

## Land-Use Change on Community Livelihoods in Tanjung Urban Village, South Purwokerto

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**Abstract**— Land-use change is a condition when the land has changed in terms of its use. The factor that can affect land-use change is distance and long-stay of the community. Its distance could make a land-use change from the rivers and roads. Land-use change can affect the livelihoods of the local community. This study aimed to evaluate the way land is changed in Tanjung Village, from 2011 to 2017, and its impact on the livelihoods of local communities. At each predetermined sample point, we collected data by interview and direct observation. Determination of sample points using a buffer analysis on satellite imagery. Respondents were selected using the accidental sampling method. To illustrate how urban land functions have changed in Tanjung Village and analyze their impact on livelihoods using spatial descriptive comparative purposes. This research shows that there has been a land-use change in Tanjung Village that is influenced by a physical factor, which is the distance from the rivers and roads, not by a social factor, which is the long stay of the community. Distance from the river 0-100 meters serves as a buffer space ecosystem. Human activity and distance from the river are more than 100 meters the supply of irrigation water to the paddy fields decreases due to high pump costs that can affect the higher chance of land-use change. Land-use change also affects the livelihoods of the local community. 47% of the respondents claimed to have side jobs.

**Keywords**— Comparative descriptive analysis; land-use change; livelihood; Tanjung Urban Village.

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### I. INTRODUCTION

Land-use change is a condition when the land has changed in terms of its use. Land-use is an overall embodiment, mostly public life in space [1]. Land use is also interpreted as a form of human intervention to fulfill both spiritual and material life [2]. Agricultural land is land used for the agricultural business, aside from paddy fields and fields and all plantation land, fish ponds for an area where livestock grazing livestock, former bushland, and forest that become a livelihood for those entitled [3].

The land has an essential meaning for stakeholders who use it—the function of an area for the community as a place to live and a source of livelihood. The land is a source of food production and survival for farmers, while the private sector considers the land as an asset to accumulate capital. Meanwhile, the land is the sovereignty of a country and its people's welfare for the government. There are many interrelated interests in land use. Many interests overlap between actors, namely farmers, the private sector, and government land use [3]. Agricultural land can be turned into

various purposes such as settlements, company land, service land, or settlement land integrated with company land [4].

Complex interactions between environmental, social, and human activities and economic factors will trigger land-use change and land cover change [5]–[7]. Previous research has shown that social factors such as population growth encourage land use because the need for space for human activities will also increase [7], [8]. Population growth will affect people's livelihoods.

The term livelihood is related to what people do to make a living and the resources that give them the ability to build satisfying lives. The term also refers to the risk factors that they must consider in managing their resources and the institutional and policy context that helps or hinders them from pursuing or improving a decent life [9]. Livelihoods are the main work that humans do for life and the resources available to improving living standards, considering factors such as overseeing the use of resources, institutions, and political relations. In its development, a person's livelihood often changes either due to internal factors, external factors, or a combination of both [10].

In addition to social factors, socio-economic factors can also affect land-use change [11]. Distance from the road, distance from the river, and distance from the forest's edge are providers of facilities to reach socio-economic development [12]. Although these variables are not directly socio-economic factors, they can act as providers of the facility to access socio-economic development [12].

Socio-economic aspects are not merely factors affecting land use but also an aspect influenced by land-use change. Land-use change can significantly affect the socio-economic aspects of rural communities, especially farmers and the poor [13]. This is because land resources, in this case, is agricultural land, is closely related to the fate of the poor [14] as the influence on energy use [15], the structure of earnings [16], and livelihood [17]. Therefore, when land-use changes, energy use, income structure, and subsistence can also be changed [18], especially in livelihoods that depend on natural resources such as agriculture. Agricultural land will be threatened to improve its use and narrow due to socio-economic conditions and increase population growth. Furthermore, the threat also causes the need for non-agricultural areas to grow as well. The narrowing of agricultural land makes the structure of the people's livelihoods also change; because when agricultural land is getting narrower, the farmers will improve their livelihoods [19].

Several studies have examined the relationship between land-use change and livelihoods, one of which was a study conducted by Rahmi Faujiyah in 2013 [19]. This study aimed to analyze land-use change, analyze the development of land values, and know the land-use difference in changes in livelihood structure in Jatinangor District, Sumedang District. Data collection techniques are field observations, interviews, literature studies, and documentation studies in this research. The results showed that there had been a change in agricultural land use from 2002 to 2012 in Jatinangor District. Land-use patterns change to settlements, and this change can be seen from the increasingly narrow land available for agriculture. An increase in land prices but with different Urban Villages characteristics is causing differences in land prices in each Urban Village. With the narrowing of agricultural land, the structure of the population's livelihoods has also changed because agricultural land is increasingly narrowed so that farmers improve their livelihoods [19].

There was also a study conducted by Pangesti *et al* [20]. To determine changes in agricultural land-use on the local community's livelihoods in Purwokerto Utara District, Banyumas Regency in 2004 and 2013. The method used in this study is a field survey. Data collection techniques are done using the interview method. Data analysis was descriptive qualitative, and comparative descriptive using frequency, percentage, and comparative tables. This study showed a change in land use from agriculture to non-agriculture resulting in changes in the livelihoods from farmers to non-farmers in the District of North Purwokerto, Banyumas Regency [20].

