

Analysis of Growth Center and Hinterland Areas in Maluku Province Indonesia

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Abstract

This study aims to identify growth centers in the Maluku Province area; analyze the interaction between growth centers and hinterlands in Maluku Province. The data in this study are secondary data using descriptive quantitative methods using scalogram analysis and gravity analysis. The results showed that Ambon City, Central Maluku Regency, East Seram Regency and Buru Regency had a higher regional development index and had complete facilities as a growth center area while other districts/cities became areas of influence of growth centers. Ambon City as a center of growth with hinterland Central Maluku Regency with the highest interaction value, West Seram Regency, Buru Regency, South Buru Regency and East Seram Regency with the lowest interaction value. Whereas Tual City as a growth center with hinterland of Southeast Maluku Regency with the highest interaction value, Aru Islands Regency, West Southeast Maluku Regency and Southwest Maluku Regency with the lowest interaction value.

Keywords: Growth Center; Interaction Value; Hinterland.

JEL Classification: O1, O2, O4

Introduction

Development is not merely demonstrated by the achievements of economic growth achieved by a country but development has a broad perspective. Development is a process of change towards better conditions through a planned one, Todaro et al (2006) defines economic development as a multidimensional process, involving major changes, both to changes in economic structure, social change, reducing poverty, inequality and unemployment in the context of economic growth. Regional economic development is a process in which the regional government and its people manage existing resources and form a partnership pattern between the regional government and the private sector to create a new job opportunity and stimulate the development of economic activities or economic growth in the region Arsyad(1999). One of the government's policies to narrow the gap between regions is the implementation of regional development policies through the concept of a reliable region, based on the potential of each region. Through this policy, it is expected that a balance of economic growth and per capita income can occur between regions, so as to close or at least narrow the economic gap between regions

Kuncoro(2012).

The concept of growth center is based on the concept of economic space proposed by Francois Perroux. Perroux states that, growth does not appear in various regions at the same time, growth will appear at the growth poles with different intensities and with different consequences Perroux(1969). In Indonesia, big cities become parasites and siphon village resources on a large scale, trickle down effect and the spread of prosperity (spread effect) are not going well Wilonoyudho(2009). According to the concept of the center of growth was introduced in 1949 by Francois Perroux who defined the center of growth as the center of the centrifugal beam and the pull of the centripetal force. Myrdal (1957) and Richardson (1978) state that the relationship between center and periphery is described by two effects, namely the spread effect from the center to the periphery and the backwash effect from the periphery to the center Muta'ali (2013). The theory of growth centers will initially absorb a lot of the resources of the surrounding area (backwash effect occurs), but in the long run the absorption decreases as the distribution of resources spreads to the surrounding area (spread effect) so that it is said to have a net spillover effect Capello(2009). The high interaction between the growth centers

and the hinterland will ultimately bring progress to both regions when followed by strengthening infrastructure and technology transfer to its supporting areas. This is important considering the interaction of the growth center with the hinterland will have an impact on the transfer of potential resources to the growth center so that without adequate infrastructure and technology support will gradually reduce the economic activities of the supporting regions. This thinking becomes an important foothold for regional planners in designing strategies to strengthen growth centers so that in turn bringing this strategy can have a positive impact as expected and does not cause the impact of depletion of resources (backwash effect) to the surrounding area.

