

The Impact Of Infrastructure Of South Cross Road Line Toward Land Value

Lustina Fajar Prastiwi^{1, a*}; Inayati Nuraini Dwiputri^{2, a}

¹lustina.prastiwi.fe@um.ac.id; ²inayati.nuraini.fe@um.ac.id

^aState University of Malang

*corresponding author

ARTICLE INFO

ABSTRACT

Article history

Received : 10-06-2021

Revised : 30-07-2021

Accepted : 06-08-2021

Keywords

Infrastructure

Land Value

Sewu Mountain

Coast area

Land is one of the production factors in an economic activity. The demand for a new property is never low, while its supply is limited. The purpose of the research is to identify the impact of JJLS (Jalan Jalur Lintas Selatan) project on the pattern of the land value surround in 2016 with the sample in four villages Gunungkidul (Giriasih, Girijati, Giripurwo and Giricahyo). Furthermore, the research identifies the variables that effect the pattern of the land value. Explorative research is used as the research design. The primary data source gained from a measurement using Google Earth software. The secondary data is based on property purchase transaction recording from BKAD Gunungkidul. Using convenience sampling, the findings of the research show that there is a weakening of 1.5% per kilometers for property which is far away from JJLS. The price of the land influenced by some factors, such as land area (4,68%), the distance to Central Business District (CBD) (0,0535%), the type of field land (3,65%), and the adequate accessibility (2,96%). Therefore, the construction of JJLS has succeeded in increasing land prices in the surrounding area. The impact of the JJLS development certainly makes land prices close to JJLS increase. Long distance land with JJLS will be cheaper. However, the location of Purwosari District is close to Parangtritis Beach, so land that is far from JJLS but can see beach views will still sell for quite high prices.

This is an open access article under the [CC-BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license.



Introduction

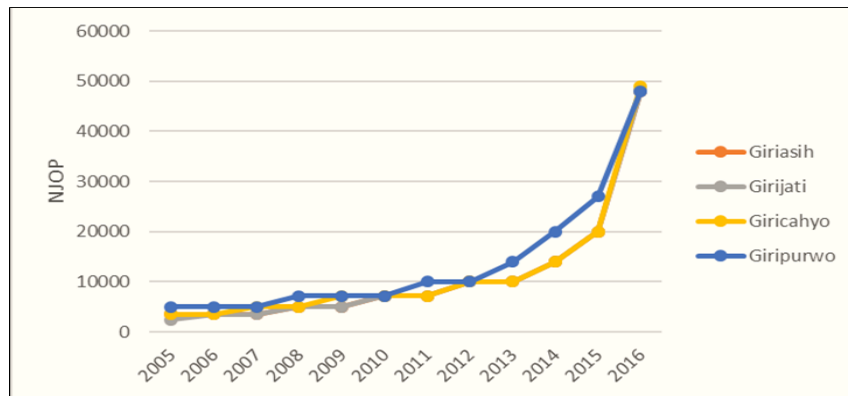
Infrastructure is one of important aspects in national growth. In Indonesia, infrastructure development is carried out by the government under the leadership of President Joko Widodo, where the infrastructure sector is able to grow the Indonesian economy (Aditya & Naomi, 2017). Adequate infrastructure is needed to support economic activities in a region, either in urban or countryside. Economic growth in an area can indicate how the achievements and economic developments in the region (Putri, 2014). One of infrastructure types that poses as public good is highways functioning as public transportation. Transportation network functions to link between growth points in many areas (Adisasmitha, 2014). The highway as the most important means that can have a

positive impact on the local residents because with a good road, the activities of the surrounding community become smoother and faster (Sharfina, 2014).

Infrastructure development as part of capital is considered capable of increasing per capita income (Dwiputri et al., 2019). Furthermore, Li & Zhou (2019) said that economic development, infrastructure and public service facilities, location, industrial structure, population and transportation can significantly affect market prices. Road transportation services can increase the value of a land and its territory, so that land use patterns can increase the development of urban areas by increasing high accessibility and accelerating economic growth (Harum, Muhammad, Sutriani, 2017). Road infrastructure investment will affect the economic sector with the assumption that this increase will act as a stimulus for regional economic development or as a fulfillment of the level of demand of a region's economic growth (Anas et al., 2016).