Land-use Changes need special attention in rice-producing regions, bearing in mind that the decrease in paddy fields can affect the reduction of farmer livelihood, resulting in a decrease in rice production. Agricultural land and forests have to be protected due to the steady increase in the global

population and the associated demand for food, housing, work, and recreation [21], especially in developing countries. Land-use changes occur in many developing countries and tropical countries, and this is also a problem that becomes a severe problem in these countries, including in Indonesia [13], [22]. Many regions in Indonesia experience changes in land use, especially changes from agricultural land to non-agricultural land. One of them is Tanjung Urban Village, South Purwokerto District, Banyumas Regency. BPS (Central Bureau of Statistics) data shows there is a significant change from 2011 [23] to 2017 [24], namely a decline in paddy soil land area, and land for building increased. The irrigated paddy fields in the Urban Village in 2011 was 47.22, and in 2017 it became 38.00 ha. Building/grounds in 2011 amounted to 91.70 ha increased by 0.24 ha, becomes 91.94 ha in 2017. Therefore, this study aims to evaluate how land-use change in Tanjung Urban Village, South Purwokerto, in the period 2011-2017, and its effect on local livelihoods.

## II. MATERIAL AND METHOD

### A. Overview of Study Area

The research was conducted in Tanjung Urban Village, South Purwokerto, Banyumas, Central Java. Tanjung Urban Village is adjacent to the Pasirmuncang Urban Village in the north, Karangpucung Urban Village in the east, Kedungwaringin, and Karangpucung Urban Village in the south, as well as Pangebatan and Pasirmuncang Urban Village in the west. Tanjung Urban Village has a population of 10,591 inhabitants, with a population of 5,624 male and a female population of 4,967. The population density in Tanjung Urban Village amounted to 7156.08/km<sup>2</sup> with a population of distinct livelihoods, such as civil servants, workers, farmers, and others [24].

Most of Tanjung Urban Village are land yards/buildings with an area of 91.94 ha, and the second-largest land-use after a building is a paddy field with an area of 38 ha [24]. Tanjung Urban Village is located at an altitude of 64-85 meters above sea level. In Tanjung Urban Village, there are many rivers and gutters to irrigate the paddy fields.

### B. Data and Analysis

Physical variables studied can influence land-use change, especially things that can encourage the social and economic development of the area and are related to accessibility. In this study, the physical variables used are the distance from the road and the distance from the river. The data that will apply for social variables that can affect land use is population growth and seen from the length of stay of the community and people's livelihoods.

We obtained primary population data using interviews and direct observation methods in Tanjung Urban Village to several respondents. The data includes respondent characteristics data such as name, age, address, education, data on the factors causing land changes, and data on the effect of land changes on livelihoods in Tanjung Urban Village. Sampling techniques in collecting data are purposive sampling and accidental sampling [25].

The purposive sampling method is used to determine the sample point of land change following predetermined criteria. The determination of sample points is based on the grid and

buffers. Each of the grid covers 100x100 meters affected by land-use change by determining one sample point. Each sample point may have different criteria. Criteria are made based on buffer analysis of the distance from the river and the distance from the road. The distance from the river and the road were divided into three classes: range <50 meters, 50-100 meters, and > 100 meters. The map of research sample points can be seen in Figure 1 and Figure 2 and the table number of sample points based on the criteria listed in Table 1. The total overall sample point is as much as 30. The

accidental sampling method was carried out at the sample point to interview respondents. Accidental sampling is a sampling technique based on chance [25]. In this sampling techniques, anyone who is in the sample point will be the respondent but also pay attention to the respondent's requirements as follows: (1) Population of Tanjung Urban Village, South Purwokerto; (2) Has been living in the Urban Village at least since 2011; (3) At least 25 years old and have worked in fields related to land; and (4) They are living in areas that experiencing land-use change.

