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Analysis of the Economic Growth at the District Level in Asahan Regency, North Sumatra

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ABSTRACT

One of the regional development strategies that became the focus of this research was the determination of the growth center. This study aims to find out the areas that are the growth in Asahan Regency and the highest relationship between spatial interactions between the growth centers and the hinterland. This analysis tool used area scalogram, centrality index, and gravity index. The results showed that the area that had a hierarchy with a high upward categorization as the center of growth was Kecamatan Kisaran Barat. Kisaran Barat as the growth center with the hinterland region which has the highest interaction value is the Kisaran Timur District, Air Joman District, and Pulo Bandring District.

Keywords: Gravity model, Centrality index, Growth center and scalogram.

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INTRODUCTION

Economic development of a region is a process in which local governments and their communities manage existing resources and form a partnership pattern between local governments and the private sector to create new jobs and stimulate the development of economic activity (economic growth) in the region. Within the framework of achieving the objectives of regional economic development, development policies based on endogenous development are needed, using the potential of local resources (Arsyad, 1999: 108).

The development process carried out by the government is a development process that balances national development and regional economic development. National development is carried out to support and encourage the development of regional development and on the other hand regional development is increased to strengthen national development and a stable and dynamic national economic structure (Adisasmita, 2013: 22).

One solution that can be taken to accelerate the development of a region is regional development by establishing a growth center. The concept of a growth center is based on the concept of economic space proposed by Francois Perroux. Perroux stated 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 in Adisasmita 2005: 31) The impact that occurs with economic development through the determination of the center Regional economic growth will stimulate the economic growth of other regions. This is because the center of economic growth can cause a spread effect to the surrounding area so that the area will also grow and develop its economy.

Regional development that is concentrated in growth centers with

capital-intensive industries will stimulate economic growth which in turn stimulates regional development activities. Government policies with capital-intensive industries must also be followed by the development of infrastructure, transportation, communication and social institutions so that naturally these conditions can increase investment attractiveness (Nainggolan, 2010:14).

The implication for the community's economic activities is that on the one hand the products from the growth center will be used by other industries in the surrounding area (hinterland) and exported to outside the region, while on the other hand it provides opportunities for products produced around the growth center area to be used by industry in growth centers. This condition allows the achievement of market mechanisms or in other words industrial policies in the growth centers are generators for agricultural and commercial activities. The growth poles are applied in the form of a regional hierarchy through the city-city system to bridge between villages and cities in the hope of minimizing differences in opportunities for economic activities and social services (Sitohang, 2001: 98-99).

Asahan Regency is an autonomous region with the status of a regency in North Sumatra Province and is located in the East Coast of Sumatra. Asahan Regency has an important position, role and function in the development of the national economy, especially economic development in North Sumatra. It can be seen that this region has a fairly high regional income and has enormous potential resources ranging from agriculture and plantations, livestock, nature tourism, hydroenergy, to industry. Until 2017, the GRDP of Asahan Regency was in 5th place out of 33 provinces in North Sumatra, which amounted to 23,525.35 billion rupiah. This position places Asahan as a suitable area for the development of urban fringe and agglomeration. Its economic movement leads to the secondary and

tertiary sectors which rely on the services and trade sectors. This illustrates the existence of a leap in the stages of development (BPS Kabupaten Asahan, 2014). However, the GRDP growth rate of Asahan Regency in the last five years has experienced ups and downs. The up and down GRDP growth rate indicates a lack of economic stability in the district or indicates an economic problem in the region.

One of the efforts of the local government and the community in Asahan Regency in order to spur and move the regional economy and to manage and develop development in their own territory is to expand the sub-districts and villages, which until 2016 Asahan Regency had 25 sub-districts and 177 villages/outputs. The expansion of the area is intended to facilitate the improvement of public services, supervision of development, creating new centers of economic growth and isolation of periphery areas, so as to increase the socio-economic mobility of the population. So to make economic adjustments between regions within a region, the approach concept that is often used is the concept of developing administrative regions. The existing sub-districts in each city or district are considered to have the potential to be developed as growth centers. In addition, the sub-district scope approach is intended so that development between sub-districts can be more evenly distributed.

The different scales of each region in the economic system, administration and public services result in different functions of the region in a harmonization pattern that is able to mutually support the role of one region with another. In addition, as a new area, it is also very important to know how the economic performance, patterns of economic structure and economic growth are both regionally (relative position) and sectorally (between sectors) and how the level of economic specialization in Asahan Regency is so

that Asahan Regency can catch up. and able to compete with other districts / cities.

