

Spatial Interaction Pattern and the Process of City Activity Formation System (Case Study, Ternate, Tidore Archipelago and Sofifi City of North of Maluku)

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Abstract: This study aims at analyzing spatial physic interaction, economy and social in Ternate, Tidore Archipelago and Sofifi City. The spatial interaction occurs through complementary process, transferability and intervening opportunities. This process then developed into city activities system formation. This study applied quantitative approach and qualitative approach (mixed approach). The data collected through observation, survey and documentation. The accumulation of the city activity functions which dominantly developed in Ternate City and the available transportation means and infrastructure make Ternate City as the primer service center, Tidore Archipelago City as the secondary service center and the Sofifi Archipelago City as tertiary service center. The physic, economic and social spatial interaction is dominantly developed in Ternate City. This process is mutual induction and show intercity and inter-area service disparity in a unity of city area expansion system in North Maluku Province.

Key words: Spatial interaction, complementarities, intervening opportunities, city activities formation system, North Maluku Province

INTRODUCTION

The development in an area expansion context and city in a spatial dimension is basically covering the physic, economy and social aspects. An area expansion closely related to the existence of the city activities functions in an area expansion system. The development of the city activities functions in its dynamic positively associated with the role of the transportation service which supported by the technology. Thus, the function and the role of the transportation service courage the population mobile and the distribution of goods and service in a wider area activity system. In a spatial dimension, function and transportation service recommended the physic, economic and social spatial interaction process. This means that the role of transportation and technology positively contributed to the city and the area advance process. So, the spatial interaction process in the city and area expansion influenced by the transportation system, city characteristics and the area geographic obstacle. In a more-macro spatial dimension show that the process of area integration is determined by the existence of the specific activity functions which developed in a city activity system or in a wider area activity system. Ullman (Hariyono, 2010), stated that there are 3 factors influenced the area spatial interaction they are if the cities differ in nature resource or human resource, automatically not

caused a movement there must be an in compulsory need which is controlled by demand and supply (complementary), a commodity both goods or service will be able to move from an area to the other area when it is supported by an adequate transportation facility, low cost and rapid shipping is a factor influence the commodity transfer speed in an area (transferability) and spatial interaction can be occur if there is an intervening opportunity. These three things can be examined in some perspectives such as peaceful area, good transportation lane, opens society and fast bureaucracy. The three factors equal with the area expansion dynamic and the dependent interrelation of the areas among the cities. This courage the movement flows, goods and service distribution that caused the physic, economic and social spatial interaction. Then Christaller (Adisasmita, 2014a, b), stated that the central places deal with the urban hierachy in area model of hexagonal trading area model. The size if the activities centers is equal with the size of each Hexagonal area. This means that the higher order centers has total and types of activity and also higher trading volume than lower volume centers. If the centers formatted, the centers domination will flows to the pole, economic syndrome as the character of the capital area, Adisasmita (2014a, b).

The phenomena of spatial interaction between two cities or more in an area unity is identified as influenced by the population heterogenic activity which based on

the development city spatial functions. This heterogeneity courage the physic, economic and social spatial interaction that is an interrelation between two cities or more. The area components attract the spatial interaction, namely; the nature bio-physic components, infrastructure components, human and the institution. In the dimension of area spatial and city, stressing more in the interaction between the intra-human and the natural resource in a specific geographic unity. In this context it was understood that the progress of an area or city positively contributed to the population mobility process, transportation service and the distribution of goods and service fully influenced by the city attraction as geographic area unity. Thus, the progression of an area and a city dimension positively contributed to the spatial interaction process in the cities around. This process is not only happened in the big cities or metropolitan but also in the medium and small city. In this perspective, it was understood that spatial interaction in the main city and small city development in the area of North Maluku Province, specially in Ternate, Tidore Archipelago and Sofifi City as a geographic area unity in a city development system which differ in characteristic among those cities.

North Maluku as a province, legally administered in the year of 1999 with totally area is 33.321,22 km² and population about 1.063.117. Geographically, the area of North Maluku Province is an archipelago with sea area wider than the land area. As an archipelago, the area of North Provinsi Maluku Province is linked mostly by sea-transportation, river-transportation and air-transportation service. This shows that geographically, the area of North Maluku Province is an archipelago surrounded by sea, so to link the islands, transportation means and infrastructure is much needed. The inter-islands and inter-cities mobile in North Maluku Province used sea-transportation and river-transportation. The types of Transportation tools are dominated by ferry, motor-boat and speed boat.

Generally, the spatial activity pattern in the city area of North Maluku Province, identified by the accumulation of the cities functions, both kinds and activities developed and centered toward Ternate City. The market area tends to develop in Ternate City, rather than the other cities in North Maluku Province area. This condition shows that the population mobile tendency and the movement of the goods and service transportation flow toward Ternate City and vise-versa. The improvement of society need on economic and social services and other need determined by the role of the transportation services, sea-transportation tools, river-transportation tools and air-transportation tools. In this context, it was

understood that spatial interaction will be closely related to the developing city activities system, population mobility, transportation tools role and the infrastructure accessibility of the area and the city. This process indicated that inter-cities and inter-area interaction in the area of North Maluku Province moved toward Ternate City. This is indicated by the availability of transportation tools and infrastructure, land-transportation, sea-transportation and air-transportation in Ternate City. This show that Ternate City has the strategic role to courage the physic, economic and social spatial interaction process. Ternate City also has potential economic resources to create the goods, human and information flows inter-city and inter-area in North Maluku Province in spatial dimension.

Dahuri and Nugroho stated that there are 4 basic things affected the developing market area, namely; first, economic of scale that the area market expansion is an absolute choice to get the optimal profit. Second, demand density this is the multiplication between the individual demand and the population density, the higher the demand will attract more producer and the narrower the market area will be. Third, transport cost, the transport cost influence to the market area is ambiguous. When the transport cost goes down in the same time with economic of scale, the producer, generally is balancing it by expanding the market area. On the other hand when transport cost goes down in the same time with product cost increase, the producer will grow the short term profit. Fourth, population factor, the increasing of the consumption and income in a long term will courage the increasing of the producer and narrower the market area in the same time. Refers to the 4 factors, applied to the spatial interaction in Ternate, Tidore Archipelago and Sofifi City are the determinant factors which affect the cities hierarchy formation process that develop in the North Maluku Province spatial area dimension. Economic activities, spatial distribution and population density tends to develop in Ternate City as the area center of the main activity. The direct impact of that process is tends of transportation mobile towards to Ternate City increase time by time. This movement identified by the high flows of goods transportation, passengers, material and information moved towards Ternate City.

