# Urban Land Sector Assessment Using Simultaneous Equation Model as Single Value for Multipurpose

**Nanin SUGITO**, **Irawan SOEMARTO**, **Sadikin HENDRIATININGSIH,** and **Bambang Edhi LEKSONO,** Indonesia

**Key words**: Assessment, Parcels, Urban, Model of Simultaneous Equations, a Single Value

## SUMMARY

Land is a gift of God that is invaluable in which every living creature activity will be resting on the ground. Parcel have value for their benefit and hope in the present and future. Prices parcel can be seen when it has known the value of field land, so the price of parcel is a reflection of the value of land. This research was conducted in the city of Bandung, where the price of land fields tend to increase very significantly. To get the price of land, it must first be sought value of parcels of land which can be obtained through assessment of the parcel. Currently the parcel in Indonesia votes in general use market price comparison approach. This still leaves the problem, namely the calculation of technical assessment is still subjective nature parcel by averaging the value of the market. Results of the assessment does not reflect the actual value. Through this research comprehensively studied the various components of the determining the value of parcels of land in urban areas. Simultaneous equation models have to be applied in the assessment of the ground plane is due to the simultaneous equations has the advantage of modeling the complex social phenomenon. This study is to be generated model of the value of land parcels in urban selanjunya will serve as Single Value for Multipurpose. This single value is needed to facilitate the interests of property valuation.

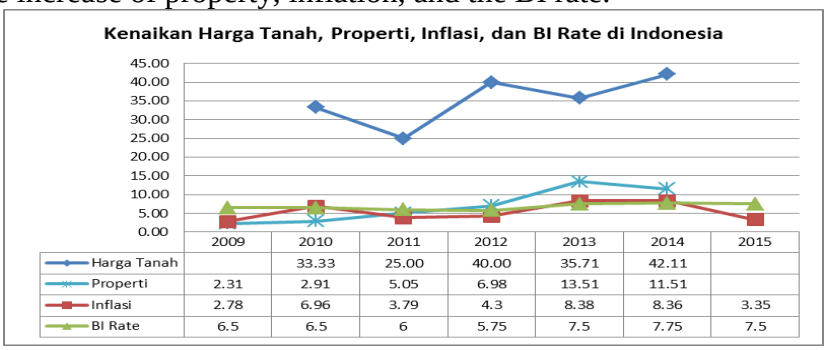
# Urban Land Sector Assessment Using Simultaneous Equation Model as Single Value for Multipurpose

**Nanin SUGITO**, **Irawan SOEMARTO**, **Sadikin HENDRIATININGSIH,** and **Bambang Edhi LEKSONO,** Indonesia

## 1. BACKGROUND AND OBJECTIVES

There are four problems of the Nation : (1) energy, (2) Air), (3) Food and (4) Land (Sulasdi, 2013). Land is a commodity or goods economy very strong influence on the life of the nation, but until now the land issue has a level of complexity of the problem is very high. The State is obliged to regulate a national life, including the aspect of land utilization, both as an economic good or residence / boards married, in order to achieve prosperity and welfare.

Land gift from God that is invaluable in which every living creature activity plants, animals, or humans rests on the ground. Land is the main thing for the human life. No land doubt into an object of infinite value. This can be evidenced by the unique properties owned by land, namely (1) supplies (supply) of land is fixed, while the demand (demand) always increase as the population; (2) The land cannot be moved (immobility); (3) the soil is durable; and (4) the land could not be discharged for consumption. The uniqueness of the nature of this land led to an increasing trend in land prices over time. The tendency of rising land prices are very high, even the highest when compared with the increase of property, inflation, and the BI rate.




| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|
| Harga Tanah | | 33.33 | 25.00 | 40.00 | 35.71 | 42.11 | |
| Properti | 2.31 | 2.91 | 5.05 | 6.98 | 13.51 | 11.51 | |
| Inflasi | 2.78 | 6.96 | 3.79 | 4.3 | 8.38 | 8.36 | 3.35 |
| BI Rate | 6.5 | 6.5 | 6 | 5.75 | 7.5 | 7.75 | 7.5 |

