
|    |        | pH potential     | 6     |
|    |        | CO₃              | ++++  |
|    |        | Organic Matter   | +++   |
| 2  | Sample 2 (respondent 4) | pH actual | 6     |
|    |        | pH potential     | 6     |
|    |        | CO₃              | -     |
|    |        | Organic Matter   | +     |
| 3  | Sample 3 (respondent 5) | pH actual | 6     |
|    |        | pH potential     | 6     |
| Sample  | pH actual | pH potential | CO$_3$ | Organic Matter |
|---------|-----------|--------------|--------|----------------|
| 4       | 6         | 6            | -      | +              |
| 5       | 6         | 6            | +++    | ++             |
| 6       | 5         | 6            | +      | ++             |
| 7       | 7         | 6            | +++++  | ++             |

Source: Survey result data, 2021

Soil conditions in Krakitan Village have a degree of acidity around 6, both actual and potential pH. The degree of acidity (pH) is included in average conditions with plant nutrients such as N, S, P, and K [8]. Good acidity for plants ranges from 5.5 to 7.5 depending on the cultivated plants [9]. For corn plants, acidity 5.5 to 6.5 is excellent and suitable [10]. Based on this, the degree of acidity in Krakitan Village is good for developing crops.

Organic matter is all materials that come from living things that exist in and on the soil's surface that have undergone an overhaul [11]. Based on table 2, Soil conditions in Krakitan Village contain organic matter, which is indicated by the appearance of foam during the quick test using H$_2$O$_2$ solution. Organic matter in the soil affects soil fertility and productivity [12]. The presence of organic matter in the soil can improve soil structure, water binding capacity, resist erosion, provide plant nutrients such as N, P, S bound in organic form, and extract mineral elements by humus acid [8].
CO$_3$ content on agricultural land in Krakitan Village is only found in a few places. The CO$_3$ content in the soil is characterized by the appearance of foam when the soil is dripped with HCl. The CO$_3$ content in Krakitan Village can also come from the geomorphology and geology of Bayat, which used to be part of the seaside and has widespread limestone layers. Agriculture needs CO$_3$ in the soil. Based on the quick test results, the soil in Krakitan tends to be suitable for agricultural land.

3.2. Farmer’s Welfare

Farmer’s welfare in Krakitan Village was analyzed through interviews with the level of community welfare developed by the BKKBN. Interviews were conducted on farmers working on agricultural land from nine respondents who had known land attributes. The indicators used are 17 of the 21 indicators developed by the BKKBN, consisting of several variables: food, clothing, place, health, education, income, family interaction, social interaction, information and communication, and roles in society.

In general, farmers in Krakitan Village usually eat twice a day or more with meat/fish/egg dishes at least once a week. Farmers have different clothes to wear on different occasions, and not all farmers in Krakitan Village get new clothes in one year. The houses inhabited by farmers in Krakitan Village, on average, have decent houses, but not all farmers have large houses.

Farmer’s health conditions tend to be good because they have been healthy for the last three months. These farmers can read writing because most of the old farmers during their school days attended the Sekolah Rakyat. Most of the other members of the farmer's family also work, but there are some farmers whose income is not used as saving or used for daily needs. Not all farmers can gather together with their families, even if only once a week. Because some farmers live alone and the family members live in the town to work. Pretty young farmers are usually active in participating in their neighborhood.

Farmer's conditions can be classified based on the indicator of the stages of a prosperous family. The data are classified into five welfare levels based on the interview results, shown in Graph 1 below.

![Graph 1. Percentage Distribution of Farmers’ Welfare Level in Krakitan Village](image)

Based on Graph 1, it can be seen that five of the nine respondents belonged to families at the level Pre-Prosperous Family because the five farmers did not meet the Prosperous Family I indicator that is basic needs. The Prosperous Family I indicator, which is primarily unfulfilled, is indicator number seven, that is, if a sick member is brought to a health facility. Based on the answers of the dominant respondents, if
there is a sick family, usually self-care at home first, such as getting enough rest. If the pain is not severe, people prefer to self-care at home.

One of the nine respondents in Krakitan Village has a stage of a prosperous family named Prosperous Family II. This respondent cannot be included in the Prosperous Family III category because he is not actively participating in community activities in the neighborhood where he lives. The other three respondents are included in the Prosperous Family III category. Respondent cannot include the Prosperous Family III Plus category because the respondent is not an administrator in community activities or associations.

