

# Land Use Change in Dramaga Village, Dramaga District, Bogor Regency, West Java

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**Abstract.** Economic growth in Indonesia requires the development of infrastructure, such as roads, service buildings, and others. This causes the demand for land to increase, one of which is in Dramaga Village. As a result, there is less agricultural land in Dramaga Village because a lot of agricultural land has been converted. The purpose of this study was to analyze the driving factors for land use change and their impact on the community in Dramaga Village. The study used a qualitative approach, namely direct observation and in-depth interviews supported by secondary data in the form of literature studies, field notes, and supporting documents. The results showed that the driving factors for land use change in Dramaga Village were due to the lack of income from working on the land, no one wanted to work on the land, and the desire to get lots of money instantly, so not a few lands in Dramaga Village were sold and converted become settlements, restaurants, cafes, and other buildings. The development in Dramaga Village is indeed economically beneficial for the surrounding community. However, this raises concerns for farmers that they will lose their livelihoods and cause food problems in Indonesia.

**Keywords:** Dramaga, Infrastructure Development, Land Use Change

## 1 Introduction

The conversion of agricultural paddy fields into non-agricultural lands in developing countries is in the process of transforming their economic structure and increasing population growth so that the demand for food needs is quite high. Economic growth demands the development of infrastructure, such as roads, industrial buildings, service buildings, and settlements. As a result, the demand for land for infrastructure and settlement development is increasing so that many paddy fields are converted. On the other hand, land conversion is not necessary because of the need to meet the food demand of the Indonesian people in rural and urban areas. One of them is the fulfillment of food needs in Dramaga Village.

Dramaga Village is a village in Dramaga District, Bogor Regency, West Java. This village has an area of 12.1  $km^2$  which consists of 2 hamlets with 7 Pillars of Citizens and 27 Rukun Neighbors (BPS Kab Bogor, 2020). Dramaga Village is located at an altitude of 192 meters above sea level which means it is included in the lowland area. To the north it is bordered by Babakan Village, to the south and west by Sinarsari Village, and to the east by Margajaya

Village. Dramaga Village has the largest population density compared to other villages in Dramaga District, which is 11,134 people/ $km^2$  with a population of 13,472 people.

According to data from Bogor Regency, the land use of Dramaga Village is dominated by settlements and public facilities, such as sports fields, schools, and health services. This is due to the large population that requires a large living area and facilities that can support the lives of its residents. Meanwhile, a small part of the remaining land is used as rice fields and fields by the residents of Dramaga Village.

The rate of land conversion in Dramaga Village is getting out of control. This is indicated by the existence of developments, including restaurants and housing, in rice fields. The existence of this land conversion affects food security in Indonesia. According to Adimiharja *et al.* (2004), the decline in rice production due to the conversion of paddy fields still cannot be balanced with efforts to increase the expansion of paddy fields outside Java [1]. Based on empirical data, the higher the productivity of converted paddy fields, the higher the losses incurred. This loss is in the form of loss of opportunity to produce rice between 4.5-12.5 tons/ha/year [1]. This calculation is based on rice production opportunities, not taking into account social, cultural and environmental losses.

The government has established regulations or laws relating to the issue of agricultural land conversion. However, land conversion control is still not optimal until now because the problem is too complex and not supported by adequate data so that its implementation cannot run effectively. There are at least 12 regulations that discuss land use change, most of which discuss the prohibition on the conversion of technically irrigated rice fields. This means that this regulation cannot be applied to rice fields that are not technically irrigated, such as simple irrigated and rainfed rice fields. In this case, it means that it will be possible for someone to change the function of land by conditioning irrigated rice fields to be non-irrigated.

Based on the explanation above, land conversion is indeed difficult to control, but in fact it can be minimized if there is a strong commitment from the government and the community. Therefore, researchers are interested in conducting an analysis related to land use changes in Dramaga Village to find out the driving factors or causes and their impact on the community in Dramaga Village, Dramaga District, Bogor Regency, West Java.

