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THE DYNAMICS AND FACTORS INFLUENCING THE LAND USE/ LAND COVER CHANGE IN CIPARAY DISTRICT, BANDUNG REGENCY

DINAMIKA DAN FAKTOR-FAKTOR YANG MEMPENGARUHI PERUBAHAN PENGGUNAAN LAHAN/TUTUPAN LAHAN DI KECAMATAN CIPARAY KABUPATEN BANDUNG

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ABSTRACT
Population growth in Ciparay District, as in several areas in West Java Province, has been increasing, especially in the last ten years, leading to an increase in housing needs and converting rice fields to residential land. This study aims to identify the spatial conversion dynamic of rice fields and analyze the factors that influence the conversion of rice fields in Ciparay District, Bandung Regency. The method used in this research is a quantitative descriptive method with map overlay analysis techniques and multiple linear regression analysis. This study found that the characteristics of land conversion in Ciparay District are divided into four land use/ land cover changes: rice field to residential land, rice field to dryland farming, rice field to vacant land, and dryland agricultural to settlement. The most significant change in land use/ land cover is in the change of rice fields to residential areas, which is 336.09 hectares. The factor that had the most influence on the land conversion of rice fields was the accessibility ratio.
Keywords: *Rice Field, Land Use/ Land Cover, Land Conversion, Ciparay District*

ABSTRAK
Pertumbuhan penduduk di Kecamatan Ciparay seperti halnya di beberapa wilayah di Provinsi Jawa Barat yang semakin meningkat terutama dalam sepuluh tahun terakhir menyebabkan peningkatan kebutuhan perumahan dan alih fungsi lahan persawahan menjadi lahan pemukiman. Penelitian ini bertujuan untuk melihat dinamika konversi lahan sawah secara spasial dan menganalisis actor-faktor yang mempengaruhi konversi lahan sawah di Kecamatan Ciparay Kabupaten Bandung. Metode yang digunakan dalam penelitian ini adalah metode deskriptif kuantitatif dengan teknik analisis overlay peta dan analisis regresi linier berganda. Penelitian ini menemukan bahwa karakteristik konversi lahan di Kecamatan Ciparay terbagi menjadi empat perubahan guna lahan/ tutupan lahan, yaitu sawah menjadi lahan pemukiman, sawah menjadi pertanian lahan kering, sawah menjadi lahan kosong, dan pertanian lahan kering menjadi pemukiman. Perubahan tutupan lahan yang paling signifikan terjadi pada perubahan lahan persawahan menjadi pemukiman yaitu seluas 336,09 hektar. Faktor yang paling berpengaruh terhadap alih fungsi lahan sawah adalah rasio aksesibilitas.
Kata kunci: *Sawah, Guna-Lahan/ Tutupan Lahan, Konversi Lahan, Kecamatan Ciparay*

1. INTRODUCTION

In general, the land conversion of rice fields to non-agricultural uses such as housing, industrial estates, trade areas, and public facilities can have negative economic, social, and environmental impacts (Irawan, 2016; Jacobson et al., 2015; Roy & Roy, 2010). Land conversion has been found to have a detrimental effect on the economic well-being of communities, mainly manifested through alterations in livelihood patterns

and income inequality (Dib, Alamsyah, & Qaim, 2018). The conversion of rice fields in Central Java has been seen to have a negative impact on the environment, particularly in terms of alterations to the local climate, particularly during periods of low precipitation (Komariah et al., 2015). For national food security, land conversion of rice fields is a serious threat, considering land conversion is difficult to avoid. In contrast, the impact on food issues is permanent, cumulative, and progressive. However, the conversion of rice fields cannot be avoided due to the growing population and urbanization, which requires land conversion for other uses such as housing, industry, and offices (Gessese, 2018).

Research on land conversion is carried out in many countries for cases and purposes ranging from food security to environmental concerns. Because of the decentralization policy in Poland, counties can carry out land conversion, such as urban housing development (Wasilewski & Krukowski, 2002). Meanwhile, in Peninsular Malaysia, it was found that the annual conversion of rice fields was 1.5%, which was a threat to food security (Yasar & Siwar, 2016). An instance illustrating the influence of changes in land use and land cover on the environment may be observed in the Upper Eyiohia river basin of Afikpo North Area, Nigeria, leading to soil erosion (Obiahu & Elias, 2020). Another illustrative example highlighting the environmental concern of land conversion is the phenomenon of land degradation observed on the island of Sardinia, situated in the Mediterranean Sea (Bajocco, De Angelis, Perini, Ferrara, & Salvati, 2012).

In Indonesia, ricefield conversion research was conducted in various places for different cases. In Java, for twenty years, rice fields' conversion was 1.2 million hectares or around 60 thousand hectares per year (Daris, Aminudin, & Feriansyah, 2018). The conversion of rice fields in Semarang City was reduced by 50% from 2000 to 2019 (Prabowo, Bambang, Sudarno, & Nurlette, 2020). In Tanjung Jabung Timur Regency, paddy fields have been converted into coconut palm plantations because they are profitable. The conversion occurred during 2004-2016 was 15,000 hectares (Daulay, Eka Intan, Barus, & Pramudya, 2016). Previous research shows that numerous regions in Indonesia are currently undergoing the process of rice field conversion. Hence, it is crucial to investigate the causes or elements that exert influence.