Based on the descriptions above, the formulation of the problem raised is to identify sub-districts that can be developed as centers of economic growth, so that the potential economic activities in each sub-district can develop more rapidly. Therefore, it is hoped that the preparation of development planning through a regional approach and a sectoral approach in Asahan Regency can be expected to be more focused so as to stimulate the growth of regions as centers of economic growth in order to create sustainable development.

In line with the background and the previous description, the problems that will be analyzed in this research are: Which sub-districts are the growth centers in Asahan Regency. And how is the interaction between the sub-districts as centers of economic growth with the sub-districts as supporters of the growth centers (hinterland).

The initial thought about the center of growth was sparked by Francois Perroux (1949) which is about the concentration of industrial activities in certain areas which can then encourage national economic growth, later developing into the concept of a growth center which in French is called the *pole de croissance*.

According to Perroux in Adissasmita (2005:31) based on the basic facts of spatial development (spatial), growth does not occur in any place and also does not occur simultaneously, growth occurs at points or poles of development, with varying intensity. and that growth spreads along various channels throughout the economy. To accelerate the increase in income there is a necessity to build one or several centers of economic power in a country or region.

Location theory is one of the theories that underlies the need for regional-based development. The basis used in location theory is optimizing space utilization. In

each space there are many locations of economic activities that describe the position of certain economic activities in that space. Between the locations of an economic activity there is a distance to economic activities in other locations and when an economic activity with other economic activities is interconnected, various consequences will arise, for example the emergence of transportation costs from one location to another. The principle of location theory is to arrange the location of all economic activities in a space in such a way that all available space can be used optimally (Tarigan, 2001: 122).

Alfred Weber in 1909 conducted an analysis of the location of industrial activity. According to Weber's theory, the selection of industrial sites is based on the principle of cost minimization. Weber stated that the location of each industry depends on the total cost of transportation and labor which the sum of the two must be minimum. The place where the minimum total cost of transportation and labor is synonymous with the maximum level of profit. According to Weber in Tarigan (2004: 140) there are three factors that affect the location of the industry, namely transportation costs, labor wages, and the strength of agglomeration or deagglomeration. In explaining the relationship between transportation costs and raw materials, Weber uses the locational triangle concept to obtain the optimum location. To show whether the optimum location is closer to the location of raw materials or the market, Weber formulates a material index (IM), while labor costs as one of the factors that can affect industrial location are explained by Weber using a closed curve in the form of a circle that is called isodapane.

Walter Christaller (1933) stated that the central place theory is a theory based on the location and distribution pattern of settlements in space. In a space, it is sometimes found the distribution of village and urban settlement patterns of

different sizes. The right way to establish and provide a service based on spatial or regional aspects is to place the activity in question in a hierarchy of settlements that increase in size and are located at the nodes of the hexagonal (central) network. This location is located in a central place that allows the maximum number of human participation, both those who are involved in service activities and those who become consumers of the goods they produce (A. Losch, 1945). These places are assumed to be gathering points that have an influence on the surrounding area.

This model is based on the study of Ravenstein (1885) which states that the volume of migration depends on distance. Migration tends to cover short distances and for long distance migration generally towards important economic centers. Ravenstein also states that the existence of transportation, industrial areas, and trade causes the frequency of migration to increase and migration decision making is mainly driven by economic motives. The calculation of population migration using the gravity model is used to calculate the absorption of migrants in the destination area which is associated with the distance factor between the sending and receiving areas of migrants. As stated in Ravenstein's Law, migration tends to travel the shortest distances and towards centers of economic growth. The distance factor according to Ravenstein is one of the main factors that cause population migration. Then this is also supported by the push and pull factors of migration which was revealed by Lee (1966) that the volume of migration is influenced by the conditions of the area of origin and destination. In this case, the area of origin can take the form of factors that encourage migration or hold back from moving. Meanwhile, the destination is a factor that attracts people to come. One of the push and pull factors in migration is the economic factor and the

availability of jobs.