Indonesia's economic growth can be maintained at a relatively high rate if new economic growth centers are developed continuously. The development policy of the new growth centers is not only believed to be a strategy in accelerating regional development but is quite dominantly used in regional planning both in developed and developing countries including Indonesia. Maluku Province which is designated as a national fish barn has an income inequality index (Gini Index) which is lower than the national average, but in line with national conditions, income inequality in Maluku tends to continue to increase. Despite having a wealth of natural resources, Maluku lags behind in terms of output, labor and investment. This raises concerns about the negative spillover effect (backwash effect) of growth centers in Maluku on the surrounding area in the long run. The high performance of Maluku's impressive economy always provides appropriate benefits in terms of poverty because it is aligned in creating sufficient productive employment namely more and better jobs. Table 1 shows that the poverty rate in Maluku fluctuated up to 2017, the poverty rate in 2013 was 20.76 percent, in 2015 the poverty rate dropped to 18.44 percent, in 2016 the poverty rate increased poverty rate decreased by 18.29 percent. The Open Unemployment Rate (OUR) in Maluku also fluctuates from year to year. In 2013 the OUR was 9.91 percent, in 2014 the OUR increased by 10.51 percent, in 2016 there was a decrease in the OUR by 7.05 percent and in 2017 the OUR increased by 9.29 percent. The Human Development Index (HDI) in Maluku Province has increased from year to year, in 2013 the HDI was 65.43 and in 2017 the HDI amounted to 68.19 an increase of 2.76 over 4 (four) years. (Table 1)

The application of the micro growth center concept to a particular region has developed rapidly. This development is seen by the increasing number of regions in Indonesia implementing regional

development activities, such as the pattern of Integrated Economic Development Zones, Production Center Areas, and the Master Plan for the Acceleration and Expansion of Indonesian Economic Development. Aiming to maximize the benefits of agglomeration, explore the potential and superiority of the region, and improve the spatial imbalance of economic development in Maluku. The establishment of growth centers is part of the government's strategy to reduce regional disparities and uneven development, especially in Maluku. The development of regional growth centers in Maluku has not been able to minimize inequality between regions. Some growth centers in Maluku are even in the category of relatively disadvantaged regions. On the other hand, high economic growth is not followed by high employment. The higher index of economic exploitation indicates the amount of resources that must be provided, which in fact is consumed more by people who live outside their territory.

Methodology and Data

This research was conducted in Maluku Province consisting of 9 districts and 2 cities. The data in this study are secondary data obtained from the Central Statistics Agency (BPS). The data analysis technique used in this research is descriptive quantitative analysis with several analytical tools, namely scalogram analysis and gravity analysis.

Scalogram Analysis

Scalogram Analysis is about facilities in an area as an indicator that the area is functioning as one of the growth centers in the area, Blakely (1994). A scalogram analysis aims to identify the role of an area based on the region's ability to provide services to the community. The Scalogram model has six variants (scalograms type I, II, III, IV, V and VI) that develop from the simplest to the most complex models. The general scalogram model is:

Table 2 of the scalogram model can be identified and known the number of infrastructure facilities that are available and available in the form of economic, educational, health and social infrastructure. Then the data is transformed into binary form (0 and 1). Facilities are given a weight, as a weighting factor for each type of facility is the ratio of the total number of regional units to the number of regional units that have the facility.

$$n/n_j \text{ ---- (1)}$$

Table 1. Comparison of Poverty, Open Unemployment Rate (OUR) and Human Development Index (HDI) Maluku Province.

Discription	2013	2014	2015	2016	2017
1. Poverty (%)	20.76	19.27	18.44	19.36	18.29
2. Open Unemployment Rate (%)	9.91	10.51	9.93	7.05	9.29
3. Human Development Index	65.43	66.09	66.74	67.05	68.19

Source: BPS-Statistics Maluku 2018.

Table 2. Scalogram model.

Region	Population	Area	Facility 1	.....	Facility -j	Hierarchy
1	1	.....	1	1
2	1	.....	1	2
...
n	1	.....	1	n

Source: Riyadi and Bratakusumah 2004.

Where:

n: total area (district / city).
 nj: number of areas that have the jth facility.

