



Regional Development and The Direction for Regional Development: Empirical Study in Bogor Regency (Sectoral and Spatial Approaches)

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Abstract: The regional approach aims to identify, analyze and evaluate the extent of regional development carried out by local governments, as well as to achieve regional development whether it is in accordance with the characteristics of the region. Bogor Regency plays an important role as a buffer area for DKI Jakarta. The high regional development and economic growth of DKI Jakarta has caused high population growth and high economic growth in Bogor Regency. However, the high economic growth does not guarantee economic equality in the region. The purpose of this study is to analyze and map regional development in Bogor Regency based on regional hierarchy and analyze the extent of equitable distribution of economic activities in Bogor Regency. The analysis method used is using Regional Hierarchy Analysis and *Overlay* by *Geographic Information System*. The data used in this study used data on *Gross Regional Domestic Income* (GRDI). The results showed that the Regional Development Index in Bogor Regency in total continued to increase. However, if observed, the value of the coefficient of variation shows a significant increase. This shows an increase in inequality during that period of 32.057 percent.

Keywords: Regional Development, Territorial Hierarchy, Equitable Distribution of Economic Activity

Introduction

Based on data from the GRDP of West Java Province, the GRDP of Bogor Regency ranks second after Bekasi, which is IDR 21,889,577 billion. However, based on the distribution of the percentage of GDP by sector group, the sectors that contribute the most to the GRDP in Bogor Regency are the secondary sectors, such as the sectors: Industry, Electricity, Gas and Clean Water, and buildings, where growth from 2003 to 2007 continues to increase to 69.69% (Ibrahim & Prakoso, 2016). Then the tertiary sector such as the sector: trade, transportation, finance and services) whose percentage decreased in 2004, and quite well the percentage in 2007 amounted to 23.95%. And the last group of sectors is the primary sector, such as the sector: agriculture and mining. Although the percentage of GDP in the primary sector tends to decline until 2007, the existence of this sector is very important, especially in order to support the economy in rural areas in Bogor Regency (Sukwika et al., 2018).

Regional development aims to improve community welfare and optimize the use of resources in an area. This involves various efforts, such as infrastructure development, increased access to education and health services, and economic development of local (Kamuli et al., 2023). The main goal of the development of the territory is to create an environment that supports sustainable economic growth and improves the quality of life of the local population (Putri & Putri, 2022). Thus, regional development plays an important role in reducing the gap between urban and rural areas, as well as ensuring that the benefits of development are felt equally by all levels of society.

The development of an urban area can be measured from the level of availability of existing infrastructure or service facilities. A practical method that can be used to measure the development of an area (hierarchy) is to calculate the number and type of service infrastructure (infrastructure) that exists in an area. Christaller (1933) dalam (Marasabessy, 2016) on the theory of *central place theory* (central place theory) suggests that the determination of the hierarchy of cities in an area can be done by reviewing the number of services that can be carried out by a city (Noviyanti et al., 2020); (Muliana et al., 2018).

Mapping economic activities through regional development is an effort to identify and understand economic patterns in various regions to improve the growth and welfare of local communities (Chikmawati, 2019). This process involves analyzing data about industry, employment, and available resources, as well as how those factors interact at the local level (Muryani et al., 2022). With this mapping, governments and decision makers can plan and implement more targeted development strategies, such as infrastructure development, increasing access to education, and promoting investment. As a result, regional development can be more focused, reduce economic inequality, and encourage equitable growth in various regions.

With a deep understanding of economic activities in each region, regional development can be carried out more effectively (Arrozaaq, 2016). For example, if an area is known for its tourism potential, then supporting infrastructure such as roads, transportation, and tourist facilities can be further developed (Priatmoko, 2017). Likewise, regions that have agricultural potential can be focused on improving agricultural technology and market access. Thus, mapping economic activity not only helps in better planning, but also ensures that each region can develop according to its potential, thus creating equitable welfare for all communities (Habib, 2021).

Bogor Regency plays a very important role, namely as a *hinterland* area of areas around Bogor Regency, such as Bogor City, the capital of DKI Jakarta, West Java Province, and Banten Province. So that in line with the growth of the region, Bogor Regency is expected to be able to achieve high and sustainable economic growth and welfare levels.

