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Growth Pole Economics in The South West Coast of Aceh

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A B S T R A C T

This research aims to identify alternative areas as the new growth pole and formulate a development strategy in the South West region of Aceh. The methods used are Klassen typology, gravity models, and breaking point. The scope of this research covers 7 (seven) districts and 1 (one) city for the period of 2011 to 2016. The entire district and city are assumed to be an economic unit treated as a parent area for all districts/cities. The results showed that, firstly, there could be 2 (two) growth poles if we divided by coastal areas, namely Nagan Raya District for the west coastal region of Aceh and Southwest Aceh District for the southern coastal region of Aceh. However, Nagan Raya Regency is the alternative choice for the new growth pole in South West region of Aceh. Secondly, the improvement of the agricultural, forestry and fishery sectors as well as the development of human resources in accordance with the needs of the labor market is necessary to be able to develop the new center of economic growth

Keywords: *Economic Growth Pole, Location Quotient, Gravity Models, And Breaking Point.*
JEL Classification Code: R10, R12, R14

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INTRODUCTION

Development is the main problem experienced by most of developing countries. Various problems arise and become obstacles to development in almost all developing countries. The problems faced include poverty, unemployment, health levels, low quality of education, income distribution gap, and higher crime rates (Todaro, 2009). Therefore, all countries need to carry out continuous development. It is expected that at the end of each stage of development, they will be able to increase the per capita income of the population, and thus, can improve the welfare of the population.

Development success is reflected in higher economic growth than the population growth in the long run. The results of economic growth must be distributed evenly throughout the region through job creation, reduction of unemployment, and decrease in poverty. The distribution of development benefits is expected to increase regional production capacity and reduce social inequality between regions and community to perceive the development benefits. In the end, sustainable development can create justice and prosperity for all communities (Hihola, H.Laoh, and Pakasi, 2016)."

Economic development is regular agenda of the central government and local governments. Regional development is one of the responsibilities of the local government based on the conditions of growth and inequality of development between regions. The difference in the availability of resources in the region is the cause of the disparity in economic growth and will enlarge the gap between regions. Due to resource interest, rapid economic growth can be less profitable for other regions. Various important factors such as capital, labor, trade activities will flow rapidly from underdeveloped areas to faster developed areas. However, the movement of those resources has slowed the development of areas with smaller economic sizes because the area loses natural resources, labor, and capital—the greater the transfer of development inputs, the more significant the development gap between developed and underdeveloped areas.

Moreover, in order to decrease the disparity, Indonesia implements a government system with regional autonomy regulated through the Law. No. 32 in 2004. The implementation of regional autonomy helps regions to get the freedom to organize their respective regions and independently utilizing the resources available in each region. It is also expected that the capacity of local government will increase and become reliable and professional in managing regional economic resources and thus, be able to improve the welfare of the community. In addition, the local government can easily prepare development planning by existing superior sectors, finding solutions from existing constraints, and moving the wheels of the regional economy.

The enactment of regional autonomy encourages the expansion of territory throughout Indonesia. Based on the Law of the Republic of Indonesia No. 4 of 2002, Aceh Province, which consisted of only eight districts and two cities, bloomed into up to 18 districts and five cities. The coastal area of Aceh also changed from 2 districts, namely West Aceh and South Aceh, to 7 districts, namely Aceh Jaya, West Aceh, Nagan Raya, Southwest Aceh, South Aceh, Simeulue, and Aceh Singkil, and one city (Subulussalam). Each region began to race to carry out development, but the impact of development throughout the coastal areas of Aceh has relatively not changed the condition of the community since then.

During 2014-2016, only three districts has been reduced the number of poor people while the other five regions increased. In terms of per capita

expenditure, during 2010 - 2015, seven regions had per capita expenditures lower than Aceh Province per capita, and only Aceh Jaya regency had higher per capita expenditure than Aceh Province. Nevertheless, the growth of per capita expenditure in Aceh is still higher than Aceh Jaya, which means if there is no change in economic conditions, then per capita expenditure in Aceh Jaya will get lower than Aceh per capita expenditure.

Furthermore, the development process in coastal areas has not been able to lift the quality of human resources. This is reflected in the human development index (HDI), where the entire area until 2016 is still below the Aceh Province. The relatively slow development progress is not following the expectations of the development that has been carried out. Therefore, a catalyst is needed to accelerate regional development. In order to spur the achievement of regional economic development, an increase in investment concentrated in a region with economic and geostrategic advantages is important. In addition, the region can also encourage the growth of economic activities in the surrounding region. The benefits of industrial activities, exports, imports, and other economic activities with significant economic value can be distributed thoroughly in all regions.

Based on theory, a group of economic activity concentrated in a particular area is a symbol of a growth pole, and the concentration of economic activity can dynamically encourage the economic development of the local area and surrounding areas. The growth pole is a theory that integrates the analysis of location gains and aspects of economic growth and connectivity between regions. The analysis will likely identify potential new areas as growth centers so that development is not only concentrated in one area (Sjafrizal, 2015).

A region needs to identify the leading sector to optimize its superior sector. This can be inferred if the leading sector in a region has advantage against similar sector in other regions (Basuki and Gayatri, 2009).

