polibatam

JAGI

JOURNAL OF APPLIED GEOSPATIAL INFORMATION

Online ISSN : 2579-3608

Volume 6

International Editorial Advisor

1. Prof. Josaphat Tetuko Sri Sumantyo, Ph.D. [SCOPUS ID: 7801490558, h-index:24] Centre for Environmental Remote Sensing, Chiba University, Chiba, (Japan).
2. Prof. Paul Doukhan, Ph.D, [SCOPUS ID 6602566873: , h-index:18], University Cergy-Pontoise, laboratory of Mathematics, AGM (Analysis, Geometry, and Modeling) UMR 8088 CNRS, France.
3. Prof. Andrzej Stepnowski, Ph.D., DSc. [SCOPUS ID: 56405670500, h-index:8] , Department of Geoinformatics, Gdansk University of Technology, Faculty of Electronics, Telecommunications and Informatics, 80-233 Gdansk, Poland.
4. Prof.Fernando Castro Herrera, Ph.D. [SCOPUS ID: 43160919700 h-index:13], University of North Texas, 1988 (USA).
5. Dr. Zulkiflee Abd Latif, [SCOPUS ID: 55991796500, h-index:16], Centre of Studies Surveying Science & Geomatics Faculty of Architecture, Planning & Surveying Universiti Teknologi Mara (UiTM) 40450 Shah Alam, Selangor (Malaysia).
6. Rozaimi Che Hasan, Ph.D., [SCOPUS ID: 54419613200, h-index:5], UTM Razak School of Engineering and Advanced Technology, Universiti Teknologi Malaysia, Kuala Lumpur, (Malaysia).
7. Shaik Asif Hossain., [SCOPUS ID: 57189032985, h-index:6], Department of Electronics and Telecommunication Engineering, Rajshahi University of Engineering and, Technology, Rajshahi-6204, Bangladesh.

ARTICLES

JOURNAL OF APPLIED GEOSPATIAL INFORMATION

Vol 6 No 2 2022

http://jurnal.polibatam.ac.id/index.php/JAGI
ISSN Online: 2579-3608

The Impact of The Operation of Jati Asih Toll Gate on Land Use Changes in Jati Asih Sub-District

Tsamara Qolbi Haridza[1], Anita Sitawati Wartaman[1]*, Wisely Yahya[1]

[1] *Department of Urban and Regional Planning, Faculty of Landscape Architecture and Environmental Technology, Universitas Trisakti, Jakarta, 11440, Indonesia.*

** Corresponding author e-mail*: asitawati@trisakti.ac.id

Received: August 25, 2022
Accepted: November 11, 2022
Published: November 11, 2022

Abstract

The construction of the JORR E1 (Cikunir-Jatiasih) toll road is expected to improve accessibility in Bekasi City, especially in Jati Asih District. The operation of the JORR E1 (Cikunir-Jatiasih) toll road in 2007 caused a change in land use in Jati Asih District, Bekasi City. On the other hand, the land use changes that occur are not in accordance with the Bekasi City Regional Regulation No. 5 of 2016 concerning Detailed Spatial Planning (RDTR). The area around the Jati Asih Toll Gate is designated as a mixed zone, but the existing condition of land use is for trade and service activities. This study aims to identify land use before the operation of the Jati Asih Toll Gate in 2006 and identify changes in land use after the operation of the Jati Asih Toll Gate in 2017. Descriptive statistical methods and spatial analysis were applied in this study by looking at land use changes at a radius of 1 km from the gate. JORR E1 (Cikunir-Jatiasih) toll road. This study shows that there is a change in land use around the Jati Asih sub-district, which is seen by the decrease in the area and distribution of the use of plantation land, moor, and vacant land from 2006-2017. Within a radius of 1 km from the Jati Asih Toll Gate in 2006-2017 there was a decrease in area and distribution on plantations, vacant land, and dry fields. This is inversely proportional to settlements and buildings, which experienced an increase in area and distribution from 2006-2017. Settlements and buildings also experienced an increase in area and distribution within a radius of 1 km from the Jati Asih Toll Gate in 2006-2017.