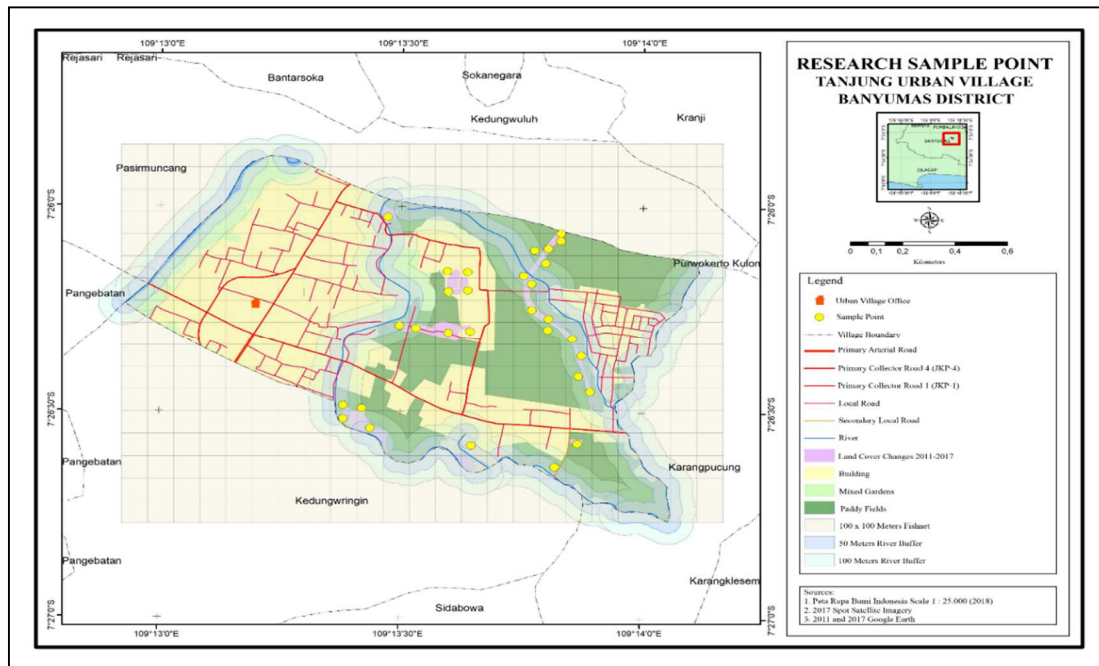


Fig. 1 Map of a research sample point and buffer distance from the river

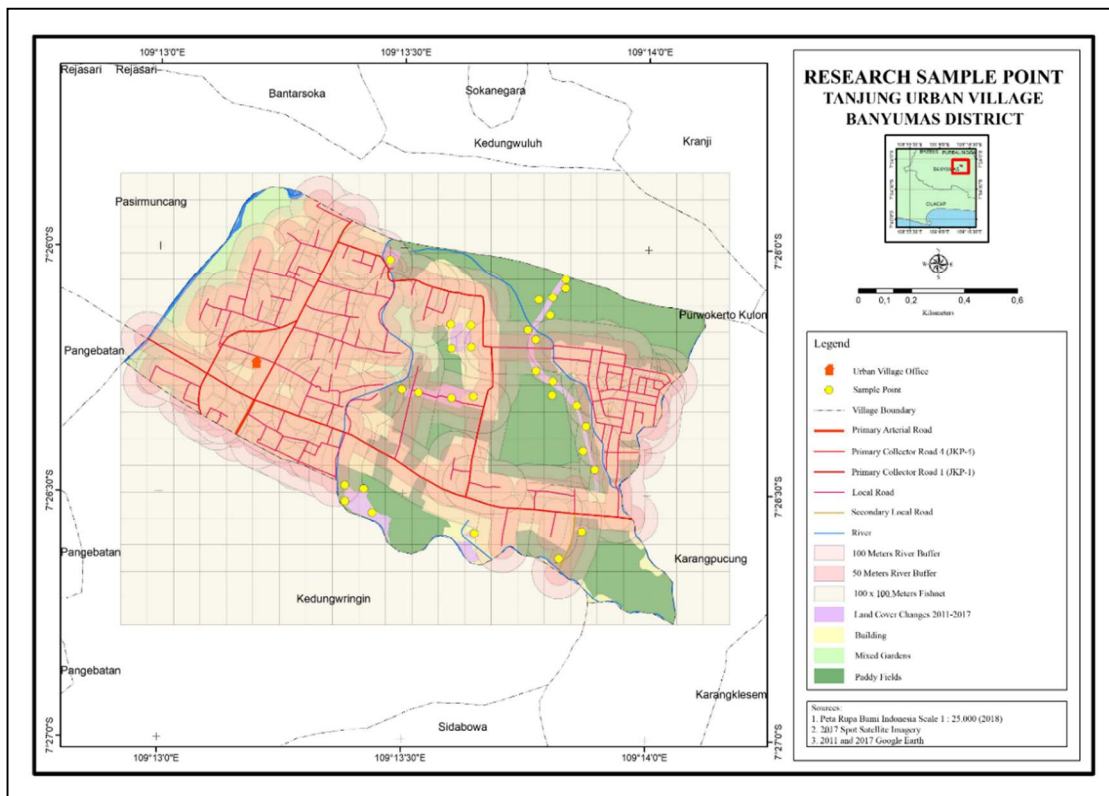


Fig. 2 Map of a research sample point and buffer distance from the road

TABLE I  
THE SAMPLE POINT BASED ON THE DISTANCE FROM ROAD AND RIVER

Distance from river	Distance from road			Amount
	<50 Meters	50-100 Meters	>100 Meters	
<50 Meters	6	3	2	11
50-100 Meters	2	4	4	10
>100 Meters	5	1	3	9
<b>Amount</b>	13	8	9	30

Secondary data used are area and land-use data in Tanjung Urban Village. Secondary data were obtained from the Office of the Urban Village include Tanjung Urban Village Statistics data in 2011 and 2017. Land-use data for 2011 and 2017 are also used to produce land-use change maps for 2011-2017. Secondary data include a Subdistrict Administrative Map of Tanjung that serves as the administrative borders of the region.

We use a comparative descriptive spatial analysis method. Descriptive spatial analysis is a method for making systematic, factual, and accurate descriptions, pictures or drawings of facts, the nature of relationships between phenomena

investigated, and comparability to compare two data that are the same but differ in years. [26]. Whereas spatial analysis aimed to describe the fact that is focusing on the "what", "how" and "where" [27], about land-use change, physical and social factors that cause land-use change, and the effect of land-use change on the community livelihood in Tanjung, South Purwokerto.

### III. RESULTS AND DISCUSSION

#### A. Land Use Change in Tanjung Urban Village

Land use in Tanjung Urban Village, South Purwokerto, is dominated by paddy fields and other agricultural fields. The area of the yard/building is 91.70 ha in 2011 and 91.94 ha in 2017. In 2011, there was 47.22 ha of paddy fields for paddy fields, and in 2017 was 38 ha. It shows that there has been an increase in the number of yards/building area and a decrease in paddy fields area. Agricultural land dominates the eastern region, while the building dominates in the western region of Tanjung Urban Village. For 2011 the land-use map is presented in Figure 3, and 2017 is shown in Figure 4.