Other factors that need to be considered are spatial interactions, which is a reciprocal relationship with mutual influence between two or more regions that can cause signs or new problems. The strength of the interaction is strongly influenced by three main factors, namely the presence of complementary regional, the opportunity to intervene, and the ease of transfer (Respati, 2015).

Theories of spatial interaction can be applied in development planning. For example, in the placement of the community service center, the development of transportation facilities can access the alienation of a region from another region and the advancement of information and technology. The theory of gravity is one example of spatial interaction theory. The theory of gravity emerged when it was first introduced in Physics by Sir Issac Newton in 1687. The force of gravity can be defined as two objects with a certain mass with a tug of war. The strength of the attraction force will be directly proportional to the result of the second time the mass of the object and inversely proportional to the square of the distance between the two objects (Ermawati, 2010).

Empirical studies showing relations with centers of economic growth are Hamri et al (2016), Suseno (2014), Priyadi and Eko (2017), Emalia and Isti (2018), Maria and Mudrajat (2017), Pratomo (2014), Rahayu and Eko (2014), Istifadah et al (2016), Gren (2003), Sang-Arun (2013) and Darmansyah (2013). The development of economic growth poles will stimulate economic activities and ultimately encourage the development of regional development activities; therefore, this study will also look at the approach to the reach of a city's interaction with the

surrounding area.

The implication of economic activity is how the production derived from growth poles can be used to carry out economic activity in the area around the growth pole (hinterland). On the other hand, the production of hinterland products can be used for economic activity available in the growth pole. Therefore, policies applied in the growth pole can be used as a motor to support the economic activity of the surrounding region. Growth poles can also be applied to bridge the differences in economic activity opportunities available in each region.

Based on the above description, this writing aims to identify alternative areas as centers of economic growth in the South West region of Aceh; and formulate a strategy for developing the new central economic growth area in the South West region of Aceh.

METHODOLOGY

The scope of this research is the South West coast of Aceh which includes 7 (seven) regencies and 1 (one) city. The period of the study is from 2011 - to 2016. All districts and cities are assumed to be an economic unity and be treated as a parent area for all districts/cities. This analysis uses secondary data sourced from publications such as the Central Statistics Agency and other official sources. The variables used in the study are Gross Regional Domestic Product (GRDP) per capita, total GRDP, population, and distance (Km).

This study uses several models arranged in such a way that they can be applied to answer research objectives, such as the rate of economic growth and GRDP growth per capita:

$$G = \frac{GRDP_t - GRDP_{t-1}}{GRDP_{t-1}} x100\% \quad \text{..... (1)}$$

Information:
G = Growth
$GRDP_t$ = Gross Regional Domestic Product of the year t
$GRDP_{t-1}$ = Gross Regional Domestic Product of t-1

$$GRDPperKapita = \frac{GRDP}{JumlahPenduduk} \quad \text{... (2)}$$

The Location Quotient formula is used to look at the potential of a region's sector to the same sector in a larger region (South West coast) of which the research area is part (Wiwekananda, 2016). The Location Quotient (LQ) model can be understood using the following equation formula Mangiri (2000):

$$LQ = \frac{PDRB_i^R / PDRB^R}{PDRB_i^N / PDRB^N} \quad \text{..... (3)}$$

Information:
$GRDP$: Total GRDP study area
$GRDP_i^R$: GRDP area of sector i study
$GRDP^N$: Total GRDP throughout the South West coastal region of Aceh
$GRDP_i^N$: GRDP all west coastal areas south of Aceh sector i

The results of this LQ calculation will be interpreted into the following three categories:
a) LQ > 1: leading sector, production in that sector can meet the needs of its region It can export to other areas.
b) LQ < 1: not the leading sector, production in the sector cannot meet the needs the region itself, so it needs help from other regions (imports).
c) LQ = 1: this sector can only meet the needs of its region but will not export or import to other regions, in Wiwekananda (2016).

Sectors of the economy with LQ points > 1 are normative standards determined as ideal/base sectors. These sectors have the potential to be optimized

in increasing the pace of development and economic growth of districts/cities on the southwest coast of Aceh. Nevertheless, while many sectors in an area produce LQ > 1, the focus is only one sector. Thus, what needs to be chosen is the sector with the highest LQ value. The greater the LQ points show, the greater the potential advantages of the sector.

In order to strengthen the findings and results of the study, this study will use the Klassen typology model, measuring the attractiveness of the growth pole area (gravity index) and the breaking point. Fattah and Abdul (2013) show that the Klassen typology is an analytical tool used to determine the differences in the characteristics of a region in each city.