Spatial perspective related to developing of the cities activities system in Ternate, Tidore Archipelago and Sofifi City affected by both the availability of the cities means and infrastructure factors and external factors that is the position of Ternate City as the National Activities Center (PKN) and as the gate of flows in and out of the goods and passengers transportation from and to North Maluku

Province area. This condition is identified by Ahmad Yani Harbor which serves the National water ways and Sultan Babullah airport which serves National Flight. Thus, the external spatial interaction positively associated with the internal spatial interaction to the three cities in North Maluku province area, namely; Ternate, Tidore Archipelago and Sofifi City. The three cities historically and geographically have a close distance link by sea-transportation service and river-transportation service and in a unity of transportation development system. The development dynamics of the three cities show significantly diversity both infrastructure service and economic social activity service. The development disparity among the three cities shows a gap in inter-cities service and unbalancing in inter-regional development as the city unity system (Ternate, Tidore Archipelago and Sofifi City) in the area of North Maluku Province. The inter-regional dependability expected in Ternate, Tidore Archipelago and Sofifi City is generatif dependability which supports each other not exploitative one. Thus, the frame of area development and formation of city activities in Ternate, Tidore Archipelago and Sofifi City need synergy in area development process which integrated in a city system through distribution of activity service, goods flow pattern and the development of city activities functions which differ in North Maluku Province development area.

MATERIALS AND METHODS

Based on the research aims at understanding the social, economy and physic spatial in Ternate, Tidore Archipelago and Sofifi City caused by complementary process, transferability and intervening opportunities. The three processes caused the formation of the cities activity system through the inter-relation of the physic, economy and social pattern. The physic, economy and social spatial interaction in Ternate, Tidore Archipelago and Sofifi City, make the population mobility by the supporting of the sea-transportation, river-transportation as the main tools of the flows of goods and services. Thus, this study analyze the pattern of spatial interaction physically, economically and socially and the process of the city activities system. In agreeing with the focus of the research this article is naturalistic, holistic and phenomenology. Thus, the approach applied is the mixed approach of quantitative-qualitative. This research consider as the most important to the qualitative data by identifying the condition and the situation related to the case of physic, economic and social spatial interaction in Ternate, Tidore Archipelago and Sofifi City. This aim at

finding the figure out of the inter-city and inter-regional in spatial dimension which relating to the event, critical incident by figuring out deeply, detail and in a specific context and holistic.

The quantitative approach in this study applied to analyze the process of the physic, economic and social spatial interaction in Ternate, Tidore Archipelago and Sofifi City. In this context, it is assumed that the spatial interaction in the three cities happened through the process of complementary, transferability, intervening opportunities and simultaneously reconditioned the city activities system formulation process which inter-related to the other cities. Based on that context, each process was interpreted while the quantitative approach applied to examine the inter-variable which influences the spatial interaction process. This information collected through observation, documentation and survey applied questionnaire instrument.

RESULTS AND DISCUSSION

The North Maluku Province area as geographies is an archipelago area which connected and dominated by the sea transportation and river transportation. Based on its geographies, Maluku province area is identified as the strategies position that connected to the Pacific Ocean directly. Geographically North Maluku position on the coordinate 3° North Latitude-3° South Latitude and 124° East Altitude-129° East Altitude, bordered to Pacific Ocean in the Northern, Seram sea in the South, Halmahera in the East and Maluku sea in the West. So, the North Maluku sea area globally has potential which strategies enough to support the national and international sailing and fish resources. The North Maluku Province has total area 145.801,10 km² after separated from the main region in 1999 and administratively only has 2 regencies and 1 city they are North Maluku Province and Center Ternate City. In 2004, the area is divided into 3 administrative areas then become 7 regency areas and 2 cities they are Center Halmahera Regency, East Halmahera Regency, Center Halmahera Regency, west Halmahera Regency, North Halmahera Regency, South Halmahera Regency, Sula Archipelago Regency, Morotai Island Regency, Ternate and Tidore Archipelago City. In 2010 one of the Tidore Archipelago City sub district of North Oba then became capital city of province which placed in Sofifi City.

North Maluku Province area development concept based on the spatial area that has been legal administered BAPPEDA, North Maluku Province, Regional Spatial Planning (RTRW 2013-2033) gave description that Ternate, Tidore Archipelago and Sofifi City as the unity

of area development based on the consideration; short distance and easier of accessibility which connected through sea transportation and river transportation but in the development process of the three cities are stand alone administratively and difference island. The fact which have been found shows that the accumulation of the city activities that tend to develop in Ternate City as business city, services, education and city activities make high flow of transportation based on the origin and destination flow system as well as the population motilities to the Ternate City. It means that the Ternate City development in the unity of area and city system has direct relation toward the surrounding area which becomes its hinterland. This reality is relevant to the conceptualization Christaller (Adisasmita, 2014a, b), stated that central development depend on goods consumption that influenced by population factor, demand, bargain, prices are a condition and transportation. Kustiwan and Pontoh, explain that system of cities is happened because has relation among the cities, both in spatial and functional. A city has potential to establish a system with the other cities because availability of infrastructure, location factor and population. In this context, understood that the spatial interaction intercity in Ternate, Tidore Archipelago and Sofifi City happen as the result of the conditional interaction pattern spatially because of the spatial relation economically and inter-population relation socially for the three cities so, reconditioned spatial interaction process running in the physic, economy and social sector. The fact shows that there are three factors that accelerate the spatial interaction process in Ternate, Tidore Archipelago and Sofifi City they are: the spatial relation growing because of geographies factor area that connected by the sea transportation and river transportation, spatial relation economically because of the relation both production and selling of the products which create the distribution flow system of product and services and the spatial relation socially growing because of the area historical factor socially and culturally as the unity of the Sultan of Ternate-Tidore Region.