Population growth in Indonesia during the last ten years has been relatively high, especially in West Java. Ciparay District is one area that has experienced rapid population growth compared to other districts in Bandung Regency, West Java (Badan Pusat Statistik Kabupaten Bandung, 2020). With the increase in population growth rate, the people need housing, especially in rural areas, which led to the conversion of rice fields to residential land in the Ciparay District. Based on Bandung Regency Regional Regulation Number 27 of 2016 concerning the 2016-2036 Bandung Regency Spatial Plan, the position of Ciparay District is as a Regional Service Center (SSC) dominated by the rice field (Pemerintah Daerah Kabupaten Bandung, 2016). The city of Bandung is geographically situated closer to Bandung Regency, and it is an integral component of the Bandung Metropolitan Area or Bandung Basin. This urban region serves as a primary destination for individuals residing in Bandung Regency seeking employment opportunities or engaging in commercial activities in order to transform the Regency region into a residential hub for individuals actively engaged in the city of Bandung (Firman, 2009; Tarigan et al., 2016).

The government has attempted to control the conversion of rice fields by issuing regulations and policies in the regional spatial plan document of the Bandung Regency. Ciparay District is positioned as a Regional Service Center (SSC). However, along with urbanization (population migration from rural to urban areas), the conversion of rice fields to residential land in the Ciparay District is getting higher. The recorded data on the extent of rice fields in the Ciparay District during 2016 amounted to 2690.96 hectares (Badan Pusat Statistik Kabupaten Bandung, 2017), which subsequently experienced a decline to 2345.86 hectares by 2020 (Badan Pusat Statistik Kabupaten Bandung, 2021). Therefore, a study is needed to explore how land conversion is in the Ciparay District. This study distinguishes itself from prior studies by focusing explicitly on the dynamics of rice field conversion near urban areas and the elements that influence this process. The research objectives are to identify the land conversion of rice fields in the Ciparay District and to determine the factors that influence the conversion of rice fields.

2. DATA AND METHOD

2.1. Research Location

The research location is Ciparay District, Bandung Regency, West Java. Ciparay is one of the largest rice suppliers in West Java and has had a relatively high population growth rate for the last five years. Ciparay District has an area of 5,452.05 hectares with an altitude of 678 meters above sea level.

2.2. Data Used in the Study

We collected land use/ land cover maps from Kementerian Lingkungan Hidup dan Kehutanan (KLHK) open-source Web GIS (http://webgis.menlhk.go.id:8080/pl/pl.htm). Table 1 shows data, format, and action in creating a land use/ land cover map of Ciparay District.

Table 1. Data of Land Use/ Land Cover and Format

No.	Data	Format	Action
1.	Land use/ land cover of 2009 from KLHK WebGIS	Regional code number in *json file	Database on regional code was combined into Ciparay District administrative and converted to *shp file
2.	Land use/ land cover of 2014 from KLHK WebGIS	Regional code number in *json file	Database on regional code was combined into Ciparay District administrative and converted to *shp file
3.	Land use/ land cover of 2019 from KLHK WebGIS	Regional code number in *shp file	Database on regional code was combined into the Ciparay District administrative.

Source: Analysis result, 2020

2.3. Method

The research method consists of two approaches: map overlay analysis and multiple linear regression analysis. The first method is the overlay technique using the geographic information system (GIS) application.

The first phase was an overlay (intersect) of the land use/ land cover of 2009 and 2014 maps to identify a land use/ land cover change in 2014 and 2009 of Ciparay District (Figure 1). The second phase was an overlay (intersect) of the land use/ land cover of 2014 and 2019 maps to identify the land use/ land cover change in 2019 and 2014 of Ciparay District (Figure 2).

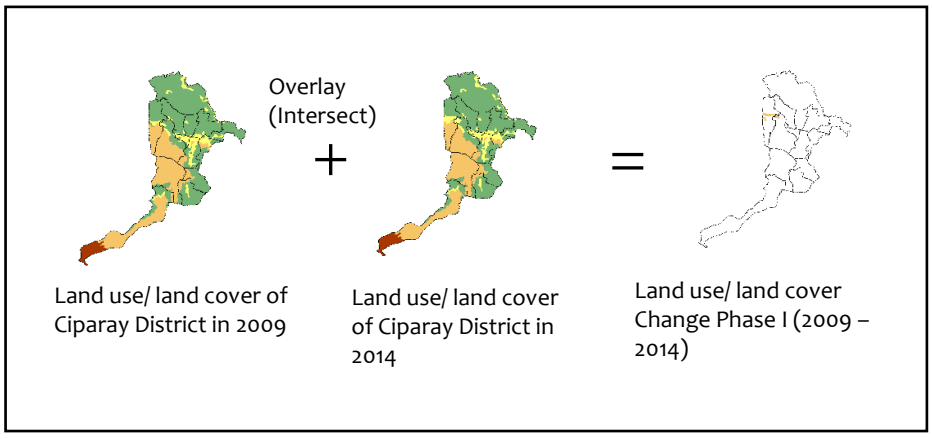


Figure 1. An overlay (intersect) of the Land Use/ Land Cover of 2009 and 2014 Maps of Ciparay District