Table 1.
Classification of Regions/Regions According to Klassen Typology Analysis

r \ a	$y_s \geq y_a$	$y_s < y_a$
$r_s \geq r_a$	Quadrant I Developed and Fast-Growing Areas	Quadrant III Fast-Growing Areas
$r_s < r_a$	Quadrant II Developed But Depressed Areas	Quadrant IV Relatively Disadvantaged Areas

Source: Arsyad (2010)

Information:
ys = GRDP per capita in the study area
ya = GRDP per capita in the reference region
rs = Gdp growth rate in the study area
ra = GDP growth rate in the reference region

Classification is done by grouping regions in 4 criteria (Kuncoro, 2004 in Iswanto, 2015):
Quadrant I : Fast-forward and fast-growing regions are areas that have a greater rate of economic growth and per capita income when compared to the reference area;
Quadrant II : Advanced but depressed areas are regions that have greater per capita income but smaller economic growth rates compared to the reference region;
Quadrant III : Fast-growing areas are areas that have a greater level of economic growth but smaller per capita income level compared to the reference area; and
Quadrant IV : Relatively underdeveloped area that have a smaller economic growth and per capita income than the reference area.

The gravity index model is used to see the strength of the interaction (proximity) between the two regions so that it can be seen how much attractiveness the potential exists in an area and creates a mutually influencing relationship between the two regions (Gulo, 2015; Tarigan, 2010).

$$T_{ij} = k\frac{p_i P_j}{d_{ij}^c} \quad \text{..... (4)}$$

Information:
Tij = Attraction residents of region i to the region j
k = A constant where the value is 1
pi = Number of population regions i
pj = Number of population regions j
dij = Distance between region i to j (km)
c = The rank from the dij that is often used is 2 (Andriyani and Utama, 2015)

Later, Newton's gravity model was applied by W. J. Reilly (1929). He is a geographer who uses this model to measure the strength of crowd interactions between two or more regions. In Rielly's opinion, the strength of interaction between the two regions is measured by considering the distance and population in both regions. Potential interaction between regions can be applied if the conditions of these areas meet the following requirements:

a) Socio-economic conditions, livelihoods, education levels, socio-culture, and population movements in each region that want to be compared relatively have similarities.

b) Natural conditions, especially topography, in each region have something in common.

c) Transportation facilities and infrastructure used to connect comparative areas also have similarities. (Kharisma & Triwardani, 2018)

Reilly's Gravity model was again modified into breaking point theory to recognize the range of influence of a city (service center) to existing interactions. The breaking point will illustrate the position of the boundary line that separates the trading area between two different regions or cities of population. This theory also estimates the placement of community service centers to be affordable for each population in two different regions. The benefits of calculating this breaking point are at the time of planning community service centers, such as government offices, industrial locations, trade centers (banks, markets, mini markets), health and education facilities, and other public services. (Habib, 2016)

Breaking points can be known using the following formulas (Yrigoyen and Otero, 1998; Tarigan, 2005; Anderson, Volker, and Phillips, 2010; Friske and Choi, 2013; Listyaningrum, Jannah, Aryanti, Rointan, and Worrabay, 2016; Hihola, H.Laoh, and Pakasi, 2016; Alhabeeb, 2019; Guite, 2019).

$$Th_{ij} = \frac{Dij}{1+\sqrt{\left(Pi/Pj\right)}} \quad \text{..... (4)}$$

Where:

Thij = Breaking point

Dij = distance between cities 'i' and 'j' (measured from the center of the capital in both regions)

Pi = Residents of the growth pole city 'i'

Pj = Residents of the surrounding city (hinterland) 'j'

RESULT AND DISCUSSION

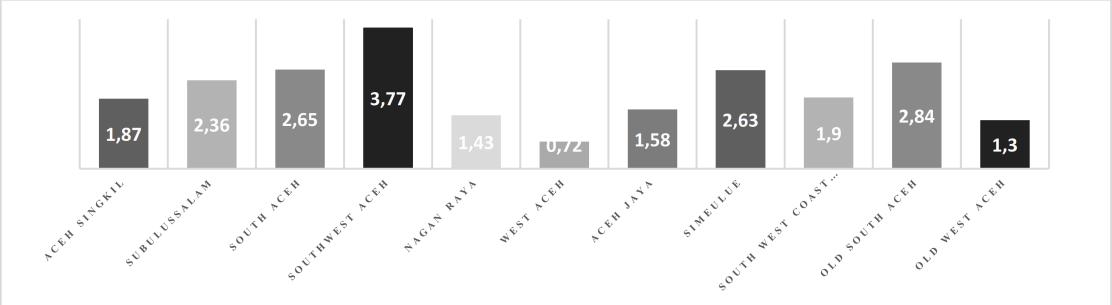
Throughout the period 2011-2016, the South West coastal region of Aceh experienced fluctuating growth. The average economic growth is 3.68 percent, whereas the region's economic growth is driven more by the expansion of South Aceh. The old South Aceh Regency expansion has an average economic growth of 4.04 percent or higher than the old west Aceh regency expansion area, which grew only by 3.46 percent.

Source: Analysis results, (2018

Figure 1.
Average Growth of GRDP on the Basis of Constant Prices in South West Coast City of Aceh Regency from 2011 to 2016

Relatively non-high economic growth has implications for the relatively low-income level of the population. In the study time frame, per capita income growth of the South West coast region was 1.90 percent. Per capita income growth of all districts/cities on the South West coast of Aceh is highly fluctuated and less evenly distributed. There are areas where per capita income growth is lower than the average growth of per capita income of the region, and there are regions that experience per capita income growth was higher than per capita income growth in the South West coastal region of Aceh.