The spatial interaction of Ternate, Tidore Archipelago and Sofifi City: The growing of Ternate, Tidore Archipelago and Sofifi City in their dynamic shows that not only short distance factor that make the easier transportation but also influenced by the population motivation factor to do the traveling because of the daily need factor socially and economically. These two factors as determinant that support the spatial interaction process physically, socially and economically. Based on

the movement pattern as well as the availability of transportation facilities, shows that the transportation movement tend to the Ternate City compared with Tidore Archipelago and Sofifi City. It means that the anglomeracy economy that develops in Ternate City, conditioned market area established that became central spatial interaction which dominant grow in Ternate City. This reality relevant with the conceptualization that there are two great indications in aglomeration related to the market area they are First, meeting two or more difference economy activities this situation grow in the city that difference Central Bussines District (CBD) position that contributed to the small cities development surround them and construct a certain network as a functional area. Second, meeting two or more same economy activities in size or uniformity market area each same producer and construct bigger market cumulatively. The two factors when adapted into spatial interaction perspective to the Ternate, Tidore Archipelago and Sofifi City shows that spatial interaction physically, socially and economically that tend to the Ternate City because of the position of the Ternate City as Central Bussines District (CBD) toward the small cities surrounding them. In the difference spatial dimension shows spatial interaction Tidore Archipelago and Sofifi City grow toward the uniformity market area as agriculture crop and fishing producer, so the two cities only as small cities and as hinterland of Ternate City in the urban development system in North Maluku Province.

Susantono (2012) states that there are 3 strategies in the urban development system they are cities development to de-concentration economy activities through the cities development that identified has regional and national relation they are the cities which have highest role connection as center of the national network of cities, city development which support the agricultural area. This strategy develop symbiotic relation among the urban development and village through network system expansion and city development which its less developed area or new agriculture area will develop quickly by systematic intervention to the cities to get minimum welfare. This research done by Susantono (2012) and has relationship with this study, found that the increasing of the product caused the increasing of rill income which affect the higher elastisitas demand than product in the urban compare with rural area. This means that the reality arise in the spatial interaction process in Ternate, Tidore Archipelago and Sofifi City by adopting Simon idea which shows the inter-regional and inter-city disparity syndrome service in the perspective of the main developing area in North Maluku Province but the

tendency grows to geographically spatial dimension of inter-cities mutual-dependence (Ternate City as primer city, Tidore Archipelago City as secondary city and Sofifi as tertiary city). Then, the three ideas concept by Susantono if adapted in spatial dimension geographically, become supporting factor spatial interaction that happen in Ternate, Tidore Archipelago and Sofifi City. So, the high population mobility flow and services and goods distribution in Ternate City as National Activities Center (PKN). In this context gives description that function and role Ternate City has center position in spatial dimension North Maluku area to encourage de-concentration economy activities is dominant in the Ternate City. In difference condition shows that status and position Tidore Archipelago and Sofifi City as potential agriculture and fishing area shows relation pattern symbiotically among the cities and village development which have relation regionally toward Ternate City existence. The difference condition shows that the status and position Tidore Archipelago and Sofifi City as potential agriculture and fishing area shows relation pattern that symbiotically among the cities and villages that have relation regionally toward Ternate City existence in production marketing system and compliance population consumption need. Means, the two cities will need intervention of community welfare development frame through cities activities function distribution effort continually.

The spatial interaction fenomena in Ternate, Tidore Archipelago and Sofifi City, indicate that function and transportation is most important by the consideration of the three cities position on the island area so, population mobility and cargo transportation their interaction intensity determine by sea transportation and river transportation. Thus, the transportation flow has importance role in the formation context cities activities system of the three cities. The transportation activities of the three cities are measured by using indicator; the distance of the two cities or more, the availability of the transportation tools, population trip motivation and development cities activities function. The fact shows that the distance between Ternate and Tidore Archipelago City >1 mile into the sea for trip average 10-15 min then the distance between Ternate and Sofifi City >13 miles into the sea for trip average 45-60 min. Whereas, the distance between Tidore Archipelago and Sofifi City >5 miles into the sea for trip average 25-30 min. The transportations choices are dominated by ferry, wood ship and speedboat transportation.

Based on the condition above, it gives information that availability of the means of transportation specially

sea transportation and river transportation are very strategies and most important to support the passenger and cargo in Ternate, Tidore Archipelago, Tidore Archipelago City based on the distance factor among the cities as the unity of the archipelago area. Mean the function and role of the sea transportation and river transportation are very strategies for the three cities in spatial interaction process physically, socially and economically. Kustiwan and Pontoh state that there are two important factors made the cities hierarchy less development they are transportation network to connect among the cities in other areas is unperfected condition and limited market that cause of their economy activities result are exported to abroad. In this perspective understood that transportation system support that has not developed perfectly in Tidore Archipelago and Sofifi City also limited market places, make spatial interaction physically, socially, economically, relative low if compared with the Ternate City as Prime City to the distribution pattern flow of goods and economy services and depending relation of the population consumption pattern in this case is among the producer (agricultural crops and fishing) and consumer so that population focused in Ternate City (Fig. 1). As the basic number of Ternate City population is 191.053 people, Tidore Archipelago City is 80.408 people and Sofifi City is 14.031 people. The ratio of transportation in the three cities can be seen on the Table 1.

Table 1 above shows the physic spatial interaction in Ternate, Tidore Archipelago and Sofifi City as an archipelago area. This shows the basic diversity on the availability of the means of transportation (Ports). The diversity indicated that the transportation dominantly tend towards to Ternate City. Thus, the availability of the transportation means and the choices transportation positively associated with spatial interaction in the three cities. This reality is relevant to the Conceptually Theory by Rondinelli D.A. who stated that the factor support the inter-regional interaction intensity is the availability of transportation means and infrastructure which link an area to the other area. Situmorang stated that a strong

Table 1: Sea-transportation infrastructure availability ratio in Ternate, Tidore and Sofifi City

Means of transportation	Unit in cities		
	Tidore Archipelago	Ternate	Sofifi
Airport	-	1	-
National Harbor	-	1	-
Inter-Islands Harbor	5	5	3
Station	2	3	1
Total	10	12	4

