

# The Impact of the Operation of the Jatiasih Toll Gate on Economic Activities in the Jatiasih Sub-district

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# The Impact of the Operation of the Jatiasih Toll Gate on Economic Activities in the Jatiasih Sub-district

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**Abstract.** The JORR E1 (Cikunir-Jatiasih) toll road was constructed with the primary goal of enhancing connectivity between the southern area of Bekasi City and other regions. The construction and opening of the toll gate could yield a range of effects on the community, spanning from positive to negative impacts. This research aims to identify the impact on economic activities and their externalities after the operation of the Jatiasih toll gate based on public perception. Data were collected through questionnaires distributed to 102 residents of the Jatiasih and Jatimekar urban villages. A quantitative descriptive method with scoring analysis was employed for the analysis. The results indicated that the operation of the Jatiasih toll gate has significantly affected the economic condition of both the Jatiasih and Jatimekar urban villages. In the economic aspect, the operation of the toll gate has led to a considerable transformation of residential functions, with business activities being incorporated into residential properties. This integration has resulted in increased economic activities within a 1 km radius. However, it is important to note that the development of economic activities within this radius has generated negative externalities in the surrounding area. This research emphasizes the importance of monitoring economic activities to better understand economic situations and to facilitate policymaking geared toward sustainable development and management.

**Keywords:** Impact, Jatiasih Toll Gate, Economic Activities, Externalities

## 1. Introduction

The E1 Section IV (Cikunir-Jatiasih) of the Jakarta Outer Ring Road was constructed with the primary objective of enhancing connectivity between the southern area of Bekasi City and other regions [1], and the Jatiasih toll gate commenced operations in 2007 [2]. As a transportation node linking Bekasi City with its external areas, the presence of toll gate may lead to various implications for changes in the surrounding areas. Previous research has shown changes in land use before the operation of the Jatiasih toll gate in 2006 and land use in 2017 within a 1 km radius [3]. 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 [3].

The alteration in land use within urban areas have notable impact on human life, such as the enhancement of economic activities that result from toll road construction [4]. The expansion of transportation infrastructure is closely tied to the advancement of land use and economic activities [3][5][6][7]. Toll road construction is anticipated to improve the welfare of the people, particularly those residing near the exit tolls [8]. Furthermore, retail development tends to thrive in proximity to the toll road exit gates [9]. The establishment of toll roads, particularly near exit tolls, paves the way for the emergence of new small and medium enterprises [10][11][12].

The growth of economic activities often brings about conflicts in spatial use. Zoning has been employed as a mechanism for implementing land use controls to address the adverse impact of negative externalities [13]. Traditional zoning systems operate under the premise of segregating residential land use from commercial or industrial land use, as commercial facilities are perceived as potential nuisances that attract crowds and lead to congestion [13]. This study assumes that the effects of toll road construction and toll gate openings on the surrounding area and community may vary, resulting in positive or negative outcomes. Several studies have discussed changes in land use and changes in economic activity around toll gates due to the operation of a toll road. However, research on the impact of the operation of toll gates on economic activity and the externalities of the rapid economic activity is still limited. Therefore, this research aims to identify impact on economic activities and its externalities after the operation of the Jatiasih toll gate based on public perception.

## 2. Methods

### 2.1. Research Area

This research was conducted in the Jatiasih Sub-district, Bekasi City, West Java, situated at 106.55 E and 6.7 – 6.15 S and has an evaluation ranging from 11 to 29 m above sea level [14]. Covering an approximate area of 2,427 hectares, the Jatiasih Sub-district comprised six urban villages. The research area consisted of the Jatiasih and Jatimekar Urban Villages, both located within a 1 km radius from the Jatiasih toll gate. This 1 km radius was chosen to assess impact of toll gate operation on the surrounding land use associated with economic activities [3][6][8].