The areas that have a growth of per capita income lower than the average growth of per capita income is generally located on the west coast, while those with higher per capita income growth are spread across the southern coast of Aceh. The growth of per capita income in the expansion area of old South Aceh regency of 2.84 percent was greatly influenced by the contribution of Southwest Aceh Regency, which grew higher (3.77 percent) while other districts grew lower than the average expansion area of South Aceh. In the expansion of West Aceh Regency, per capita income growth is evenly spread throughout the expansion area. The per capita income of regencies in the expansion area of West Aceh grew by 1.30 percent, whereas only West Aceh Regency grew lower (0.72 percent) while all expansion areas grew higher than the average west Aceh expansion area.



Source: Analysis Results (2018)

Figure 2.
Average Per Capita Income of South West Coast Regency/ City of Aceh
Period 2011 - 2016

The classification of regions in the South West coastal region of Aceh based on economic growth and per capita income growth indicates that there is no developed growth pole in quadrant I (developed and fast-growing areas). The best growth poles are in quadrant II (developed but depressed areas), namely Nagan Raya and West Aceh Regencies. Nevertheless, choosing the area in quadrant II as a growth pole is not the best option. Therefore, a more solid approach is needed to choose the forerunner of the central economic growth area on the South West coast.

The chosen area for growth pole candidates identified by dividing the South West coast into two regions, namely the expansion area of South Aceh and the west Aceh expansion area. The division of the South West coast into two regions is done based on historical considerations and approaches. The entire South West coastal area was originally part of the Regency and West Aceh Regency. Each expansion district has had economic relations in fellow regions and with the paternal regency for a long time.

First, the region's classification is

carried out in the expansion area of South Aceh Regency consisting of Subulussalam City, Aceh Singkil Regency, Southwest Aceh, and South Aceh. The classification of regions in the expansion area of South Aceh shows that Southwest Aceh Regency is an area that is included in quadrant I. It shows that the southwest Aceh can be a driver of the development of other sectors. Other areas are included in quadrant IV, which is a disadvantaged area, where these areas must get special attention where they have a potential to be developed again to increase GDP per capita and the rate of economic growth in the area (Andriyani and Utama, 2015). Thus, the south Aceh region and its expansion found the candidate center of growth in quadrant I (advanced and fast-growing region), namely the Southwest Aceh Regency.

The economy of Southwest Aceh Regency still depends on the agricultural, forestry, and fisheries sectors. The contribution of the agricultural, forestry and fisheries sectors to the GDP is 26.90 percent. The next sector that contributed significantly was the extensive trade and retail sector, car and motorcycle repairs (16.52%), and the construction sector (13.45%). The leading sectors of Southwest Aceh Regency are other service sectors (5.27), health services and social activities (2.53), and transportation and warehousing sectors (2.26).

Second, the expansion area of West Aceh consists of Nagan Raya Regency, Aceh Jaya Regency, Simeulue Regency, and West Aceh Regency. Economic conditions in this region are relatively better than the South Aceh region and its expansion. Nagan Raya regency is in quadrant I, West Aceh Regency is in quadrant II while Aceh Jaya regency and Simeulue Regency is in quadrant III. Thus, the areas that are expected to be the center of growth of the South West coast of Aceh are Nagan Raya Regency, West Aceh Regency, and Southwest Aceh Regency.

The economy of Nagan Raya Regency is highly dependent on the agricultural, forestry, fisheries sectors, and the mining and quarrying sectors. Both sectors contribute more than 60 percent of Nagan Raya's GRDP. The agriculture, forestry, and fisheries sectors accounted for 38.13 percent of Nagan Raya's GDP, and the mining and quarrying sectors contributed 25.33 percent of GRDP. The sectors with the third-largest contribution were the extensive trade and retail sectors car and motorcycle repairs with a contribution of 10.19 percent. The trade sector is also the flagship sector of Nagan Raya, with an LQ coefficient of 2.77. The other two sectors with the highest LQ coefficients are the education services sector (2.46) and the construction sector (2.41).

West Aceh regency also has considerable dependence on the agricultural, forestry, and fisheries sectors, contributing 29.87 percent of the West Aceh GRDP. The following sectors to enormous contribute are the large trade and retail sectors, car and motorcycle repairs (16.46%), and the mining and quarrying sector (11.82%). Meanwhile, the 3 (three) leading sectors owned by West Aceh Regency are the accommodation and drinking food provision sector (5.14), the financial services and insurance sector (4.92), and the corporate services sector (4.54).