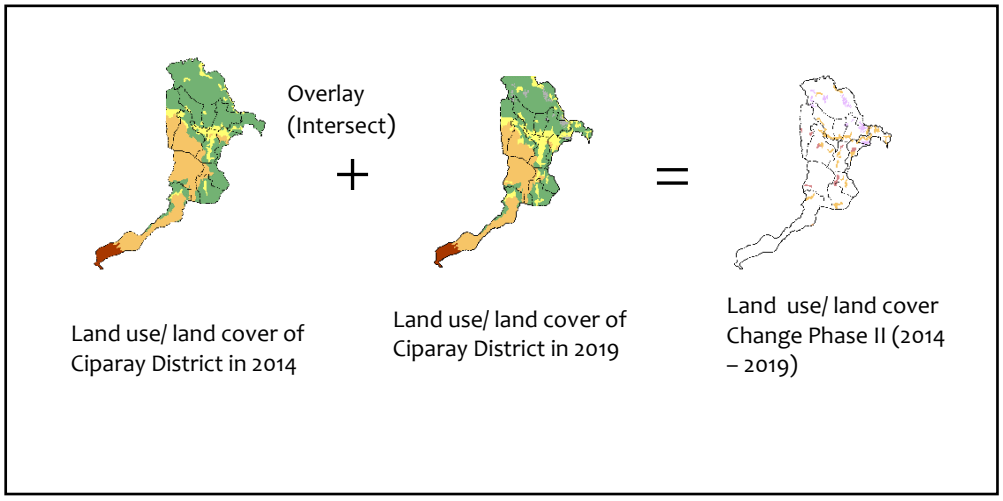


Figure 2. An Overlay (Intersect) of the Land Use/ Land Cover of 2014 and 2019 Maps of the Ciparay District

Multiple linear regression analysis is a technique to analyze the relationship between more than two variables stated in a regression line. The method is used to measure the significant relationship between the independent variable and the dependent variable. Table 2 shows the variables predictor to analyze the factors influencing land conversion.

The general equation formula for multiple linear regression is:

$$Y = a + b_1X_1 + b_2X_2 + \ldots + b_nX_n$$

where
Y = dependent variable
X = independent variable
a = constant
b = estimator coefficient

The independent variables were chosen based on previous works (Kurniasari & Ariastita, 2014; Lulan, Darwanto, & Hartono, 2017).

Table 2. Predictor Variables for Multiple Linear Regression

No	Variable	Notes
1	Y	Rice field land conversion (%)
2	X1	Rate of Population growth (%)
3	X2	Land price ratio
4	X3	Regional accessibility ratio

Source: Analysis Result, 2020

In calculating multiple linear regressions, the unit of analysis is the village. The data used were obtained from various sources, as follows:

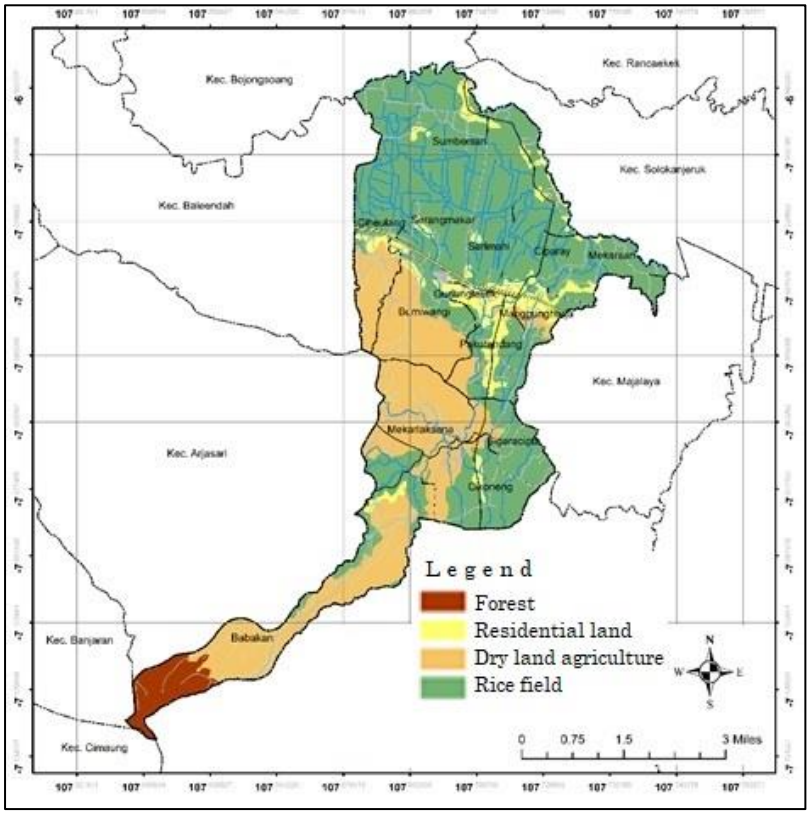
- The data on rice fields' conversion is on changes in rice field cover to non-rice fields in ten years (from 2009 to 2019).
- Data on the percentage of population growth rates in the past ten years in Ciparay District were obtained from the Central Bureau of Statistics, Ciparay District.
- The land price ratio is the ratio of the price of non-rice fields and rice fields. This data was obtained by dividing the average selling price of non-rice fields by the rice fields for each village in 2019.

