

Analysis of Land Conversion and Its Impact on Tenurial Changes in Cikarawang Village, Dramaga

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Abstract. Land and tenure change is a complex phenomenon and has a significant impact on environmental sustainability and community welfare in various regions. This research aims to identify agricultural land conditions and changes in Cikarawang Village, analyze tenure patterns in Cikarawang Village, and examine the impact of land conversion on tenure changes in Cikarawang Village. This research uses a qualitative approach, with primary data collected through interviews and observations, as well as secondary data from relevant literature. The research results show that the conversion of agricultural land into other infrastructure such as residences, restaurants and life-supporting buildings in Cikarawang Village occurred because the village's location was considered strategic and close to state universities. This caused foreign parties to start entering the tenure system of Cikarawang Village. Therefore, effective policies are needed to manage tenure changes and maintain a balance between development, environmental sustainability and community welfare in Cikarawang Village.

Keywords: Agricultural, land conversion, tenure.

1 Introduction

Indonesia's population continues to increase every year. By mid-2024, Indonesia's population is expected to reach this figure 281,603.8 million people, up from 278,696.2 million people in 2023 (BPS Data, 2024) which places it as the fourth largest country in the world today after China, India and America (reported from World Population Review, 2024). This increase in population causes land reduction and narrowing space for movement because humans themselves are an inseparable part of the ecosystem [1].

As an agricultural country, many Indonesians still rely on agriculture as a source of daily income. According to BPS Agricultural Census data, agricultural business households in Indonesia reached 28,419,398 households and there are as many as 27,799,280 farmers using agricultural land in Indonesia in 2023. With these large numbers, Indonesia has great potential in the agricultural sector. Farming productivity by increasing the rice harvested area can be a way to optimize the agricultural sector, but this is difficult to do because of limited natural resources, especially rice fields which tend to decrease due to being converted to non-agricultural use [2]. Data from BPS shows that the area of rice fields in Indonesia has experienced a significant downward trend from 2012-2015. In 2012, the area of rice fields in Indonesia was as large as 8,127,264.00 hectares and has continued to decline over the years until 2015 when it became 8,087,393.00 hectares. This decline must be considered because it threatens food security and independence if not addressed comprehensively [3].

Ownership and use of land is related to tenure. Tenure is a concept that talks about the relationship between actors regarding the use of natural resources, including who can use what, how, what binding conditions and how long these rights are granted [4]. Land and tenure change is a complex phenomenon and has a significant impact on environmental sustainability and community welfare in various regions [5]. The ownership and use of a land is related to tenure. Tenurial is a concept that talks about the relationship between actors related to the use of a natural resource, including who can use what, how, conditions that bind anything to how long the right is [6]. Land and tenure change is a complex phenomenon and has a significant impact on environmental sustainability and community welfare in various regions (Kusdiane *et al.*, 2019). The phenomenon of agricultural land conversion has caused a wide and diverse impact, both economically, socially, and environmentally. Land conversion is the process of changing land use from one use to another, for example non-agricultural such as residential areas [7]. In the context of Cikarawang Village, land conversion can occur in response to various factors, such as urbanization pressures, the need for infrastructure or changes in the consumption patterns of local communities.

Basically, tenure change refers to changes in the ownership, use, or control of land and related natural resources. Changes in tenure can affect the social and economic position of local communities as well as the distribution of wealth. The high rate of land conversion and its impact on tenure change requires an in-depth analysis to understand the factors driving such changes and their impact on environmental sustainability and social well-being of the community in Cikarawang Village. Effective management requires a thorough understanding of the dynamics of land conversion and its impacts, as well as the active involvement of various stakeholders in formulating appropriate policies [8]. By considering the theoretical framework and related research findings, this research aims to conduct a comprehensive analysis of land conversion and its impact on tenure changes in Cikarawang Village, Dramaga. Through a qualitative approach by utilizing primary and secondary data, interviews with stakeholders and literature studies, it is hoped that this research can provide a better understanding of the dynamics of change occurring in this village.

2 Background Theory

Agriculture. According to Kassie (2016), Agriculture is an activity that utilizes natural resources with the aim of managing and producing agricultural products. Agriculture can be

understood in two contexts, namely narrow and broad [9]. In a narrow sense, agriculture refers to smallholder farming which only includes crop cultivation. While in a broad sense, agriculture includes the utilization of living things both plants and animals, including livestock, fisheries, and plantations. Farmers carry out agricultural activities with the aim of increasing income through optimizing production results.

