The Understanding of Growth of Transport-Stop Node on Development Axis as Base of Development of New Strategy of Local Development

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ABSTRACT
Development-Axes (DA) theory, is a theory which is originally stated by Pottier (1963), and restated by Hilhorst (1972) as well as stated as an alternative growth theory (Paelinck and Nijkamp, 1975, 1978; Richardson 1978, 1981, 2011) in explaining the existence of nodes or centers along development axes and the end-point cities (Richardson, 1978, 1981). or prime center or growth pole (Hilhorst, 1972) connected. Some of the real evidences of the implementation are the growing of many cities along highways in America, along Grote Postweg road in Indonesia, and in many other countries. So it can be said that the theory is significance as development strategy in the world, especially in making place from transport-stop node which has role as infant settlement to be larger settlement (maybe as town or city in the future) along development axes. This paper focuses on seeking theoretical explanation as new understanding about how the the growth of transport-stop node (as one of the local nodes) along DA that is influenced by the flow of people & goods along the axis. We found that the growth cannot be explained by resource-based growth theory alone and neither other conventional theories of city growth. In fact, not all transport-stop node along DA could have same growth wheter the flow of people and goods are equal along the DA. Based on the observation and in-depth interview as well as questionnaire, we found that the growth of transport-stop node is initiated by the existance of transport facility or service at development axes. We also found that the growth of transport-stop node has five stages of growth and the “attractiveness” as the significant factor to the growth of transport-stop node to be larger settlement. We argue that the implication of the explanation to the policy is usful in decentralized era in Indonesia.

KEYWORDS : Development Axes, transport-stop node, growth theory, local development, development strategy

1. INTRODUCTION
Local node along corridor which then grow as larger settlement as a natural phenomenon or ‘developed node’, have been existed since ancient Rome till this modern era. The growth is driven by the existence of main road as the itinerary of the development axes (Pottier, 1963 in Hilhorst, 1972). Some of the real evidences of the growth of local node along corridor, are the growing of many cities along highways in America, along Grote Postweg road in Indonesia, and in many other countries. So it can be said that the theory is significant as development strategy in the world, especially in making place from transport-stop node which has role as infant settlement to be larger settlement (maybe as town or city in the future) along development axes.
Landuse-Transport System and the model of Myrdalian Cumulative Causation.

This paper focuses on seeking theoretical explanation as new understanding about how the growth of transport-stop node (as one of the local nodes) along DA that is influenced by the flow of people & goods along the axis. And also describing the consequence of the new understanding in formulating the new strategy in development of local node by local government in Indonesia and also in any other countries which have similar condition with Indonesia.

2. LITERATURE REVIEW AND THEORIZING

2.1. DEVELOPMENT AXES (DA) THEORY: DEFINITION, AND COVERAGE

Pottier stated the Development Axes theory / concept, firstly in 1963 in Franc language, and then restated by Hilhorst (1972) in English. According to Hilhorst (1972), DA is defined as communicating or joining of two or more Growth Pole/Growth Center at continental, national, and sub national with development axes itinerary directly. There are three component in DA: 1) itinerary, which it would be better that the itinerary is not single way and would pass away many center of settlement and the place with important economic activities; 2) infrastructure along the axes itinerary, that it is developed many inter mode junctions with variation of gasoline station, rail station, automotive repair shop, hotel, motel, etc; and 3) stream of traffic, which comprise of people and goods. The flow of people will create potential demand to all node along the axes, and then rise creating of new activities to full fill the demand. The flow of goods will tend to rise producing of the complementary goods with cheaper price. The itinerary can be identified with an area of relatively low transport cost.

According to Richardson (1978), the axes/axis will strengthens economic agglomeration, minimizes gap of price, reduces transport cost, and expands economic of scale of activities along the axes. It will put the place/node/city along the axes in higher level of efficiency and will strengthen each of End Point. (This promotion of End Point/Growth pole connected, may conflict with spatial planning goals, because it can drive the growth of Primat city). According to Richardson (1981), it was stated that promotion of axes/axis would reinforce cities along corridors. The economic rationale for the development axes is based on idea that the promotion of axes will reduce transport cost along the axes, and able to raise the advantages of the End Points, at least initialy. Then in the next step it will raise growing each of End point. After that stage, it will grow the place about midpoint along DA, and then the place along the axes. Travel speed along DA should be fast, with large capacity, and not too far betwen end points. Paelink and Nickamp (1978), stated that refered to Hilhorst (1972), the existence of the axis act as transmitter of growth efect. These DA constitute importantly a spatial diffusion mechanism for development process.

2.2. REVIEW OF DEVELOPMENT AXES THEORY

The closest theory/concept of the phenomenon of the growth of the local node along corridor is Development Axes Theory/concept. From the detail of DA theory according to few experts above, it can be said that there is inadequate theoretical explanation, especially in explanation on how the process of growth of the node along
the axes influenced by the flow of goods and people along DA. Because, in fact not all of the node along the axes can grow in the same level, although the flow is equal, and have lower level of transport cost along the axes. And the development of local node along DA may in anyplace which has other advantages factor. If the node has great natural resources, it can be explained by resources based development theory. But on the other hand, if the node doesn’t have great resources and doesn’t have location in junction with intermode terminal/sub terminal, as well as doesn’t have industries/firms oriented to export, there is no adequate explanation to describe how the node can grow become larger settlement along DA.

