

# The Impact of Agricultural Land Conversion into Residential Land on the Sustainability of Community Agriculture in Cihideung Udik Village

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**Abstract.** The rapid increase in population has increased the need of residential areas. The massive development has led to the loss of agricultural land in Cihideung Udik Village, Bogor Regency. This research aims to examine the impact of the agricultural land's conversion into residential areas, the adaptation strategies of the local community, and determine the governments' and stakeholders' roles in responding to this phenomenon. The research conducted was descriptive by using qualitative research methods. The conversion of agricultural land has impacted the reduction in the number of farmers, the loss of livelihoods, and the narrowing of irrigation. In the face of these changes, the head of the Gapoktan tried to develop edu-tourism to attract the younger generation's interest. This research recommends the government and stakeholders, who have not played a role in the situation, to make more comprehensive policies in balancing development and maintaining agricultural sustainability in Cihideung Udik Village.

**Keywords:** Adaptation strategies, land conversion, residential development.

## 1 Introduction

Indonesia is the most populous country after India, China, and the United States. Based on data from the Central Bureau of Statistics (BPS) 2024, Indonesia's population has reached 281.6 million people. Every year, Indonesia's population continues to grow with a population growth rate of 1.1% (BPS 2024). This increase in population has a direct impact on the increasing need for residential land. Population growth will be followed by an increase in housing needs, which will trigger land conversion [1]. Land conversion is the process of transforming the use of land resources to other forms of use [2]. Rice fields are the most vulnerable to conversion. This is because rice fields have a high population density, are located close to urban areas, have better infrastructure development patterns than in dryland

areas, and flat topography in rice fields accelerates the development of residential and industrial areas [3].

The reduction of agricultural land due to land conversion will affect the economic, social, and environmental aspects of the community in the region [4]. Agricultural land conversion often only provides short-term benefits for owners and cultivators. In the long term, the loss of productive agricultural land can threaten the economic sustainability of local communities. When agricultural land is taken, many farmers lose their livelihoods, leading to increased unemployment and triggering social problems [5]. The decline in farmers' welfare has also caused the younger generation to not want to continue working in the agricultural sector. The decline of farmers has caused social interactions based on agricultural activities to decline, shifting the characteristics of communal society to become more individualistic. Based on the results of Mariyani and Yusiana's research, the social activities of the community that are harmonious as a characteristic of a *gemeinschaft* society have begun to shift due to the conversion of agricultural land [6].

Agricultural land can function in flood and erosion prevention, controlling the balance of water systems, and reducing household waste pollution [7]. However, rice fields that are converted into residential areas have a great potential to eliminate the ecosystem function. Disrupted water availability due to land conversion can reduce the amount of agricultural production so it can cause losses among farmers. Lately, the need for land in an area has been very high, where land needs are triggered by rapid population growth, so land needs have increased [8]. The increasingly narrowing area of agricultural land due to land conversion into residential land, employment sector land, and diversion outside the production of food sources is increasingly threatening the needs of the community in the level of food consumption. This happens because there is a linear relationship between the increase in the community's economy and their food consumption needs, because the same thing was conveyed by Rusdiana and Maesya that economic growth is very influential on the growth of food needs, due to the increase in population and the increasing economic value in society [9]. Requires land erosion by converting agricultural land.

If the conversion of agricultural land is allowed to continue, many affected farmers will lose their main source of economic income to fulfill their needs or even their families [10]. If we see this, the narrowing of agricultural land will have a negative impact on the increasing food needs of the community, the availability of agricultural land for food production, and the economy of people who depend on agriculture. People's demands for their daily food consumption needs are thrown together with people's demands for the availability of residential land and decent jobs for them raising many notes for the government to fulfill their needs sufficiently. The government can reaffirm the policies it used to maintain and increase national food production capacity. One of them is to issue legal products aimed at controlling the conversion of agricultural land and improving the quality of agricultural land so that food productivity will increase. This is anticipated so that national food security can be realized and maintained [10].

One significant example of agricultural land conversion in Indonesia is the transition in Karawang Regency. The region that was originally dubbed as the "City of Rice Barns" is now known as a city that is densely populated with industries. In fact, the majority of the population used to work in the agricultural sector. The total area of rice fields in Karawang

Regency based on 2015 Central Bureau of Statistics (BPS) data specifically using irrigation is 92,595 Ha [11]. The rice fields are also supported by the availability of water from the Walahar Dam which is located in Klari District. The Soekarno administration designated Karawang as a national food barn and planned to establish a rice research institute and make massive investments in the agricultural sector. Currently, rice fields in Karawang Regency are under threat due to the development of the industrial sector in the area as well as threats from surrounding areas [12]. The influx of investors and the interests of non-local communities gradually began to erode agricultural areas to be diverted as land to fulfill economic needs that switched functions to industrial, trade, and service areas. This was caused by President Soeharto's decision to issue a presidential decree on the Development of Industrial Estates in Karawang Regency. That was when the history of Karawang Regency as an industrial city began. The impact of the narrowing rice fields will result in the rice industry being cut off and more and more residents switching professions from farmers to small traders, factory workers, motorcycle taxi drivers, or coolies.