Given that many people are highly dependent on agricultural products, this activity must be carried out in a sustainable manner. Agricultural products can be obtained through various subsectors. There are five sub sectors in agriculture, namely the food crop, horticulture, livestock, plantation, and fishery subsectors.

Land Conversion. Land as one of the main elements in the production process has an important role as a source of agricultural products and the location of production activities. In the context of agriculture, especially in developing countries like Indonesia, the role of land as a production factor is crucial. This can be seen from the high returns obtained from land use compared to other production factors, indicating the importance of the contribution of land in the agricultural sector.

Land conversion is the process of changing land use from its original function to another function that has a negative impact on the environment [10]. Land conversion, which means a change or adjustment of land use, is generally caused by several main factors, such as the need to meet the demands of a growing population and expectations for a better quality of life. This process can include changes from agricultural land to non-agricultural land, such as industrial, residential or infrastructure areas. Land use change from agriculture to non-agriculture is an important concern given the community's dependence on the agricultural sector [11].

According to Lestari (2009), the process of conversion of agricultural land to non-agricultural uses is caused by several factors [12]. There are three important factors that cause the conversion of paddy fields, namely:

1. External Factors: It is a factor caused by the dynamics of urban growth, demography and economy.
2. Internal Factors: This factor looks more at the side caused by the socio-economic conditions of land-using agricultural households.
3. Policy Factors: This is the aspect of regulations issued by the central and regional governments related to changes in the function of agricultural land. Weaknesses in the regulatory aspect or the regulations themselves are mainly related to the problem.

Utomo said that land conversion can be permanent or temporary (Sulistyawati 2014). If technical irrigated rice fields are converted into residential or industrial areas, the change is permanent. However, if the land is converted into sugarcane plantations, the change is temporary because the land can still be returned to paddy fields in the following years. The impact of permanent land conversion is generally greater than that of temporary land conversion.

Tenure and Tenure Systems. According to Bruce (1998) tenure is the conditions attached to control over something (land). The rights and obligations attached to those who control and/or hold land. The notion of tenure must be distinguished from the notion of ownership. A person can have tenure over certain land without having to own the land [13].

According to Larson (2013), land tenure relates to who owns, utilizes, manages, and makes decisions about land resources [14]. Land tenure determines who is given the right to use certain resources, how they are used, how long they are used, and under what conditions. In addition, it also regulates who has the right to transfer these resources to other parties and what the transfer process is. Land tenure system refers to the legal arrangements and relationships that govern rights to land and natural resources, including the ownership, management and utilization of such land and resources. The concept covers aspects such as ownership, use and transfer of land rights.

The tenure system is the overall form of tenure recognized under state legislation or local customary rules (Bruce 1998). The following are forms of tenure under tenure systems:

1. Private Property: Assets owned by private/non-governmental individuals or groups
2. Public Property: Assets controlled by the government
3. Common Property: Shared control over natural resources.

The definition of Property refers to a set of rights attached to an object or land.

3 Research Method

This research uses a qualitative approach that combines primary and secondary data. A qualitative approach is qualitative research carried out with a research design whose findings are not obtained through statistical procedures or in the form of calculations, but rather aims to reveal phenomena holistically-contextually by collecting data from natural settings and utilizing researchers as key instruments [15]. In Cikarawang Village, Dramaga, Bogor Regency, research was conducted in May 2024, choosing to focus on the Association of Farmer Groups (Gapoktan) and Village Heads who play an important role in guiding and supporting local farmers. The decision to choose Cikarawang Village as a research location was driven by its proximity to the research and academic center, namely IPB University, which can influence the structure and mobility of the community. The technique for determining sources in this research utilized snowball sampling, which is a non-probability sampling method (samples with unequal probabilities). Snowball Sampling is a way of taking samples from a population, where the initial sample will recommend subsequent samples. In other words, snowball sampling is a procedure for taking samples in a chain (multi-level) manner [16].

The main speakers consisted of the Chairman of the hamlet, the Chairman of Gapoktan, and the Independent Farmers of Cikarawang Village. The researcher uses interview techniques to obtain various perspectives from the speakers, which are then analyzed according to the research objectives and formulated problems. In processing and presenting data, this research uses descriptive methods to provide an overview of the conditions of the research location and the public's perception of it. The descriptive method is a method that can provide a description of events and explain the relationship between variables, making meanings and implications regarding the results of data collection [17]. This research also uses a qualitative approach, which is an approach with a method of interpreting a phenomenon both from the actors involved and the results of their actions. A qualitative approach was used to describe the condition of Cikarawang Village, starting from geographical aspects to the views of the local community, with the support of secondary data which serves as a guide for planning further research steps. In addition, quantitative data is also used to provide a more detailed and accurate picture through

the numbers available in the research. Thus, the qualitative approach in this research provides an in-depth understanding of the phenomenon under study and its overall context.