Table 2.
Origin and Destination South West Coast Region of Aceh / Center for Growth and Research Destination Area 2016

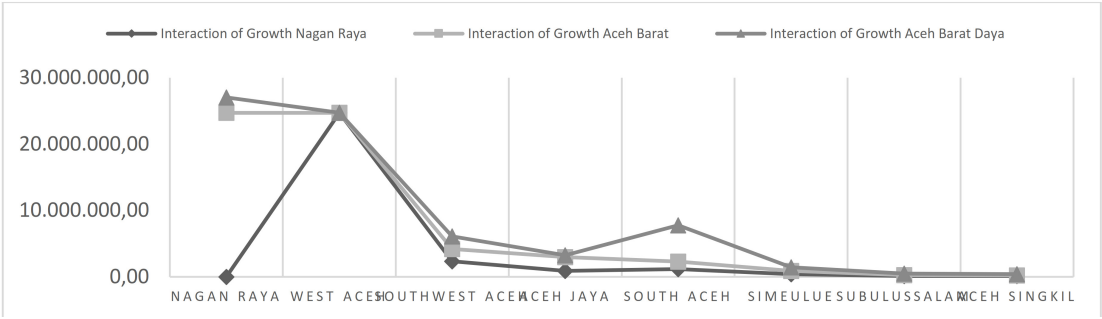
No	Growth Pole (District/ City of Origin)	Regency/ City Purpose	Sum Inhabitant Origin (Soul)	Population Purpose (Soul)	Distance (i-j)	Pi.Pj	Distance $(i-j)^b$	Number Interaction
	(i)	(j)	(Pi)	(Pj)	(thigh/Km)	(ij)	(^{dij2})	(Iij)
1	Nagan Raya (NR)	West Aceh (WA)	158.223	197.921	35,60	31.315.654., 383	1.267,36	24.709.359,92
		Southwest Aceh (SWA)	158.223	143.312	98,70	22.675.254.576	9.741,69	2.327.651,01
		Aceh Jaya (AJ)	158.223	87.622	125	13.863.815.706	15.625,00	887.284,21
		South Aceh (US)	158.223	224.897	174	35.583.878.031	30.276,00	1.175.316,36
		Simeulue (Sime)	158.223	90.291	190,70	14.286.112.893	36.366,49	392.837,28
		Subulussalam (S)	158.223	77.984	320	12.338.862.432	102.400,00	120.496,70
		Aceh Singkil (ASK)	158.223	116.710	407	18.466.206.330	165.649,00	111.477,92
2	West Aceh (WA)	Southwest Aceh (SWA)	197.921	143.312	123	28.364.454.352	15.129,00	1.874.840,00
		Nagan Raya (NR)	197.921	158.223	35,60	31.315.654.383	1.267,36	24.709.359,92
		Aceh Jaya (AJ)	197.921	87.622	91	17.342.233.862	8.281,00	2.094.219,76
		South Aceh (US)	197.921	224.897	199	44.511.839.137	39.601,00	1.124.007,96
		Simeulue (Sime)	197.921	90.291	186,43	17.870.485.011	34.756,14	514.167,64
		Subulussalam (S)	197.921	77.984	345	15.434.671.264	119.025,00	129.675,88
		Aceh Singkil (ASK)	197.921	116.710	432	23.099.359.910	186.624,00	123.774,86
3	Southwest Aceh (SWA)	West Aceh (WA)	143.312	197.921	123	28.364.454.352	15.129,00	1.874.840,00
		Nagan Raya (NR)	143.312	158.223	98,70	22.675.254.576	9.741,69	2.327.651,01
		Aceh Jaya (AJ)	143.312	87.622	211	12.557.284.064	44.521,00	282.053,06
		South Aceh (US)	143.312	224.897	76,60	32.230.438.864	5.867,56	5.492.988,37
		Simeulue (Sime)	143.312	90.291	152,72	12.939.783.792	23.323,40	554.798,39
		Subulussalam (S)	143.312	77.984	222	11.176.043.008	49.284,00	226.768,18
		Aceh Singkil (ASK)	143.312	116.710	309	16.725.943.520	95.481,00	175.175,62

Source: Central Bureau of Statistics and Google Maps, 2018 (processed)

Furthermore, we use the gravity models to see the interrelationship between the growth poles of the South West coastal region of Aceh. This model is used to look at the strength of the relationship between two. In regional economies, the relationship between these regions can be identified as the interaction between the growth pole and the surrounding areas. The close relationship between the growth pole and the surrounding areas can be shown from the magnitude of the interaction number. The interaction is characterized by the movement of people, money, and goods in the region's economic and social service relationships (Emalia and Isti, 2018).

The growth pole region has a higher quadrant than other regions. Based on the results of the calculation of the gravity model using the distance variables and the number of residents between districts, it can be seen that the calculation of the interaction of each district as a growth pole with districts / cities in the south west coast of Aceh is shown in table 2.

The Growth Pole of Nagan Raya Regency, West Aceh, and Southwest Aceh can be reached using land transportation from the hinterland region of the South West coast of Aceh. Simeuleu regency is geographically separated by the island from the growth pole so that the connectivity of this region with other regions cannot use land transportation but must use sea transportation facilities. The distance of interaction of this district is not measured by pulling a tortuous line or following the road's path like other districts/cities on the South West coast of Aceh, but measured by drawing a straight line in google maps. Therefore, Simeulue cannot be categorized as qualified in applying interaction patterns between regions because it has different regional conditions from other districts on the South West coast of Aceh (Kharisma & Triwardani, 2018).