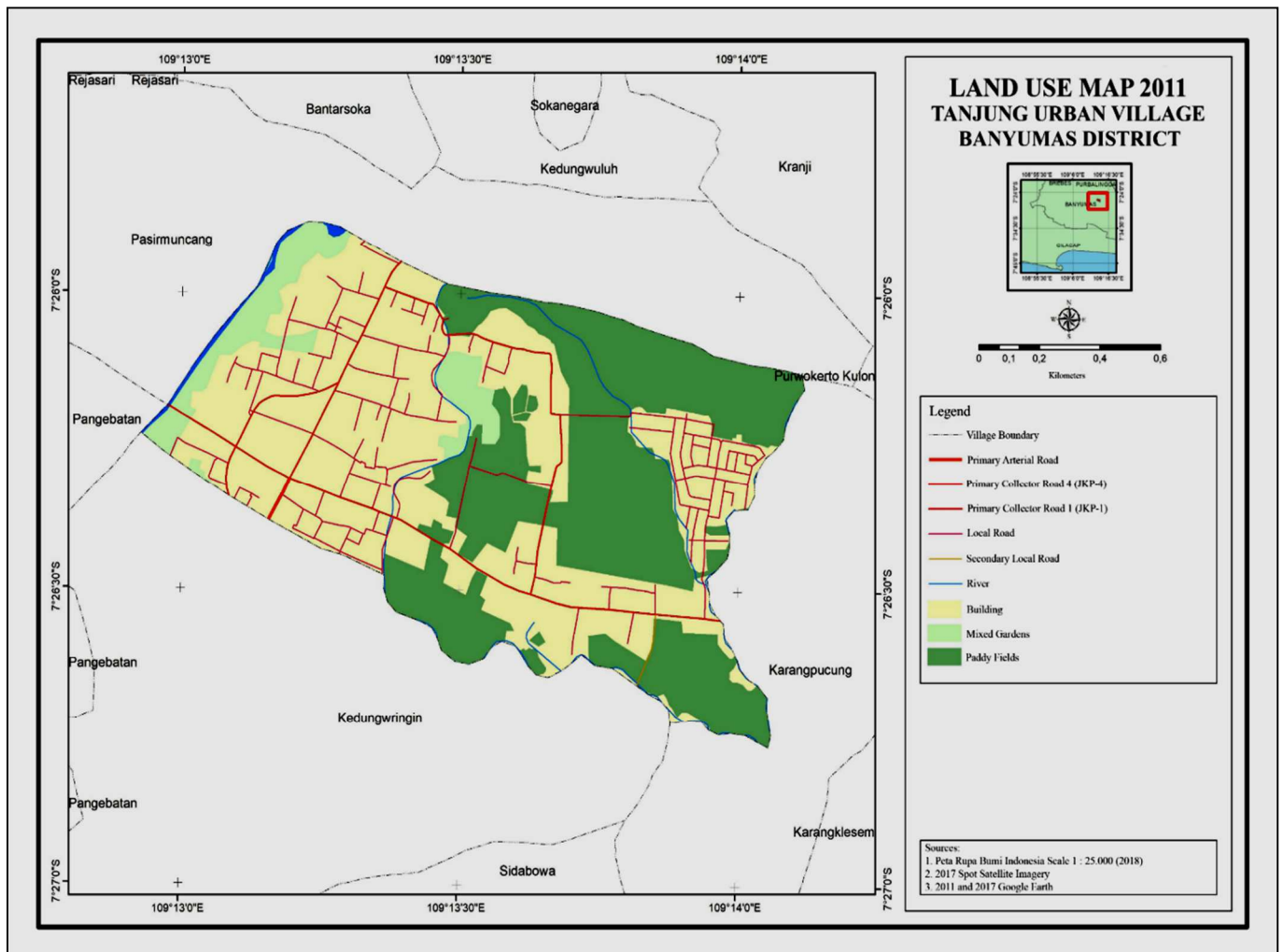


Fig. 3 Land use map of Tanjung Urban Village 2011



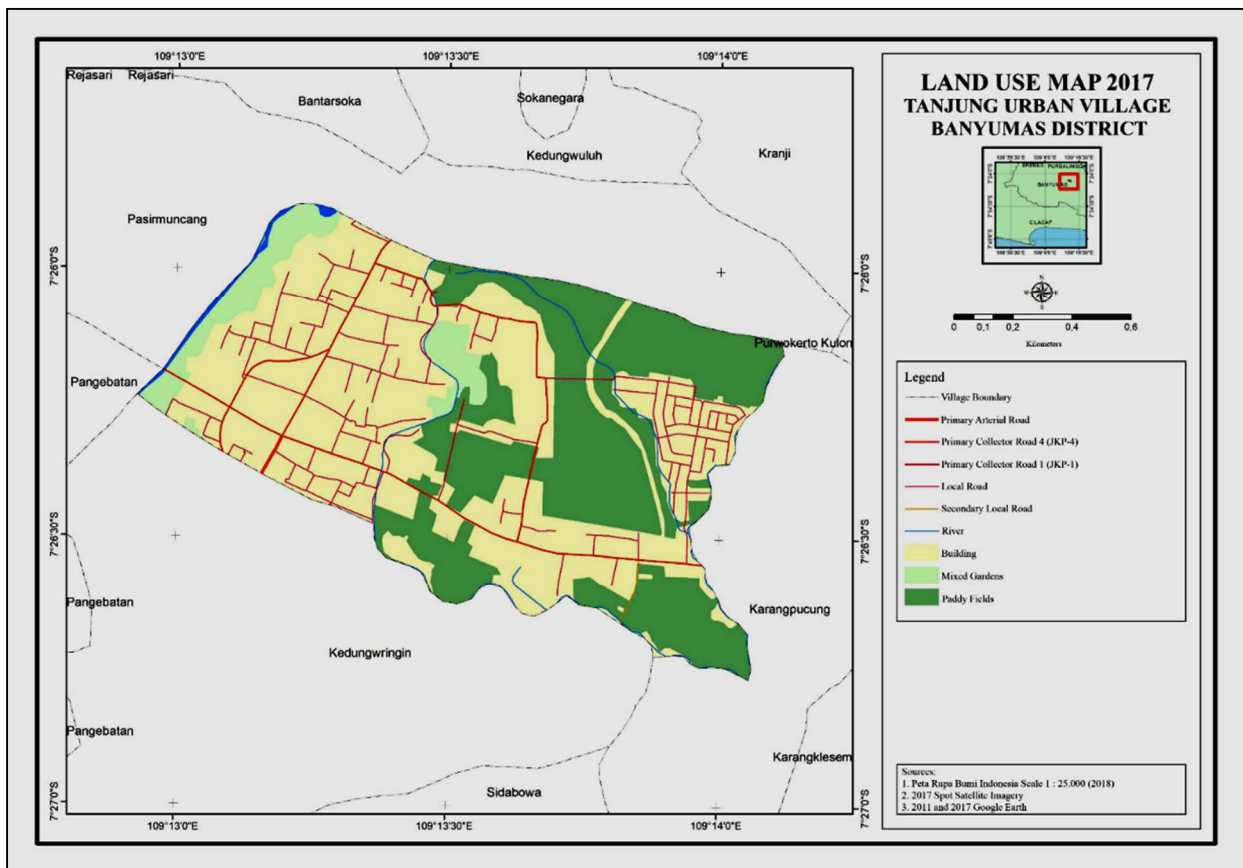


Fig. 4 Land use map of Tanjung Urban Village 2017

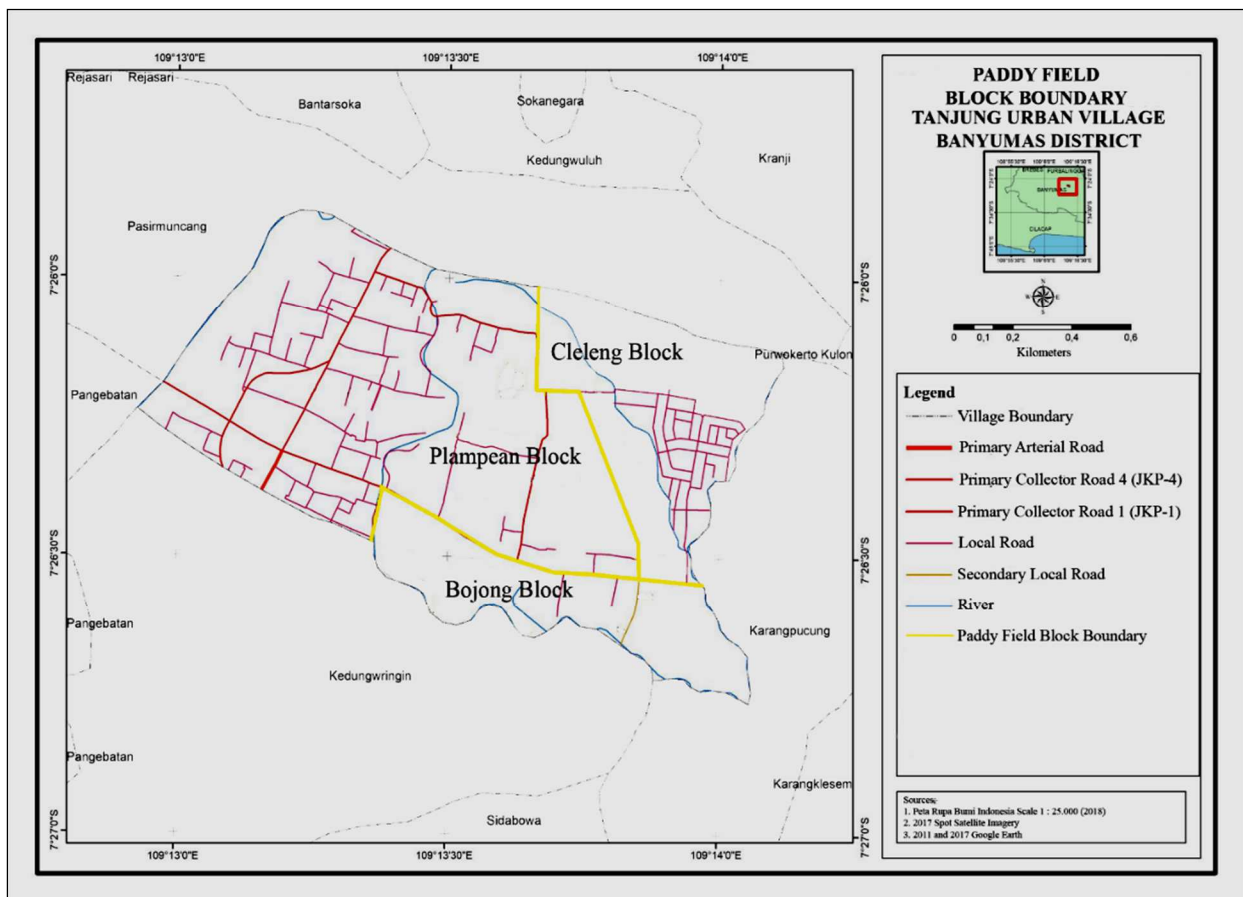


Fig. 5 Paddy fields block boundary in Tanjung Urban Village

The paddy farming region in Tanjung is divided into three blocks, namely Plampean, Cleleng, and Bojong. Paddy fields block boundary can be seen in Figure 5. The paddy fields area has decreased to around 9.22 ha from 2011 to 2017. The decrease in paddy area is due to the conversion of paddy fields to non-paddy farmland, such as buildings and roads. This land-use change has occurred since 1994. This land-use change has happened since 1994, beginning with the gradual development of Grand Tanjung