- The regional accessibility ratio is obtained by dividing the total length of roads in each village by the area of each village.

3. RESULTS AND DISCUSSION

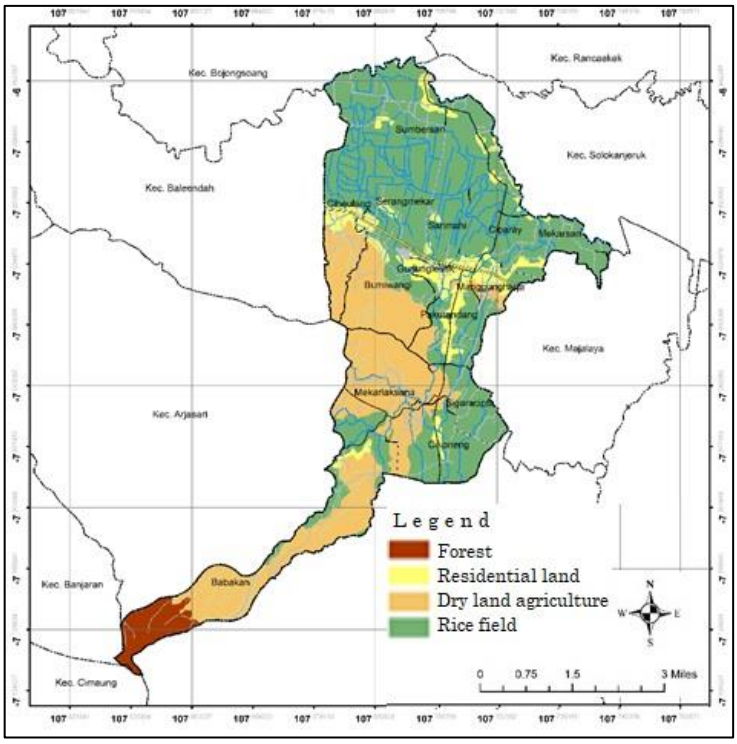
3.1. Land Conversion in Ciparay District

There were two phases for land conversion analysis: the first phase was the land use/ land cover change from 2009 to 2014, the second phase was land use/ land cover change from 2014 to 2019, and the identification of land conversion for the 2009-2019 period. The land conversion analysis method overlaps the land use/ land cover map and then identifies the area of land that has changed for ten years. To identify land conversion, we conducted land use/ land cover mapping for 2009 (Figure 3), 2014 (Figure 4), and 2019 (Figure 5).



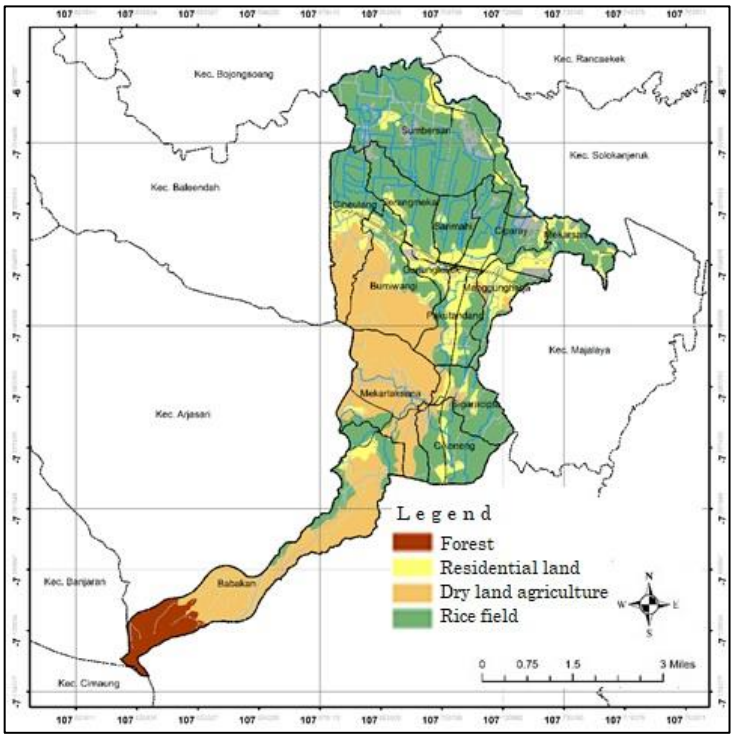
Source: KLHK, 2009

Figure 3. Land Use/ Land Cover Map of Ciparay District in 2009



Source: KLHK, 2014

Figure 4. Land Use/ Land Cover Map of Ciparay District in 2014



Source: KLHK, 2019

Figure 5. Land Use/ Land Cover Map of Ciparay District in 2019

Figure 6 and Table 3 show the first phase of land conversion from 2009 to 2014. The map shows that there has been no significant change in land use/ land cover from 2009 to 2014; almost all villages have no changes in land use/ land cover. The type of land use/ land cover change was from rice fields to residential areas in Ciheulang and Bumiwangi Village.