Keywords: *Land Use Changes, Toll road, Jati Asih District, Radius.*

1. Introduction

Land use is closely related to human activities with regional infrastructure, especially in the development of toll roads. The development of an area due to the development of toll roads will certainly affect the increase in pressure on the land which then leads to a land conversion (Muhammad Naufal, 2020). The land change in urban areas is also due to the policy of constructing primary collector roads and large-scale toll roads which of course will consume the related land (Nurmadi, 2014). The entire area is the Ngawi-Kertosono Toll Road (Eko Wahyudi, 2012), the Cipali toll road (Septian Andi Prasetyo, 2019), and the Ulujami-Serpong Toll Road in 2000-2016 (Aisyah Desinah, 2017).

The Strategic Plan of Jati Asih Sub-district in 2003-2008, it was explained that Jati Asih Sub-district is still difficult to reach by the community if they do not use private vehicles due to inadequate access. secondary arterial road network, and the Outer Ring Road (outer ring) development plan with the Bekasi JORR Jalan Jatiasih-Cikunir route to then build a toll road network that will connect the southern area of Bekasi city to other areas.

There are land use changes that occur around the Jati Asih toll gate, Jati Asih District, Bekasi City. This is not in accordance with the Bekasi City Regional Regulation No. 5 of 2016 concerning Detailed Spatial Planning (RDTR). The area around the Jati Asih toll gate is designated as a mixed zone, but the existing condition of land use at the time this research was conducted was as a category of trade and service area. The existence of a fairly wide access creates the potential for land use changes around the Jati Asih toll gate. In this study, there is a research question, namely "How is the change in land use before and after the operation of the Jati Asih toll gate?". The purpose is to identify any changes in land use before and after the operation of the Jati Asih toll gate.

2. Research Method

2.1 Time and Location

The implementation of this research was carried out for 5 months from March to July 2022. In this study, the research location was in Jatiasih District. Jatiasih sub-district is part of the second level area of Bekasi City and geographically, its area is 2,304.9 Ha or 10.45% of the total area of Bekasi City. The degree is at 6.55° - 6.80° South Latitude and 107.65° - 107.76° East Longitude with an altitude of about 20 meters above sea level with land slopes below 15º. Initially, Jatiasih District was established in 1986 under the name Representative District as a result of the expansion of the Pondok Gede District area, then definitively, Jatiasih District was established in 1992. The condition of the Jatiasih area has invited many developments, as with the many housing and office development companies, which expand their business activities to make significant changes and growth to the economy and population. This is still being added with the operation of the Outer Ring Road Toll Road in 2007 until now. In addition to the variations in topographical conditions, Jati Asih District also has quite a variety of land use variations. In this study, using a 1 km radius from the Jati Asih toll gate to see changes in land use due to the operation of the JORR E1 toll road. The land use of Jati Asih Sub-district in 2006 was classified into seven classes, namely buildings/buildings, plantations, settlements and places of activity, rivers, vacant land, and dry fields.

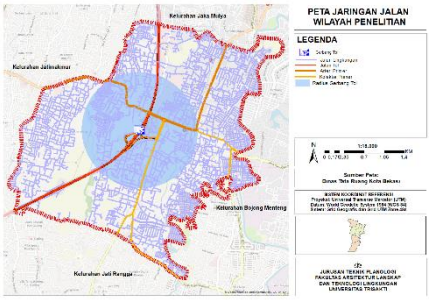

Figure 1. Research Location Map
Source: Bekasi City Spatial Planning Office, 2022

2.2 Data Collection

There is only one type of data used in this research , namely secondary data or data obtained through data from various agencies related to research discussions, literature studies, or also preliminary research, which includes institutional data and satellite image data. Some documents related to information on land use maps in this study were obtained through reference books, data from relevant agencies consisting of the Central Statistics Agency (BPS) of Bekasi City, Bekasi City Spatial Planning Service, and Bekasi City National Land Agency (BPN). and the Regional Development Planning Agency (Bappe litbangda) Bekasi City . Satellite imagery is described as a form of data processing through digitizing maps of built and non-built land in an area , which in this study is through digitizing the 2006 land use map, and 2017 land use map, seeing that the changes that occur are known with the aim of seeing data on changes in area and types of land use. For clarity in data collection, the following is a table of data collection methods.