By multiplying the value of the weight of the basic matrix, we will get the weighted value of the number of certain facilities contained in a particular region.

$$n / nj \cdot X_{ij} \text{ ----- (2)}$$

Where:

n: total area (district / city).
 Nj: number of areas that have the jfacility
 Xij: number of j-facility units in the i-region

Gravity Analysis

The gravity model is a very useful operational tool for estimating nodalities that can be used to identify dominant centers in highly complex urban areas, Richardson (1978). The basic concept of this analysis is to discuss the size and distance between two places, namely the center of growth with the surrounding area, to how far an area that is a center of growth affects and interacts with the surrounding area. The closer the distance between two locations the greater the attraction that occurs between the two or vice versa the greater the distance between the two locations the smaller the attraction that occurs between the two. Gravity model analysis aims to determine the closeness of the relationship between the two regions, in this case the area is considered a mass that has a gravitational attraction, this relationship is identified as an economic interaction between the growth center and the surrounding area, the relationship between the two regions is reflected in the index value gravity gained.

The gravity model is formulated as follows Isard(1960) and Sang Arun (2012):

$$I_{12} = k \frac{(W_1 P_1)(W_2 P_2)}{d_{12}^b} \text{ ----- (3)}$$

Where:

I₁₂ : spatial interaction between region 1 and region 2
 W₁ : GRDP per capita region 1
 W₂ : GRDP per capita region 2
 P₁ : total population of region 1
 P₂ : total population of region 2
 d₁₂ : distance between region 1 (destination / center) and region 2 (origin/hinterland)
 k : constant

b : value constant 2

Results and Discussion

Regional Development Analysis

To find out the Regency Development Index is determined by calculating the number of results of standardization of facilities and accessibility in an area. The Regency/City Development Index values are sorted based on the largest to the smallest value. The greater the Regency Development Indexvalue of an area, the higher the level of development and hierarchy, conversely the smaller the Regency Development Indexvalue of an area, the lower the level of development and hierarchy. Based on the Regency/City Development Index, the area can be grouped into 3 (three) hierarchies, namely hierarchy I (high), hierarchy II (moderate), and hierarchy III (low). To determine the regional hierarchy based on the standard deviation (StdDev) Regency Development Index of each regency/city and the average value, as shown in Table 3.

The availability of infrastructure and urban facilities owned by an area as an attraction or as one of the service centers and growth centers are presented in Table 3. The hierarchy and level of regional development in the scalogram can be explained as follows:

1. Hierarchy I is a regency / city with a more advanced level of regional development compared to other regions. Region with hierarchy I has a complete number and facilities so it is categorized as a high level of development. Regencies / cities that fall into this category have better accessibility and infrastructure compared to other regions, so that this region can become a service center and a provider of facilities for the surrounding area.
2. Hierarchy II is a district / city with a moderate level of regional development. Region with hierarchy II is an area where the number and type of infrastructure is not as complete as the region in hierarchy I, so it is categorized as a moderate level of development. This region cannot be used as a growth center or service center for the surrounding area, it only functions as a hinterland region.
3. Hierarchy III is a regency / city with the lowest level of regional development. Areas with hierarchy III are areas where the number and types of facilities and infrastructure are not as complete as the regions in hierarchy I and II, so they are categorized as areas with low development level and function as hinterland areas.

The results of the scalogram analysis, Table 4 shows the development of districts/ cities in Maluku in 2017 with a high level of development in hierarchy I is Ambon City, Central Maluku Regency, Buru Regency and East Seram Regency with Regency Development Index of 19 greater from the average Regency Development Index. Ambon City is a growth center in Maluku Province which has complete facilities and has a high level of development. Central Maluku Regency, Buru Regency and East Seram Regency have the same high level of development as Ambon City because they

Table 3. Hierarchy intervals between the Regency Development Index.

Hierarchy	Interval Value (X)	Level of Development
I	Regency Development Index X > (Average Regency Development Index + Std Dev Regency Development Index)	High
II	Average Regency Development Index ≥ Regency Development Index X ≤ Std. Dev Regency Development Index	Medium
III	Regency Development Index X <Average Regency Development Index	Low

have complete facilities. Hierarchical Category II with a moderate level of development is Tual City, West Southeast Maluku Regency and Aru Islands Regency with a Regency Development Index of 18. Tual City is the administrative center of Southern Maluku but facilities are not as complete as Ambon City and Central Maluku, Buru and East Seram. For the hierarchical category III with a low development level are the West Seram Regency, South Buru Regency and Southeast Maluku Regency with a Regency Development Index of 17 while the Southwest Maluku Regency with a Regency Development Index of 15. The Southwest Maluku Regency has a lower development index compared to regencies/cities in general. The geographical position of the Southwest Maluku Regency which is quite far from the center of the provincial capital and the center of growth with the distance between the subdistricts and villages consisting of scattered islands resulting in a lower level of development of the district (shown in figure 1).