4 Research Result

4.1 Demographic and Geography Conditions

Cikarawang Village is a village in Dramaga District, Bogor Regency, West Java with an area of 226.56 Hectares. Judging from the topography and contour of the land, Cikarawang Village is generally a plain with rice fields, at an altitude of around 193 meters above sea level. The average temperature ranges from 25 to 30 degrees Celsius. Cikarawang Village has a supportive and good social environment for the agricultural system. This can be seen from the agricultural sector which is one of the main incomes of the local community, especially in the production of sweet potatoes. The activities of the Joint Farmer Group (Gapoktan) which are still rooted to this day also proves the importance of the agricultural sector in the Cikarawang Village community.

In terms of demographics, Census data in 2022 shows that the population of Cikarawang Village is 9,588 people, with almost equal gender percentages, namely 4,957 males and 4,631 females. This figure has increased from the previous year, namely 50 people. This shows the mobility of the population is still active in Cikarawang Village.

4.2 Economic Conditions

Economics plays a crucial role in people's lives in that it can determine the level of social status and be a benchmark for a person, both positive and negative. This situation has encouraged awareness for the residents of Cikarawang Village to seek income to support their families, children, and spouses. Most of them have vehicles in the form of public transportation (Angkot) which are used as additional income and others work as Civil Servants (PNS).

Table 1. Livelihoods of Cikarawang Village Residents

Livelihood	2020	2021
Agriculture/rice fields	310	120
Farm	3	4
Fishery	2	-
Plantation	25	30
Trade	31	49
Home Industry	12	12
Hospitality	-	-
Service	-	-
Midwife	3	3
Farm workers	225	180
Private Labor	750	750
Civil Servants	180	180
Mechanic	3	3
Retired	215	230

4.3 Changes in Agricultural Land in Cikarawang Village

The worsening change in agricultural land use is a phenomenon that threatens the agricultural system and life in Indonesia. Apart from making agricultural land scarce, the conversion of agricultural land also causes national food products to decline while food prices can increase. Changes in agricultural land also affect the balance of the ecosystem which is threatened with disruption, and farmers and farm workers will lose their source of income [18].

Agricultural land in Cikarawang Village has decreased. This is due to various factors, such as population growth and the existence of an educational institution, namely IPB University, which is only about 2.3 kilometers away. The existence of this educational institution has the potential to increase the number and needs of population settlements. Population growth accompanied by efforts to provide housing has the potential to cause an increase in land conversion [19].

The existence of IPB University resulted in changes in infrastructure and changes in land use, where areas previously used for agriculture were now converted for development such as boarding houses, housing, cafe, and other facilities. The absence of strict regulations regarding land conversion also increases the number of agricultural land conversions. According to the chairman of Gapoktan Mandiri Jaya, as many as 78 hectares or a third of the total land originally used for agriculture is starting to decline.

“When I previously signed documents with the Regent, the total agricultural land in Cikarawang Village reached 78 hectares, but now it has decreased.” (Mr Akhmad, Head of Gapoktan Mandiri Jaya, Cikarawang Village, 7/5/2024)

The conversion of agricultural land in Cikarawang Village has led to a reduction in agricultural area, changes in socio-economic aspects, instability in food supply, and loss of local knowledge related to traditional agriculture [20]. According to one of the farmers in Cikarawang Village, initially Cikarawang Village had large and fertile rice fields, but now many of them have been reduced and converted into land for buildings.

In the past, there were many rice fields here, many students conducted research here, now the rice fields have been replaced with buildings” (Mr. Nyubadi, Cikarawang Village, 7/5/2024)

4.4 Tenurial Patterns of the Cikarawang Village Community

History of the Cikarawang Village Tenurial System. Agriculture has become an inseparable part of Cikarawang Village. According to the Cikarawang Village Government, the name Cikarawang was taken from several families who lived on farming and had Gamelan instruments from Karawang which were often performed. When they no longer used them, the Gamelan instruments were buried so they would not be used again, which in the sense of the language they used at that time was "Jarang Mulang Cikarawang". Eventually this area became known as "Kampung Carang Pulang Cikarawang Village". With this history, agriculture seems to have become an inseparable part and has become embedded and ingrained in the local community.