Relationship Official of North Maluku Province in 2014

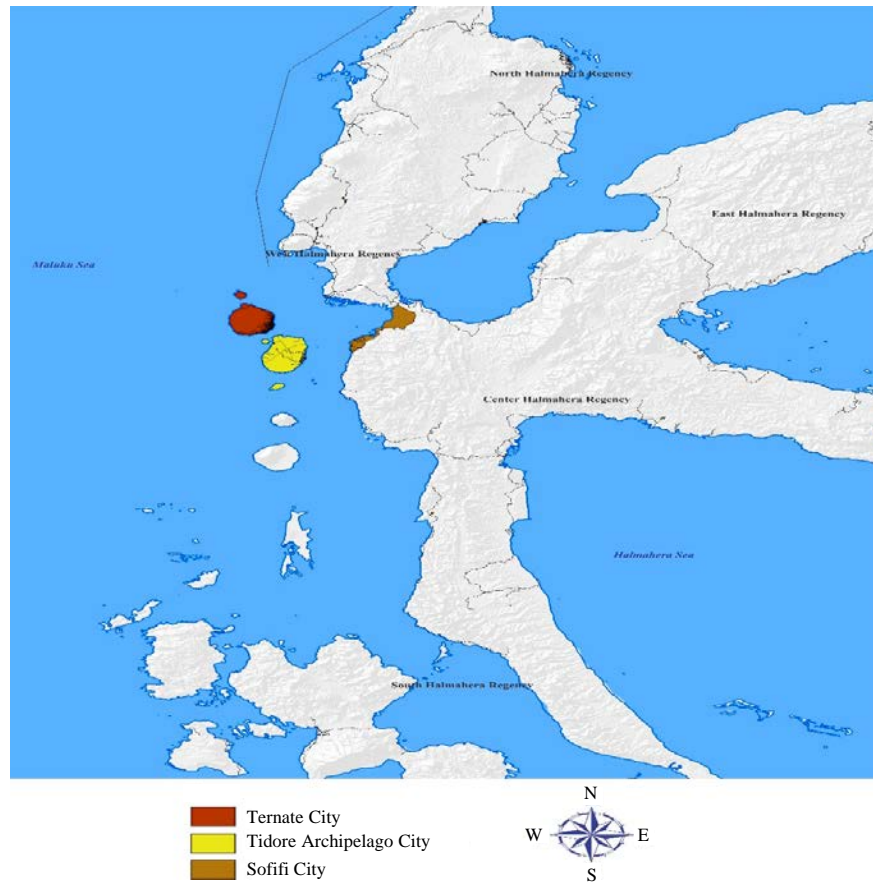


Fig. 1: Orientation Map of area study in Ternate, Tidore Archipelago and Sofifi City



Fig. 2: Transportation Means of goods and Passengers based on the origin and destination, Ternate, Tidore Archipelago and Sofifi City

inter-relation of some cities need a wise integrated city authority for the all cities or city agglomeration. The spatial interaction in Ternate, Tidore Archipelago and Sofifi City need a wise integrated city authority for the all cities in the frame which courage city agglomeration in balancing the cities of Ternate City toward to Tidore Archipelago and to Sofifi City.

Figure 2, above shows the transportation means used by the people from their origin to their destination. From the figure above it can be interpreted that first, the most dominant means of transportation used by people in their mobile is speed boat because using speed boat takes less time to reach their destination. Second, the wooden boat has less frequency because they cannot compete with the two other transportation means. This caused by

Tabel 2: Choices of transportation ratio in spatial interaction in Ternate, Tidore Archipelago and Sofifi City

Rout no (1)	Transportation route (2)	Transportation means based on type unit			Transportation frequency/week (f)		
		Ferry (3)	Wooden boat (4)	Speed boat (5)	Ferry (6)	Wooden boat (7)	Speed boat (8)
1	Ternate-Tidore Archipelago	3144	1032	5256	21	14	24
2	Tidore Archipelago-Ternate	3570	1454	5686	21	14	24
3	Ternate-Sofifi	3644	-	5677	21	-	16
4	Sofifi-Ternate	2432	-	4544	21	-	16
5	Tidore Archipelago-Sofifi	571	282	860	2	7	12
6	Sofifi-Tidore Archipelago	461	264	658	2	7	12

Primer data, 2015

considering the less time allotment and the comforting during the trip. Third, ferry as the means of transportation has also less frequency, even it has bigger capacity than the other two transportation means. This condition caused by the limited transportation frequency. Thus, the spatial interaction in Ternate, Tidore Archipelago and Sofifi City is identified by the choices of transportation means. The choices Transportation means used by the people based on their origin and their destination in the following table.

From the Table 2 shows that choice of transportation means based on the types through sea-transportation and river-transportation services, courage the spatial interaction in Ternate, Tidore Archipelago and Sofifi City. The spatial interaction is measured by its mobile intensity of the transportation frequency, trip motivation and choice of transportation means. Some interpretation of choice of transportation means used, trip motivation and the transportation frequency as follows; First, spatial interaction between Ternate and Tidore Archipelago City based on the pattern of origin and destination shows high intensity with means transportation choices is speedboat and frequency of 24 times/week. Second, spatial interaction between Ternate and Sofifi City is relatively medium interaction with means transportation choices is speedboat and frequency of 16 times/week. Third, spatial interaction between Tidore Archipelago and Sofifi City with means transportation choices is speedboat and frequency of 12 times/week. Thus, it could be concluded that the high or low intensity of the spatial interaction indicated by distance factor, choices of means transportation and the availability of transportation and also the trip motivation for the economic goal and social goal. In the field fact, also found that trip motivation of the people differ in goal and motivation of their trip from Ternate to Tidore Archipelago City mostly on social relationship building in contrary goal and trip motivation from Tidore Archipelago to Ternate City growing to economic motivation (Shopping and selling their agriculture and fishery product) and social motivation quite low if compared with economic motivation. People trip motivation from Ternate to Sofifi City dominantly to

work, the civil servants who live in Ternate City and work in the center of government offices in Sofifi City. The trip motivation from Sofifi to Ternate City is to build social relationship and economic motivation (Shopping and selling their agriculture and fishery product), the trip goal from Tidore Archipelago to Sofifi City and vise versa, dominantly goes to social motivation (social relationship). The three basic diversities show that physic, economy and social spatial interaction based on the people trip motivation which shows disparity inter-cities services based on the function of the growing cities of Ternate, Tidore Archipelago and Sofifi City. The tendency of developing infestation especially in economic infestation is dominantly concentrated in Ternate City while in Tidore Archipelago and Sofifi City get less attention. This reality is relevant to conceptually theory by Hariyono (2010) who stated that development gap courage the concentrated of the population growth in specific region caused by urbanization and migration factor which needs even distribution development. Physic, economy and social spatial interaction process in Ternate, Tidore Archipelago and Sofifi City in Fig. 3.