**Figure 1.1.** Price Increase Land, Property, Inflation, and the BI Rate in Indonesia (Source: kajianstrategishms.wordpress.com)

Based on Government Regulation No. 24 year of 1997 about Land Registration, this study specifically examined the plot. Plot is part of the earth's surface which is a unit field boundary. Price and value plot plot is a unity that can not be separated. Plot have value because of their usefulness or benefits and hope in the present and future. The plot prices can be seen when it has known the value of field land, so the price of plot is a reflection of the value of land. More concretely, the price of plot is a sum of money paid in a transaction to acquire the property of an object (Hidayati, 2001). This research was conducted in the city of Bandung. The price of plots in the city of Bandung has increased very significantly. Based on the analysis of the properties of UrbanIndo.com on March 2013 the average price of land parcels in the city of Bandung Rp. 2.7 Million / square meter. In less than a year, the average price of land parcels increased to Rp. 3.69 Million / square meter or

increase of 36%. Even for plots of land in North Bandung area such as Dago and Setiabudi, the average price of land parcels may reach 9.19 million / square meter. The variation of the price of land parcels in the city of Bandung is determined based on the allocation and utilization. The Residential / landed houses values tend to be higher than the value of agricultural land. While the value of land for commercial activities and services is higher than the value of land settlements (Tilaar, 2013).

To get the price of land, the first thing must be sought value of plots of land which can be obtained through assessment of the plot. In general, there are three approaches used in the assessment of a property, like (1) the market price comparison approach (sales competition approach); (2) the cost approach (cost approach), (3) the income approach (income capitalization approach). This time ratings plot in Indonesia using the market price comparison approach. Technical calculation of votes is still subjective nature plot by averaging the value of the market (at least 3 samples). In this case the sample size is not sufficient to assess the ground plane. Results of the assessment does not reflect the actual value.

This research comprehensively studied the various components of the determining the value of plots of land in the valuation of plots of land in urban areas. Several previous studies have examined the components of many determinants of the value of the ground plane through a linear regression analysis. Base on the phenomenon happens, the value of land parcels in urban areas tend to rise uncontrolled. To overcome the disadvantages of ratings plot current, will be made ratings plot using a simultaneous equations model. Model of simultaneous equations have to be applied in the assessment of land parcels in urban areas because of simultaneous equations has the advantage of modeling the complex social phenomenon. Rate plot is very complex, as a number of decisive component of land value.

The something new from this research is to be generated model of the value plots of land in urban areas which be used as a single value for multipurpose. This single value is needed to facilitate the interests of property valuation. Assessment of the property has many roles in the economy, among others: (1) the role in the implementation of the central government and the regions; (2) a role in taxation; (3) with respect to the role of the banking system; and (4) as a reference in the manufacturing zone map land value is applied at the Ministry of Agricultural and Spatial Planning / National Land Agency and the Department of Revenue.

## 2. METHOD

The research was conducted in several stages following technical.

a. Spatial and Attribute Data Inventory of Land. Early stage in the research is to provide spatial and attribute data. The spatial data in form of high-resolution imagery (Quickbird Satellite Imagery) and Bandung Administrative Map 1: 25,000 which comes from the Geospatial Information Agency (BIG). Data attributes such as demographic data of Bandung. The products of this phase is a limitation common areas of research bergeorefensi.
b. Comprehensive Assessment Component Field Value Determinants of Urban Land. The next stage in the research is to examine comprehensively the determining component value of plots of land in urban areas as follows by:

(1) Physical Factor = f (environmental conditions, location, availability of social facilities)
(2) Status tenure / aspects of legality = f (Hak Milik, Broking, leasehold, right to use on state land or the right to use of land of Local Government, management rights on state land, Right Opening / Collecting forest products)
(3) Social Factor = f (total population, number of households, level of education, crime rate, land use pattern)
(4) Economic Factors = f (Demand, Supply)
(5) Government factor = f (government policy areas of development or use of land, provision of facilities and services by the government)