Elok housing. After that, in 2007, began construction of a road that connects to Gerilya Street towards the Purwokerto plaza.

Land-use changes occur in this Urban Village caused by the need for space for real estate and roads. In Tanjung Urban Village, the Tanjung Elok Real Estate Area construction

begins in 1994. The process of real estate construction has finished gradually. Until 2019, the Grand Tanjung Elok Real Estate is inhabited by most migrants from outside the Urban Village of Tanjung.

Furthermore, it built roads as the infrastructure supporting access to the real estate, since 2017 constructed road from Gerilya Street leading to the Purwokerto plaza. Land-use changes in this Urban Village also occur because of the construction of social facilities such as schools and waste treatment facilities. Land-use change in 2011-2017 in Tanjung Urban Village can be seen in Figure 6. It displays its physical appearance, such as schools, housing, roads, and other buildings.

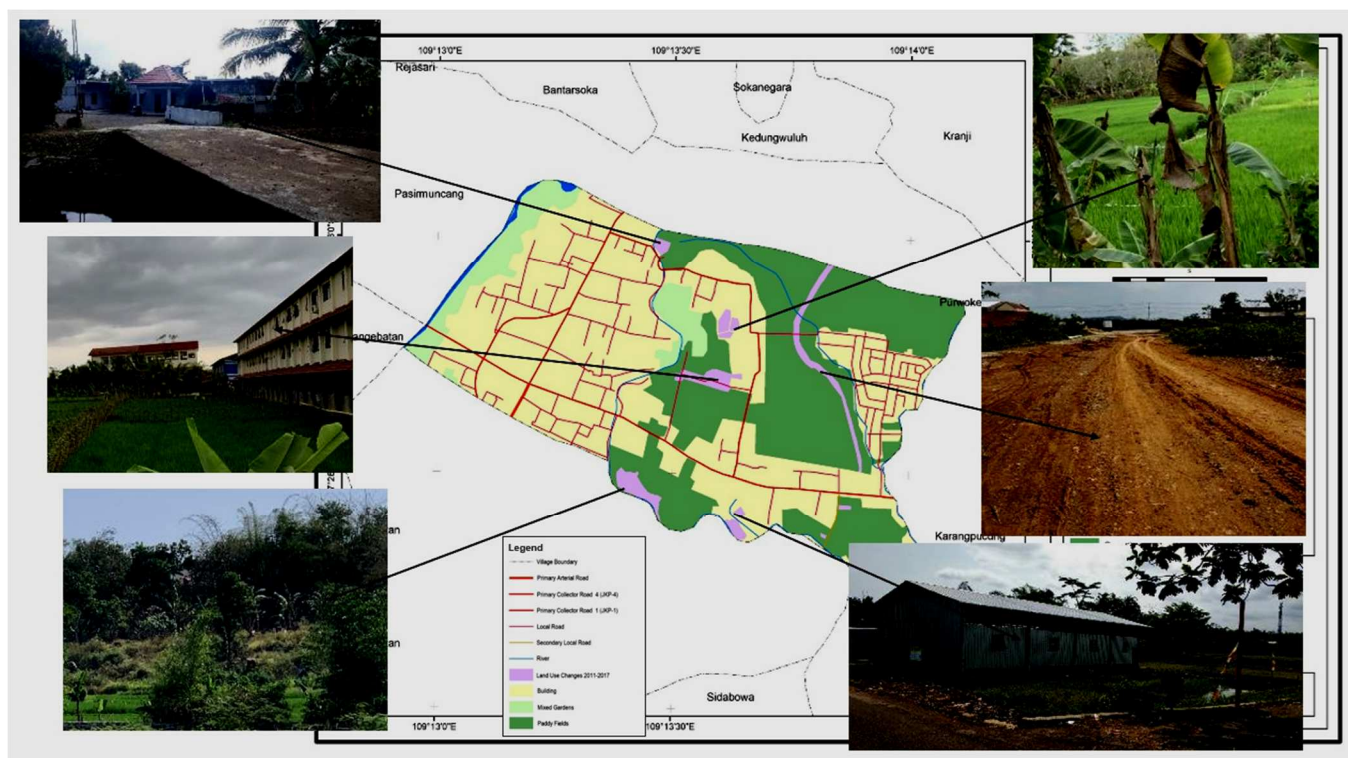


Fig. 6 Map of land-use change and physical appearance in Tanjung Urban Village

The majority of Tanjung Paddy fields are owned by the government and cultivated by farmworkers who are citizens of the Tanjung Urban Village. According to Chairman of Farmers Group (Gapoktan) Mekar Tanjung, before 2007, paddy fields located in Tanjung were auctioned freely, including people outside Tanjung. However, after 2007, with the establishment of Gapoktan, there was agreement that the Tanjung Urban Village community itself works all existing paddy fields.