Figure 3 above shows the physic, economy and social spatial interaction process in Ternate, Tidore Archipelago and Sofifi City. Some interpretations on the spatial interaction process in the three cities as follows; first origin and destination mobile encourage the physic, economy and social spatial interaction in Ternate City to Tidore Archipelago, shows high interaction intensity. The fact in the field shows that interaction intensity in Ternate City-Tidore Archipelago which supported by the choices of the more available transportation means and the people mobile motivation also influenced by differ activities function dominantly in develop in Ternate City, namely; trading function and services, high education function, tourism function and the availability of the transportation means and the transportation infrastructure which identified by the port of Ahmad Yani and the airport of Sultan Baebullah and some river-transportation piers such as; Resident Pier, Dufa-Dufa pier, New City pier, Bastiong pier and Mangga Dua pier. So, it could be concluded that the spatial interaction intensity in Ternate

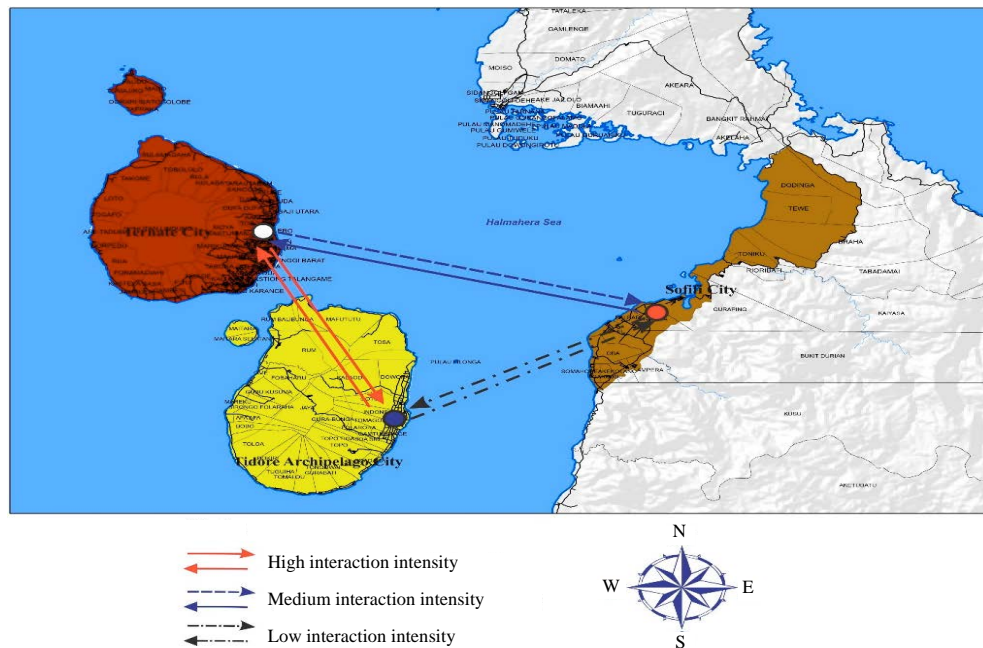


Fig. 3: Spatial Interaction in Ternate, Tidore Archipelago and Sofifi City

City and Tidore Archipelago identified by the transportation means choices factor, close distance, cities activities functions, total population and the availability of infrastructure of transportation services. This reality is relevant to the theory by W.J. Reilly (Adisasmita, 2014a, b) who stated that interaction power between two different regions can be measured by seeing the total population and the distance between the two regions. Second, spatial interaction between Ternate and Sofifi City shows that the pattern of the origin and the destination of the transportation encourage the medium intensity of the physic, economy and social spatial interaction process. The fact in the field shows that the spatial interaction in Sofifi City is medium as the statue of Sofifi City as the Capital of the Province of North Maluku is unsupported by availability of city activities and there is only one function which growing that is offices function (the center of government of the Capital of North Maluku Province). That the flows of transportation dominantly to support the civil servant mobile to go to work. While to support the people life they tend to go to Ternate City. Third, the physic, economy and social spatial interaction intensity from Tidore Archipelago to Sofifi City is low. This conditioned affected by the availability of the city activities functions in Tidore Archipelago and Sofifi City is not yet optimal growing. The fact in the field shows that the spatial interaction process only occur in the frame of social relationship, even the two city lied in the same administrative

region. In the beginning, Sofifi City is a sub-district of Tidore Archipelago City administrative region. The most interesting in this finding is that the economic need of the two cities is fulfilled in Ternate City as the trading center which supported by the goods and services flows pattern.

Based on the opinion above, it was shown that the determinant factor of the physic, economy and social spatial interaction Ternate, Tidore Archipelago and Sofifi City generally caused by the availability of the transportation service and especially by the transportation means and infrastructure in the unity of the geographic area. The role and the function of the transportation service become the power of inter-region relationship. This reality is relevant to the conceptualization theory by Kansky, he stated that the power of interaction determined by the connectivity index and connectivity index affect the human, goods and service mobility and also it fasten the inter-region mobility level. It could be concluded that function and role of transportation contributed to the growing of an area and reconditioned the inter-cities interaction pattern in an area development system. In the spatial dimension the role and the function of transportation services encourage the population mobility, the flows of goods transportation and passenger transportation and the distribution of goods and services. The spatial interaction process in Ternate, Tidore Archipelago and Sofifi City shows the inter-region and inter-cities complementary process. This process identified by the flows of goods and services