Every community has its own way of utilizing the natural resources around them. In general, the tenure system is the methods, strategies, and patterns used by a community in managing its natural resources [21]. In accordance with its history, the tenure system formed by the people of Cikarawang Village emphasizes family relationships, especially between parents and children. This kind of relationship is commonly referred to as the inheritance system. The inheritance process is an activity of transferring ownership of resources from one generation to another to maintain and strengthen a family's traditions [22]. In the agricultural context, Parents who own agricultural land will give their children an inheritance in the form of agricultural land. His children will later manage the land, although it is not uncommon for someone to sell it.

"I am now a farmer and have land because my parents gave it to me" (Mr. Nyubadi, Cikarawang Village, 7/5/2024)

Cikarawang Village Tenurial System. Tenure refers to the requirement attached to the control of something, which in this context is land. According to the theory of John W. Bruce in his book entitled Land Law Reform, tenure is a number of rights and obligations inherent to actors in owning/controlling a land. The concept of tenure must be distinguished from the meaning of owning, because a person can actually have tenure over a piece of land without having to own it. From this explanation, it can be concluded that the tenure system is the entire form of tenure in accordance with applicable regulations, both state and local community regulations.

The tenure system in Cikarawang Village leads to private ownership (private property). Private ownership gives individuals the right to exclude/prohibit other parties from obtaining the flow of benefits from those resources and using them at a level or in a manner determined by the individual concerned [23]. The Head of Cikarawang Village in 2024 said that the agricultural land in Cikarawang Village was spread among many community members. This is supported by the statement from the Chair of the Cikarawang Village Gapoktan who also said the same thing. That way, the pattern of land ownership in Cikarawang Village, apart from the pattern of private ownership, also refers to the pattern of dispersion.

The culture of agricultural management in Cikarawang Village also has its own pattern. This can be seen from the agricultural affairs which will be handed over and managed directly by the Gapoktan. The Gapoktan, known as Gapoktan "Mandiri Jaya", is a unified agricultural production unit to meet market needs in Cikarawang Village. This Gapoktan consists of eight farmer groups spread across various regions in Cikarawang Village. The existence of this farmer

group can indirectly be used as an effort to increase farming productivity through simultaneous management because forming a group will be easier to achieve the desired goals compared to working alone or individually [24].

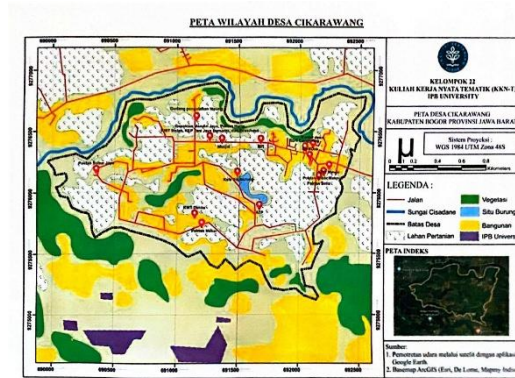


Fig. 1. Map of the Cikarawang Village Farmer Group Area

4.5 Impact of Land Conversion in Cikarawang Village

Impact of Land Conversion on Agricultural Land. Development is a stage towards better change. Development in the context of the state is actually oriented towards the community holistically to achieve common prosperity. In the development process, infrastructure which includes development supporting infrastructure is an important part of driving economic growth [25]. Therefore, infrastructure development is something that is being considered and is the focus of the government to build a better life, including Cikarawang Village.

On the other hand, development that leads to the modern era like today affects people's lifestyles, especially in terms of work. The modern era, which is characterized by technological advancements, provides opportunities for new sources of income for the community, optimizes productivity, and increases access to job opportunities [26]. This has resulted in many people leaving their areas of origin and turning away from derivative livelihoods, including the people in Cikarawang Village.

The people of Cikarawang Village began to leave the farm that had been in their family for generations. In cases presented by local farmers, it is not uncommon for agricultural land inheritance from farmer parents to their children to be no longer used for farming and end up being sold or converted. This system of inheritance and distribution of ownership can lead to land fragmentation. Land fragmentation is the process of separating agricultural land ownership into several parcels of land within a large area [27]. One example of land fragmentation is the existence of a system for inheritance and conversion of agricultural land to non-agricultural land. This inheritance system generally results in the fragmentation of agricultural land ownership [28]. This kind of land fragmentation phenomenon occurs in Cikarawang Village so that ownership of agricultural land is now starting to spread.