The products of this reserch is a determinant component values tested and validated plot is:

a. The application of Simultaneous Equation Model. Determinant component values tested and validated plot will then feed into the simultaneous equation model. The products of this phase is the value of land parcels that have a high degree of accuracy.
b. Application of Single Value for Multipurpose. Value plot that has a high degree of accuracy would then be used as a single value for multipurpose. This single value has many roles in the economy, among others: (1) the role in the implementation of the central government and the regions; (2) a role in taxation; (3) with respect to the role of the banking system; and (4) as a reference in the manufacturing zone map land value is applied at the Ministry of Agricultural and Spatial Planning / National Land Agency and the Department of Revenue.
c. Recommendations and Reporting. As a final activity of a whole series of research is the communication of the recommendations and reporting. Through this research is expected to contribute scientifically as a reference for the government in policy decisions for the welfare of the people.

The following flow chart visualization research (diagram below).

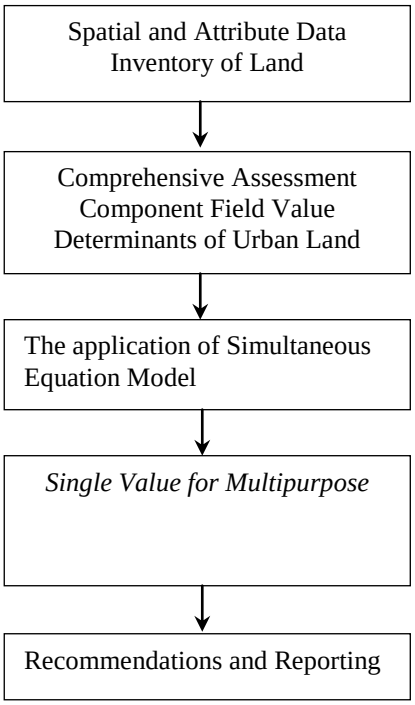


**Figure 2.1.** Flow Research

## 3. RESULTS AND DISCUSSION

Currently land plot in Indonesia generaly use for market price comparison. This still have a problem, for example the calculation of technical assessment is still subjective nature plot by averaging the value of the market (at least 3 samples). In this case the sample size is not sufficient to assess the ground plane. Results of the assessment does not reflect the actual value.
To overcome this drawback, the ratings plot simultaneous equation models have to be applied in the valuation of plots of land in urban areas. Simultaneous equations has the advantage of modeling the complex social phenomenon. Rate plot is very complex, as a number of decisive component of land value.

The value of land is determined by physical factors, the status of land tenure / aspects of legality, social factors, economic factors, and government factors. In this case the physical factors have a strong influence in determining the value of land.

Determinant component values tested and validated plot subsequently packaged in a simultaneous equation model. The products of this phase is the value of land parcels that have a high degree of accuracy.

## 4. CONCLUSION

The Simultan equation models have to be applied in the assessment of the ground plane is due to the simultaneous equations has the advantage of modeling the complex social phenomenon. This study was generated model of the value of land parcels in urban selanjunya will serve as a single value for multipurpose. This single value is needed to facilitate the interests of property valuation.To produce a model of land value equation that has a high degree of accuracy, should be supported by data plot spatial and attribute facilitated by government agencies. In this case the data exchange land parcels should ideally be easily accessible in support of research.

## ACKNOWLEDGMENTS

- Survey and Cadastre Research Group, ITB
- Remote Sensing and Geographical Information Systems Research Group, ITB

## REFERENCES

ATR/BPN. (2016). *Peta Bidang Tanah Kota Bandung*.
Badan Pusat Statistik. (2013). *Data Inflasi Indonesia 2010-2013*.
http://galerydata.blogspot.com
Hidayati, W. (2001). *Konsep Dasar Penilaian Properti.* Yogyakarta: BPFE Yogyakarta.
Peraturan Menteri Keuangan No.66/PMK.011/2012 tentang Sasaran Inflasi tahun 2013, 2014, dan 2015.
Sulasdi, W. N. (2013). *Catatan Kuliah Filsafat Ilmu*.