Cihideung Udik Village is located in Ciampea Sub-district, Bogor Regency, West Java Province. Geographically, this village is located in a strategic area, which has become a target for residential development due to increasing urbanization. In recent years, Cihideung Udik Village has experienced a significant conversion of agricultural land due to the increasing demand for residential land. Based on data from the Central Statistics Agency (BPS), in 2021 the population of Cihideung Udik Village reached 17,229 people with a population density of 6,067 people per square kilometer [13]. Meanwhile, in 2016 the population of Cihideung Udik Village was recorded at 15,165 people, with a population density of 5,340 per square kilometer. From this data, it can be seen that there has been an increase in population density which is the main factor in massive land conversion in Cihideung Udik Village [14].

This rapid increase in population has significant consequences for the sustainability of agricultural land in Cihideung Udik Village. According to Village Potential Data in 2011, the main source of income for most residents was the agricultural sector [15]. However, in 2021 the main income of most residents shifted to the trade and services sector [16]. Therefore, research on the impact of the conversion of agricultural land into residential areas in Cihideung Udik Village is important to determine the social, economic, and environmental impacts of land use change on community agriculture in Cihideung Udik Village. This research also analyzes the adaptation strategies applied by the community after the conversion of agricultural land. In addition, this research provides an overview of the role of government and *stakeholders* in responding to the impact of agricultural land conversion in Cihideung Udik Village.

## **2 Methods**

This research is descriptive in nature with the method used is qualitative research methods. Descriptive research is research to describe independent variables, either one or more variables without comparing them with other variables [17]. A qualitative approach is a research technique that explains the meaning of certain social phenomena with the researcher as the key instrument to interpret every social phenomenon [18]. The qualitative approach makes it easy to collect and analyze data directly from the source and understand various

community perspectives on the phenomenon of agricultural land conversion in Cihideung Udik Village.

Data collection was conducted on August 21-23, 2024 and September 7-10, 2024 in RW 06, RW 09, and RW 13 in Cihideung Udik Village, Ciampea District, Bogor Regency, West Java. The research location was chosen deliberately with the consideration that the area has a lot of agricultural land that has been converted into residential areas so it makes an impact on the sustainability of community agriculture in Cihideung Udik Village.

The data used in this research are primary data and secondary data. Primary data was obtained through research activities in the form of observations and interviews. Direct interviews were conducted in-depth with Cihideung Udik Village Government Staff, the Head of Gapoktan, farmers who had converted their agricultural land, and the community affected by the conversion of agricultural land in Cihideung Udik Village. Respondents were selected through the *snowball sampling* technique, which is a sampling method in which the initial respondents who have been identified recommend or direct researchers to the next relevant respondents. Secondary data used as supporting data was obtained through existing documents and literature such as BPS data, village potential data, journals, or literature of previous studies related to this research.

### 3 Results and Discussion

#### 3.1 The Impact of Land Use Change on Community Agriculture in Cihideung Udik Village

Based on the results of the research, land conversion has various interrelated negative impacts, ranging from social, environmental, and economic impacts. The conversion of agricultural land into residential land has resulted in a reduction in the number of people who work as farmers. According to Mr. Edi, a local farmer,

*"When there were still many people farming, farmers often gathered to help each other, chatted in the fields, and even held meetings with outsiders to discuss agricultural issues. Now, farmers are few in number and most are elderly." (Edi, Cihideung Udik Village, 07/09/2024).*

From these remarks, it can be concluded that land conversion has lots of significant social impacts, especially in the lives of farming communities. These impacts include the reduction of socialization and mutual cooperation activities among farmers, as well as the potential for social conflict [19]. However, in Cihideung Udik Village, the conversion of agricultural land into residential areas did not trigger conflict, because the housing developer implemented an effective negotiation strategy. They sent workers to talk directly with the farmers, who eventually relented and agreed to sell their land.