Source: Central Bureau of Statistics and Google Maps, 2018 (processed)

Figure 3.
Results of Interaction of Growth Pole Regency with South West Coast Regency / City of Aceh in 2016

Table 2-3 and figure 3 show that the growth pole is in Nagan Raya Regency with the highest and strongest interaction between regional groups in West Aceh Regency, which is 24,709,359.92 units of attraction, following The District of Southwest Aceh, South Aceh, and Aceh Jaya in moderate interaction and Subulussalam city and Aceh Singkil get the weakest interaction category between hinterland areas. The strength of Nagan Raya Regency's interaction with West Aceh is also caused by the location of West Aceh Regency close to Nagan Raya Regency (35.60 Km).

Southwest Aceh regency is one of the alternative growth poles. The highest contribution to attractiveness in the Southwest Aceh Regency area is South Aceh at 5,492,988.37 units of attraction. This is because of the factor of distance to the growth pole area. Moreover, for Nagan Raya regency, Aceh Singkil regency has more population (116,710 inhabitants) than Aceh Jaya (87,622 people) and Subulussalam (77,984 inhabitants) because of the very long-distance (±407 Km from Nagan raya and 309 Km from Southwest Aceh Regency) causes Aceh Singkil to have a weaker interaction of these two districts. Aceh Singkil regency also has the weakest interaction and most distance from all growth poles. The

interactions that occur are categorized into three, namely:

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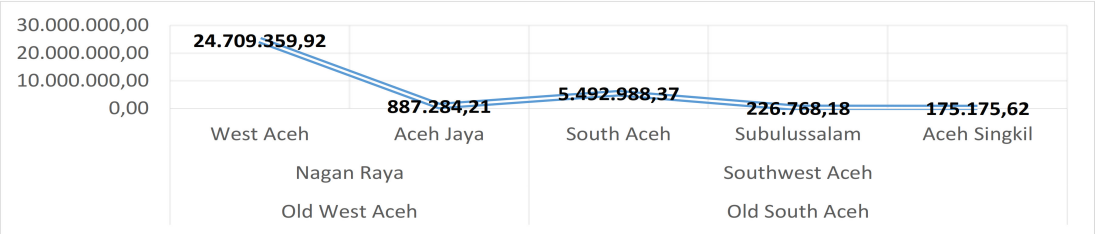
Table 2.
Origin and Destination South West Coast Region of Aceh / Center for Growth and Research Destination Area 2016

No	Interaction / Growth Pole	Nagan Raya	West Aceh	Southwest Aceh
1	strong	West Aceh (WA)	Nagan Raya	South Aceh
2	Keep	Southwest Aceh (SWA) South Aceh (US) Aceh Jaya AJ)	Aceh Jaya (AJ) Southwest Aceh (SWA) South Aceh (US)	Nagan Raya (NR) West Aceh (WA)
3	Weak	Subulussalam (S) Aceh Singkil (ASK)	Subulussalam (S) Aceh Singkil (ASK)	Aceh Jaya (AJ) Subulussalam (S) Aceh Singkil (ASK)

Source: Central Bureau of Statistics and Google Maps, 2018 (processed)

Figure 4 shows the results of the calculation of interactions divided into two coastal areas, namely the west coast of Aceh, which is the expansion area of West Aceh, where the area is Nagan Raya as the center of growth, WA and AJ. Second is the southern coast of Aceh, namely the Expansion of South Aceh, where the center of growth is in the Southwest Aceh region is the US, S, and ASK. The growth pole will be compared to their surrounding areas without hinterland areas outside the region



Source: Central Bureau of Statistics and Google Maps, 2018 (processed)

Figure 4.
Results of Interaction of West Aceh Expansion Center District and South Aceh in 2016

Figures 3-4 and table 2-3 above show that there are more substantial areas of interest in the division of the two west and south coastal regions, namely as follows:

a) The city of Subulussalam, where the growth pole is located in NR and in WA, gets a weaker interaction of 120,496.70 and 129,675.88 units of attraction but obtained slightly higher interaction in coastal areas, with the growth pole being in SWA, which is 226,768.18 units of attraction.

b) Aceh Singkil regency is the area that has the most distance from the three growth poles on the South West coast of Aceh. Although it is included in the category of weak interactions, this district has a slightly

greater interaction rate at the growth pole located in SWA Regency (175,175.62 units of attraction) when compared to other growth poles, namely 111,477.92 units of attraction from NR growth pole and 123,774.86 units of attraction from WA.

c) The number of interactions in the category strongly contributes to the appeal to the growth pole of Southwest Aceh Regency is the US Regency of 5,492,988.37 units of attraction, which is greater than in other coastal areas where the U.S. only gets the category of interaction being in the other two growth poles.

d) The growth pole in Nagan Raya on the west coast of Aceh has a better interaction category than Southwest Aceh. This district excels in the acquisition of interaction categories, namely three medium interactions and two districts/cities of weak interaction compared to the comparison of SWA growth centers that only obtain two districts of medium interaction category and three weak interaction districts.

Based on the above explanation, there is a relationship of mutual need and interdependence between the growth pole and the surrounding areas (hinterland) in the territorial system. The interrelationship in economic relations, namely as a center of distributors of basic goods, center of education, center of marketing, centers of production both agriculture, plantations and household industries, trade centers, labor absorption, agricultural and plantation development centers, and sea transportation centers (Gulo, 2019). The breaking point point is used to plan community service centers and other public services and see the picture of the boundary position of the growth pole trade area with the surrounding area, namely Nagan Raya with the surrounding area (hinterland) on the west coast of Aceh and the Southwest Aceh region with the surrounding area (hinterland) on the southern coast of Aceh. The estimated placement of community service centers to be affordable for each resident in two different regions can be seen as follows: (Habib, 2016).