### B. Causes of Land Use Change in Tanjung Urban Village

Based on the land-use map generated from image interpretation, it is known that changes in land use occurred around the river and the road. The distance from the river and the road determine the occurrence of land-use change. Distance from the river less than or equal to 50 meters and a length of 50-100 meters serves as a buffer space ecosystem that human activity does not interfere with the river's function. The distance from the river also can affect the existing water

pump to irrigate the fields. If the distance from the river is more than 100 meters, then the supply of irrigation water to the paddy fields decreases due to high pump costs. Thus, spans over 100 meters have a higher chance of land-use change [28]. Interviews with respondents provide information that much land-use change occurs at a distance of >100 meters from the river.

Land-use change also occurs in the region adjacent to the road. More land-use changes occur at a distance of >50 meters from the road based on interviews and field surveys. The availability of large roads that connect the Tanjung Urban Village to the city center makes this Urban Village experience significant socio-economic development. The distance is still too far, and this then encourages the Tanjung Urban Village to build new roads so that this Urban Village is closer to the city center. Besides, this road construction also aims to support the community's movement and increase accessibility in activities so that socio-economic growth can continue to be improved. According to Von Thünen's theory, the closer

location of the land to the city center, which is a center of economic activity, the higher the land-based value on utilization or rent its value [29]. Thus, agricultural land that closes to the center of the city is likely to experience land-use change. In the future, road construction in Tanjung Urban Village can also create another land-use change and continue to reduce paddy fields in this Urban Village.

Based on social factors, things that probably can affect land use is the number of populations that have been alive a long time in Tanjung. Increased basic needs, namely: shelter, food, and clothing, will accompany the increase in the population [30]. However, the interview data results show that the population growth factor does not affect land-use change in Tanjung Urban Village. The land-use change has occurred because of the development of road and housing infrastructure. Real estate can be an attraction for people from outside the region to come and settle.

### C. Land Use Change on Community Livelihood in Tanjung

According to BPS Subdistrict South Purwokerto data, there is an increase in population from 2011 until 2017. In 2011 there were 9.842 people, and then in 2017, there were 10.603 people. The number of residents who have a livelihood in the agricultural sector in the Tanjung Urban Village in 2011, there were 248 people [23] and were 346 people in 2017 [24]. In 2019, the number of residents working in the agriculture sector recorded by the Tanjung Urban Village government was 29 people, and the majority working as general employees were 1404 people. The number of farmers registered in this district is different from the data held by Gapoktan. Farmers recorded in Gapoktan are 79 people, divided into 49 at Tanjung Seto Group 1 and 30 at Tanjung Seto Group 2. According to the group union, many members of Gapoktan have a second job since the land-use change happened. It happens because they feel their opinions are lacking in meeting their daily needs. In Block Cleleng, people who have side jobs amount to 44%, Block Bojong by 43%, and Block Plampeyan by 43%. Overall, 14 of 30 people or about 47% of residents have side jobs.

Land-use change in Tanjung Urban Village affects the livelihoods of the affected population of the land-use change, especially farmers. The reduced area of paddy fields in Tanjung Urban Village made most concerned farmers have two jobs to cover their income reduction due to their paddy fields' reduced area. These results are consistent with previous research that suggests the presence of land use and farmers turned into non-farmers [20].

Land-use change causes the income of farming communities in Tanjung to be reduced, so they tried to have another job as a side job to fulfill their needs. It has been mentioned before that around 47% of the Tanjung Urban Village population have side jobs. If it is broken down based on the distance from the river, 45% of citizens (5 out of 11 respondents) who live at a distance of <50 meters from the river have side jobs. Meanwhile, 4 out of 10 respondents or 40% of residents living at a distance of 50-100 meters from the river have side jobs. Then 5 of 9 or 56% of residents living in the distance >100 meters have a side job. Bar graph about Livelihood status based on distance from the river in Tanjung Urban Village can be seen in Figure 7. The higher percentage of residents who have side jobs at a distance of >100 meters

from the river is in line with land-use changes, which is also higher at a distance of >100 meters from the river.

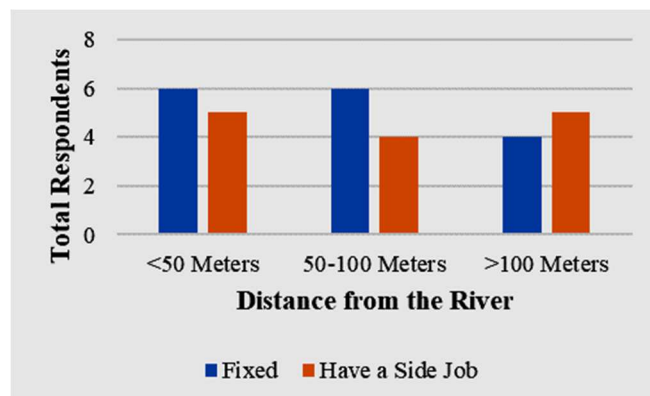


Fig. 7 Livelihood status based on distance from the river in Tanjung Urban Village

In addition, the livelihood status of the population is based on the distance from the road, 5 out of a total of 13 residents (38%), who live within <50 meters of the road explain that they have side jobs. 4 out of 8 respondents, or 50%, who live 50-100 meters from the road, have side jobs. Residents living within >100 meters of the road having side jobs are 4 out of 9 residents (22%). Bar graph about Livelihood status based on distance from the road in Tanjung Urban Village can be seen in Figure 8. The higher percentage of residents who have side jobs at a distance of <50 meters from the road is in line with the land-use change that also higher at <50 meters from the road.