Table 1. Data Collection Method

Variable	Indicator	Data Type	Data source
Toll Exit Location	Toll Exit Radius	Secondary	Satellite Image
Type of Land Use	Type of Land Use		Bekasi City Spatial Planning Office, Satellite Image
Land Use Area	The area of built and undeveloped land before and after the operation of the Jatiasih toll gate		Bekasi City Spatial Planning Office, Satellite Image

2.3 Data Analysis Method

This study includes the method of analysis with two types of statistics. First, statistical spatial analysis is an analytical technique that is useful in the processing of GIS (Geographic Information System) data, with the results of the analysis being determined by the research location. In addition, this analysis is also interpreted as an analytical technique for exploring data and spatial perspectives. This study uses spatial analysis, which was carried out in this study using ArcGIS 10.5 software, to map and overlay land use. Mapping analysis here is carried out by producing final results that are possible to be a reference for decision making related to problems related to spatial matters. As for the implementation, the analysis of this research is on land use before and after the Jatiasih toll gate operates.

Second, descriptive statistical analysis is useful in analyzing land use changes before and after the Jati Asih toll gate operates. This analysis is used to describe the characteristics of the predetermined variables (Bahari, 2019). Each variable related to land use is processed quantitatively and then, based on the results of calculations or measurements, will be able to describe or explain well based on the results of the research itself or in words. In the calculation of statistical analysis in this study there is a formula to calculate the rate of land use change, which can be determined in the following formula.

$$V = \frac{L_t - L_{t-1}}{L_{t-1}} \times 100\%$$

Information:
V : Area of land depreciation (%)
L_t : Land area in year t (Ha)
L_{t-1} : Land area of the year before t (Ha)

Based on the formula for the rate of change in land use above, if the result is V < 0 then the land area is shrinking/decreasing, but if V ≥is 0 then the land use area is increasing/widening (Tang *et al.,* in Hidayat and Noor, 2020). Based on the explanation above, the following is a table of analytical methods that will be carried out through this research.

Table 2. Data Analysis Method

Target	Analysis Method	The final result
Identify the type and area of land use prior to the operation of the Toll Gate Jati Asih Bekasi City in 2006.	• Spatial analysis • Descriptive statistical analysis	• Type of land use before the operation of the Jatiasih toll gate. • The area of land use before the operation of the Jatiasih toll gate.
Identify the type and extent of land use change due to the operation of the Toll Gate Jati Asih in 2017.	• Spatial analysis • Descriptive statistical analysis	• Changes in the type of land use after the operation of the Jatiasih toll gate. • Changes in land use area after the operation of the Jatiasih toll gate.

3. Result and Disscusion

3.1 Land Use Before the Operation of the Jati Asih Toll Gate in Jatirasa Village, Jatikara Village, and Jatiasih Village in 2006

The Jatiasih toll gate is located in Jatiasih village. In this study, we used a 1 km radius to see changes in land use that lasted for a period of 10 years. Within a radius of 1 km from the Jatiasih toll gate, there are 5 types of land use, namely residential land and places of activity, rice fields, dry land/fields, vacant/barren land, and plantations. The area of land use within a radius of 1 km is 883.04 Ha. To see the area and types of land use within a radius of 1 km in 2006 will be shown in table 3 below.