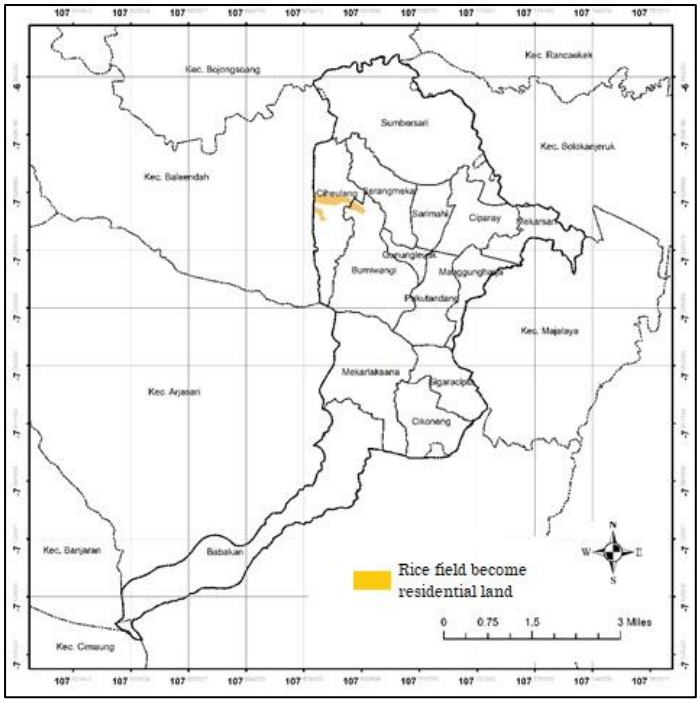


Figure 6. Land Use/ Land Cover Change Map 2009 to 2014 of Ciparay District

Table 3. The conversion of Land Use/ Land Cover Area of Ciparay District in Five Years (Second Phase in 2009 to 2014)

Villages	Land Use/ Land Cover Area Change in Five Years (Hectares)				
	Rice Field	Residential Land	Dryland Agriculture	Vacant Land	Forest
Bumiwangi	-8.32	8.32	0.00	0.00	0.00
Cikoneng	0.00	0.00	0.00	0.00	0.00
Gunungleutik	0.00	0.00	0.00	0.00	0.00
Manggungharja	0.00	0.00	0.00	0.00	0.00
Mekarlaksana	0.00	0.00	0.00	0.00	0.00
Mekarsari	0.00	0.00	0.00	0.00	0.00
Pakutandang	0.00	0.00	0.00	0.00	0.00
Sarimahi	0.00	0.00	0.00	0.00	0.00
Serangmekar	0.00	0.00	0.00	0.00	0.00
Sigaracipta	0.00	0.00	0.00	0.00	0.00
Sumbersari	0.00	0.00	0.00	0.00	0.00
Babakan	0.00	0.00	0.00	0.00	0.00
Ciheulang	-28.13	28.13	0.00	0.00	0.00
Ciparay	0.00	0.00	0.00	0.00	0.00
Total	-36.44	36.44	0.00	0.00	0.00

Unlike the first phase, the second phase, from 2014 to 2019, there was a significant land conversion in the second phase. Figure 7 and Table 4 show a map of land use/ land cover conversion in all Ciparay District

villages. Conversion includes rice fields into residential areas, rice fields into dry agricultural land, rice fields into vacant land, and dry agricultural land into residential areas. Table 4 shows some increase or decrease in land use/ land cover area. In almost all villages, rice fields were decreased, except for Mekarlaksana Village. Almost all the decrease in rice fields area became an increase in settlements and vacant land. The most extensive conversions occurred in Sumbersari, Mekarsari, and Ciparay villages. In Sumbersari Village, 94.02 hectares of rice fields were converted into residential land (24.06 hectares) and vacant land (74.96 hectares). In dryland agriculture, eight villages out of 14 experienced land use/ land cover conversion, consisting of seven villages experiencing declines and one village increasing in the area.

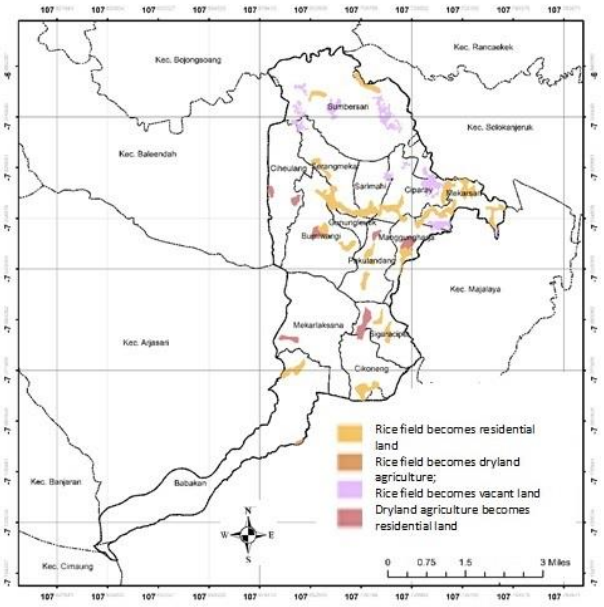


Figure 7. Land Use/ Land Cover Change Map 2014 to 2019 of Ciparay District

Table 4. The Conversion of Land Use/ Land Cover Area of Ciparay District in Five Years (Second Phase in 20014 to 2019)