METHODOLOGY

Analysis of Scalograms and Sentimental Indexes The scalogram analysis provides a description of the hierarchy or ranking of regions based on the type and number of development infrastructure units from the most to the least, so that the growth center area can be determined and in the scalogram analysis (regional hierarchy) to determine the level of regional growth based on the availability of facilities and infrastructure. regions according to the number and type of units, by writing down the number of facilities and infrastructure owned by each region, or writing down the presence/absence of facilities and infrastructure in an area without regard to the amount/quantity (Ermawati, 2010).

Then, the Centrality Index Analysis is the next step of the scalogram analysis which is analyzed not only based on the number of functions or service facilities that exist in an area, but also based on the frequency of existence of these functions or facilities in the area being reviewed. The frequency of the existence of a function shows the number of similar functions that exist and are spread in a certain area (Mutaali, 2003) with the formula:

$$C = (x/X)$$

Information :

- C = weight of function attribute x
- X = total number of functions in the system
- x = Combined centrality value = 100

The indicators used in the preparation of the center and hierarchy in this research are educational facilities, health facilities, religious facilities and community institutions, market facilities, banking, telecommunications and others.

Interaction or Gravity Analysis

Gravity analysis is often used to

analyze the relationship between potential locations and the size of the potential area. The magnitude of the interaction between the two regions can be determined by several factors such as the number of jobs, the number of residents and others in the two regions. Because it is easy to get data, the size used is the number of people. The size of the population is used because the population is related to the various sizes above. The general formula for gravity is as follows (Tarigan, 2004:95):

$$I_{ij} = k \frac{P_i P_j}{d_{ij}^b}$$

Furthermore, the use of the gravity formula can be simplified to (Daldjoeni in Saruhian, 2006:14):

$$I = \frac{P_1 \times P_2}{d^2}$$

- I = The amount of interaction between cities/regions A and B
- P1 = Number of inhabitants of the city/region I thousands of people
- P2 = Total population of the city/region j (thousands of people)
- dy = distance between city I and city j (km)
- k = Constant number based on experience
- b = Power of dy which is often used b = 2

The close relationship between the centers of growth and the surrounding areas (hinterland) is shown by the increasing number of interactions between sub-districts as centers of economic growth and the surrounding area.

RESULTS AND DISCUSSION

Scalogram and Centralized Index Analysis Results

This analysis is used to determine the center of economic growth in the sub-district in Asahan Regency by looking at the availability of public facilities such as

social, economic and government facilities that exist in an area. Furthermore, this scalogram analysis was developed to determine the weighted centrality index. Determination of the hierarchy of growth centers with this centrality index is not only based on the number of functions or service facilities that exist in an area, but also based on the frequency of existence of these functions or facilities in the area under review.

Some of the data used for scalogram analysis in this study amounted to 18 types of functions/facilities which include data on social, economic and government facilities. These types of facilities include data on social facilities in the form of: educational facilities, health facilities and worship facilities. For data on economic facilities in the form of: market, industry (medium, large), post office, cooperative. The results of the calculation of the Scalogram Analysis and the Centralist Index are presented in the Hierarchical Table of Availability of Social, Economic and Government Facilities for Each District in Table 1.

Analisis Skalogram dan Indeks Sentralis, menunjukkan bahwa terdapat VI hierarki yang ada di Kabupaten Asahan berdasarkan kelengkapan dan ketersediaan

fasilitas yang ada disetiap kecamatan. Berdasarkan jumlah jenis ketersediaan fasilitas ada 4 kecamatan yang memiliki jumlah jenis fasilitas tertinggi yaitu, Kecamatan Kisaran Barat, Air Batu, Air Joman dan Kisaran Timur. Sedangkan Kecamatan yang memiliki jumlah fasilitas paling banyak adalah Kecamatan Kisaran Barat dengan jumlah 675 unit fasilitas, yang terdiri dari 17 jenis fasilitas berupa fasilitas Pendidikan (Sekolah TK, SD/MI sederajat, SMP/MTs sederajat, SMA/SMK/MA sederajat), fasilitas Perekonomian (Pasar, Industri besar/Menengah, Industri Kecil dan Rumah Tangga, Bank), fasilitas Kesehatan Masyarakat dan Sejenisnya (Puskesmas Induk, Puskesmas Pembantu, Posyandu, Rumah Sakit, Apotek), fasilitas Peribadatan (Masjid, Gereja protestas, Wihara), dan fasilitas Pelayanan Umum berupa Koprasi. Dari 18 fasilitas yang digunakan dalam penelitian Kecamatan Kisaran Barat hanya tidak memiliki 1 unit fasilitas saja yaitu fasilitas Peribadatan berupa Gereja Katholik. Jumlah Gereja Katholik di Kabupaten Asahan hanya terdapat di beberapa kecamatan saja, hal ini disebabkan oleh masyarakat yang beragama Katholik paling sedikit di bandingkan dengan kecamatan lainnya.