Table 3. Land Use Within a Radius of 1 Km in 2006

Types and Areas of Land Use Within 1 Km Radius in 2006			
No	**Type of Land Use**	**Area (Ha)**	**Percentage (%)**
1	Plantation	71.94	8.15
2	Settlements and Activities	577.21	65.37
3	Ricefield	104.19	11.80
4	Bare Land	39.73	4.50
5	Moor/ Field	89.97	10,19
	Total	**883.04**	**100**

Source: Analysis Results, 2022

Based on the table above, it can be seen that within a radius of 1 km the largest types of land use are settlements and places of activity, which are 577.21 Ha with a percentage of 65.37%, the second largest land use is occupied by rice fields, which is 104.19 Ha with the percentage of 11.80%, then the third position is the type of land use upland/field with an area of 89.97 Ha and a percentage of 10.19%. The land use in the fourth position is the type of plantation land use, which is 71.94 Ha and a percentage of 8.15%, and the type of land use in the last position is occupied by the type of vacant land use, which is 39.73 Ha and the percentage of 4.5%. The following is a picture of the distribution of land use in 2006 within a 1 km radius as shown in Figure 2 below.

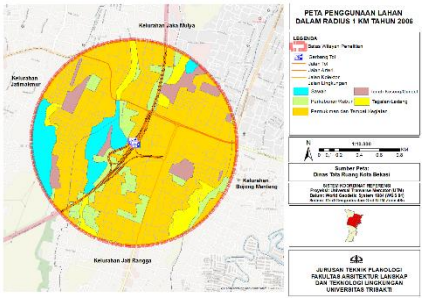

Figure 2. Map of Land Use Within a Radius of 1 Km in 2006

Source: Analysis Results, 2022

Based on the map above, it can be seen that within a 1 km radius of the Jati Asih toll gate, the types of land use for settlements and places of activity are evenly distributed. The types of paddy fields within a radius of 1 km from the Jati Asih toll gate are in the western part, namely in the Jatiasih village, and in the north, namely in the Jatirasa village, and for the types of land use, vacant/barren land, plantations, and dry fields/fields are evenly distributed in the area. 1 km radius from the Jati Asih toll gate.

It is requested not to us any of footnotes. All references should be in the References. Explanations should be preferably included in the text.

3.2 Changes in Land Use After the Operation of the Jati Asih Toll Gate Within a Radius of 1 Km in 2006 and 2017

In 2017, 10 years have passed since the operation of the Jati Asih toll gate. In 2017, as in 2006, the types of land use for settlements and places of activity and buildings/buildings continued to increase in terms of area and percentage. To see land use within a 1 km radius in 2017, is shown in table 4 below.

Table 4. Land Use Within 1 Km Radius in 2017

Types and Areas of Land Use Within 1 Km Radius in 2006			
No	**Type of Land Use**	**Area (Ha)**	**Percentage (%)**
1	Building	14.81	1.68
2	Plantation	11.19	1.27
3	Settlements and Activities	729.14	82.57
4	Ricefield	104.12	11.79
5	Bare Land	5.74	0.65
6	Moor/Field	18.04	2.04
	Total	**883.04**	**100**

Source: Analysis Results, 2022

As shown in the table data, the types of land use within a radius of 1 km. In 2017 there are 6 types of land use. There are 2 types of use of vacant land and dry fields that will return in 2017, although with an increasingly smaller area. Settlements and places of activity remain the most dominating with an area of 729.14 Ha and a percentage of 82.57%. Then the second rank is rice fields with an area of 104.12 Ha and a percentage of 11.79%. The third rank is occupied by buildings with an area of 14.81 hectares and a percentage of 1.68%. For the fourth rank is the moor/field with an area of 13.04 Ha and a percentage of 1.48%. And the last type of land use is bare land with an area of 10.74 Ha and a percentage of 1.22%. To see the distribution of land use within a radius of 1 km in 2017, is shown on the following map.