Some important points contained in the *Regional Medium Term Development Plan* (RPJMD) of Bogor Regency are; (1) Improving a competitive regional economy by focusing on agricultural revitalization, (2) Improving quality and integrated and sustainable infrastructure, (3) Improving equitable distribution of community welfare. In planning the development of an area, not only prioritizing economic growth, but also how to equalize the economy and equitable distribution of infrastructure facilities in the region. There are 3

(three) important points to be studied in this study, how is the policy scenario for economic growth, income equality and the combination of growth and income equality policies (Setda, 2021).

Many studies have studied regional development, the first research was conducted by (Santika et al., 2018), This study discusses the analysis of the impact of regional expansion on performance and economic equity in North Lombok Regency. This research aims to realize the effectiveness of governance, development implementation, and community development as well as to further accelerate the realization of equal distribution of community welfare. This research is important because regional expansion is expected to provide better services to the community by local governments, especially in the context of the center of government adjacent to the community. Then a second study was conducted by (Noviyanti et al., 2020), This study discusses the "Analysis of Regional Development of West Java Province for the Direction of Development Area-Based Development," discusses the analysis of regional characteristics, economic development potential, and region-based development directions in West Java Province. This research highlights the importance of understanding the characteristics of each Development Area (DA) in West Java, including demographic, social, facilities, infrastructure, and economic potential aspects to develop efficient and effective regional development strategies. In addition, this study also emphasizes the need to optimize regional potential as part of the concept of regional development to achieve economic convergence and encourage transformation and acceleration of economic growth in various Development Area's in West Java Province. Furthermore, the third study conducted by (Hadju et al., 2021), This study discusses development inequality that usually occurs in Indonesia, where high economic growth is not necessarily followed by equitable distribution of development results between regions. This inequality can occur both vertically and horizontally.

Disparity causes social, economic and political problems, policies are needed through programs that are able to overcome regional disparity problems and planning that is able to realize balanced regional development. In the perspective of the interconnectedness paradigm between regions, poverty in one place will be very dangerous for other regions. Therefore, welfare in a place must be distributed equitably throughout the region.

Research Method

Research Location

This research was conducted in Bogor Regency, West Java Province, with 40 sub-districts of observation area in Bogor Regency.

Data Types and Sources

The data conducted in this study are secondary data obtained from Central Bureau of Statistics and Regional Planning and Development Agency of Bogor Regency, Bogor Regency Integrated Service Office, Bogor Regency Industry and Trade Office, and other

related agencies. To support the availability of different data, the author also looks for different data sources that can be accessed on the internet, such as papers and research journals relevant to this study.

In addition, other secondary data are also used to achieve the research objectives that have been set, including:

- 1) GRDP of Bogor Regency (based on constant prices and prevailing prices),
- 2) Bogor Regency Data in Numbers and Districts in Numbers,
- 3) Land Area Data by Land Use,
- 4) Bogor Regency Village Potential Data,
- 5) Data Population by Education Level,
- 6) Administrative map of Bogor Regency;
- 7) Data Publication from BPS and other related agencies.

Analysis Methods

The analysis method used in this study is *Skalogram* analysis to determine the regional hierarchy in Bogor Regency. After obtaining all these analyses, an overlay analysis based on the value of the regional hierarchy the *Geographic Information System* (GIS) to identify and map regional economic equity in Bogor Regency.

The *Scalogram* analysis method is used to determine the hierarchy of the village. The data unit used in this study is Bogor Regency village potential data, especially those containing data on the number of facilities and the number of types of facilities (basic infrastructure) and ease (accessibility) of these facilities (Alecsandru & Raluca, 2015).

The stages in the preparation of this simple scalogram analysis are: (1) arranging facilities according to the distribution and number of facilities, (2) adding up all facilities with a "countif" function so that zero-valued facilities are not counted, (3) sorting or ranking villages that have the highest number of types of facilities to the lowest facilities, and (4) sorting or ranking per facility, from those with the largest number of facilities to the least has a number of facilities.

