

# Spatial Modelling of Land Price in The Semarang City

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**Abstract:** Land has a very important role in supporting the population activity in both urban and rural areas. Demand for land tends to increase due to the increase in population, on the other hand the availability of land is limited. The increasing demand of land also occurred in the city of Semarang due to population growth and economic activity growth. The increasing demand for land in Semarang City has caused a shift in spatial demand patterns. The shift in land demand is due to limited supply of land in the area near to the city center, and the price become unaffordable for some residents of Semarang City. Due to the limitation of land supply in the city center has affected to the increasing demand of land in the suburbs. This phenomenon causes an increase in the price of land in the periphery of Semarang, and forms a land price pattern that resembles a circus tent, especially at a new center of activity on the periphery.

**Keywords:** Land, Land Price, Spatial Modelling

## 1. Introduction

The city of Semarang is developing very rapidly in the last decade, one of the indications is the growth of the population that grows significantly. BPS (Central Bureau of Statistics) [1] noted that population growth in Semarang increased by more than 350 thousand people, or about 35 thousand people per year. The population in Semarang City in 2015 was increased by 24.64% as compared to the population in 2005. This rapid population growth largely filled the spaces on the outskirts of Semarang City, creating a competition to gain space in the region - suburbs [2].

The population growth of Semarang City gives an influence to the demand of land on the periphery. Land demand on the periphery affects land price increase. This increase in land prices is a market phenomenon, where if demand increases while limited land supply will cause land price increase [3–5]. The three previous studies also see that the rise in urban land prices in addition to influenced by non-accumulated land supply factors is also influenced by access and availability of urban supporting facilities.

Demand for land on the outskirts of Semarang City causes changes in spatial land price patterns. The pattern of land prices that usually follow the distance function, which is farther away from downtown land prices will be lower starting to change, the location in the suburbs are dominated by activities that provide high economic opportunities tend to experience significant price increases [6–9]. This incident led to the emergence of new residential centers on the periphery with random patterns [10]. The development of



residential areas on the outskirts of Kota Semarang has also provided a very significant implication for changes in land price patterns, especially land prices based on market prices. This change of spatial pattern will give an implication for efficient land management [11] and it is necessary to study the spatial pattern of land price (market price) in an effort to determine the instrument of control of spatial use as well as the instrument to optimize the source of regional income from the permit land.

Previous research in Semarang City and Magelang City used NJOP data of land as a foothold in developing land pricing model, then in this research will use market price as a foundation to form model of spatial land price in Semarang City. The use of market price as a foundation in the development of spatial model is based on the economic opportunities that can be obtained by the stakeholders and at the same time eliminate the potential losses from the Government of Semarang City against PAD revenue from various land related transactions.

## **2. Data and Methods**

### *2.1. Data*

This research used land price data according to market price in Semarang City. The process of collecting land price data was done by using the primary survey and survey method online by using the data of property selling price at several online trading sites. As a comparison of price data on the site online also conducted the excavation of land market information by using land buying and selling ads in local mass media. To find out the real price of the offer on the online site and mass media was done by phone verification process to get the exact price of the offered price. In general, the price of land price according to market price in Semarang City after going through the verification process is still in line with theories about urban land prices, where the price of land in the city center has the highest value and in the periphery has a lower value. A more complete description of land prices in Semarang City can be followed in the following tables and figures.

### *2.2. Methods*

The process of data processing and analysis in making spatial pattern of land price in Semarang City used the aid of geographic information system software. Data processing in general as described in the previous description in the previous section is through georeferment process of land price data until the interpolation process. In detail the process of data processing and spatial pattern analysis of land prices can be followed in the following description.

#### *2.2.1. Digitizing Land Price Data into Geographic Information System Using Google Earth*

This process is done by finding the location geoposition of the land to be sold in the city of Semarang. After that the position is marked and coordinate system information is then saved in \* kmz format.

#### *2.2.2. Convert KMZ to Files in Geographic Information System Formats*

After all land price data has georeferenced then the process of converting data from google earth into the geographic information system software environment can be started. At this stage, it is also done consolidation of data topology so ready to be done process of analysis to data.

#### *2.2.3. Data Interpolation*

The interpolation process uses four approaches, and then selected the most appropriate to the factual conditions.

#### 2.2.4. Spatial Analysis of Land Price Pattern

At this stage, spatial statistical analysis was conducted to see the typology of land price and its form factor. This process is carried out by overlapping the land price map with the map of land price form factor such as the distribution map of the settlement area, the distribution map of the activity center, the regional accessibility map, the disaster condition map [12]. The result of this analysis was able to describe how big contribution of land price form factor to spatial pattern of land price (Tabel 1).