Yogyakarta Special Region (Daerah Istimewa Yogyakarta/DIY) is one of provinces that is passed through by South Cross Road Line Project (Jalan Jalur Lintas Selatan/JJLS). This project is developed by central government. The purposes are to give accessibility in southern shore of Java with less productivity, to introduce natural landscape along Indian Ocean, and to be one alternative highway among provinces instead of passing through eastern coastline and middle lane. One of the regencies in this province, which is passed by JJLS, is Gunungkidul. Gunungkidul has particular landscape with hills and limestone mountains. It causes the area to have quite severe drought during dry season (www.gunungkidulkab.go.id). Purwosari is one of the isolated sub-districts because it is located to Sewu mountain range. That sub district is very far from central regency Gunungkidul which is located in East. The accessibility of this area only relies on local streets. Beside that, there is a lack of traffic signs. In addition, socio-economy growth has been stagnant for many years because the city-dwellers only work as laborers or farmers. The rising of demand in property has become one of local economy's turning points in the surrounding areas.

Since the JJLS project was established, Purwosari is being acknowledged by public and property developers. They envision that the area has potential as wildlife or natural tourist object. The growth and development of the area has taken highly during 3-5 years period. Around the development area of JJLS, there have been built many hotels, villas, and cottages. The infrastructure development has managed to increase the property price in the area, as shown in the increase of Taxed Object Selling Value (Nilai Jual Object Pajak/NJOP) every year.



Source: BKAD Gunungkidul, 2017 (processed data)

Figure 1. Change of Land Price in Purwosari year 2005-2016

The Taxed Object Selling Value (NJOP) of Purwosari, especially in Giriasih, Girijati, Giricahyo, and Giripurwo villages from year 2005 up to 2016, tends to have insignificant different values. From year 2005 up to 2011, the property price in those areas is only around Rp 5.000,- up to Rp 10.000,-. However, after the development of JJLS had been done around year 2010 till 2012, the property value of those areas increases every year to Rp 20.000 since 2014 and keeps increasing. In the year 2015, the property price has reached Rp. 25.000 and it reached Rp 48.000 in 2016 (Figure 1).

Estate or property is taken to be valuable if it gives potential usages such as for housing, recreational facility, farming, transportation line or route. Factors and principles that must be paid attention in deciding property value are anticipation, change, offer and demand, substitution and balance (Grubbe et al., 2013). Generally, the factors which give influences to property value are demand, offer, physical property, location and placement, and politics or government policies (Hidayati. W. and Harjanto, 2014). Location is considered as the most significant factor in deciding property value.

The distance toward Central Business District (CBD) becomes another factor which affects property value. Gaolu (2015) explained that not only its location, but also the distance to CBD greatly affects the property price. Concept of CBD is defined as economy zone in Land Value Zone (Zona Nilai Tanah/ZNT) which covers or links to the location of central activity for shopping, education, office, bus or railway station, etc. The referred CBD location in this research is Parangtritis Beach. The reason is that Purwosari is located very near with a tourism spot Parangtritis Beach, which has special attractions to visitors and property development investors. The existence of empty places in that area will attract more investors in their trade and business.

The research by Gaolu (2015) about the effect of central business district on house

prices in Chengdu Metropolitan Area, mentioned that the factors affecting property value are the width, the distance to CBD, and the width of street in front of the area or the place. The property value shown by property selling price in each region has its own different characteristics, causes and effects. Estate or land has certain unique and inherent characteristics so that the value is changeable according to the location. Zhuang & Zhao (2014) explained that establishing means of transportation comprehensibly will increase the property value and housing around that area. The existence of traffic, developing trade, and transportation will be the fundamental point in establishing new developing district(s).

Generally, Gunungkidul Regency is seen as less productive area in Yogyakarta Province because of the lack of accessibility and infrastructure. However, it has now become one of significant areas with existing development including the apparent natural and adequate human resources. South Cross Road Line Project (JJLS) community project can increase the productivity, introduce the region to the wide society, and open the chance of investment nationally and internationally to stimulate the economy and social welfare. According to the presentation about the important of land and the effect of construction around JJLS in Purwosari sub-district Gunungkidul regency, it needs a deeper research about the price changing of the property around JJLS in 2017. The purpose of this research is to decide which factors can affect the price pattern of the estate or property surrounding JJLS construction and development.