### **1.1 History of Land Use in Dramaga Village**

During the Dutch period, Dramaga was inhabited by the Van Motman family. Van Motman himself became a clan with the founding father of a landlord named Gerrit Willem Casimir (GWC) Van Motman. Van Motman was born on January 17, 1773 then died in Dramaga on May 25, 1821. Van Motman joined the VOC due to the French invasion and sailed to the Dutch East Indies and then started his career as an administrator of the VOC warehouse in Buitenzorg (the name of the city of Bogor during the Dutch period). Shortly after the VOC went bankrupt Motman became a landlord with a total ownership area of 117,099 hectares covering the areas of Semplak, Kedong Badak, Roempin, Tjikoleang, Trogong, Dramaga, Tjampea, Djamboue, Nangoeng, Bolang, Djasinga, Pondok Gedeh, Pasar Langkap and Rosa in the Gunung Preanger, Tjikandi Ilir and Tjikandi Oedik in Bantam. Until now his house is still standing in Dramaga called Groot Dramaga or Big Dramaga.

Long story short, in the 18th century Dramaga was once a coffee, sugar, tea and rubber plantation. Tea plants that live at an altitude of 500-1200 meters above sea level, then rubber grows in the lowlands at an altitude of 200 meters above sea level and Dramaga itself is located at an altitude of 244 meters above sea level. The two plants that were supposed to live in very different places could thrive in Dramaga. It indicates that our land is indeed fertile so that any tree can grow regardless of height. In contrast to what is happening now, the changing times have brought major changes to the Bogor city area, including the Dramaga District and Dramaga Village. Currently, the development of infrastructure and residential areas dominates the Dramaga area, both in urban and rural areas. Agricultural land conversion and land use change also change over time. Even today's tea plantations don't want to thrive in the hot Dramaga and famous for its traffic jams.

## **1.2 Concept of Land Use**

Governance has the meaning of rules (usually used in compound words); regulations or instructions on how to build; land use rules or systems; environmental arrangement [2]. Land is land that already has owners, both institutions and individuals [3]. Land use is a form of arranging, regulating, simultaneously using land for human activities based on rules and regulatory systems [3]. Then, in Government Regulation No. 16 of 2004 concerning Land Use, it outlines the conclusion that land use means the control, use and utilization of land in a consolidated form through institutional rules related to land use as an order for the benefit of the community fairly.

Land has a very important role for living things, especially for humans. Land is part of the earth that has its own function and character with its natural wealth, so that human activities cannot be separated from different land functions [4]. Arsyad (1989) defines land as part of the environment that has climate, relief, soil, water, vegetation and everything on it as long as there is an influence on land use [4]. Therefore, land use has a dominant role and function in social life. Any transactions that occur on the land will determine the life and patterns of the people around the land.

The results of researcher showed that the land use arrangement in Gorontalo City resulted in changes in community patterns [2]. One example is on Attorney General Soeprapto Street which is an educational area. The level of congestion that occurs is due to the lands around the area that do not have parking spaces. So that congestion occurs in the area due to reduced road capacity. Based on the results of these studies, land use planning that is not well targeted can have a significant impact on the community.

## **1.3 Agricultural Land Conversion and Its Effect on National Food Sustainability**

The decreasing availability of agricultural land due to the conversion of agricultural land into non-agricultural land into residential and industrial areas is currently being discussed a lot. These changes have had a significant impact on the country's food security. Farming communities who initially cultivated their agricultural land to produce food began to switch professions after various land conversions were carried out regularly, and the production of agricultural products also slowly decreased along with the increase in land conversion that occurred in Indonesia.