To determine the value of the Village Development Index (IPD), it is mathematically formulated as follows:

$$IPD_i^n = \sum I'_{ij} \text{ where } I'_{ij} = \frac{I_{ij} - I_{Imin}}{S_{di}}$$

Information:

IPD_i = i-th Village Development Index

I_{ij} = Value (score) of the j-th development index of the i-th village

I'_{ij} = Value (score) of the jth village development index corrected (standardization) of the first village

S_{di} = Standard deviation of the i-th village development index

I_{ij} is data in the form of the number of selected J facility units in the Ith village. Especially for some facilities with data in the form of accessibility (distance to the location of the

facility) the following formula is used: , for case = 0 (that is, facility j is in the i-th village) then , where min is the lowest value other than zero ($\neq 0$).
$$I_{ij} = \frac{I}{X_{ij}} X_{ij} I_{ij} = \frac{I}{X_{ij} + S_{di}} X_{ij} X_{ij} X_{ij}$$

The expected result of this analysis is to obtain a ranking of villages that have the largest number of types of facilities to the least. And then an analysis is carried out to obtain the hierarchy of the territory.

Result and Discussion

The analysis of the regional hierarchy of Bogor Regency can be studied by *Scalogram* analysis. *Scalogram* analysis is built to determine the level of development of an area based on social, economic activities, as well as identify the level of welfare, area and accessibility of residents to service centers (Sari, 2021). As we know that, the availability of facilities is not uniform across villages. Therefore, this study was conducted to determine the hierarchy of village/sub-district areas in Bogor Regency (Siska, 2019); (Noviyanti et al., 2020).

In this study, using 36 variables used in the scalogram analysis, then divided into 10 indices, including variables: (1) Area index, (2) Population index, (3) Education facilities index, (4) Health facility index, (5) Social facilities index, (6) Economic facilities index, (7) Accessibility index to educational facilities, (8) Accessibility index to health facilities, (9) Accessibility index to social facilities, and (10) Accessibility index to economic facilities. In this study using village potential data, namely to see the extent of the development of the Bogor Regency area (per sub-district).

In this analysis, it was found that, in total, the level of inequality in Bogor Regency showed a significant increase in inequality, which was 32.057%. This is shown from the value of the *Coefficient of Variation* (CV) and the total average of Bogor Regency sub-districts which continue to increase. This picture can be seen in the following table:

Table 1 Criteria for Total Regional Development of Bogor Regency

Total Criteria	Year	
	2006	2008
Standard Deviation	10,480	13,715
Track	21,471	16,960
Coefficient of Variation (%)	48,810	80,868

In this analysis, the classification of regions is made into 3, namely: (1) Areas that have IPD values of $>$ (average IPD + standard deviation) are categorized as hierarchical areas I, the most complete facilities and better accessibility, (2) Areas that have IPD values $>$ average IPD are categorized into hierarchical II areas, whose completeness of facilities and accessibility are quite good, and (3) Areas that have IPD values $<$ IPD averages are categorized into regions hierarchical III, has complete facilities and accessibility is still incomplete.

Table 2 Classification Criteria for Regional Development of Bogor Regency

Criterion	Sum Kecamatan	Percent (%)	Track IPC	Stdev IPC	CV (%)
Year 2006					
Hirarki I	5	12,821	39,737	10,085	25,379
Hierarchy II	15	38,462	25,814	3,031	11,743
Hierarchy III	19	48,718	13,234	4,701	35,521
Year 2008					
Hirarki I	5	12,500	44,399	11,436	25,758
Hierarchy II	13	32,500	21,796	3,680	16,884
Hierarchy III	22	55,000	7,867	6,028	76,623

The table above shows that in general, the Total District *Development Index* (DDI) of Bogor Regency from 2006 to 2008 has increased. However, if we look further, from the index of coefficient of variation and standard deviation of each regional hierarchy that continued to increase during that period, this shows that there was an increase in inequality between sub-districts during that period by 32.057%. There are some areas where the facilities are the most complete and accessibility is the easiest to reach, while there are also other areas where the number of facilities is small and accessibility is very difficult to reach from where they live.