Method

The research design used in this research is explorative research. This design is applied to a research object which is still new and obscure or vague (Cooper. Donald & Emory. William C, 1996). Thus, the explorative is done to find out the problem. This method is used because the research object is located in Sewu mountain range, shore tourism development area, and regency passed by JJLS project. This study also seeks to determine the elasticity of changes in land prices in the area due to factors that affect land prices. The main purpose of this research is to find the impact of South Cross Road Line Project (Jalan Jalur Lintas Selatan/JJLS) toward the property value in mountain range, tourism zone, including the areas which are affected by the infrastructure development. The researcher used quantitative method Ordinary Least Square and cross section data. The data which were used are transaction data in Purwosari sub-district, Gunung Kidul, Yogyakarta Special Region in year 2016. Different from Zhuang & Zhao (2014), this research identifies in more depth the elasticity of change in land prices. Prastiwi et al. (2017), used difference in difference to identify the effect of construction of Sapon Dam Kulon Progo. This research

used are quantitative method. The quantitative method was done by using Ordinary Least Square (OLS) to represent the link between the variables that influence the estimation model which have been determined.

The type of the data in this research is secondary data type. Those data consist of cross-section data i.e transaction data compiled by Bureau of Financial and Regional Asset (Badan Keuangan dan Aset Daerah/BKAD) Gunungkidul regency, Yogyakarta Province. The data collection was done by using convenience sampling method on the land-selling transaction data in 2016 in the regency. The intended areas are the villages in Purwosari sub-district; Giripurwo, Giricahyo, Giriasih, and Girijati villages. The transaction data used in this research include the obtained price and its rights, land type, land width of properties that were sold in Purwosari in the year 2016. The related variables consist of the distance to CBD, and the distance of South Cross Road Line which was measured by using Google Earth Pro software with ruler grid. Non-structured interviews were also done to obtain more accurate data and analysis.

The research model of this research is shown below:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon \quad (1)$$

or

$$\text{Log } Y = 0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon \quad (2)$$

Formula Y shows dependent variables in this research. Those are fixed land value which were proxied by land price (Log Y). The Log Y model is used to determine the elasticity of changes in the independent variable to the dependent variable (Gujarati, Damodar & Porter, 2013). In this study to see the elasticity of changes in land prices which are influenced by the factors forming land prices. The first independent variable is land width (X1) which has been in transactions. The wider the land is put in sale, the higher the price is. The second variable is the distance to reach the nearest Central Business District (X2). Central Business District (CBD) is the society's activity center or most crowded area that influence the property price around it. Central Business District (CBD) in this research is Parangtritis Beach area where many visitors are attracted to go and is one the most crowded tourism spot. The beach also poses as economical center for local community. The fourth variable is the proxy distance from JJLS (X3). The distance from JJLS also influences the land price because the location with easier access will have higher market price. The land type (X4) is a dummy variable differed into field land and non-field land. Accessibility (X5) is also considered as dummy variable, categorized into land with access and land without access.

value of Obs*R-square < the value of X2 table, then the selected regression model is free from heteroschedasticity. The result of the last analysis is linearity, that F statistic < F table which means that the regression model has a linear function. This model is able to explain the elasticity of dependent variable toward independent variable, the change of Y percentage when there is change in X percentage.