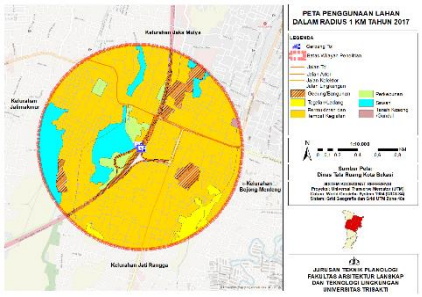

Figure 3. Map of Land Use Within a Radius of 1 Km in 2017

Source: Analysis Results, 2022

The map of land use within a radius of 1 km in 2017 shows that the types of land use for settlements and places of activity are evenly distributed. For buildings/buildings within a radius of 1 km in 2017, the distribution is clustered in three urban villages. Then, paddy fields are only found in the west, namely Jatiasih Village and the north, namely Jatirasa Village, and for plantation land it is found in Jatiasih Village and Jatirasa Village, but for vacant land only in Jatirasa Village, and dry land/fields are only found in Kelurahan Jatirasa. Jatimkar only. After looking at the distribution of land use in 2017, the following is a table of changes in land use within a 1 km radius in 2006 and 2017.

Table 5. Changes in Land Use Within a Radius of 1 Km in 2006 and 2017

Changes in Type and Area of Land Use Within 1 Km Radius in 2006 and 2017					
No	**Type of Land Use**	**2006**		**2017**	
		Ha	**%**	**Ha**	**%**
1	Building	0	0	14.81	1.68
2	Plantation	71.94	8.15	11.19	1.27
3	Settlements and Activities	577.21	65.37	729.14	82.57
4	Ricefield	104.19	11.80	104.12	11.79
5	Bare Land	39.73	4.50	5.74	0.65
6	Moor /Field	89.97	10,19	18.04	2.04
	Total	**883.04**	**100**	**883.04**	**100**

Source: Analysis Results, 2022

Based on the table above, it can be seen that settlements and places of activity continue to increase in area. This is also followed by the type of land use for buildings/buildings, but this is inversely proportional to the use of plantation land, paddy fields, dry fields, and vacant land, which has decreased in area over the years. 11 years.

Types of land use for buildings/buildings and settlements and places of activity continued to increase in area. For buildings/buildings, the area increased by 14.81 Ha with a percentage increase of 1.68%. Settlements and places of activity in the last year also experienced an increase in area of 151.93 Ha with the percentage increase in the last 11 years was 17.2%.

There are 4 types of land use within a 1 km radius that have decreased in area and distribution, namely plantations, rice fields, dry fields, and vacant land. For the type of plantation land use, there has been a decrease in area in the last 11 years by 60.75 Ha with a percentage decrease of 6.88%. For rice fields in the last 11 years, it has only decreased slightly, namely by 0.07 Ha with a percentage decrease of 0.01%. The type of use of dry land and vacant land in the last 11 years has decreased in area and the percentage of vacant land in 11 years has decreased by 33.99 Ha or equivalent to 3.85%. Then, because of the use of dry land/fields in the last 11 years, the area has decreased by 71.93 Ha or equivalent to 8.15%. After an explanation of the types of land use that experienced changes in area, the following is a map of land use changes within a radius of 1 km in 2006 and 2017.

Based on the comparison map of land use within a radius of 1 km in 2006 and 2017, it can be seen that in the north in 2006 there were plantations, vacant land and rice fields, and in 2017 they turned into buildings/buildings as well as settlements and activities, then in the west in 2017. 2006 there was the use of paddy fields but in 2017 it became a settlement and place of activity. In the east in 2006, there was a type of use of dry land and plantations, and in 2017 it has turned into settlements and places of activity and buildings/buildings.