Furthermore, if observed from the distribution map, it can be seen that in 2006, areas in Bogor Regency that had the highest regional development (Hierarchy I) mostly clustered in the western part (Jasinga and Cigudeg) and eastern part (Jonggol and Citeureup) of Bogor Regency. As for areas with regional development, including the sufficient / medium category (Hierarchy II) spread almost throughout the Bogor regency. For areas with the lowest regional development (Hierarchy III) in 2006 it was seen that it was quite numerous and evenly distributed in the western part of Bogor Regency, such as: Parung District, Parung Panjang, Kemang, Gunungsindur, Rancabungur, Ciomas, Leuwiliang, and Dramaga). In addition, it is also spread in the eastern part of Bogor Regency, among others: Cariu, Sukamakmur, Cileungsi and Klapanunggal Districts.

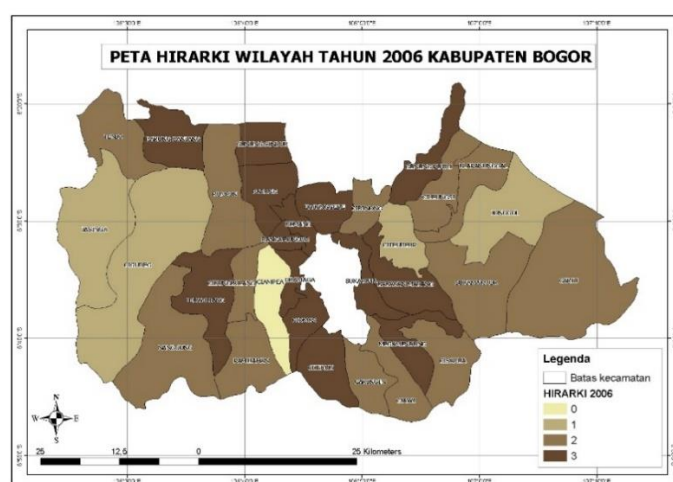


Figure 5. Map of Regional Development of Bogor Regency in 2006

The development of areas in Bogor Regency in 2008 generally experienced a shift in the development of the Hierarchy I area which was initially almost evenly distributed in all parts of Bogor Regency, but in 2008 the Hierarchy I area was more clustered in the eastern part of Bogor Regency, including: Cisarua and Ciawi Districts. The jam is also spread in the eastern part of Bogor Regency, including: Babakan Madang District, Cileungsi and Cibinong.

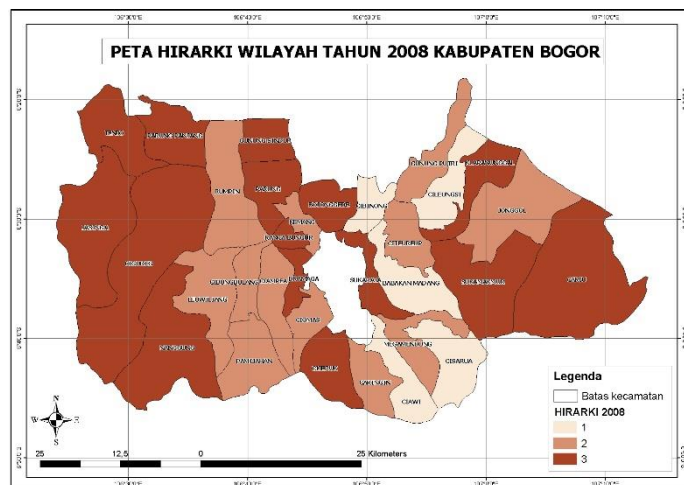


Figure 6. Map of Bogor Regency Regional Hierarchy in 2008

The results of the scalogram analysis showed that, in 2006 the areas in Bogor Regency that had the highest DDI (Hierarchy I) were in Jasinga, Sukajaya, Cigudeg, Citeureup, and Jonggol Districts. This shows that in this area the facilities needed by the community (education, health, social, and health) are the most complete and the distance is very easy to reach by the local community. This is indicated by the large number and type of basic infrastructure/facilities at the location. In addition, villages that have a high level of development or hierarchy have better accessibility (Suryana et al., 2021). Better accessibility is the ease with which a facility can be reached from a certain location or area by the community (Ardeasari & Sigit, 2021). Thus, the area can be used as a center of activity as well as a service center and facility provider for the surrounding area.