Table 4 shows the location of the breaking point between Nagan Raya Regency and West Aceh Regency which is approximately 18.80 Km, Nagan Raya and Aceh Jaya are 53.33 Km. While the farthest breaking point in the growth pole of Southwest Aceh Regency is in Aceh Singkil (146.58 Km). The location of the two growth pole areas is also in line. The breaking point of Nagan Raya and Southwest Aceh is 48.13 Km. Thus, it can be concluded that the service center is planned to be placed at this breaking point area

Table 4.
Growth Pole District Breaking Point with Hinterland South West Coast Region of Aceh in 2016

No	Regency/ City of Origin	District / Destination City	Sum Inhabitant As long as	Sum Destination Residents	Distance (i-j)	Pi/Pj	$\sqrt{P_i/P_j}$	$1+\sqrt{P_i/P_j}$	Breaking Point
	(i)	(j)	(Pi)	(Pj)	(Thigh/Km)	(ij)	(ij)	(ij)	Thij
1	Nagan Raya (NR)	West Aceh (WA)	158.223	197.921	35,60	0,80	0,89	1,89	18,80
		Aceh Jaya (AJ)	158.223	87.622	125	1,81	1,34	2,34	53,33
2	Southwest Aceh (SWA)	South Aceh (US)	143.312	224.897	76,60	0,64	0,80	1,80	42,60
		Subulussalam (S)	143.312	77.984	222	1,84	1,36	2,36	94,24
		Aceh Singkil (ASK)	143.312	116.710	309	1,23	1,11	2,11	146,58

Source: Central Bureau of Statistics and Google Maps, 2018 (processed)

Here is the location of the service center:

1. The Limit of The Influence of the Part of Growth Pole Region (PGPR) of Nagan Raya Regency on the Surrounding Area (Hinterland) in the West Coast Region of Aceh

a) Nagan Raya Regency Breaking Point (NR) with West Aceh Regency (WA)

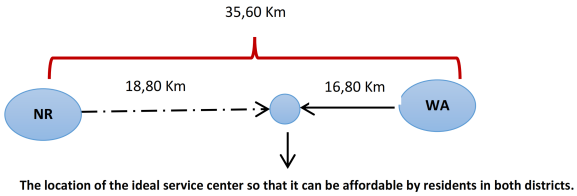


Figure 5.
Limit the Influence of PGPR Nagan Raya Regency on West Aceh

From the results of the picture analysis above, Nagan Raya Regency has a relatively more substantial influence limit than West Aceh. Based on calculations, the breaking point must be placed at 18.80 from Nagan Raya Regency and 16.80 from West Aceh Regency, namely in Kuala Pesisir District, Nagan Raya (Hihola, H.Laoh, and Pakasi, 2016; Yrigoyen and Otero, 1998).

b) Nagan Raya Regency Breaking Point (NR) with Aceh Jaya Regency (AJ)

The limit of influence of PGPR Nagan Raya on Aceh Jaya is 53.33 Km and 71.67 Km from Aceh Jaya to PGPR; then the following illustrations are obtained:

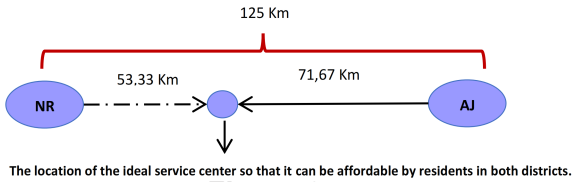


Figure 6.
Limit of PGPR Influence of Nagan Raya Regency on Aceh Jaya

Analysis of figure 6 shows Aceh Jaya has more substantial influence limit than the Nagan Raya growth pole, which is at a distance of 53.33 Km from NR and 71.67 Km from AJ. The breaking point is in Samatiga Subdistrict, West Aceh.

2. Limit the Influence of the Part of Growth Pole Region (PGPR) of Southwest Aceh Regency on the Surrounding Area (Hinterland) of the South Coastal Region of Aceh.

b) Southwest Aceh Regency Breaking Point (SWA) with South Aceh Regency (US)

The limit of influence of PGPR of Southwest Aceh on South Aceh is 42.60 Km and 34.00 Km from South Aceh to PGPR, and then the following illustration is obtained:

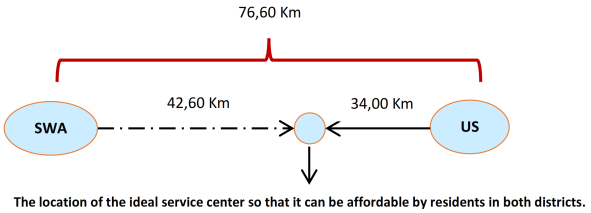


Figure 7.
Limit the Influence of PGPR Of Southwest Aceh Regency on South Aceh

Southwest Aceh Regency as a growth pole has more substantial influence limit when compared to South Aceh, so the breaking point must be placed at a distance of 42.60 Km from SWA and 34.00 Km from the US, namely in Meukek Subdistrict, South Aceh.