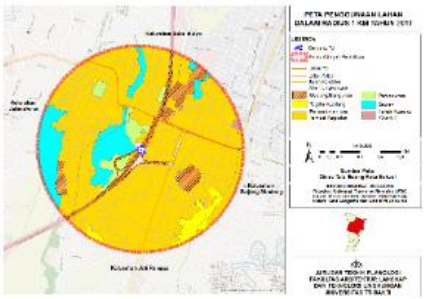

Figure 4. Comparative Map of Land Use in 2006 and 2017
Source: Analysis Results, 2022

Based on the comparison map of land use within a radius of 1 km in 2006 and 2017, it can be seen that in both 2006 and 2017 the distribution of settlements and places of activity was evenly distributed, and for the use of building/building land in 2006 the distribution was not visible, but in 2017 the distribution was clustered in three villages. For the type of use of paddy fields, both 2006 and 2017, they were scattered in groups in the Jatiasih and Jatirasa villages, and for the type of dry land use in 2006. But it has been spread over three villages, but in 2017 it was only found in Jatimkar village. The use of vacant land in 2006 was spread over three villages. But in 2017 it was only found in the Jatirasa village, and because of plantations in 2006, it was spread across three villages and after 11 years had passed, in 2017, it was located in the west, namely in the Jatiasih village and a little in the Jatirasa village.

Changes in use that occur within a radius of 1 km have several reasons, including many people who build buildings without having building permits. They are added to the development of a transportation network plan in the Jatiasih sub-district which makes it easier for people to move to the Jabodetabek area, and the land acquisition carried out causing changes in land use around the Jati Asih toll gate. In addition, if based on the pattern of area change, differences were found in the pattern of land use change between the locations of the Jati asih 1 toll gate and the Jati asih 2 toll gate. A linear pattern was found in the area of land use change at the Jati asih 1 toll gate location, with changes in land are noa. which gets smaller as you get further away from the toll exit location. Then a convex pattern was found in the change in area at the location of the Jatiasih 2 toll gate, by finding an enlargement of the area of land change to a certain point and then decreasing again. The land use change area has a maximum point of 1 kilometer from the toll exit location.

Based on research (Andi Susanto, 2019) with research locations on the Bogor Outer Ring Road/Bogor Outer Ring Road (BORR) in 2006-2017 and (Aisyah Desinah, 2017) on the Ulujami-Serpong Toll Road in 2000-2016, it can be seen that there are similarities in the change in the type of land use, namely the use of residential land which continues to increase after the operation of the toll gate, and around the toll gate becomes a trade and service area or building/building, this also occurs around the Jatiasih toll gate which is within a radius of 1 km from toll gates when compared to 2006 in 2017 there are many trade and service areas, and the study also explains that for land use such as rice fields, vacant land plantations, dry fields, the area has decreased into built-up areas such as settlements, trade and services, and roads. toll. After a detailed explanation of land use around the Jati Asih toll gate and an explanation of changes in area and percentage of land use changes around the Jati Asih toll gate.

4. Conclusion

As described in the discussion of the research that has been carried out, the conclusions obtained to achieve the research objectives are as follows:

For land use within a radius of 1 km, in 2006 there were 5 types of land use, namely plantations, settlements and places of activity, rice fields, vacant/barren land, and dry fields/fields. The land use within a radius of 1 km, which has the largest area, is settlements and places of activity covering an area of 577.21 hectares , rice fields 104.19 hectares , and fields 89.97 hectares . When viewed in terms of the percentage of settlements and places of activity, the highest percentage is 65.47%, the second is rice fields at 11.80%, and the third position is moor 10.19%.

Changes in land use that occurred within a 1 km radius after the operation of the Jati Asih toll gate in 2017, there was a decrease in the area and distribution of plantation land use, paddy fields, dry fields, and vacant land, but the use of residential land and places of activity experienced an increase in both area and distribution. , as can be seen before the operation of the Jati Asih toll gate the building/building in 2006 was not visible or 0 ha and after the operation of the Jati Asih toll gate in 2017 it increased again to 14.81 ha. This also happened to settlements and places of activity which, before the operation of the Jatiasih toll gate had an area of 577.21 Ha and after the operation of the toll gate in 2017 it became 729.14 Ha.