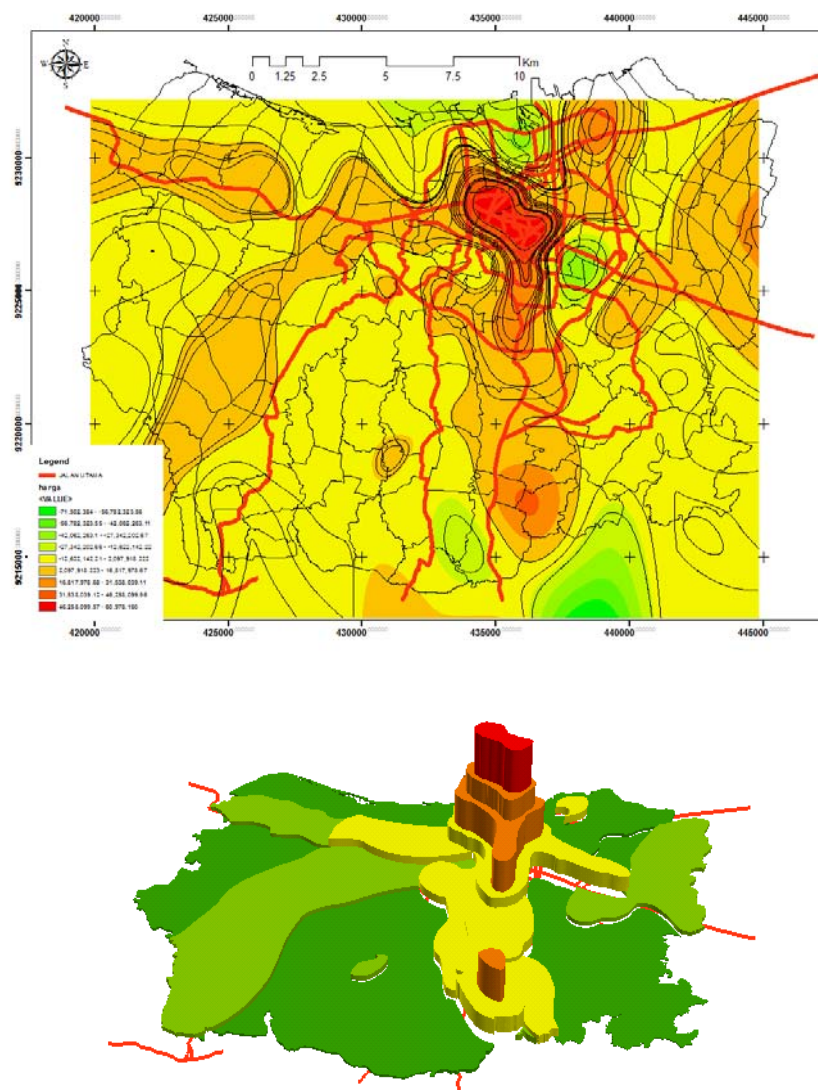
**Table 1.** Land Price by Market Price in Semarang City 2016

No	District	Location	Market Price (IDR)
1	Tugu	Desa Randu Garut (edge of Semarang highway Kendal)	3,243,243.24
2	Ngaliyan	Candi Kalasan	2,250,000.00
		Sekitar LP Kedungpane	725,000.00
		Candi Perak	1,650,000.00
		Bringin Putih	800,000.00
3	Mijen	Polaman	700,000.00
		Ngadirgo	175,000.00
4	Pedurungan	Jalan Wolter Monginsidi	3,500,000.00
		Jalan Fatmawati	1,900,000.00
		Klipang	1,165,413.53
5	Semarang Barat	Jalan Pamularsih, near simongan	8,650,519.03
		Jalan Abdurahman Saleh (near Balaikota)	4,972,375.69
		Jl. Indraprasta	1,900,000.00
6	Gayamsari	Jalan Elang Raya	2,250,000.00
7	Gunungpati	Jalan rejosari III, Desa Ngijo	453,091.68
		dusn Pingangan	75,000.00
		Ds Ngijo	300,000.00
8		Jalan Sultan Agung	25,000,000.00
9		Jalan Muara Mas Gang 8	1,750,000.00
10		Jl. Watulawang 6	1,436,950.15
11	Banyumanik	Jl. Permata Grafika	1,500,000.00
		Pudak Payung	875,000.00
12		Jl. Kedungmundu, Perum Sambiroto Baru	2,300,000.00
		Watugong, jalan alvita	1,700,000.00
		Ngesrep Barat	3,400,000.00
13	Tembalang	Jl. Mulawarman Selatan	1,900,000.00
		Jalan banjarsari barat	3,000,000.00
		jangli skip	1,650,000.00
		Perum Polri Mangunharjo	1,025,641.03
		Sendang Mulyo	1,174,089.07
14	Tlogosari	Perumnas, dekat apotik jamilah	833,333.33

Source: Market Survey, 2016

### 3. Results and Discussion

Based on the results of tracking the land market in Semarang City by using online buying and selling site and verification process with seller can be described spatial pattern of land price in Semarang City. The spatial pattern of land prices in Semarang City has not changed significantly in pattern and still follow the pattern of urban land price in the world, where the highest price is in the central area of main activity and decreases with distance and position to main activity center and road network. A more detailed description of the spatial pattern of land prices can be followed in Figure 1.