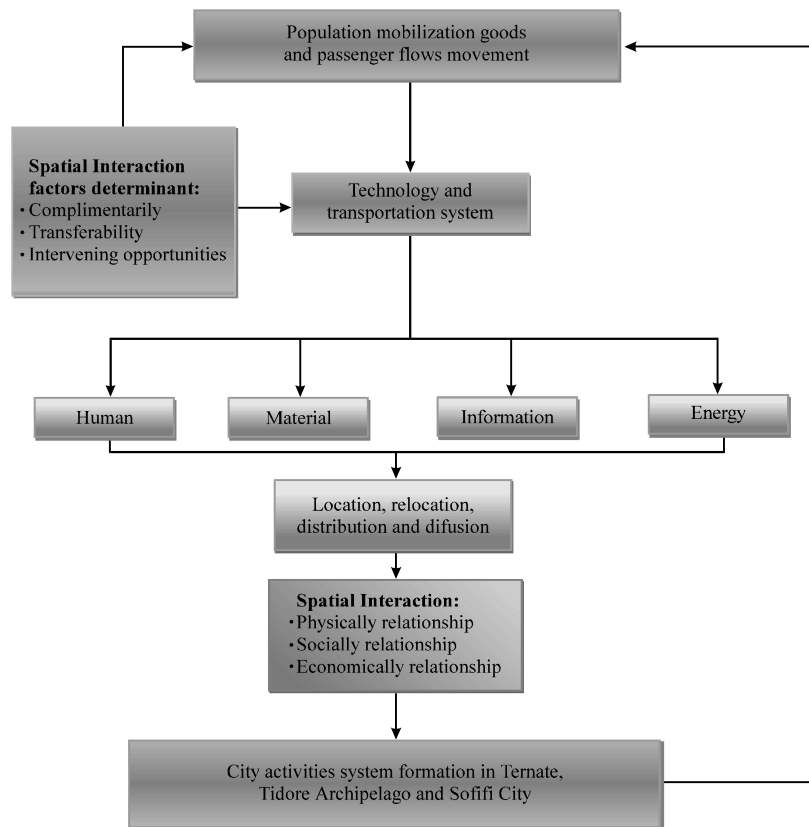


Fig. 4: The Spatial Interaction in Ternate, Tidore Archipelago and Sofifi City

the demand in Tidore Archipelago and Sofifi City wholly fulfilled by the availability of the city activities function in Ternate City. The next factor is the distance and the availability of the transportation means which positively associated with the transferability process in fulfilling the goods and services demand which flows from Ternate to Tidore Archipelago and Sofifi City which conditioned by the availability of transportation facilities, low cost and quick sending of the goods to the destination (Tidore Archipelago and Sofifi City). The quick transfer of the goods and services flows in the dimension of spatial in Tidore Archipelago and Sofifi City is mostly determined by the availability of transportation means and infrastructure in Ternate City and vice versa. The difference of the growing interaction intensity is affected by complementary and transferability factors. The government policy is also plays an important role in the growing of the cities activities function. The statue and position each city is determined by the government policy in the frame of city system development as the factors in spatial interaction process. The spatial interaction process in Ternate, Tidore Archipelago and Sofifi City is figured out the following schema.

Figure 4 above shows the spatial interaction process in Ternate, Tidore Archipelago and Sofifi City. There are 3 interpretations about the spatial interaction process given namely; first, the population mobility and the movement of the goods and passenger flows supported by technology which dominantly grow in Ternate City and also supported by the activities function of trading, services and commercial economic activities. Reconditioned the surplus of the city economy resources which need to be distributed to the other hinterland in other side the complementary process in Ternate to Tidore Archipelago and Sofifi City by strengthen the spatial interaction, mutual complementary of each demand, each city plays the role as the producer and consumer. Second, the spatial interaction encourages the transferability process. This caused by the position and the statue of Tidore Archipelago and Sofifi City as the producer of agriculture, horticulture and fishery which market and Ternate City as the consumer and the market of the products. Third, the supporting nature resources dominantly from Tidore Archipelago and Sofifi City which oriented on relative the same products, reconditioned the intervening opportunity process. Because of the relative

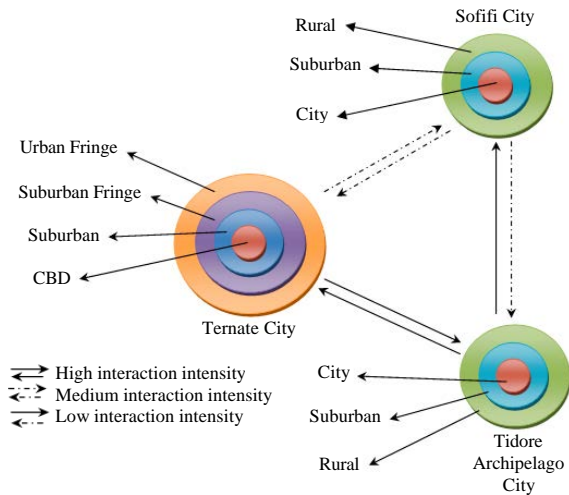


Fig. 5: Spatial interaction and spatial zone formation in Ternate, Tidore Archipelago and Sofifi City

the same products in the two cities and the position of Ternate City make the spatial interaction get low. The three factors determinate the spatial interaction in Ternate, Tidore Archipelago and Sofifi City, caused the movement flows of human, goods, material, information and energy takes places in the same time. The process is measured based on; the inter-city and inter-region distance (relative or absolute distance); transportation cost and the easiness and the rapid of the inter-region and inter-cities transportation means and infrastructure.

The movement mobility of the human, goods, material, information and energy simultaneously conditioned the position and the statue of each city. The spatial interaction in Ternate, Tidore Archipelago and Sofifi City, conditioned the physic, economic and social process of location, relocation, distribution and diffusion which encourage the formation process of city activities system in Ternate, Tidore Archipelago and Sofifi City. The formation of the city activities system in the three cities has reconditioned Ternate City as the primer service center, Tidore Archipelago City as the secondary service center and Sofifi City as the tarsier service center. The city activities system in the three cities, then formulated city spatial zone. The city spatial zone in Ternate, Tidore Archipelago and Sofifi City is shown in the following Fig. 5.