Table 1. The Effect of Land Value Factor and Classic Assumption Result

| Variable | Coefficient Regression | Standard Error | Probability |
|---------------------------------------------------------------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|---------------------------|
| Constanta | 2.532544 | 0.033748 | 0.0000 |
| Width | 0.046823*** | 0.004816 | 0.0000 |
| Distance to CBD | 0.000535 | 0.002125 | 0.8027 |
| Distance to JJLS | -0.015038** | 0.006243 | 0.0216 |
| Land Type (1= Field; 0= Non-field) | 0.036532*** | 0.010088 | 0.0009 |
| Existence of Accessibility (1= existent; 0 = non-existent) | 0.029617*** | 0.009182 | 0.0028 |
| R-Square | 0.763642 | | |
| Prop (F-Statistic) | 0.0000 | | |
| Normality Test | JB test : 0.032681 | X ² Table : 55.75848 | Normal Distribution |
| Autocorrelation test | Obs* R-squared Value : 0.096423 | X ² Table : 55.75848 | No Autocorrelation |
| Multicolinearity test (VIF Value) | Width Distance to CBD Distance to JJLS Land Type Existance of Accessibility | VIF : 1.856525 VIF : 1.175629 VIF : 1.407231 VIF : 2.178951 VIF : 1.791465 | No Multicollinearity |
| Heteroskedastis test | Obs*R-suared value : 15.69071 | X ² table : 11.07050 | No Heteroschedasticity |
| Linearity test | F Statistic Value : 0.7377 | F table value : 2.64 | Linear |

Source: result of Eviews Regression 9.0

Note: ***: significant to $\alpha=1\%$; **: significant to $\alpha=5\%$; *: significant to $\alpha=10\%$

According to Table 1, it can be seen that R² value has filled the good percentage level in 76.36 %. Significant variable level is partially and simultantly representing other variables

to land value. The t-test probability shows that the 3 independent variables individually have a significant positive effect, namely land area, soil type and the presence of accessibility. Meanwhile, the distance to the CBD and the distance to the JJLS individually have no significant effect on the value of the land in Purwosari District.

The changing of Y related to X can be inferred quite clearly using coefficient regression. The total of X1 variable influencing Y is 0,046823, every 1 square meter added will affect the rise of land value in Purwosari by 4,68 %. The regression result shows that variable of land width significantly influences toward land value. It can be said that the wider the land is sold, the higher the value is. This is in line with Ritter et al., (2020) findings, which show the ability to buy land at a higher price.

The X2 variable will affect Y by 0,000535, every added distance will increase the land price by 0.053 %. The distance toward CBD which CBD in Purwosari is Parangtritis Beach shows the insignificant rise of price when the distance is nearer to the tourism center. It indicates the rise of land value is not very much even though it is near to the tourism spot. This can be due to lack of infrastructure, public service facilities, industrial structure, and transportation in that area is less than optimal. This is in accordance with research Li & Zhou, (2019) which states that land prices can be significantly affected by infrastructure, public service facilities, industrial structure, and transportation. Therefore, tourism spot without being accompanied by quality infrastructure, public service facilities, industrial structure, and transportation will not have a significant effect in influencing the increase in land prices.

The mix of shore area and mountain range area makes the property value becoming unnatural. The suitable property prospect in these areas is villas and hotels. Those property prospects tend to focus both on landscape and natural scenic view of coastline, and man-made tourism spot which attracts visitors. Hence, it does not really mean that a location near to coastline will have higher or raised price. Even though the location is far from coast, if it can provide scenic views then the land price can still hold quite highly.

The X3 (Distance to JJLS) variable influences Y by -0,015038. It means that every added distance from a location to JJLS by 1 km will lower the land price by 1.5 %. Or the further a location is, the lower price it will be. This is inconsistent with previous research by Li & Zhou (2019). This also happens when property prices are getting further away from the bus rapid transit, the property prices will go down (Andres & Calvo, 2017), and happened in Park-and-ride stations lead to decreases in property values (Mulley & Tsai, 2016). Those research explain that every property located near with highways has higher accessibility than those who are far. The effect of JJLS as infrastructure is long-term, but the positive

impact of the construction of the facility has been identified. As Levine & Renelt (1992) and Dwiputri et al. (2019) stated that effect infrastructure as part of investment is long-term. The development of transportation infrastructure can increase the value of the surrounding property quite significantly simultaneously (Tideman & Plassmann, 2017). Therefore, for further research, it is necessary to identify the impact of JJLS on land prices after 3-5 years of JJLS construction being implemented. It could be found the higher effect to land prices.

Land type (X4) give effect as high as 0,036532 toward land price. The field land type has value 3.65% higher than non-field type. The effect of field type is quite significant to land price. It means that a field land type sells more highly that a non-field type. This evidence stated that field land has higher value than other land types because this type of land is pretty much ready to be established. Wang (2009) indicates that field land type is more commercial than non-field type land.