Villages	Land Use/ Land Cover Area Change in Five Years (Hectares)				
	Rice Field	Residential Land	Dryland Agriculture	Vacant Land	Forest
Bumiwangi	-28.76	38.29	-9.54	0.00	0.00
Cikoneng	-20.50	24.45	-3.96	0.00	0.00
Gunungleutik	-7.82	7.82	0.00	0.00	0.00
Manggungharja	-23.29	34.14	-13.23	2.38	0.00
Mekarlaksana	0.00	8.38	-8.38	0.00	0.00
Mekarsari	-80.70	64.85	0.00	15.83	0.00
Pakutandang	-20.72	26.04	-5.31	0.00	0.00
Sarimahi	-19.49	17.22	0.00	2.26	0.00
Serangmekar	-38.04	30.61	0.00	7.42	0.00
Sigaracipta	-15.80	33.53	-17.73	0.00	0.00
Sumbersari	-95.02	24.06	0.00	70.96	0.00
Babakan	-19.19	16.47	2.73	0.00	0.00
Ciheulang	-1.36	12.39	-12.39	1.35	0.00
Ciparay	-62.06	31.92	0.00	30.14	0.00
Total	-432.75	370.18	-67.80	130.35	0.00

Source: Analysis Result, 2020

The data shown in Figure 8 and Table 5 provide insights into the cumulative land conversion occurring within the Ciparay District. The most significant land use/ land cover change in Ciparay District for the second phase (2014 to 2019) was dominated by changes in rice fields covering 469.19 hectares, followed by residential areas of 406.63 hectares, 130.35 hectares of vacant land, about 67.80 hectares of dryland agriculture. The rice field in each village tends to be lessened, starting from the smallest area of 7.82 hectares in Gunungleutik Village and the largest covering 95.02 hectares in Sumbersari Village. Meanwhile, there is no change in the rice field land area in Mekarlaksana village.

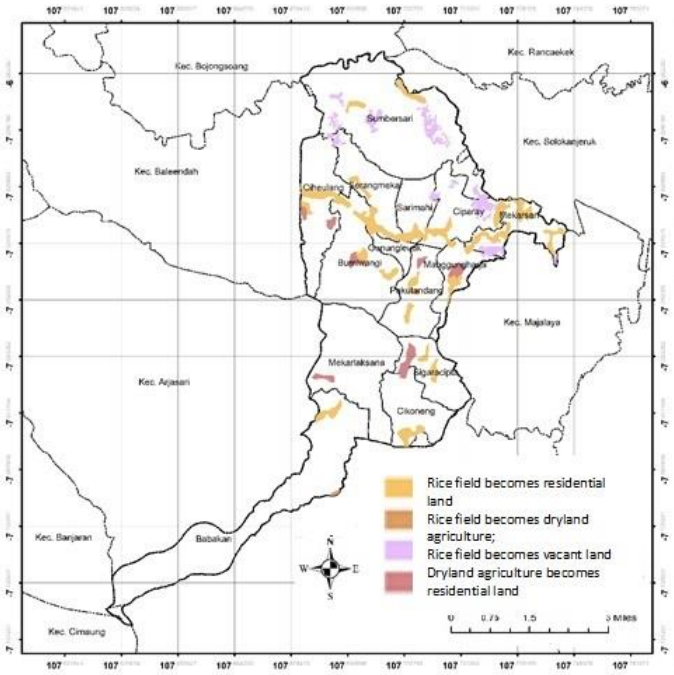


Figure 8. Land Use/ Land Cover Change Map 2009 to 2019 of Ciparay District

Table 5. The Conversion of Land Use/ Land Cover Area of Ciparay District in Ten Years (2009-2019)

Villages	Land Use/ Land Cover Area Change in Ten Years (Hectares)				
	Rice Field	Residential Land	Dryland Agriculture	Vacant Land	Forest
Bumiwangi	-37.08	46.61	-9.54	0.00	0.00
Cikoneng	-20.50	24.45	-3.96	0.00	0.00
Gunungleutik	-7.82	7.82	0.00	0.00	0.00
Manggungharja	-23.29	34.14	-13.23	2.38	0.00
Mekarlaksana	0.00	8.38	-8.38	0.00	0.00
Mekarsari	-80.70	64.85	0.00	15.83	0.00
Pakutandang	-20.72	26.04	-5.31	0.00	0.00
Sarimahi	-19.49	17.22	0.00	2.26	0.00
Serangmekar	-38.04	30.61	0.00	7.42	0.00
Sigaracipta	-15.80	33.53	-17.73	0.00	0.00
Sumbersari	-95.02	24.06	0.00	70.96	0.00
Babakan	-19.19	16.47	2.73	0.00	0.00
Ciheulang	-29.48	40.51	-12.39	1.35	0.00
Ciparay	-62.06	31.92	0.00	30.14	0.00
Total	-469.19	406.63	-67.80	130.35	0.00