Figure 5 shows the spatial zone in Ternate, Tidore Archipelago and Sofifi City caused by the spatial interaction process. There are 3 interpretations could be made related to the city spatial formation in the three cities, namely; first, spatial zone in Ternate City as the primer service center there are 4 spatial zone categories,

namely; city center region (Center Business District; CBD) identified by the availability of shopping center, trading, services, Ternate Sultanate Region, hotels, offices, ports, slum area and defection piers. Second zone, the suburban area identified by the city activities function such as; airport area, settlements area and local shops services. Third zone is suburban fringe area this area is the expansion area of Ternate new city, identified by the availability of the large scale of settlements function, high education, agriculture area and horticulture area. Fourth zone is urban fringe area, identified by the availability of the little scale settlements (limited), forest area and potential hazard area (Gamalama Mountain area) with radius 10 km to the center of Ternate City. This reality is related to the conceptualization of Burges (Hariyono, 2010) who stated that the city center region (DPK) or Central Business District (CBD) which is stated in the center of the city in the circle form and it is the center of the social, economy, culture and politic and the zone of the city high accessibility zone.

Second, spatial zone formatted in Tidore Archipelago City in its position as secondary service center is divided into 3 spatial zone, namely: zone 1 is the city area of Tidore Archipelago City as the capital of the regency, identified by the availability of the city activities such as offices, trading (traditional market) in local scale, city settlement, education and other city activities. Suburban zone is the smallest part of the city and it is the hinterland of Tidore Archipelago City. The city functions are offices, traditional market, education and settlement. Rural area zone this zone identified by agricultural activity, horticulture, fishermen settlements and forest area. The fact in the field shows that the Tidore Archipelago City growing pattern tends to linier indentified by the city main road lane which link the cities inter-region bordered by watery and the growing of Tidore Archipelago City tendency shows that the land value is determined by the agricultural productive land. This means that the closer the agricultural product activity the higher the land is. This reality is relevant to the Conceptually Theory by Homer Hoyt (Haryono, 2014), he stated that the high cost or high rent cost landscape laid in suburban; the low cost or low rent cost landscape laid in the lanes straight from the center of the city to the suburb; and center zone is the activities center region.

Third, spatial zone formatted in Sofifi City in position as the tarsier service center consists of 3 spatial zones, namely; zone 1 is the city area of Sofifi City as the capital of the province, indicated by the availability of city activities such as the Province government center, traditional market in local scale and settlements. Suburban

zone is city area for the new settlement growing in the frame of supporting the position of Sofifi City as the capital of the province. The city function activities are settlements, harbor, agriculture and horticulture. Rural area zone this zone identified by agriculture activity, horticulture, fishermen settlements and forest area. The fact in the field shows that the city growing pattern in Sofifi City tends to be linear identified by the city main road lane which link the cities inter-region spatial function and watery border. The tendency of the Sofifi City growing shows that the land value determined by the agriculture and horticulture productivities.

The three things above show that inter-regional interaction in a city system based on the spatial zone which formatted in Ternate, Tidore Archipelago and Sofifi City that show the very basic difference. The difference is very significantly affected the function and the position of each city in the system of services and distribution pattern of goods and services flows. The fact in the field found that the position of Ternate City is the primer services center (core city) in North Maluku Province area development constellation. The development of Ternate City as the Core City identified by the availability of the trading centers in regional scale that impact to the high population movement mobility, goods flows, material and information. The tendency of physic, economy and social spatial interaction caused by the availability of the city activities function in Ternate City spatial dimension which grows to be a modern city which identified by high population density caused by the urbanization and migration and also the availability of slum in the city center indicated the significant influence to the degradation of the environment quality and the city transportation system based on formatted spatial zone. In Tidore Archipelago and Sofifi City based physic, economy and social spatial interaction pattern which show that the two cities is the pole of the development of Ternate City growing. The fact in the field found that the tendency of the spatial interaction caused by the marketing of the agricultural products, horticulture and fishery caused by high demand of Ternate City population and the vice versa happened to Tidore Archipelago and Sofifi City accomplishment of their primer demand by the availability of the growing activities function in Ternate City. It can be concluded the physic, economy and social spatial interaction encouraged by the transportation service role and function this conditioned the relationship pattern of inter-city dependable and inter-region in a system of developing of Ternate, Tidore Archipelago and Sofifi City. The pattern of the dependence conditioned by the three cities spatial process which impact to inter-region disparity and the

inter-cities gap. The inter-region and inter-cities gap caused by the high concentrated of the inter-region economy activities and the tendency that make the increasing of the inter-region development gap because of that the development process in the region will be faster with the higher concentrated economy activities, Jeffrey G. Williamson.

Spatial interaction influence toward city activities system formation:

Spatial interaction phenomena which happening in Ternate, Tidore Archipelago and Sofifi City, shows relation pattern with inter-cities relationship in one area development system. Interaction as social process, economy and culture nor politic process quickly or slowly will change social and economic spatial interaction. Marshall states that spatial analysis is location analysis that focused into three aspects they are distance, interaction and movement and W.J. Reilly (Adisasmita, 2014a, b) by adapting Isaac Newton gravitation theory, states that the interaction power inter-region measured by focused into the population number ratio by inter-region distance. The three of the theories are same by understanding that spatial interaction happen based on the its intensity this happened with supporting by the means of transportation infrastructure which functioned to connect inter-cities in one area so, recommended the process of social, economy, culture and politic development. In its process shows that interaction intensity determine by distance factor, relation inter-cities marketing and movement or population motilities, simultaneously create interrelationship a city toward the other cities as region unity so, become power formation cities activities system both external and internal.

Phenomena Ternate City development, Tidore Archipelago and Sofifi City through spatial interaction process both external and internal, based on the fact that found, it shows that spatially relation tendency inter-cities one direction only, even though interrelationship transportation movement. This condition happened because the existence of cities activities functions mainly develops in Ternate City as a prime city and National Activities Center. Direct impact which observed is activities movement flow that has been made by Ternate City contributes positively toward the city spatial structure process and move to pattern formation process Tidore Archipelago City pattern and Sofifi City. Mean, a city that develops in its position as prime services center associate positively toward the cities development surrounding it and has significance influence toward the human movement activities, cargo transportation mobility. So, it can be concluded that the dynamic of the Ternate City development not only influenced by activities

Table 3: Spatial interaction influences toward Cities Activities System Formation Process Ternate, Tidore Archipelago and Sofifi City

Interaction spatial	Variable/indicators	t-test	Sig.
Physic	Transportation equipments	1.311	0.041
	Traveled time	1.467	0.029
	Traveled distance	1.743	0.001
Economy	Good distribution flows	2.179	0.162
	City economy activities	-1.052	0.013
Social	Information flows pattern	1.347	0.043
	Social relation pattern	2.376	0.198

Analysis result, 2015

functions that develop internally but also influenced by the existence of Tidore Archipelago and Sofifi City as its hinterland. Spatial interaction influences that happening physically, socially and economically in Ternate, Tidore Archipelago and Sofifi City can be seen on Table 3.