The fifth variable shows that land with accessibility has value 2.96 higher than land without access. The accessibility inherent to a property gives more positive value. This means that a property which has decent or adequate access is favoured highly than a property without access. The easier accessibility a location has, the more productive and beneficial it is economically. The results of this research are consistent with Li & Zhou (2019) who also found that infrastructure, public service facilities, and transportation have a significant effect on land prices. It shows that accessibility is an important variable in affecting land prices.

In short, this research can identify factors which influence property value. This study provides reinforcement to the existing literature (Li & Zhou, 2019); (Wang, 2009); (Zhuang & Zhao, 2014) regarding the variables that affect land prices. This study found that the variables that have a positive effect on land prices are width, land type, and existence of accessibility.

Land is an important asset in the economical activity. Its quantity is hard to increase or even renew, whereas the needs of it are still high. The national project of JJLS triggered the upsurge of land prices in the coast and mountain area. Furthermore, the wider the land is sold, the higher the value is. Unfortunately, the area of which closer to CBD does not always have a high price. It depends on the building prospect, whether it can be built as villas, hotels, and other commercial properties or not. On the other hand, when the location of the land is closer to JJLS, it will get a higher price. It is generated by access to reach the location. Access becomes an ancillary factor to push the price up. A property that has adequate access is favoured highly than a property without access. For sure, an area with limited access has

a lower price for transactions. The type of field land has a greater price than the other type of land. The field is potentially to build.

Property or land is scarce need for people. However all human activities are done on the surface of earth. Hence the property location becomes the most important thing which affects property price or value. The policy to build national highways causes the rise of property price significantly. Privately-owned property will also have high selling price. On the other hand, effect of tourism makes land price raise as the need of investors to establish commercial business and to make fortune is also rising. This research manages to reveal the land or property characteristics which have high value so that it can be used as a foundation to evaluate the property or estate price for society, government, and investors when a purchase or sale of property is to be made in mountainside, tourism spot, or area affected by road line construction.

Conclusion

This study found that land prices are positively determined by the variables of land area, land type, and existence of accessibility. The larger the land area, the higher the land price will be. The field land type is more expensive than non-field type land. The existence of accessibility can increase the price of land too. This study also found that the closer the location to JJLS, the higher the land price. This shows that the construction of JJLS has a positive effect on land prices.

This study implies that for land in mountainous areas there are several factors that have a positive effect, namely land area, distance to the CBD, soil type and availability of accessibility. The impact of the JJLS development certainly makes the pattern of land prices close to JJLS increase, because it is related to ease of accessibility. Long distance land with JJLS will be cheaper. However, the location of Purwosari District is close to Parangtritis Beach, so land that is far from JJLS but can see the beach view will still sell for quite a high price. This is quite interesting because there are two factors supporting the level of land prices, namely tourism factors and JJLS development factors. This research is able to see the price of land in mountainous areas supported by tourism and infrastructure development. The limitation of this study is that it can only see the effect of land prices in 2016, but has not been able to see the effect of land prices several years after the construction of JJLS. Other research could be conducted with longer years and wider locations to comprehensively understand the impact of infrastructure development on land prices in mountainous areas.