Currently, the main problem in food security is the conversion of intensive paddy fields to non-agriculture, especially for road infrastructure, airports, offices, housing and industry [5]. Land conversion has very negative impacts when viewed from an economic, social and even environmental point of view. Based on data in 2017, the area of raw rice fields was 7.75 million hectares, and in 2018 it was reduced to 7.1 million hectares (BPS, 2018). The reduction of 0.64 hectares is of course due to land conversion. The fact is that farmers' family land tenure is currently very small. For example, on the island of Java, the average ownership of agricultural land only ranges from 0.2-0.3 hectares per household.

The rate of growth of an area causes an increase in population along with the rate of development of an area and is of course closely related to the increasing need and allocation of land for various activities [4]. The increase in population is also one of the triggers for the current rampant conversion of agricultural land. The goal is none other than for human needs themselves. Although food is also a primary need, if we look at the rapid population growth and not accompanied by regional expansion, there will be one option that must be given up. For example, the reduction or conversion of agricultural land into settlements due to the need for human habitation is currently more needed.

It is estimated that in 2045 the shrinkage of rice fields will end at 5.1 million ha [6]. The rate of land conversion will be higher outside Java than in Java. Land conversion carried out outside Java is allocated for the construction of public facilities and housing. The fate of Indonesia's agriculture and food is threatened due to the population explosion in the next few years. Several alternatives that can be applied to address the fulfillment of food needs, especially rice as a staple food and demand for fish, can be intensified by optimizing the existing land and implementing integrated agriculture such as cultivation methods that integrate rice and fish to meet the nutritional needs of the community [7].

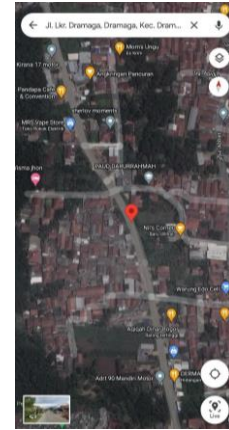
## **2 Method**

The research uses a qualitative approach, namely with the assistance of direct field research which is investigated by describing the current subject or object of research based on the facts that appear or as they are. In the process of compiling research, researchers go directly to the field to obtain issues and phenomena that exist in the field for later processing in research analysis. Retrieval and data collection used several ways, namely, observation, interviews and documentation. Informants were taken from several communities and farmers in Dramaga Village who have been living for a long time. In addition, some secondary data that had existed previously from the literature study were also collected. The data analysis technique used in this study is a qualitative data analysis technique, namely data collection, data reduction, data presentation and conclusion drawing. After that, the presentation of the data obtained is presented in written form which is a general description of the conclusions of the research results.

This research on land use change is located around Dramaga Village, West Bogor, especially in areas that are directly related to where land conversion occurs based on changes in activity patterns and developments in the area. Precisely the research is located on the Lingkar Dramaga Street. The time of the research starts from April 20, 2022 to May 20, 2022. The selection of this location uses the consideration that Dramaga Village is one of the areas experiencing land use changes.



**Fig.1.** Dramaga District Map



**Fig. 2.** Research Locations

### 3 Result and Discussion

#### 3.1 Causes or Drivers of Land Use Change in Dramaga Village

Over time, changes in the function of paddy fields in Dramaga Village are increasingly being used as non-agricultural land. It can be compared from the use of land a few years ago around the Dramaga ring which was previously used for rice fields and currently the construction of the ring road has narrowed the rice fields in Dramaga Village. The construction of the new access road that started about three years ago is a rice field owned by a corporation that is rented by local farmers, then they use it to cultivate rice for the needs of their family. The construction of Lingkar Dramaga street from the economic, transportation and trade perspective is considered profitable in terms of distribution access. But from the other side, looking at agriculture, it may be very detrimental because the impact on land is getting narrower and then it will have an impact on decreasing rice production.