From Table 3, some interpretations can be stated such as First that spatial interaction physically measured based on the choice of transportation tools which significance value is 0.041, traveled time which significance value 0.029 and traveled distance which significance value is 0.001. It means that the three variables has significance influence toward spatial interaction physically and formation activities system in Ternate, Tidore Archipelago and Sofifi City. So, it can be concluded that spatial relation physically will continue and fully conditioned by transportation system services among the three cities in the unity cities development area in North Maluku Province. Second, spatial interaction economically, measured based on the good distribution flow which significance value is 0.162 and cities economy which significance value is 0.1013. It means that spatial interaction which conditioned by good distribution flows not only grow through relation inter-cities in this case the position Ternate City as prime services center (externally and internally) but also the formation market area which growing to the supply and demand with related to the goods distribution that come from Ternate City toward Tidore Archipelago and Sofifi City as hinterland area. On the other side economy activities every cities in the relationship inter-cities decrease when the crops is rare found in the market. It means that the position of the Tidore and Sofifi City as the agriculture crops commodity and fishing will contribute toward economy activities pattern that growing between the two cities. It means that if the production increases so, cities economy growing vice versa. Economy activities in the Ternate City become stable because external influence and the position Ternate City as National Activities Center. Third, spatial interaction socially based on the indicator, information flow pattern which significance is 0.043 and stable social relation pattern. It means that interaction socially in the three cities depend on the information flow continually and social relation pattern

growing determine by individual trip motivation and community in the three (Ternate, Tidore Archipelago and Sofifi City).

Based on the consideration above, on the spatial interaction influence both internal and external related to the cities activities system formation in Ternate, Tidore Archipelago and Sofifi City in North Maluku province development area context by straighten the goods flows distribution pattern, services and cities activities services functions development, so, many things need to be thought in the frame to support inter-cities relation pattern physically, socially and economically in frame to reduce inter-cities disparities services and inter-regions through dependencies relationship among Ternate, Tidore Archipelago and Sofifi City as the unity development in North Maluku Province. So, cities activities development system concept that can be done as follows.

Controlling the functions area activities that focused in Ternate City, through distribution prime city functions services to create development balances based on the potential and characteristic each areas and cities as the unity of cities development system continually in spatial physic, social and economy dimension.

Determining strictly Ternate City position as prime services center which as main business and services function, moreover do not add new prime activities function by the consideration that Ternate City is potential hazard disaster position (threatening by Gamalama Volcano), besides limited space for city activities development by the hinder of topography and geography area. Business and services functions development based on the historical of Ternate City as agricultural crops business route since the colonial era.

Increasing of the Tidore Archipelago City function and role through the new activities function development such as the high study function, history tourism place (the unity of tourism package). This function is importance because of Tidore Archipelago City has historical relation toward the Sultanate existence in North Maluku Province (Ternate Sultanate, Tidore, Bacan and Jailolo Sultanate). Development this functions through preparation adequate transportation infrastructure and the short distance from Ternate City. Transportation system development are development of main road and bridge which across the sea from Bastiong to Rum by length 2 km from Ternate to Tidore Archipelago City.

Supporting the city activities function development in Sofifi City as the new city area in North Maluku province area development system and the government Center position. The city activities functions are development of industrial area based on the agricultural

crops and fishing process by consideration that North Maluku is potential fishing producer in East Indonesia Area. The other alternatives are tourism development mainly sea tourism development because of Sofifi City is as archipelago area that supported by clean coastal area to support the various tourism attraction activities continually.

The four things above when they develop optimally will increase region productivities and city continually physically, socially and economically and also accelerate the cities activities of Ternate, Tidore Archipelago and Sofifi City through adequate transportation infrastructure among land, sea, air and river transportation. This transportation can improve the three cities development as their potential and functions and also spatial interaction that develop to the relationship inter-cities among Ternate, Tidore Archipelago and Sofifi City that will make relationship and dependency economically but not for underestimate among the cities but as the unity of North Maluku development system.

CONCLUSION

Based on the aims of this study and the result discussion, it can be concluded as follows: spatial interaction in Ternate, Tidore Archipelago and Sofifi City through complementary, transferability and intervening opportunities, caused population mobile, flows of goods distribution and information service. The tendency of the spatial interaction dominantly towards to Ternate City as the result of the position of Ternate City as the center of primer services and as the center of national activity and also caused by the support of the availability of the transportation means and the infrastructure. The spatial interaction between Ternate City and the other two island of Tidore Archipelago and Sofifi City is relatively medium and low. The pattern of spatial interaction indicated the inter-relation of products and market system of the products economically.

Spatial interaction through means and infrastructure supporting and the inter-relation of products and market system of the products economically in Ternate, Tidore Archipelago and Sofifi City moved towards the area activity formulation and the city spatial zone formulation. The process of city spatial zone formulation arise identified the inter-regional disparity and the gap of inter-cities services of Ternate, Tidore Archipelago and Sofifi City in a unity of developing of North Maluku Province area.

Inter-regional disparity and the gap of the city activities service show the diversity in developing of the city area in Ternate, Tidore Archipelago and Sofifi City. This diversity caused economy products goes to one way and dominated the way to Ternate City. The splitting up of the diversity and the gap of the inter-city services by the distribution of the city primer functions. This done by legalizing the function and the position of each city as follows; Ternate City has the main function as the center of trading and services, Tidore Archipelago City has the main function as higher education function and Historical Tourism Spot function and Sofifi City has the main function as government offices center, industrial area on agricultural and fishery base and maritime tourism which is supported by the availability means and infrastructure in a unity of the main developing North Maluku Province area.

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