REFERENCES

- Adisasmitha, R. (2014). *Pengelolaan Pendapatan dan Anggaran Daerah*. Graha Ilmu.
- Aditya, O., & Naomi, P. (2017). Penerapan Manajemen Risiko Perusahaan dan Nilai Perusahaan di Sektor Konstruksi dan Properti. *Esensi: Jurnal Bisnis Dan Manajemen*, 7(2), 167–180. <https://doi.org/10.15408/ess.v7i2.4981>
- Andres, J., & Calvo, P. (2017). The effects of the bus rapid transit infrastructure on the property values in Colombia. *Travel Behaviour and Society*, 6, 90–99. <https://doi.org/10.1016/j.tbs.2016.08.002>
- Cooper. Donald, R., & Emory. William C. (1996). *Metode Penelitian Bisnis Buku 2* (5th ed.). Penerbit Erlangga.
- Dwiputri, I. N., Pradiptyo, R., & Arsyad, L. (2019). Corruption and capital growth: Identification of bribery by the firm. *International Journal of Economics and Management*, 13(2), 467–479.
- Gaolu, Z. (2015). The Effect of Central Business District on House Prices in Chengdu Metropolitan Area: A Hedonic Approach. *Proceedings of the 2015 AASRI International Conference on Circuits and Systems*, 9(Cas), 349–352. <https://doi.org/10.2991/cas-15.2015.83>
- Grubbe, H. F., Chitester, K., Shea-Joyce, S., McKinley, M., Ruzich, E., & Landis, M. (2013). *The Appraisal of Real Estate* (14th ed.).
- Gujarati, Damodar, N., & Porter, D. C. (2013). *Dasar-Dasar Ekonometrika*. Salemba Empat.
- Harum, Muhammad; Sutriani, S. (2017). Pengaruh Pembangunan Jalan Tol Sutami Terhadap Nilai Lahan Disekitarnya. *Nature : National Academic Journal of Architecture*, 4(1), 66–73. <https://doi.org/10.24252/nature.v4i1a8>
- Hidayati. W. dan Harjanto, B. (2014). *Konsep Dasar Penilaian Properti* (1st ed.). BPFE.
- Levine, R., & Renelt, D. (1992). A sensitivity analysis of cross-country growth regressions. *American Economic Review*, 82(4), 942–963. <https://doi.org/10.2307/2117352>
- Li, X. J., & Zhou, R. P. (2019). The analysis of dynamic change of benchmark land price on Shuanghe Town of Togtoh county based on GIS. In *Lecture Notes in Electrical Engineering* (Vol. 463). Springer Singapore. https://doi.org/10.1007/978-981-10-6571-2_53
- Mulley, C., & Tsai, C. P. (2016). When and how much does new transport infrastructure add to property values ? Evidence from the bus rapid transit system in Sydney , Australia. *Transport Policy*, 51, 15–23. <https://doi.org/10.1016/j.tranpol.2016.01.011>
- Prastiwi, N. B., Makhfatih, A., & Dwiputri, I. N. (2017). Evaluation of Public Infrastructure: A Case of Sapon Dam Kulon Progo, Indonesia. *Jurnal Ekonomi Pembangunan: Kajian Masalah Ekonomi Dan Pembangunan*, 18(1), 93. <https://doi.org/10.23917/jep.v18i1.3245>
- Putri, P. I. (2014). Pengaruh Investasi, Tenaga Kerja, Belanja Modal, Dan Infrastruktur Terhadap Pertumbuhan Ekonomi Pulau Jawa. *JEJAK: Jurnal Ekonomi Dan Kebijakan*, 7(2), 110–120. <https://doi.org/10.15294/jejak.v7i2.3892>
- Ritter, M., Hüttel, S., Odening, M., & Seifert, S. (2020). Revisiting the relationship between land price and parcel size in agriculture. *Land Use Policy*, 97, 0–18. <https://doi.org/10.1016/j.landusepol.2020.104771>
- Sharfina, S. (2014). DAMPAK PEMBANGUNAN BANDARA KUALANAMU TERHADAP NILAI TANAH (Studi Pada Kantor Kecamatan Beringin , Kabupaten Deli Serdang). *Perspektif*, 7(1), 271–290.

<https://ojs.uma.ac.id/index.php/perspektif/article/view/160>

Tideman, T. N., & Plassmann, F. (2017). The Effect of Transportation Improvements on the Separate Values of Land and Buildings. *SSRN Electronic Journal*.

<https://doi.org/10.2139/ssrn.3025058>

Wang, R. (2009). The structure of chinese urban land prices: estimates from benchmark land price data. *Journal of Real Estate Finance and Economics*, 39(1), 24–38.

<https://doi.org/10.1007/s11146-007-9100-4>

Zhuang, X., & Zhao, S. (2014). Effects of land and building usage on population, land price and passengers in station areas: A case study in Fukuoka, Japan. *Frontiers of Architectural Research*, 3(2), 199–212. <https://doi.org/10.1016/j.foar.2014.01.004>