b) Southwest Aceh Regency Breaking Point (SWA) with City Subulussalam (S)

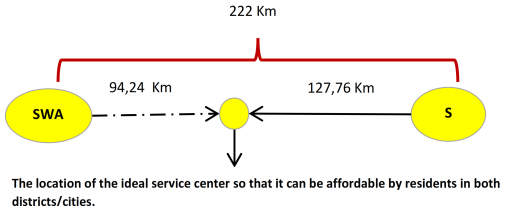


Figure 8.
Limit of PGPR Influence of Southwest Aceh Regency on Subulussalam City

Figure 8 illustrates that the city of Subulussalam has a more vital influence limit than Southwest Aceh, which is at a distance of 127.76 Km from S and as far as 94.24 Km from SWA. The calculations obtained are seen the breaking point must be at a distance of 94.24 Km from SWA and 127.76 Km from S, namely in Pasie Raja District, South Aceh.

c) Southwest Aceh Regency breaking Point (SWA) with Aceh Singkil Regency (ASK)

The limit of influence of PGPR West Aceh on Aceh Singkil is 146.58 Km and 162.42 Km from Singkil to PGPR, then the following illustration is obtained:

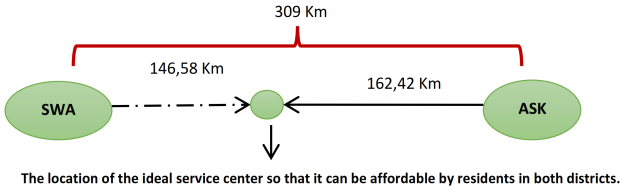


Figure 9.
Limit of PGPR Influence of Southwest Aceh Regency on Aceh Singkil

Figure 9 shows Aceh Singkil Regency has a more vital influence limit than SWA, so the breaking point must be at a distance of 146.58 Km from SWA and 162.42 Km from ASK namely in Bakongan Tim District, South Aceh.

The above analysis reflects that the limit of influence of PGPR of Southwest Aceh Regency (SWA) with the surrounding area (hinterland) on the southern coast of Aceh, the breaking point will be correct if it is in South Aceh Regency both from South Aceh itself, Subulussalam and Aceh Singkil.

CONCLUSION

Based on the purpose of the research and the results of the analysis of the center of economic growth in the South West coastal region of Aceh, it can be concluded as follows that the determination of economic growth poles that are expected to attract the surrounding area can be focused on 2 (two) scenarios, namely first, growing 1 (one) center of economic growth where Nagan Raya Regency can be expected to be the best area; and second, growing 2 (two) growth poles with the suspicion of Nagan Raya Regency is

the best area for the west coastal region of Aceh and Southwest Aceh Regency for the southern coastal region of Aceh.

The economy of the expansion of South Aceh and the expansion of West Aceh is supported by the agricultural, forestry, and fisheries sectors. However, the sector was not the leading sector in each region. Each district in each region has a superior sector, and there is almost no similarity between each district. Therefore, regional economic development should be done by making the agricultural, forestry, and fisheries sectors as base sectors that connect the superior sectors of the region.

The development of each sector is carried out in conjunction with the development of human resources that can fill the needs of the labor market that will arise due to the region's economic growth.

Calculations of gravity analysis between the growth pole and the surrounding area (hinterland) of supporting districts/cities showed that the growth pole in Nagan Raya Regency in the west coast region had a better interaction category than the growth pole Southwest Aceh on the southern coast of Aceh. This regency excels in the acquisition of interaction categories where West Aceh has a solid interaction with Nagan Raya with a gravity index value of 24,709,359.92 units of attraction. Three regencies show moderate interactions: Southwest Aceh, South Aceh, and Aceh Jaya. Subulussalam, Aceh Singkil showed a weak linkage with Nagan Raya. At the same time, the Center for Growth of Southwest Aceh region in west Aceh only obtained one strong interaction district with South Aceh (5,492,988.37 units of attraction), two districts of medium interaction category, and three districts/ cities of weak interaction.

The development of the Pole Growth Area (PGPR) of Nagan Raya regency and Southwest Aceh on the South West coast of Aceh affects the surrounding area (hinterland), giving rise to mutual relations. PGPR Nagan Raya on the west coast of Aceh affects Aceh Jaya where the breaking point is at a distance of 18.80 Km and West Aceh 53.33 Km. PGPR Southwest Aceh on the southern coast of Aceh affects South Aceh where the breaking point is at a distance of 42.60 Km, Subulussalam 94.24 Km, and Aceh Singkil 146.58 Km.

This research recommends that the determination of the economic growth pole of the southwest region of Aceh can be focused on 2 (two) namely:

1. The acceleration of economic development in the region that can be budgeted by the fulfillment of integrated facilities and infrastructure, improvement, and expansion of regional accessibility to support the economy both in the short-term and long-term.
2. Cluster formation in each region gives rise to superior sectors in each cluster making the agricultural, plantation, and forestry sectors as base sectors connected to the leading sector sectors

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