Source: Analysis Result, 2020

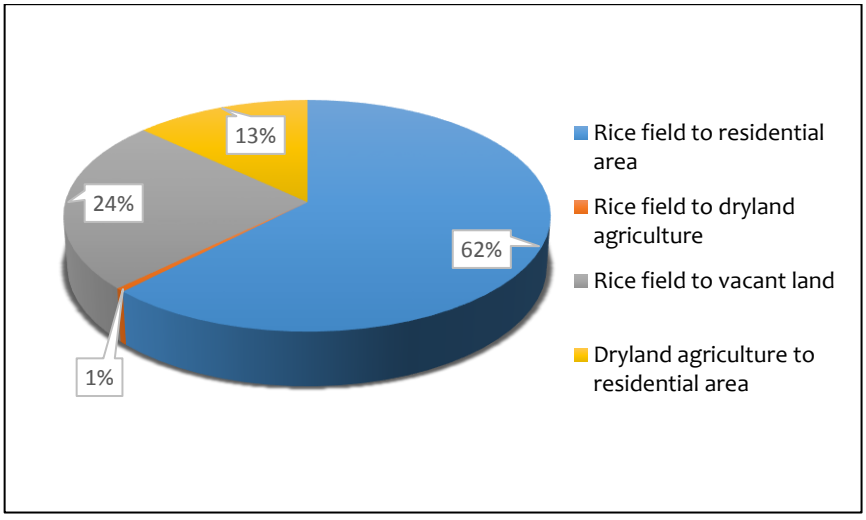
The characteristics of land conversion according to the type of land use/ land cover change are divided into four types of land use/ land cover change, including (a) Rice field becomes residential land; (b) Rice field becomes dryland agriculture; (c) Rice field becomes vacant land, and (d) Dryland agriculture becomes residential land.

Table 6 and Figure 9 show that the most significant percentage for the type of land conversion in Ciparay District from 2009 to 2019 is rice field to residential land, which was 62.27% (336.09 hectares), followed by rice fields to vacant land, about 24.15% (130.35 hectares), dryland agriculture into residential land as much as 13.07% (70.54 hectares). The smallest is rice field to dryland agriculture, which is only 0.51% (2.74 hectares).

Table 6. The Conversion of Landcover Area by Type of Change of Ciparay District in Ten Years

Villages	Area of Land Use/ Land Cover Conversion by Type of Change (Ha)			
	Rice Field to the Residential Area	Rice Field to Dryland Agriculture	Rice Field to Vacant Land	Dryland Agriculture in the Residential Area
Bumiwangi	37.07	0.00	0.00	9.54
Cikoneng	20.50	0.00	0.00	3.96
Gunungleutik	7.82	0.00	0.00	0.00
Manggungharja	20.91	0.00	2.38	13.23
Mekarlaksana	0.00	0.00	0.00	8.38
Mekarsari	64.85	0.00	15.83	0.00
Pakutandang	20.72	0.00	0.00	5.31
Sarimahi	17.22	0.00	2.26	0.00
Serangmekar	30.61	0.00	7.42	0.00
Sigaracipta	15.80	0.00	0.00	17.73
Sumbersari	24.06	0.00	70.96	0.00
Babakan	16.47	2.73	0.00	0.00
Ciheulang	28.13	0.00	1.35	12.39
Ciparay	31.92	0.00	30.14	0.00
Total	336.09	2.74	130.35	70.54

Source: Analysis Result, 2020



Source: Analysis Result, 2020

Figure 9. The Conversion of Landcover Area by Type of Change of Ciparay District in Ten Years (%)

This research on land use/ land cover changes in the Ciparay District aligns with the results in several regions in Indonesia and other countries. In Denpasar City, Bali, rice fields changed into residential areas, and the built-up area for 13 years was 1695 hectares. The decrease in rice field area is 130 hectares per year, and the increase in housing is 133 hectares per year (Supardan, Panularsih, & Darmawan, 2018). Research results on land use/ land cover change in Dujiangyan City, China, show that changes in agricultural land occur due to human activities (Nath, Niu, & Singh, 2018). From 2000 to 2005, there was a decrease in rice fields in a built-up area in southern China (Liu et al., 2010). This condition also follows the projection results in the City of Solok that rice fields' land use/ land cover will continually change. Estimating changes in paddy fields to settlements in Solok City still occur with or without planning for additional road networks (Rustiadi & Barus, 2017).

3.2. Factors of land conversion in Ciparay District

We identified factors affecting land conversion with multiple linear regression. Table 7 describes the dependent variable (Y) and the independent variables (X) used in multiple linear regression. The dependent variable (Y) used is the data on the conversion area of paddy fields obtained from the cumulative land conversion analysis (%). The independent variable consists of three types of data, namely data on the percentage of population growth rate (X1), data on land price ratios (X2), and data on regional accessibility (X3).