Table 1
Hierarchy of Availability of Social, Economic and Government Facilities
Each District in 2017 Using Scalogram Analysis

No.	District Name	Number of Types of Facilities	of Centralized Index	Hierarchy
1	Kisaran Barat	17	101.89	HIERARCHY I
2	Aek Kuasan	16	89.39	HIERARCHY II
3	Air Batu	17	88.61	HIERARCHY II
4	Air Joman	17	86.23	HIERARCHY II
5	Kisaran Timur	17	85.23	HIERARCHY II
6	Sei Dadap	14	80.73	HIERARCHY II
7	Aek Ledong	14	77.96	HIERARCHY III
8	Pulau Rakyat	16	73.73	HIERARCHY III
9	Simpang Empat	16	73.73	HIERARCHY III
10	Rahuning	15	70.95	HIERARCHY III
10	Teluk Dalam	13	61.43	HIERARCHY IV

	Sei	Kepayang			
12	Barat		12	59.73	HIERARCHY IV
13	Bandar Pulau		15	59.45	HIERARCHY IV
13	Buntu Pane		15	59.45	HIERARCHY IV
15	B. P. Mandoge		14	58.82	HIERARCHY V
16	Aek Songsongan		14	53.9	HIERARCHY V
17	Sei Kepayang		14	53.9	HIERARCHY V
18	Setia Janji		14	53.57	HIERARCHY V
19	Meranti		14	53.9	HIERARCHY V
	Rawang	Panca			
19	Arga		14	53.9	HIERARCHY V
21	Tanjung Balai		12	51.57	HIERARCHY V
22	Tinggi Raja		12	48.74	HIERARCHY V
23	Pulo Bandring		10	42.38	HIERARCHY VI
24	Silo Laut		11	43.05	HIERARCHY VI
	Sei	Kepayang			
25	Timur		9	37.71	HIERARCHY VI

Source: BPS, District in Figures 2017, processed data.

The sub-district that has the least number of facilities is the East Sei Kepayang District, with 9 types of facilities and 43 units of facilities consisting of educational facilities (TK, SD/MI equivalent, SMP/MTs equivalent, SMA/SMK/MA equivalent), facilities Economy (Large/Medium Industries, Small and Home Industries), Public Health facilities and the like in the form of Posyandu, worship facilities in the form of mosques, and public service facilities in the form of cooperatives.

The results of the type weighting per facility unit using scalogram analysis and centralized index show that the West Kisaran District is in hierarchy I. This is because the West Kisaran District has the most complete number of facility units. Hierarchy II is obtained by the Districts of Aek Kuasan, Air Batu, Air Joman, and Kisaran Timur. Hierarchy III was obtained by the Districts of Aek Ledong, Pulau Rakyat, Simpang Empat, and Rahuing. Hierarchy IV is obtained by Teluk Dalam, West Sei Kepayang, Bandar Pulau and Buntu Pane Districts. Hierarchy V was obtained by the Districts of Bandar Pasir Mandoge, Aek Songsongan, Sei Kepayang, Faithful Promise, Meranti, Rawang Panca Arga, Tanjung Balai and Tinggi Raja. Meanwhile,

the sub-districts in hierarchy VI which are the last hierarchies are Pulo Badring, Silau Laut and Sei Kepayang Timur sub-districts.

West Kisaran District is a district that has a very high number of types of facilities and a very high centralist index value. So that the West Kisaran District has the potential as a growth center. Kisaran Barat District as a growth center is closely related to the stipulation of this sub-district as the capital of Asahan Regency and at the same time as the center of government, so that in this sub-district there are many business developments or community economic activities, be it trade and service businesses, small industries and also the construction of various facilities. economy such as markets, banking and so on. Kisaran Barat Subdistrict is also a place of population concentration with a population density of 1,816 people/km² in 2017. The large number of residents in this subdistrict has resulted in the community's need for the availability of social facilities also increasing, so that in this Subdistrict many educational, health and religious facilities are built. In addition, people also tend to choose to live in areas that have complete

availability of facilities compared to areas that have few facilities. Therefore, this sub-district can function as an important growth center area in order to provide services to the community and also develop other areas in Asahan Regency.