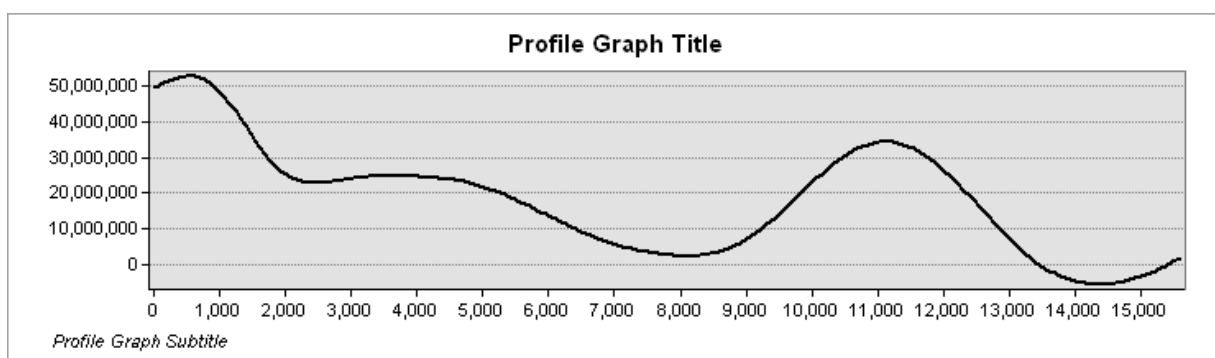
Source: *olx.co.id*, 2016, processed by the drafting team, 2016

**Figure 1.** Spatial Pattern Land Price (Market Price) Semarang City Year 2016

This spatial pattern still follows the economic patterns of the land, where the land with the opportunity to bring high economic benefits tends to have higher selling prices, if the supply of land in the region is

increasingly limited. Simpang Lima area, Youth and Gajahmada area is the location with the highest land price value in Semarang City. This condition is inseparable from the highly prospective economic opportunities of trading businesses and services (malls, hotels, apartments) in these areas.

This economic opportunity is inseparable from the completeness of regional infrastructure and the accessibility of the area is very high when compared with accessibility in other areas in Semarang City. This condition will certainly provide a very high location advantage, because it can be a major magnet for economic activities in the city of Semarang. The proximity to the airport makes these areas currently filled with hotel business activities. Recorded in the area four- and five-star hotels are located. For example spatial pattern of land price can be seen from land price pattern on corridor intersection of five-pioneer independence, as can be followed in Figure 2.



Source: *olx.co.id*, processed research team, 2016

**Figure 2** Land Price Patterns on the Corridor of Simpang Lima-Perintis Kemerdekaan

In Simpang Lima area which is the main activity center the price of land reaches IDR 60 million per square meter, then decrease at a distance of 8 km from the intersection of five or around Jatingaleh to around IDR 8 million and rise back around Tembalang to around Rp 30 million per meter square. This pattern of increase cannot be separated from the very high demand of land in the area around Tembalang for the development of commercial activity in the form of trade, rental houses and apartments that are currently growing rapidly in the Tembalang area. Tembalang area has become a major magnet of property investment in Semarang City. This condition cannot be separated from the increasing demand of land that continues to increase in line with the growth of the number of students in Tembalang area which rose significantly from year to year. It is this student market that provides a derivative demand for land for commercial functions in the Tembalang Regions. Different conditions occur in Gunungpati area which is a region of higher education. In Gunungpati area although there is a spike in land prices in the area around Unnes Campus but the market value of land in the area is not as high as the price of land in Tembalang area. This condition is inseparable from the factor of land demand is much lower than the Undip Tembalang.

#### 4. Conclusion

Based on the results of the analysis can be concluded that the spatial pattern of land prices in Semarang City has a common pattern that is identical with the pattern of urban land prices in general. This pattern also resembles the land price pattern in Semarang City in 1998 as the result of research conducted by Widjonarko [3] where the highest land price is in the central area of main activity and decreases as it away from the city center and the position on the network main road.

There is a tendency for land price increase in new centers in the outskirts of Semarang which is a new activity center such as in the Tembalang area, New Semarang Bukit Baru area, Pedurungan Area and Area of Sekaran. In these areas the pattern of land prices tends to be higher than the surrounding area. The patterns of land prices in areas that are not residential areas tend to not change the pattern, except in the un-built areas around the new activity center. This pattern is triggered by the demand for land in the area which tends to be higher than other areas in Semarang City, so that the market mechanism occurs. When there is a higher demand for land, on the one hand the supply of land is fixed then the consumer will be willing to pay a higher price.

## 5. Acknowledgments

Thank you to the Department of Urban and Regional Planning of the Faculty of Engineering Diponegoro University for the facilitation of funds for the study of Land Price Pattern of Semarang City.

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