Acknowledgements

This paper is part of the author's thesis. On this occasion the author expresses his gratitude and appreciation to Dr. Ir Anita Sitawati Wartaman, M.Si, and Wisely Yahya, ST, MPWK have provided a lot of guidance and direction. As well as to the Bekasi City Spatial Planning Agency, Bekasi City Bappelitbangda, and Bekasi City National Land Agency (BPN) who helped a lot with data collection and analysis of land conversion.

References

Adisasmita, SA (2011). Transport networks: theory and analysis. First Edition. First Print. Graha Ilmu. Yogyakarta.

Adisasmita, SA (2011). Transportation and regional development. First Edition. First Print. Graha Ilmu. Yogyakarta.

Adisasmita, SA (2011). Transportation development planning. First Edition. First Print. Graha Ilmu. Yogyakarta.

Aditianata, A. (2014). Phenomena of Land Use, Housing and Transportation in the Development of Big Cities (Case: Surabaya City and Metropolitan Gks Plus). *Planesa* , *5* (01), 213118.

Aji, TWP, Amarrohman, FJ, & Sudarsono, B. (2019). Analysis of Land Use Changes in East Ungaran and West Ungaran after the Construction of the Semarang–Solo Toll Road. *Undip Journal of Geodesy* , *9* (1), 115-125.

Amelia, S., & Oetomo, H. (2018). Identification of the Application of the TOD Concept in East Bekasi District (Case Study of TOD Eastern Green LRT City). *Scientific Journal of Plano Krisna Vol* , *12* (2).

Ashari, TI, Subiyanto, S., & Amarrohman, FJ (2020). Comparative Analysis of Land Value Zones in the Area Around Boyolali Toll Gate and Solidarity Circle. *Undip Journal of Geodesy* , *9* (3), 42-50.

Central Bureau of Statistics. 2020. Jati Asih Subdistrict in Figures 2020. Indonesian Central Statistics Agency. Bekasi.

Dabukke, AS, & Susetyo, C. (2021). Prediction of Land Cover Change Post Construction of the Soreang Toll Gate in Soreang District, Bandung Regency Using Binary Logistics Regression. *Journal of ITS Engineering* , *10* (2), C204-C211.

Desinah, A., Tambunan, MP, & Supriatna, S. (2017, July). Changes in land use before and after the construction of the Ulujami-Serpong toll road in 2000-2016 in South Tangerang City. In *Proceedings of Industrial Research Workshop and National Seminar* (Vol. 8, pp. 470-476).

Faricah, D. (2019). *Analysis of Land Use Change Due to Toll Road Construction in Sidoarjo Regency Using Multitemporal Satellite Imagery* (Doctoral Dissertation, Sepuluh Nopember Institute of Technology).

Firmansyah, C. (2014). *Identification of Land Use Changes in the KH Noer Ali Flyover Non-Toll Road Area and Its Impact on Livelihoods and Income Levels (Case Study: North Bekasi, Bekasi City)* (Doctoral dissertation, Indonesian Computer University).

Handayanto, RT, Haryono, H., & Syifa, SA (2021). Prediction, Optimization of Land Use, and Land Value in Bekasi City. *Journal of Students' Research in Computer Science* , *2* (1).

Hartanto, AA, & Pradoto, W. (2014). The Effect of Toll Road Development on Changes in Patterns and Spatial Structures in the Sidomulyo Area, East Ungaran. *PWK (City Area Planning) Technique* , *3* (4), 729-737.

Hermanto, SSA, Makalew, ADN, & Sulistyantara, B. (2018). The Relationship Between Changes in Land Cover and Total Population Affected by the Urbanization Phenomenon in Bogor, West Java. *Indonesian Landscape Journal* , *10* (1), 7-11.

Jimmy, JN, Darmadi, I., & Darmadi, MM (2019). Analysis of the Impact of the Jatikarya On-Off Ramp Traffic on the Transyogi Road, Cibubur. *Journal of Civil-Architecture Engineering* , *18* (2), 1-12.