The Head of Hamlet 3, Cikarawang Village, said that currently there are people in Cikarawang Village who are converting their agricultural land into various businesses such as cafes,

boarding houses, housing, and others. This was done to support a new lifestyle that was starting to be adopted by the local community, especially because of the presence of non-local students living around Cikarawang Village. This has resulted in a reduction in existing agricultural land, although according to the Chairman of Gapoktan Mandiri Jaya, quite a few people still rely on the agricultural sector as their main livelihood and are enthusiastic about developing agriculture in Cikarawang Village, although some of them have begun to switch to developing other infrastructure.

Impact Land Conversion to the Tenurial System. The conversion of agricultural land to non-agricultural has an effect on the tenure system of a region. Agricultural land conversion causes a decrease in agricultural land, resulting in a decrease in farmers' access and rights to agricultural production [29]. This happened to the people of Cikarawang Village. Outsiders who have started to enter Cikarawang Village to build new businesses have become part of the tenure system and changed the rights of farmers. Although it had been approved, the existence of this outside party makes the tenure system that initially leads to private property owned by local residents into private property owned by local residents as well as parties outside the village.

Apart from influencing land ownership patterns, land conversion also affects the tenure system in social, cultural and economic aspects. Land conversion threatens food independence, the search for sources of income, the waste of irrigation investment, the equitable distribution of welfare, and the establishment of the social structure of the community [30]. In the case of Cikarawang Village, land conversion resulted in the expansion of opportunities for other sources of income outside of farmers which resulted in the type of wealth changing from what was originally agricultural land to other forms. This has an effect on the fading of the inheritance system in the form of agricultural land. Regarding this change, Nyubadi (59 years old), a local farmer, regretted the potential possessed by Cikarawang Village. Since the change in tenure, the quality of natural resources such as irrigation and soil fertility has begun to decline and even existing communities have gradually turned from agriculture to other industries. This causes fewer young people to want to continue farming.

Impact of Land Conversion and Policy Changes. Development based on community participation has now become a policy that has been established for agricultural development planning. Through community participation, planning and design decisions can be made based on community needs, priorities and affordability which often results in better and more realistic designs, plans and programs [31]. Sustainable agriculture has become an important issue in current development. This is because it is closely related to the increasing rate of agricultural land conversion, so food agricultural land must receive more attention. Related to policy, one of the strategies that the government can use to prevent the conversion of agricultural land is by including community participation or the commonly called the Land Tenure System method [32]. Furthermore, Kami and Yulianah (2016) also explained that according to Pearce and Turner in their book entitled *Economics of Natural Resources and the Environment*, the Land Tenure System method is a way of management through the improvement of the land purchase and selling regulations and land tenure patterns as an effort to maintain the existence of agricultural land carried out by stakeholders or parties with authority.

The successful implementation of the Land Tenure System method must be accompanied by the implementation of other methods, such as the Regulation and Incentive and Charges methods. The Regulation Method is a preventive step for the transfer of agricultural land

functions carried out by policymakers to establish various rules related to land use by considering supporting factors such as technical, economic, and social. Based on these three considerations, a clear and transparent licensing mechanism is made by involving all existing stakeholders after the zoning of land that is likely to be converted. Whereas Incentive and Charges is a method that can be used by the government by providing a number of subsidies or incentives to farmers who can optimize and improve the quality of their land. This method can also be done by providing profitable tax incentives for farmers who are trying to maintain their agricultural land and providing supporting facilities and infrastructure so that their agricultural outputs can increase.

5 Conclusion

This research explores the impact of agricultural land conversion on the land tenure system in Cikarawang Village and finds that significant changes have occurred as a result of infrastructure development. The previously large agricultural land has been converted into non-agricultural areas such as housing, restaurants, and other facilities, mainly driven by the village's strategic location which is close to IPB University. This phenomenon results in a decrease in the area of agricultural land and affects the welfare of the community. The agricultural sector, which was previously the main source of income, experienced a significant decline and shifted to other sectors that focused on infrastructure and development.

To overcome this problem, better and more inclusive land management policies are needed. Such policies should include a community-based approach to preserve the remaining agricultural land, as well as clear regulations regarding land use and incentives for farmers. Implementing a land management system that involves all stakeholders can help maintain a balance between infrastructure development and environmental sustainability, while supporting the welfare of the Cikarawang Village community.

Therefore, active involvement of various stakeholders, including government, local communities, and the private sector, is essential in formulating and implementing sustainable land management policies. Good collaboration between these parties will ensure that the land conversion process can be carried out by considering social, economic and environmental aspects holistically, thereby encouraging inclusive and sustainable development in Cikarawang Village.

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