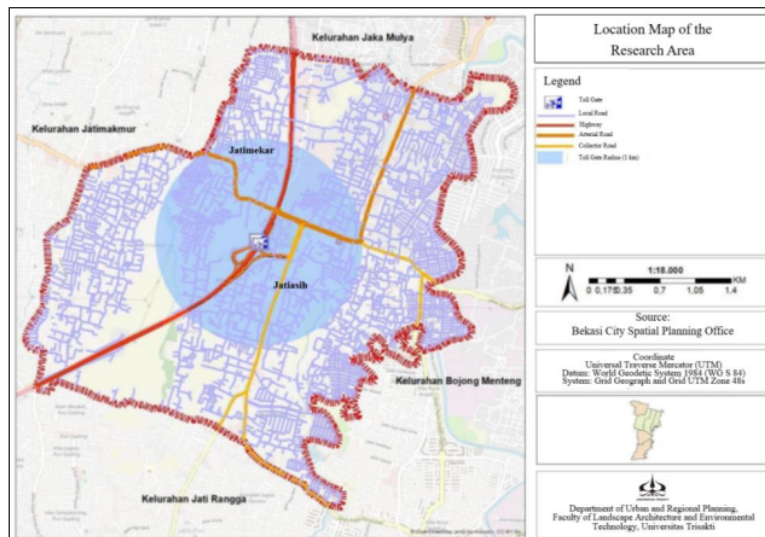


Figure 1. Location Map of the Research Area

### 2.2. Data Collection

The primary data were obtained through questionnaires that were distributed offline from June 22<sup>nd</sup> until July 17<sup>th</sup>, 2023. The questionnaire included inquiries about the profile of the respondents and their perceptions regarding the economic impact of the operation of the Jatiasih toll gate. Simple random sampling was employed, ensuring that each member of the population had an equal chance of being selected as a subject [15]. The population consisted of households in the Jatiasih and Jatirasa urban villages located within a 1 km radius from the Jatiasih toll gate. Using the Slovin formula ( $n = N / (1 + Ne^2)$ ) [16] with an error margin of 8.5%, a total of 102 respondents were included in the analysis, as presented below.

**Table 1.** Sampling

Urban Village	Community Unit	Neighborhood Unit	Number of Household	Number of Respondents
Jatiasih	No. 05	No. 01,05,06	105	27
	No.06	No.04	35	9
	No.08	No.06	35	9
	No.09	No.01,02	80	21
	No.10	No.01	35	9
Jatimekar	No.09	No.01,03	70	18
	No.10	No.11	35	9
Total	7 Community Units	11 Neighborhood Units	395	102

### 2.3. Data Analysis

The research employed a quantitative method to assess the perception of residents regarding the influence of the operation of the Jatiasih toll gate on economic aspect. Data in the form of a Likert scale were collected from the answers of the respondents, with the scale ranging from "1 = Strongly Disagree" to "5 = Strongly Agree".

**Table 2.** Variables and Indicators

Objectives	Variables	Indicators/Statements
Identification of impact on economic conditions after the operation of the Jatiasih toll gate	Economic Activities	<ul style="list-style-type: none"> <li>a. The operation of the Jatiasih toll gate has impact on increasing economic activities within a 1 km radius.</li> <li>b. The operation of the Jatiasih toll gate becomes a determining factor in selecting a business location.</li> <li>c. The operation of the Jatiasih toll gate has impact on transforming residential functions by incorporating business activities into residential properties.</li> </ul>
	Income	<ul style="list-style-type: none"> <li>d. The operation of the Jatiasih toll gate increases residents' income from business activities.</li> </ul>
Identification of externalities related to economic activities that have developed after the operation of the Jatiasih toll gate	Environmental Condition	<ul style="list-style-type: none"> <li>a. The increase in economic activities after the operation of toll gate affects the amount of waste generated.</li> <li>b. The increase in economic activities after the operation of toll gate affects a decrease in water and air quality.</li> </ul>
	Congestion	<ul style="list-style-type: none"> <li>c. The increase in economic activities after toll gate operation contributes to congestion.</li> </ul>

The scoring table used in this research was presented below, and the average score was used to measure the perceptions of the community regarding economic impact resulting from the operation of the Jatiasih toll gate on the surrounding. Furthermore, the interval range was derived by calculating the class interval as  $I = \text{Range (highest score - lowest score) / Number of classes}$ .

**Table 3.** Range and Category

Aspect	Range	Category
Economic Conditions	4.0 – 7.2	Very Insignificant Impact
	7.21 – 10.4	Insignificant Impact
	10.41 – 13.6	Moderate Impact
	13.61 - 16.8	Significant Impact
	16.81 - 20	Very Significant Impact
Externalities of Economic Activities	3.0 – 5.4	Very Insignificant Impact
	5.41 – 7.8	Insignificant Impact
	7.81 – 10.20	Moderate Impact
	10.21 - 12.6	Significant Impact
	12.61 – 15.0	Very Significant Impact

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### 3. Results and Discussion

#### 3.1. Identification of Impact on Economic Conditions After the Operation of the Jatiasih Toll Gate

The results from the survey indicated that 78% of the respondents expressed a positive perception regarding the operation of the Jatiasih toll gate. These respondents stated that it has significantly contributed to an increase in economic activities, particularly in trade and services, within their respective domicile areas, including the Jatiasih and Jatimekar urban villages. Based on public perceptions, the operation of the Jatiasih toll gate has a significant impact on promoting economic activities within a 1 km radius, as evidenced by an average score of 4.22. However, the operation of toll gate was not the sole determining factor in selecting a business location, as indicated by an average score of 2.31. This indicator was considered to have no significant effect due to the fact that the majority of respondents (71%) had been residing in the Jatiasih and Jatimekar urban villages for more than 16 years (before the operation of the Jatiasih toll gate). These results were consistent with the answers of the respondents, where only 21% agreed or strongly agreed that the operation of toll gate influenced their business location choice, while 69% of respondents stated their business location was not influenced by the Jatiasih toll gate.