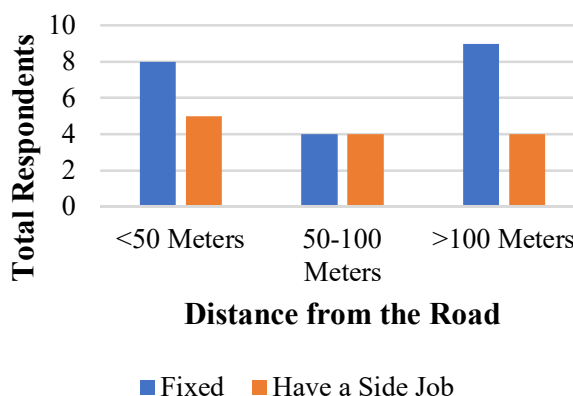


Fig. 8 Livelihood status based on distance from the road in Tanjung Urban Village

It shows that land-use change affects farmers' livelihoods and affects their income [18]. The decrease in farmers' income affects the purchasing power, which will decrease and impact the decreasing economic accessibility of farm households to food [31]. So, Tanjung Urban Village farmers have side jobs to fulfill daily needs. Based on interviews, most farmers who have side jobs have side jobs as laborers and traders. However, there are still a few people who choose not to have a side job. Farmers who do not have side jobs are older farmers or farmers who have not too many family dependents, so their income is still sufficient. Although land-use change has affected the livelihoods of the Tanjung community, this has not affected them to change their jobs. The map of land use and livelihoods in Tanjung can be seen in Figure 9.



#### IV. CONCLUSION

Land-use change in Tanjung Urban Village, South Purwokerto, occurs due to the construction of the Grand Tanjung Elok Real Estate and the roads leading into the Kota Purwokerto by local governments. Physical factors such as

distance to roads and rivers in Tanjung affect the existence of land-use change. Meanwhile, social factors, such as population growth, do not affect the reality of land-use change. Tanjung Urban Village changes in land use make the farming community have side jobs due to reduced income due to reduced agricultural land.

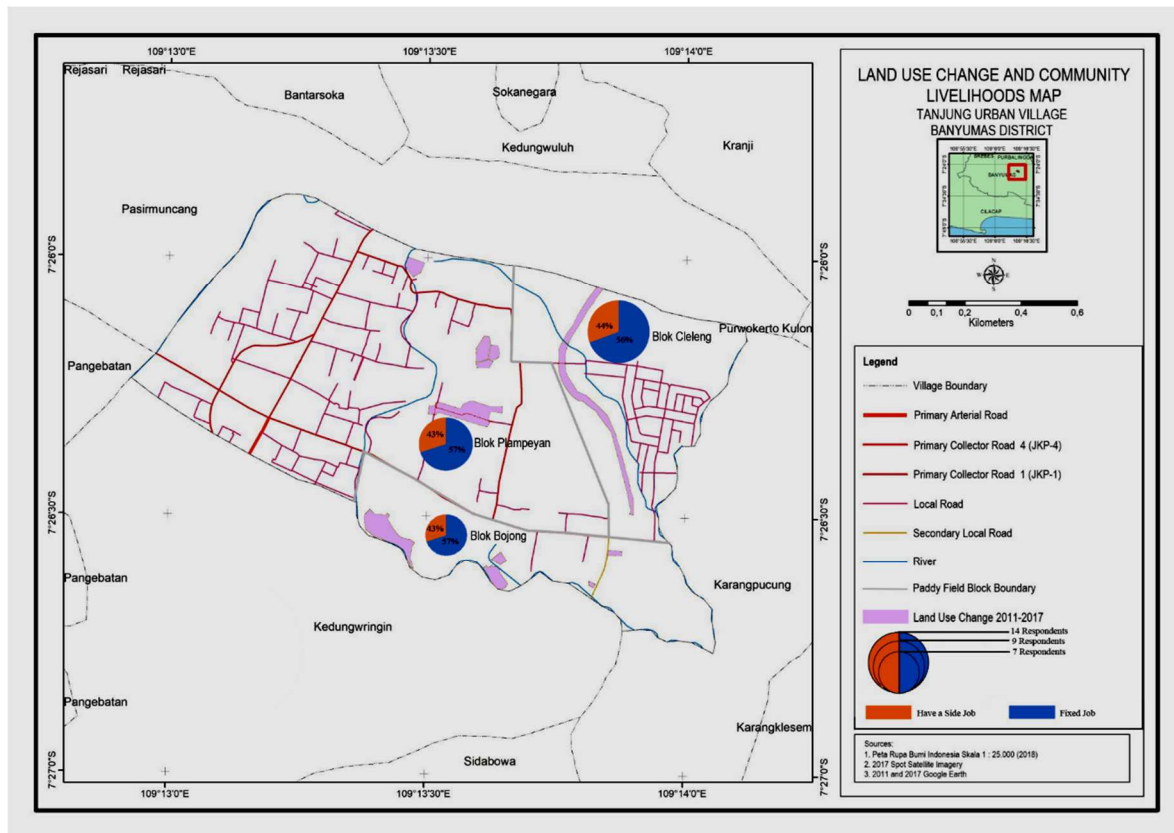


Fig. 9 Map of land use and livelihoods in Tanjung

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