Based on the results of the sclogram analysis and the centrality index on the availability of social, economic, and government facilities, it is known that the link between the available facilities and the function of the region as a growth center is the more complete or the higher the value of the centrality index it has, the more the region will have more functions. large compared to other regions. Sub-districts that have the availability of more complete facilities compared to other sub-districts, this means that the sub-district has a better ability to provide services to the community and furthermore because of this condition the sub-district is able to play a role as a growth center in the area. The results of the analysis of the scalogram and the centralist index in this study are in accordance with what was stated by Perroux (1995) in his theory of the Growth Center that people will choose to live in

areas that have complete availability of facilities.

Gravity Analysis

To see the interrelationships between regional growth centers by looking at the population and the distance between each sub-district to the growth center area in Asahan Regency. Based on the gravity analysis, there are three sub-districts that have a high interaction value with the growth center area of West Kisaran, namely East Kisaran District, Pulo Badring District and Air Joman District. The three sub-districts are directly adjacent to the West Kisaran District. Pulo Badring District has the closest distance to West Kisaran District, which is 5.7 Km. East Kisaran District is 6.2 Km away and Air Joman District is 14 Km away. While the sub-district that has the smallest interaction value with West Kisaran District is Aek Songsongan District. This is because the distance between Kisaran Timur District and Aek Songsongan District is quite far, which is 71 Km. The results of the interaction calculation using the interaction method or gravity can be seen in Table 2.

Table 2
Results of Interaction between the Growth Center District and the Sub-District Surroundings (Hinterland) Year 2017

No.	District Name	Interaction Value
1	Eastern Range	115073955.6
2	Pulo Bandring	54631504.09
3	Joman Water	14976519.14
4	Sei Dadap	11683124.62
5	Stone Water	8674619,938
6	Dead Pane	7368949582
7	4-way intersection	6314629.263
8	Rawang Panca Arga	5727183362
9	Meranti	4848706.586
10	Tanjung Balai	2484378.101
11	King's Height	2395346,614
12	Faithful Promise	1513971324
13	Sea Silo	1432941.149
14	BP Mandoge	841946.5964
15	Deep Bay	690520.61
16	West Sei Kepayang	669035.6931

17	People's Island	668663.4876
18	Sei Kepayang	592245.5489
19	Rahuning	414320.8269
20	Aek Kuasan	392555.3193
21	Sei Kepayang Timur	380868.2472
22	Island City	310304.3538
23	Aek Ledong	307655.134
24	Aek Songsongan	209229.7237

Source: BPS, District in Figures 2017, processed data.

CONCLUSION

Based on the results of the analysis of the scalogram and the centralized index, which was carried out using 18 types of existing facilities, there were 6 regional hierarchies based on the availability of types of facilities in each sub-district. Of the 25 sub-districts in Asahan District, Kisaran Barat District is identified as the center of growth. Kisaran Barat sub-district has a number of types of functions/facilities and a high centralist index value when compared to the other 24 sub-districts in Asahan Regency. Based on the gravity analysis carried out, West Kisaran District as a growth center area has the strongest interaction with East Kisaran District, Pulo Badring District, and Air Joman District. So that the three sub-districts are hinterland areas of the West Kisaran District.

The Asahan Regency Government needs to follow up on the determination of the West Kisaran District as the main growth center in Asahan Regency so that governance and development as well as services to the people of Asahan Regency are getting better. It is hoped that there will be additional facilities for sub-districts that are far from Kisaran Barat District and new sub-districts, so that existing facilities can be more and more evenly distributed in each sub-district in Asahan Regency so that in the future it can support development in these areas. the.

Increasing the attractiveness of regional investment in developing leading commodities in underdeveloped areas through the provision of incentives and

ease of licensing, ease of access to land for investors, and increased availability of infrastructure.

Connectivity in Asahan district is still constrained by the unavailability of inadequate road infrastructure that connects one sub-district to another. Most of the road infrastructure in Asahan Regency after the construction of good roads will not last long because the activities of trucks transporting oil palm and coconut plantations cause roads to be easily damaged. For this reason, it is necessary to implement a spatial planning policy through the preparation of regulations related to the agreed space utilization permit. by all parties, both the Central Government and the Regional Government.

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