The research showed that a considerable proportion (92%) of the respondents had converted a small or large portion of their residence for business activities. The area of residential conversion into business activities ranged from 5 m<sup>2</sup> to 125 m<sup>2</sup>, with an average conversion size of 20.5 m<sup>2</sup>. Various business activities were observed within the residential zones, including grocery stores, eateries/cafes, workshops, car dealerships, and other services (laundry services and digital printing). Specific examples of business activities in residential areas were illustrated in Figure 2. Based on public perception, the operation of the Jatiasih toll gate has a significant impact on transforming residential functions by integrating business activities into residential properties, as evidenced by an average score of 4.56. The community also perceived that the operation of toll gate moderately impacted the increase of the income of the people from business activities, with an average score of 3.16 on this particular indicator.



**Figure 2.** Economic Activities in the Jatiasih and Jatimekar Urban Villages

In this section, four indicators/statements elucidated <sup>1</sup> impact of the operation of the Jatiasih toll gate on economic aspect. The cumulative average score of these indicators was 14.25, signifying that the operation of toll gate since 2007 has had a significant impact on economic condition of both Jatiasih and Jatimekar urban villages.

**Table 4.** Public Perception Regarding <sup>1</sup> Impact of the Operation of the Jatiasih Toll Gate on Economic Conditions

No.	Indicators	Frequency					Score	Average
		1	2	3	4	5		
1	The operation of the Jatiasih toll gate has impact on increasing economic activities within a 1 km radius.	5	36	2	9	5	430	4.22
2	The operation of the Jatiasih toll gate becomes a determining factor in selecting a business location.	0	30	2	18	0	236	2.31
3	The operation of the Jatiasih toll gate has impact on transforming residential functions by incorporating business activities into residential properties.	17	15	4	41	17	465	4.56
4	The operation of the Jatiasih toll gate increases residents' income from business activities.	26	10	23	16	26	322	3.16
Total								14.25

### 3.2. Identification of Externalities Related to Economic Activities that Have Developed After the Operation of the Jatiasih Toll Gate

This analysis showed externalities resulting from the rapid development of economic activities in the research area. The increase in economic activities after the operation of toll gate has a significant impact on the increase of generated waste, as indicated by an average score of 3.74. The respondents stated that the surge in economic activities after the operation of the Jatiasih toll gate has a significant impact on decreasing water and air quality, with an average score of 4.30. Based on public perception, the increase in economic activities after the operation of toll gate significantly contributed to the congestion in the area, with an average score of 3.83.



**Figure 3.** Congestion in the Jatiasih Urban Village

This section presented three indicators/statements that explain externalities resulting from economic activities developed after the operation of the Jatiasih toll gate. The cumulative average score of these indicators was 11.87, indicating that the development of economic activities within a 1 km radius of toll gate generated negative externalities with significant impact in the surrounding area.

**Table 5.** Public Perception Regarding Externalities of Economic Activities

No.	Indicators	Frequency					Score	Average
		1	2	3	4	5		
1	The increase in economic activities after the operation of toll gate affects the amount of waste generated (solid and liquid waste).	3	10	35	17	37	381	3.74
2	The increase in economic activities after the operation of toll gate affects a decrease in water and air quality.	1	3	14	30	54	439	4.30
3	The increase in economic activities after toll gate operation contributes to congestion.	18	2	8	25	49	391	3.83
Total								11.87

### 3.3. Discussion

The construction of the JORR E1 (Cikunir-Jatiasih) toll road in 2007 had significant implications for land use changes within Jatiasih District, Bekasi City [3]. Over the period spanning from 2006 to 2017, an analysis conducted within a 1 km radius from toll gate exhibited a reduction in the size and dispersion of plantations, vacant land, and dry fields, accompanied by noticeable growth in residential and commercial areas [3]. This change in land use was interconnected with economic condition of the research area, impacted by the operation of toll gate. Within the residential zone, a spectrum of activities was observed, including grocery stores, eateries/cafes, workshops, car dealerships, and other services (laundry services and digital printing). These results aligned with previous reviews, which indicated the potential viability of businesses in the food and transportation sectors [8]. However, the development of economic activities resulting from changes in built-up areas after the operation of the Jatiasih toll gate has contributed to negative environmental impact. The increase in commercial activities around residential areas could lead to higher residential land values to some extent [13]. Beyond a certain threshold level, land values might decrease due to congestion or excessive noise, offsetting convenience [13]. This research emphasized the importance of monitoring economic activities to better understand economic situations and facilitate policymaking geared toward sustainable development and management. Further investigations were necessary to address planning, design, and zoning regulations to anticipate and mitigate potential negative externalities [13].

### 4. Conclusion

The operation of the Jatiasih toll gate has undeniably exerted a significant impact on economic condition of the Jatiasih and Jatimekar urban villages, as indicated by an average score of 14.25. Among economic indicators, the third indicator stood out with the highest score, signifying that the operation of toll gate has a significant impact on transforming residential functions by integrating business activities into residential properties, with an average score of 4.56 for this indicator. However, it is important to acknowledge that the increase in economic activities after the operation of toll gate has had an adverse effect on the environmental conditions. As public perception indicated, the development of economic activities within a 1 km radius of toll gate generated negative externalities in the surrounding area, resulting in an overall average score of 11.87. The respondents emphasized that the surge in economic activities had a very significant impact on decreasing water and air quality, with an average score of 4.30.

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