Tilaar, S. (2013). Kajian Nilai Lahan Permukiman di Wilayah Kecamatan Malalayang Kota Manado. Jurnal Sabua Vol.5, No.2, Agustus 2013, 96-102.

## BIOGRAPHICAL NOTES

**Nanin Trianawati SUGITO, ST., MT.**, born in 1983, Graduated in 2005 as Engineer in Surveying and Mapping from Institut Teknologi Bandung (Indonesia), obtaining Master degree in Surveying and Mapping from Bandung Institute of Technology (Indonesia) in 2007. Now, Nanin Trianawati Sugito, ST., MT. is member of Department of Geography Education, in Universitas Pendidikan Indonesia, Indonesia.

**Dr. Ir. Irawan SOEMARTO, M.Sc.**, born in 1955, Graduated in 1979 as Engineer in Surveying and Mapping from Bandung Institute of Technology (Indonesia), obtaining Master degree in International Institut for Aerial Survey and Earth Sciences in 1985 and doctorate degree in Curtin University Of Technology, Australia in 1977. Now, Dr. Ir. Irawan Soemarto, M.Sc. is member of Remote Sensing and Geographical Information Science Research Group in Institut Teknologi Bandung, Indonesia.

**Prof. Dr.Ir. S. HENDRIATININGSIH, MS.**, born in 1951, Graduated in 1976 as Engineer in Surveying and Mapping from Institut Teknologi Bandung (Indonesia), obtaining Master degree in Surveying and Mapping from Bandung Institute of Technology (Indonesia) in 1996 and doctorate degree in Surveying and Mapping from Bandung Institute of Technology (Indonesia) in 2005. Now, Prof. Dr.Ir. S. Hendriatiningsih, MS. is member of Survey and Cadastre Research Group in Institut Teknologi Bandung, Indonesia.

**Dr. Ir. Bambang Edhi LEKSONO, M.Sc**., born in 1957, Graduated in 1982 as Engineer in Surveying and Mapping from Institut Teknologi Bandung (Indonesia), obtaining Master degree in Urban Survey & Human Settlement Analysis (ITC-Holland) in 1990 and doctorate degree in Geography in 1996 from Universite de Nice Sophia Antipolis (France). Now, Dr. Ir. Bambang Edhi Leksono, M.Sc is member of Survey and Cadastre Research Group in Institut Teknologi Bandung, Indonesia.

## CONTACTS

Nanin Trianawati SUGITO, ST., MT.
Department of Geography Education
Nu'man Somantri Building 2nd floor,
Jl. Dr. Setiabudhi 229, Bandung- 40154
INDONESIA
Tel. +62.22.2013163 Fax. +62.22.2004985
Email: nanintrianawati@upi.edu

Dr. Ir. Irawan SOEMARTO, M.Sc.
Remote Sensing and Geographical Information Systems Research Group, ITB
Labtek IX-C 3rd floor,

Jl Ganesha 10, Bandung- 40132
INDONESIA Tel. +62.22.2530701
Fax. +62.22.2530702
Email: irawansumarto@gmail.com

Prof. Dr.Ir. S. HENDRIATININGSIH, MS.
Survey and Cadastre Research Group, ITB
Labtek IX-C 3rd floor,
Jl Ganesha 10, Bandung- 40132
INDONESIA Tel. +62.22.2530701
Fax. +62.22.2530702
Email: shendriatin@gmail.com

Dr. Ir. Bambang Edhi LEKSONO, M.Sc.
Survey and Cadastre Research Group, ITB
Labtek IX-C 3rd floor,
Jl Ganesha 10, Bandung- 40132
INDONESIA Tel. +62.22.2530701
Fax. +62.22.2530702
Email: bleksono2013@gmail.com
bleksono@gd.itb.ac.id