The City Center area can be divided based on the character of the region and the condition of the natural physical area and the city administration area. When reviewed according to the theory of optimal growth pole becomes a center of growth that functionally becomes a location of concentration of business groups or branches of industry which due to the nature of the relationship has dynamical elements so as to stimulate economic life both inside and outside (the area behind it). Geographically, the center of growth is a location that has many facilities and conveniences

so that it becomes a center of attraction (place of attraction) that causes various kinds of businesses interested to be located there and the public likes to come to take advantage of existing facilities in the city, although there is probably no interaction between these efforts. Differences in the level of development between regions are very large in an area/region can also weaken and inhibit the progress of the region can ultimately disrupt the regional economic system. Within an area / region will trigger a flow of movement and mobility of the population which is increasing as well, where the population will tend to move to urban centers (growth) to look for opportunities as well as employment opportunities and greater wages, Hamri (2015). This condition will have an impact on the loss or reduction of potential and productive energy in an area. Tiered regional hierarchies with a good level of equilibrium between regions on one side can lead to and increase competition between regions, but on the other hand can encourage and mobilize other regions so as to increase economic activity and minimize the flow of population mobility between regions.

Analysis of Interaction and Regional Attraction

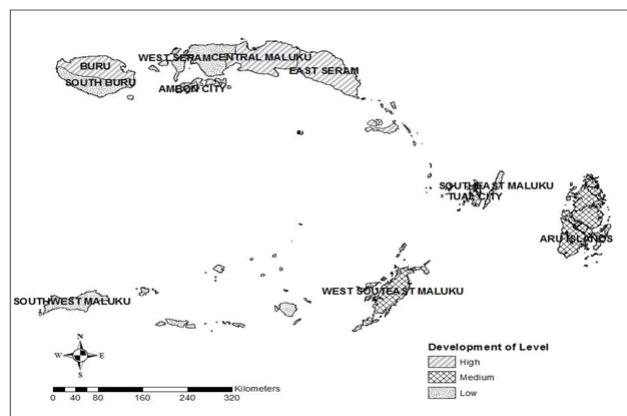
The results of the gravity calculation method in 2010-2016 at the growth center of Ambon City with hinterland (Central Maluku Regency, West Seram Regency, Buru Regency, South Buru Regency and East Seram Regency). Tual City growth center with hinterland (Southeast Maluku Regency, Aru Islands Regency, West South-

Table 4. Scalogram Analysis of Regency/City Development Index in Maluku Province.

Regency/city	Regency Development Index	Hierarchy	Level of Development
Ambon	19	I	High
Tual	18	II	Medium
Central Maluku	19	I	High
Buru	19	I	High
South Buru	17	III	Low
West Seram	17	III	Low
East Seram	19	I	High
Aru Islands	18	II	Medium
Southeast Maluku	17	III	Low
West Southeast Maluku	18	II	Medium
Southwest Maluku	15	III	Low
Average	17.81		
Standard Deviation	1.25		

Source: own calculations

Figure 1. Level of development city/regency in Maluku Province.



east Maluku Regency and Southwest Maluku Regency). Bahasoan et al (2019) state the typology of Klassen based on regional division namely Maluku in the northern region (Ambon City, Central Maluku Regency, West Seram Regency, East Seram Regency, Buru Regency and South Buru Regency) and Maluku southern region (Tual City, Southeast Maluku Regency, Aru Islands Regency, West Southeast Maluku Regency and Southwest Maluku Regency).