Table 7. Variable of Independent and Dependent Data

Villages	Rice Field Land Conversion (%) (Y)	Population Growth Rate (%) (X1)	Land Price Ratio (X2)	Regional Accessibility Ratio (X3)
Bumiwangi (1)	7.90	0.28	14.33	22.52
Cikoneng (2)	4.37	3.26	7.85	23.92
Gunungleutik (3)	1.67	0.27	13.50	84.93
Manggungharja (4)	4.96	1.43	10.51	40.23
Mekarlaksana (5)	0.00	2.38	6.05	19.71
Mekarsari (6)	17.20	1.58	12.88	32.87
Pakutandang (7)	4.42	3.40	16.74	31.04
Sarimahi (8)	4.15	0.69	9.51	6.58
Serangmekar (9)	8.11	1.07	11.48	22.19
Sigaracipta (10)	3.37	0.10	7.44	32.96
Sumbersari (11)	20.25	1.18	12.80	20.88
Babakan (12)	4.09	0.23	13.63	14.52
Ciheulang (13)	6.28	2.71	4.66	21.40
Ciparay (14)	13.23	0.29	6.43	18.27

Source: Analysis Result, 2020

Table 8 contains the test results in multiple linear regression analysis, which concludes as follows.

1. Simultaneously and partially, there is no significant influence between the dependent variable (rice field conversion) and the independent variable (population growth rate, land price ratio, and area accessibility ratio).
2. The most effective contribution value was the area accessibility ratio of 6.32%, the land price ratio of 4.29%, and the population growth rate of 1.64% consecutively.
3. The highest relative contribution values were the area accessibility ratio of 51.58%, the land price ratio of 35.06%, and the population growth rate of 13.36% consecutively.
4. Based on the equation's results, the increase in population density and the regional accessibility ratio negatively affect rice fields' conversion (if the increase in population density and the accessibility ratio for the area increases, the conversion value for rice fields decreases). In contrast, the land price ratio

positively affects the conversion of rice fields (if the ratio of land prices increases, the conversion rate of rice fields will also increase).

Research on determining paddy field conversion in Java and Sumatra uses the variables of agricultural sector income, service sector income, and population density. The results show an insignificant factor as a determinant of change, namely the regional income of the service sector(Harjanti & Hara, 2020). Other similar situations showed that the industry sector was the factor for land conversion in Java (Febrina, 2017).

Table 8. Summary of Multiple Linear Regression

Variable	Regression Coefficient	T	Effective Contribution (%)	Relative Contribution (%)	Sig.
Constant	6.537				
X1	-0.665	-0.441	1.64	13.36	0.669
X2	0.393	0.788	4.29	35.06	0.449
X3	-0.095	-0.961	6.32	51.58	0.359
F	0.466				0.712
R Square	0.123				
Multiple Regression Linear Equation:					
Y = 6.537 - 0.665(X1) + 0.393(X2) – 0.095(X3)					

Identifying the factors influencing rice field conversion in the Ciparay District is relatively different from the results of several studies conducted in various regions. The findings of the study on the determinants of rice field conversion in Mataram City encompass variables such as the number of households, Gross Regional Domestic Product (GRDP), and the extent of raw rice fields (Safitri, Sidik, Dipokusumo, & Sjah, 2022). In other areas (Timor Island), the factors affecting rice field conversions are building area and the number of industries (Lulan et al., 2017). Studies regarding the conversion of rice fields in Java show that elements contribute to the Gross Regional Domestic Product (GRDP) in the agriculture sector, the GRDP in the service sector, and the population density (Harjanti & Hara, 2020). One variable that exhibits similarity in its outcomes is population density. Land conversion in Ciparay District has primarily occurred in the last five years, while the factors suspected to be the cause in the last five years have not changed much.

It is necessary to manage urban growth by controlling land conversion, especially in the outskirts of urban-rural areas. However, the causal relationship between growth management and land conversion in suburban-rural areas is poorly understood (Hersperger, Grădinaru, & Siedentop, 2020). Land conversion management also applies to the Ciparay District, which is a suburban area. Therefore, studying the factors influencing land use/ land cover change must consider applicable policies and regulations.

4. CONCLUSION

The land conversion in the Ciparay Subdistrict for ten years is divided into four types: rice fields into residential land, rice fields into dry land agriculture, rice fields into vacant land, and dryland agriculture into residential land. The areas of the highest to the lowest land conversion were the conversion of land from paddy fields to residential land, which is 336.09 hectares, followed by rice fields to vacant land, about 130.35 hectares, dryland agriculture to residential land use/ land cover 70.54 hectares, and rice fields become dryland agriculture, which only covers 2.74 ha.

Simultaneously and partially, there is no significant influence between population growth rate, land price ratio, and area accessibility ratio to rice field conversion. The rates of the Contribution of the estimator variables to the conversion of rice fields were the area accessibility ratio (51.58%), the land price ratio (35.06%), and the population growth rate (13.36%). The population growth rate and the regional accessibility

ratio have an inversely proportional relationship with the conversion of rice fields. Meanwhile, the ratio of land prices is directly proportional to the conversion of rice fields.

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