Farmers who lost their land usually moved away and bought cheaper land elsewhere, or chose to stay by switching professions to the service sector, such as construction workers, drivers, or traders. These changes have led to a decline in the community's social activities due to job diversification and the displacement of natives, while the influx of migrants who tend to be

more individualistic has reinforced this shift. Ningsih and Rismawati's research showed that the shift in occupation makes people busier, so they have less time to socialize, which in turn leads to individualism in social life [19].

Before land conversion became massive, Cihideung Udik Village was dominated by rice fields. The loss of this agricultural land has caused serious environmental degradation. Research by Angraini *et al.* shows that the conversion of paddy fields can damage soil texture, pollute soil, water, and air, and reduce important environmental services [7]. This impact is particularly pronounced in Cihideung Udik Village, where water quality and quantity have declined dramatically. This not only disrupts agricultural activities, but also people's daily lives. The decrease in agricultural productivity due to environmental degradation is one of the consequences that is very pronounced.

The conversion of agricultural land into residential areas has also disrupted community welfare, especially in terms of the economy. In the past, as told by Mrs. Neneng, the residents of Cihideung Udik Village lived prosperously from agricultural products. However, with the reduction of agricultural land, the community now has difficulty meeting their food needs and is forced to look for work in other sectors. This is in line with Hendrawan's research, which shows that the narrowing of agricultural land has an impact on the decline in farmers' production and income [20]. Many farmers who originally owned their own land are now farm laborers or even unemployed. The head of Gapoktan, Mr. Cecep, also observed that land conversion has led to irrigation damage and instability in agricultural prices, further worsening farmers' conditions. The story of Mrs. Neneng, a resident of Cihideung Udik Village, clearly illustrates how the conversion of agricultural land has changed people's lives. In the past, their families lived prosperously from agricultural products. However, now they have to struggle to fulfill their daily needs.

### **3.2 Community Adaptation Strategies After the Conversion of Agricultural Land in Cihideung Udik Village**

In facing the negative impacts of land conversion, farmers in the Cihideung Udik community need to implement adaptation strategies to maintain their welfare. Adaptation strategies are individual or group efforts to survive in the face of social phenomena that occur [21].

Land conversion directly results in a decline in the welfare of farmers and cultivators. Because of this, the interest of the younger generation to continue farming is diminishing. That is why many agricultural lands are sold rather than continuing to be a source of income. To overcome this, Mr. Cecep as the Head of Gapoktan tried to motivate young people to continue agriculture in Cihideung Udik Village. Therefore, Mr. Cecep took the initiative to create an edu-tourism area to attract young people. However, this did not go smoothly due to a lack of attention from the farming community, government, and extension workers.

*"Together with the Head of Village, I utilized the empty land behind the Head of Village's house to be used as an edu-tourism area. The hope is that this edu-tourism can attract young people as well as prosper the farmers." (Cecep, Cihideung Udik Village, 21/08/2024).*

Around the 90s, Cihideung Udik village was known as a fertile agricultural area with vast farmland. The commodity grown by farmers at that time was mostly rice because the irrigation system was still supportive. Irrigation can increase the production of paddy rice farming by 3.98% [22]. Housing development results in the narrowing of irrigation so that there is a decrease in agricultural production, especially rice paddies. The lack of water due to the narrowing of irrigation has caused people to switch to planting secondary crops that are more suitable for planting on dry land. However, due to the increasingly erratic weather climate coupled with devastating food prices, the change of commodities still cannot increase farmers' income.

*"In the past, the RW 06 area was all planted with rice. But after many housing estates, we switched to planting sweet potatoes, cassava, and long beans. The water is getting less, so rice is no longer suitable for planting here." (Edi, Cihideung Udik Village, 07/09/2024).*

Along with the decline in agricultural welfare due to land conversion, the livelihood patterns of the farming community in Cihideung Udik Village also tend to be diverse. Farmers who sell their land will usually move and look for other sources of livelihood in their new place of residence. Meanwhile, farmers who decide to stay in the village mostly shift their professions to the service and trading sectors. According to 2011 Village Potential data, the main source of income for the people of Cihideung Udik Village is in the agricultural sector [15]. However, in 2021 the main source of income shifted to the wholesale and retail trade sector, car and motorcycle repair [16]. This is in accordance with the statements of all respondents that after the land conversion, they inevitably seek additional income by opening stalls, becoming construction workers, becoming drivers, or renting a place to live to help meet their daily needs.

### **3.3 The Role of Government and Stakeholders in Responding to the Impact of Agricultural Land Conversion in Cihideung Udik Village**

With the drastic changes that affect the community, especially those whose lives depend on agriculture due to land conversion in Cihideung Udik Village, this should provide awareness for the government and those responsible for the causes of these impacts. The government and stakeholders from agricultural institutions in Cihideung Udik Village need to carry out their roles to respond to the impact of agricultural land conversion on the welfare, economy, and sustainability of community life.