Table 5 shows the results of the gravity index (interaction) between the growth centers and the hinterland. The growth center of Ambon City with its hinterland which has the highest interaction with the first rank is Central Maluku Regency with an interaction value of 15,146,757.46; the second rank is West Seram Regency with an interaction value of 8,597,095.27 and the fifth (last) rank is East Seram Regency with an interaction value of 168,569.72. Spatial interaction for the growth center of Tual hinterland City which has the highest interaction is Southeast Maluku Regency which is the first rank with an interaction value of 8,012,996.82, second rank of West Southeast Maluku Regency with an interaction value of 2,782,155.26 and rank 4 is Southwest Maluku Regency with an interaction value of 25,442.08 (Figure 2)

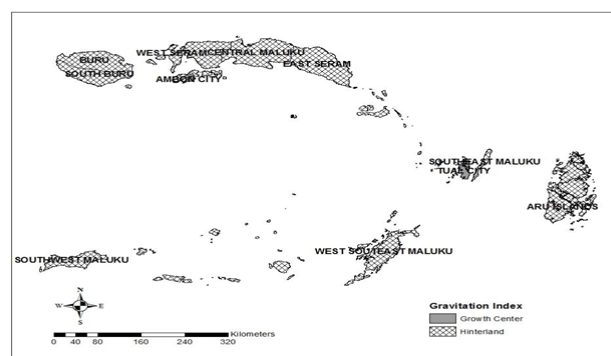
Linkages or interactions between growth centers and their supporting areas (hinterland) include: (1) physical linkages, in the form of human integration through transportation networks (rivers) both natural and engineering, (2) economic linkages, closely related to marketing so that commodity flows occur in various types of materials and manufactured goods, capital, and income as well as forward linkages and backward linkages between various economic activities, (3) Linkages of population movements, both permanent and temporary migration patterns. This linkage is a picture of the relationship of rural areas with the relationship between rural and urban areas, (4) technological linkages, especially equipment, methods and methods of production must be spatially and functionally integrated because technological innovation alone will not spur social and economic transformation region if it is not adapted to a need, (5) social linkages is the impact of economic linkages on the pattern of population social relations, (6) social service linkages, such as health services, education, clean water, electricity and banks, (7) administrative, political and institutional links, for example in government structures, administrative or budgetary boundaries and development costs reflected in the structural relations of formal governance.

Table 5. The results of the gravity index (spatial interaction) between the growth center and its rear region (hinterland) in Maluku Province 2010-2016.

Growth Center	Hinterland	Interaction Value	Ranking
Ambon City	Central Maluku Regency	15.146.757,49	1
	West Seram Regency	8.597.095,27	2
	East Seram Regency	168.569,72	5
	Buru Regency	1.642.717,51	3
	South Buru Regency	943.308,77	4
Tual City	Southeast Maluku Regency	8.012.996,82	1
	Aru Islands Regency	227.856,96	3
	West Southeast Maluku Regency	2.782.155,26	2
	Southwest Maluku Regency	25.442,08	4

Source: own calculations

Figure 2. Gravitation Index in Maluku Province.



Conclusion

Based on the results of the research and discussion it can be concluded: (1) the regency/ city regional development index in Maluku Province is Ambon City, Central Maluku Regency, East Seram Regency and Buru Regency have a higher regional development index and have complete facilities which are the central region growth while other regencies/cities are the areas of influence of growth centers. (2) The result of the gravity index (spatial interaction) between the growth center and its rear region (hinterland) in Maluku Province is Ambon City as the growth center with the back region (hinterland) Central Maluku Regency, West Seram

Regency, Buru Regency, South Buru Regency and East Seram Regency with the highest value of interaction is Central Maluku Regency and the lowest interaction is East Seram Regency. Whereas Tual City as the center of growth with hinterland of Southeast Maluku Regency, Aru Islands Regency, West Southeast Maluku Regency and Southwest Maluku Regency with the highest interaction value is Southeast Maluku Regency and the lowest interaction value is Southwest Maluku Regency.

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