3.3. Land Utilization Type and its Relation to Farmer’s Welfare

Land Utilization Type and its relation to farmer's welfare analyzed by cross tabulation. Land Utilization Type is divided into five categories: secondary crops, farm, rice field, banana, and teak. The farmers' welfare is known as the level of farmer's welfare. The result of cross tabulation is shown in Table 3 below.

Table 3. Cross Tabulation between Land Utilization Type and Farmer’s Welfare

| Level of Welfare | Pre-Prosperous Family | Prosperous Family II | Prosperous Family III | Total |
|------------------|-----------------------|----------------------|-----------------------|-------|
| Secondary Crops  | 3                     | 0                    | 0                     | 3     |
| Count % of Total | 33.3%                 | 0.0%                 | 0.0%                  | 33.3% |
| Farm             | 0                     | 0                    | 1                     | 1     |
| Count % of Total | 0.0%                  | 0.0%                 | 11.1%                 | 11.1% |
| Ricefield        | 1                     | 1                    | 1                     | 3     |
| Count % of Total | 11.1%                 | 11.1%                | 11.1%                 | 33.3% |
| Banana           | 1                     | 0                    | 0                     | 1     |
| Count % of Total | 11.1%                 | 0.0%                 | 0.0%                  | 11.1% |
| Teak             | 0                     | 0                    | 1                     | 1     |
| Count % of Total | 0.0%                  | 0.0%                 | 11.1%                 | 11.1% |
| Total            | 5                     | 1                    | 3                     | 9     |
| Count % of Total | 55.6%                 | 11.1%                | 33.3%                 | 100.0%|

Source: data processing, 2021

Table 3 above shows that secondary crops farmers included in Pre-Prosperous Family with a percentage of 33.3%. These secondary crops farmers work on leased agricultural land and government land. On the government land, secondary crops are planted under large trees (Figure 2). The area of cultivated agricultural land is around 150-800 m². The technology used for farming is still traditional technology. Income from the harvest that is used for daily living needs. Farmer's income is significant for farmers, high or low yields can affect their lives [13]. Farmers that included Pre-Prosperous Family are on
moor planted with bananas (Figure 3). The government owns the land under cultivation. The area being worked on is narrow, only about 150 m².

Farmers working on rice fields are divided into three levels of welfare that is Pre-Prosperous Family, Prosperous Family II, and Prosperous Family III. Farmers on rice fields belonging to the Pre-Prosperous Family work on other people's rice fields and only as farm laborers with several other farmers on the land. Agricultural products are not sold but are used alone to meet daily life. The farmer of the Prosperous Family II (Figure 4) is working on the auction land obtained this year. The rice field is planted with paddy and corn, the paddy production is for personal consumption, and the corn production is sold, which will be saved. Farmers who are part of the Prosperous Family III (Figure 5) cultivate land belonging to other people, but they do it themselves with an area of about 2000 m² of agricultural land.

![Figure 2. Secondary Crops Under Large Trees](image1)
![Figure 3. Moor Planted with Bananas](image2)
![Figure 4. Rice Field Planted with Corn](image3)
![Figure 5. Rice Field](image4)

Source: Personal Documentation, 2021

Farmers included in the Prosperous Family III own their land and used it for the chicken farm with eggs as a product and used for teak plantation. The agricultural land used is about 1000 m². The produce of the land is then sold to meet daily needs and also saved.

Based on the result of the analysis, farmers who cultivate their land have a higher level of welfare. The broader area that is cultivated, the higher the level of welfare [3]. The land used for secondary crops in Krakitan Village is intercropped under the large trees in the government land. secondary crops farmers have the lowest welfare based on the results of cross-table calculations.
4. Conclusion
The conclusion from this research are as follows:
1. Land Utilization Type in Krakitan Village is divided into five categories based on the type of plant planted on the land. The Land Utilization Type are secondary crops, rice fields, bananas, teak, and farm. The attributes data of agricultural land in Krakitan Village, on average, have similarities such as market orientation in local markets, and agricultural technology is mostly still traditional.
2. More than 50% of the respondents belong to Pre-Prosperous Family because farmers do not have their own land and land that is cultivated relatively narrow so that its income can only meet their daily needs. Farmers who own their land have a higher level of welfare. The broader area of agricultural land, the higher the level of welfare.

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