Mr. Cecep, the Head of Gapoktan in Cihideung Udik Village felt that he was given too much burden and was seen as responsible for all the problems to advance agriculture in Cihideung Udik Village. With this, he proposed several inputs to the government to drive a program that could make this happen. The Village Government then designed a Food Security program that was implemented in a grass field in RW 9 of Cihideung Udik Village, which would later be processed to create several plots of agricultural land, several plantation crops, and a place for animal management and livestock products.

The program has good potential to maintain food production and advance the quality of agriculture in Cihideung Udik Village. However, the major obstacle faced in the program is how the village government relies heavily on the active role of farmers, while the number of farmers in the village is decreasing and the regeneration of farmers from the youth is

dwindling. Despite such treatment, the government still pays little attention to the welfare of the farmers. The focus of the government is only on the implementation of the program such as the provision of plant seeds, livestock, and production tools of the Food Security program, without thinking about how to improve the welfare of farmers and make them willingly implement the Food Security program. According to Mr. Cecep, the Head of Gapoktan,

*"The government instead of providing their role, assistance, and mentoring to implement the Food Security program and the design of the Cihideung Udik Edu-tourism Village, they instead seemed to be handed off and let us farmers do all the work. As a result, the program has not been completed until now and the plan has not been implemented due to the lack of role of the government, stakeholders, and agricultural extension officers" (Cecep, Cihideung Udik Village, 21/08/2024).*

From the farmers' point of view, they need support from stakeholders, especially the extension workers who assist them in carrying out agricultural activities. The lack of the presence and guidance of extension workers has resulted in the slow development of agriculture in Cihideung Udik Village. This causes the regeneration of young farmers not realizing any benefits that they can get from working in the agricultural sector. The government has also not shown its support for agriculture by narrowing irrigation which results in the land drying out. Not only irrigation and the guidance of extension workers, special attention for farmers is also needed to ensure the welfare of the farming community and its agriculture. Many farmers depend on agriculture for their livelihoods, and if only they are encouraged and actively involved, the sustainability of agriculture in the village can be maintained, and their welfare will improve over time. Therefore, the government is expected to prioritize policies for the agricultural sector because the goal of development in food security is to ensure the availability and consumption of sufficient, safe, quality, and nutritionally balanced food for the community [23].

## **4 Conclusions and Suggestions**

### **4.1 Conclusions**

The conversion of agricultural land into residential in Cihideung Udik Village has a significant impact on the sustainability of community agriculture in Cihideung Udik Village, especially in terms of social, economic, and environmental aspects. The conversion of agricultural land has had an impact on the declining interest of the younger generation to continue farming in Cihideung Udik Village. This has also resulted in a decline in social activities based on the agricultural community. Community life, which used to be harmonious, has become more individualistic along with the loss of agricultural land and the influx of new residents. In addition, housing development led to the narrowing of irrigation, which had a direct impact on the decline in agricultural productivity. The decline in agricultural productivity then has an impact on the decline in community welfare.

The adaptation strategy carried out by the community is to increase income from other sectors or switch professions to the trade and service sectors. The head of the Gapoktan also took the initiative to create an agricultural edu-tourism area to attract young people while aiming to improve the welfare of farmers. Due to the lack of water and erratic weather climate,

commodities that were previously rice switched to secondary crops because they are more suitable for planting on dry land.

In the midst of a deteriorating situation due to the conversion of agricultural land, the village government pays little attention to the welfare of farmers. Support and assistance from both the village government and extension officers are minimal, so programs such as the development of eco-tourism and food security programs are not sustainable. A more comprehensive policy is needed from the government to ensure active support to farmers in order to maintain agricultural sustainability and community welfare.

#### **4.2 Suggestions**

To support the sustainability of agriculture in Cihideung Udik Village, the village government needs to make and implement regulations regarding the conversion of agricultural land strictly to prevent massive land conversion. The government must also guide and assist farmers so that they do not easily release their agricultural land, this needs to be supported by providing regional spatial planning in several sectors. With that, the government and the community can maintain areas designated as agricultural land and still support the growth of industrial, residential, and other sectors.

In addition, efforts are needed to increase the interest of the younger generation to work in the agricultural sector. This can be done by educating and providing ongoing training to create awareness of the importance of preserving agriculture. Programs such as eco-tourism initiated by the chairperson of the Cihideung Udik farmer group can be strengthened with the support of the government and extension workers to create awareness of the importance of agriculture in the future.



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