Hierarchy II areas include: Pamijahan, Tenjolaya, Cibinong, Cileungsi, Cariu, Tanjungsari, Sukamakmur, Nanggung, Ciawi, Rumpin, Cibungbulang, Cisarua, Tenjo. Caringin and klapanunggal. The area is an area with a moderate level of development. The level of development of the medium category area, namely the number and type of infrastructure, is not as complete as the Hierarchy I area. Therefore, the Hierarchy II area cannot be used as a center of activity or service center for surrounding villages, but only functions as a *hinterland area*.

In areas that have the lowest DDI or are in Hierarchy III include: Parung Panjang District, Mount Sindur, Sukaraja, Gunung Putri, Cigombong, Ciomas, and so on. This shows that, in this region is an area with a low level of development. Because the number and type

of infrastructure is not proportional to the large number of people living in the area who want to use it. In addition, the facilities in the location are relatively more difficult to access by the community who lives in this region. Details are presented on the appendix page.

Areas that have the highest total DDI score or are in Hierarchy I include: Cibinong, Babakan Madang, Cileungsi and Ciawi Districts. This shows that this region belongs to a region with high development. This is because it has a relatively more complete number and type of infrastructure and is more accessible to the local community. While the areas in Hierarchy II include: Jonggol District, Citeureup, Pamijahan, Gunung Putri, Ciomas, Kemang, Ciampea, Leuwiliang, and so on. These areas include having moderate regional development, where in this region has a number and type of facilities that are not as complete as areas in hierarchy I, so this region only functions as a *hinterland* for the surrounding area. Furthermore, the areas in Hierarchy III are: Sukaraja, Parung, Cigudeg, Bojong Gede, Gunung Sindur, Jasinga, Dramaga, and so on. These areas include villages with a low level of development, because the number and types of basic infrastructure are not proportional to the large number of people living in these locations, making it more difficult to access basic infrastructure in these locations when compared to areas in Hierarchy I.

From the results of the scalogram analysis, it can be concluded that during the period 2006 – 2008 sub-districts in Bogor Regency generally experienced changes in regional development patterns. This is possible, considering the region as a very dynamic system. However, if you look closely, when compared to 2006, in 2008 more sub-districts in Bogor Regency were in Hierarchy II and III, the coefficient of variation and standard deviation of each hierarchy also increased significantly in 2008. This shows that in 2008 there was regional inequality, especially in areas in Hierarchy II and III. That is characterized by the uneven distribution of regional facilities and infrastructure that causes agglomeration of economic sectors in certain areas, namely in this case in the Hierarchy I area where the distribution of facilities and infrastructure is relatively better than other hierarchical areas.

Directions of Development

Acceleration of Regional Development (RD) through the development area implementation strategy and Regional Hierarchy (RH) is an effort to implement regional development policies that allow the development area hierarchy to run in accordance with the functions and roles that have been determined.

Thus, allowing for a more balanced pattern of regional development. The development of the territory is a spatial manifestation of the development of the economy. Economic development tends to fill certain geographical areas, giving rise to spatial inequalities based on income, prosperity and material well-being. Therefore, the government needs to carefully intervene the process of developing the area through regional planning, one of which is the division of regional spatial structure based on the Development Area (DA) and regional hierarchy.

Conclusion

The conclusion of this study shows that regional development in Bogor Regency experienced significant dynamics between 2006 and 2008. Based on the analysis of the salogram, it can be seen that the areas with the highest development (Hierarchy I) tend to have more complete facilities and better accessibility. Sub-districts such as Cibinong, Babakan Madang, Cileungsi, and Ciawi fall into this category, where people can easily access basic facilities such as education, health, and economy. However, inequality between sub-districts is still quite high, with some areas with very limited facilities and difficult to reach by local residents, especially those in Hierarchy III such as Parung Panjang District, Gunung Sindur, and Sukaraja.

This research also highlights the importance of development strategies that focus on equitable distribution of facilities and infrastructure throughout the Bogor Regency area. The inequality shows that further efforts are needed to improve infrastructure and accessibility in less developed areas. By paying attention to the potential and needs of each sub-district, the government can design more effective policies to reduce disparities and encourage more equitable economic growth. This is expected to improve the welfare of the community as a whole and make Bogor Regency a sustainable and inclusive developing region.

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