Law of the Republic of Indonesia Number 26 of 2007 Spatial Planning. 26 April 2007. State Gazette of the Republic of Indonesia Year 2007 Number 68. Jakarta.

Marlina, L., Endaryanto, T., & Hijriani, A. (2021). Analysis of Changes in Agricultural Land Use Due to Toll Road Construction Based on Satellite Imagery in South Lampung Regency. *Journal of Food Systems and Agribusiness* , 11-18.

Mukhlis, J., & Soetomo, S. (2017). Analysis of the effect of exit toll on land use in Brebes Regency. *Journal of Urban & Regional Development* , *13* (3), 327-338.

Munardi, M. (2010). The Effect of Land Use Utilization on the Lhokseumawe City Pase Corridor on the Transportation System. *Portal: Journal of Civil Engineering* , *2* (1).

Nathania, J., Subiyanto, S., & Suprayogi, A. (2017). Analysis of Land Changes and Land Value Zones in East Ungaran District Due to the Construction of the Semarang-Solo Toll Road (2008–2017). *Undip Journal of Geodesy* , *6* (4), 433-442.

Naufal, M., & Susetyo, C. (2020). Prediction of Land Cover Changes After the Operation of the Pandaan Toll Gate (Interchange) in Pandaan District, Pasuruan Regency Using the Binary Logistics Regression Method. *Journal of ITS Engineering* , *9* (1), F53-F59.

Prasetyo, SA, & Djunaedi, A. (2019). Changes in Land Use in Areas Passed by Toll Roads. *Ellipsoida: Journal of Geodesy and Geomatics* , *2* (01), 107-114.

Purba, EDP (2016). Effect of land use on traffic performance on Jalan Sam Ratulangi Manado. *Spatial* , *3* (1), 85-94.

Putra, AAASP (2018). *Formulation of the Factors of Land Use Change Due to the Construction of the Waru-Juanda Toll Road in Tambakoso Village, Sidoarjo Regency* (Doctoral dissertation, Sepuluh Nopember Institute of Technology).

Regional Regulation Number 13 of 2011. Bekasi City Spatial Plan 2011-2031. December 16, 2011. Regional Gazette of Bekasi City Year 2011 Number 13 Series E. Bekasi.

Regional Regulation Number 5 of 2016. Detailed Spatial Plan of Bekasi City for 2015-2035. 26 September 2016. Regional Gazette of Bekasi City Year 2016 Number 5. Bekasi.

Regulation of the Minister of Agrarian Affairs and Spatial Planning Number 9 of 2017.

Guidelines for Monitoring and Evaluation of Spatial Utilization.

Regulation of the Minister of Public Works Number 41/PRT/M of 2007. Guidelines for Technical Criteria for Cultivation Areas.

Saraswati, ZF, Purqon, A., Malik, II, Awfa, D., Awan, FN, Risky, M., ... & Putra, N. (2022). Model of Land Cover Change Caused by Toll Road Access Using Cellular Automata in Sumatra Island. *Journal of Architecture* , *12* (1), 51-66.

Susanto, A., & Marsoyo, A. (2019). The Influence of the Location of the Bogor Outer Ring Road Toll Exit Toll on Changes in Land Use Around Jalan Soleh Iskandar, Bogor City. *Journal of Geography and Its Teaching* , *17* (2), 1-14.

Wahyudi, E. (2012). Forecasting Analysis of Land Use Change in Nganjuk City related to the Interchange Location Plan for the Ngawi-Kertosono Toll Road. *Journal of Urban and Regional Development* , *8* (2), 167-177.

Yunanto, MA (2018). *Prediction of Land Use Change Due to the Construction of the Krian and Driyorejo Toll Gate in Driyorejo District, Gresik Regency* (Doctoral dissertation, Sepuluh Nopember Institute of Technology).