Land use patterns reflect the human activities of the areas that support them. The higher the community activity, the faster the changes in land use will occur [8]. Population growth in this case is very influential on changes in land use. Some people need road access to make it easier to get to where they want to go. Likewise, the number of residential areas that are now being built is the impact of population growth. In the process, changes in agricultural land use are always related to the expansion or expansion of urban areas as a physical manifestation of the urbanization process of the Dramaga area. Based on Peraturan Daerah Kabupaten Bogor concerning the Bogor Regency spatial planning in 2005-2025 in article 56 paragraph (5), namely road management carried out for public welfare and security defense. The regulation may be useful to the local community who really feel the benefits of using the new road. However, not to farmers who are increasingly worried about abandoned rice fields due to infrastructure development.

If you look again at this time, the rice fields in the Lingkar Dramaga Street have a lower position than the road. According to a source named Mr. Suhada as a smallholder farmer, in the past the road was a rice field whose position was still parallel to the rice fields on the left and right sides of the road. Mr. Suhada does not know for sure how the land changes into roads is the agreement between the farmers who own the rice fields and the government regarding the construction of the road. However, it can be concluded that the road was built on land that used to be rice fields as an element of deliberate action by the government to be used as road infrastructure to reduce congestion in Dramaga. The government built a road from Laladon Terminal to Duta Berlian Hotel, which was previously a rice field owned by local residents.

In general, land is obtained by someone by buying and selling. Buying and selling land is a form of transfer of rights that often occurs in society. The transfer of ownership rights to land can also be carried out through hereditary inheritance, granting a will or exchange. Apart from acquiring land because of these things, a person who does not have enough money to buy land or needs land but only for a short term (a certain period of time), can acquire land through land lease or land contract system. The land contract system is implemented to take advantage of land without the need for land ownership. With this land contract system, people who have limited capital but have the ability to cultivate land or farm can be helped in meeting their economic needs.

The land contract system was found at the research site with a rice field agro-ecosystem. According to a presentation by one of the farmers in Dramaga Village, Mr. Suhada, he manages a rice field plot which has an area of about 500 square meters. The harvest is not sold but is used for daily needs. Mr. Suhada also explained that the agricultural land rented by Mr. Suhada and other agricultural lands were owned by someone from Yogyakarta. A person who rents out land is usually a land owner who is unable to work on his own land for some reason or someone who buys the land with the aim of obtaining additional benefits by alternatively renting out the land. Mr. Suhada also said that all the rice fields on the Lingkar Dramaga Street are owned by the same person and the farmers who take care of the rice fields are sharecroppers. The fee that Mr. Suhada has to pay to the land owner is 8 million rupiah each time he harvests. In general, the size of the land rent value is influenced by several factors, including: land class, type of land, types of plants cultivated, fertility and payment system. The higher the land class, the level of fertility (proxied from land productivity), and the economic value of the cultivated plants, the higher the land rent will be.

Based on Mr Suhada's explanation, previously the land he worked on belonged to the indigenous Dramaga community. However, the existence of an inheritance system that divides land causes the land cultivated by the heirs to be narrower so that the income generated from farming is getting less and less. Because of this small income, working on the land is considered ineffective by the heirs and in the end the land will be sold to other parties. The other reason is because no one wants to work on the land anymore or wants to get a lot of money instantly. Mr. Suhada also said that people nowadays tend not to be separated from technology and want to live comfortably so they don't want to work in agriculture anymore. Therefore, the local community sells it to the current land owners (Yogyakarta people). The construction of the Lingkar Dramaga Street in Dramaga Village has changed the shape of the land around the road so that there is land that is no longer cultivated by farmers so that the land is also sold. The land beside the Lingkar Dramaga Street was built for economic activities, such as the Restaurant Sawah Abah Bogor.



**Fig.3.** Agricultural Land



**Fig.4.** Sawah Abah Restaurant

According to the results of an interview with Mr. Hari as the leader or direct person in charge of the Restaurant Sawah Abah Bogor, the restaurant was built because of the new road so that the area is often traversed by many drivers, especially people from outside Bogor, like Jakarta. It is expected that the restaurant can be crowded with visitors. Its strategic location and the presence of rice fields around it, further support the reasons for building a restaurant in the area.

### **3.2 Impact of Land Use Changes in Dramaga Village**

Land use changes in Dramaga Village certainly have an impact on the surrounding community. The existence of a new road that used to be agricultural land has a sustainable impact on agricultural land around the land. One of them is the construction of the Restaurant Sawah Abah Bogor on agricultural land. The impact of this change certainly has a positive and negative impact.

Based on the results of the interview with Mr. Hari who is the person in charge of the Restaurant Sawah Abah Bogor field, he conveyed several points. First, the restaurant opens job opportunities for local residents, one of which is a parking attendant or security guard who is a native around the restaurant. In addition, the restaurant has also opened a *part time*, but it is not clear whether the system is open to the public or only for local residents. If you pay attention to this, it is a positive impact. Mr. Hari said, if in the next 3 months there is an increase in visitors, then land expansion will be carried out and it is very likely that the rice fields around the restaurant will be converted by following appropriate operational standards.

However, according to Mr. Suhada as a smallholder farmer around the Restaurant Sawah Abah Bogor area, he actually said something different from Mr. Hari. Based on his confession, they themselves did not accept the invitation to work at the restaurant. The land he has managed for 40 years is only a plot and the results are still sufficient to meet household needs. Currently the existence of the restaurant has not affected the farmers in the vicinity. Irrigation conditions are also still safe, there are no obstacles at all. As far as carrying out agricultural activities, there are contributions from farmer groups and also the government. However, the land is getting narrower and some farm workers are starting to lose their jobs and have to switch to other jobs.

As for the results of an interview with a security guard at Restaurant Sawah Abah Bogor, Mr. Romi said that the existence of this restaurant had a positive impact. The Lingkar Dramaga Street is increasingly crowded by residents from outside the village so that it can have an

economic impact on the residents. He also said that Restaurant Sawah Abah Bogor gave a job to him who was out of work because his business went out of business during the pandemic. According to Mr. Romi, the Restaurant Sawah Abah Bogor also invited local orphans at the restaurant's opening. This certainly has a positive impact on him and the residents.

In this case, there are two perspectives in the results of this interview. First, the restaurant itself feels the benefits of running the business and can have a positive impact on the local residents. Likewise with Mr. Romi as a security guard at Restaurant Sawah Abah Bogor who felt the positive impact of the restaurant. Then from the farmer's perspective, the existence of a restaurant that has only been running for about a month has not had any impact, either positive or negative. However, the existence of this restaurant causes concern for smallholders because they may lose their jobs if the land owner sells his land to the restaurant. Currently, the impact is not visible, but in the future there will definitely be a clearly visible impact.

#### **4 Conclusion**

From the results of the research analysis above, it can be concluded that there is a change in land use in Dramaga Village, Bogor Regency, West Java. Changes that occur in the form of agricultural land into settlements, restaurants, and road infrastructure. Based on the results of research in Dramaga Village, it was found that agricultural land was inherited to the heir and sold by the heir to another party for several reasons, including: (1) small inheritance land, (2) income obtained from working on the land was small, (3) not there are heirs who want to work, (4) the desire to get a lot of money instantly, and (5) the desire to live comfortably. The construction of road infrastructure in Dramaga Village aims to reduce congestion in Dramaga. This was followed by other developments, such as Restaurant Sawah Abah Bogor, because its location can be easily reached by vehicles.

The impact of the change in land use is that agricultural land becomes increasingly narrow, causing concern for smallholders because they have to look for other livelihoods. In addition, the narrowing of agricultural land will cause food problems. On the other hand, development in Dramaga Village has had a positive impact on local residents. This is because the village is becoming more and more crowded and contributes to economic benefits, for example the Sawah Abah restaurant, Bogor, which recruits local residents to work in the restaurant as security guards, parking attendants, or restaurant waiters.



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