Related to the second stage of growth that in DA theory is at the midpoint of the DA (such as Richardson explain to the DA theory), but in fact many local nodes don’t always at the midpoint of the development axes. It can be seen that in the second stage of the growth of node in the DA of American highway did not at the mid point between two Poles, or national center connected by the highway. And neither at the local node along DA Bandung-Tasikmalaya in West Java (see below).

Incompleteness of explanation of the DA theory/concept in explaining phenomenon of the growth of local node along corridor make the need to do research in meso and micro perspectives, in order to complete the theoretical explanation to the DA theory related to the phenomenon of growth of transport-stop node at development axes.

2.3. THEORIZING: THE GROWTH OF TRANSPORT STOP NODE AT DEVELOPMENT AXIS

As analysis by Santoso (2012a), it can be concluded that among the various theories and models of urban development, there is no theory or concept of urban growth that have been able to provide adequate explanations about the development of transport-stop node along development axes or corridor become a larger settlement / nodes that in the future can be larger as town or city, even metropolitan.

Till the first decade of XXI century, it can be said that there is no sufficient theoretical explanation to the growth of the transport-stop node along development axes/corridor. Especially the growth of transport-stop node along development axes while export oriented industry or firm is absent at the node. Classical theory of urban growth initiated by primary sector to tertiary sector (North, 1969), concentric theory-burgess, Sector theory-Hoyt, Polycentric theory-Haris & Ulman, Corridor theory-Whebel, Core-Periphery-Friedman (1966, 1969), Stage and Structure of Corridor-Taaffe (Rodrigue, 2009), and also economic base theory, can not provide sufficient explanation to the growth of transport-stop node along DA become larger settlement that in the future the settlement become town and cities.

The theory and model that closer enough that provide explanation about the urban growth, is the Myrdalian-cumulative causation model (from Myrdal in 1957 to Goodal, 1974). But this models have not been able to provide sufficient explanation about the phenomenon of growth of transport-stop node while industry or firm oriented to export there have been exist on the node. But the way of the cumulative causation in explaining the process of the growth of city driven by new export oriented firm or industry, can be benchmarked in formulating the new theoretical explanation of the
growth of transport-stop node along DA. This model once expressed by Myrdal (1957), and then developed by Pred, Keeble, and Goodal in a variety of different variables (Moseley, 1974 and Stillwell, 1995). This models was developed by using the theory of economic base. The following figure shows the progression of the theory of ‘cumulative causation’ that have different version between book of Moseley (1974) and book of Stillwell (1995). They have similar initial of growth that both of the growth initially driven by existence of industry or firm oriented to export. The industry or firm oriented to export in this case, act as the part of the base sector of the city/node (like as in the theory of economic base). Besides that, other equality of the models are: 1) both models have circular process from the start to start again; 2) Both models have principal of cumulative causation, in which the result of the first circular may become causation of the next circular process.

But the way in explaining the process of growth of cumulative causation’s model can be benchmarked in formulating the new concept. The principal of circular process and the cumulative causation principles, can be used in explaining the growth of transport-stop node along DA.

According to the cumulative causation, the explanation of the growth of transport-stop node along development axes, is hypothesized like as on the Figure 2 below. The main difference between the model of cumulative causation and the theoretical explanation with “Attractiveness” is, while in the cumulative causation’s model initiated by new location of export oriented firm/industry, the growth of transport-stop node along DA, can be initiated by new transport facility/service in the transport-stop node along DA.

The growth local node along DA has some possibilities:
1. If the local node has great natural resources, the growth may dominantly influenced by the great of resources. This phenomenon has been explained by resource based development theory
2. If the local node is an articulation point (Rodrigue, 2009) or transhipment point, the explanation of growth has been provided by articulation and transhipment point
3. If the local node has belonged industry or firm orientation to export, the growth of the node has been able to be explained by ‘cumulative causation’
4. If the local node initiated from the existence of transport facility/service at node along DA, but before condition like as at point 1, 2, and 3. This condition needs continued explanation.

Condition mentioned in point 1, 2, and 3, are the conditions which node has other advantages that influence the growth of local node along corridor. But if condition 1, 2, and 3 is none, how the local node along DA can grow to be larger center/settlement? It is hypothesized that local node can grow in success condition if the node be able to raise its “Real Attractiveness” (Santoso, 2012b), in which can be driven by initially transport facility/service at the node. And because the growth of transport node along DA is very close to the the reciprocal theory of land use-transport system (LUTS), it is useful to use the LUTS model as the base frame model to describe the attractiveness of transport-stop node among factors of the growth of the transport node. By concerning the principles of cumulative causation, reciprocal theory of LUTS, and concept of “Attractiveness”
(comprise of Real Attractiveness and Cognitive Attractiveness), the theorizing the growth of transport-stop node, can be seen as figure below.

3. PRELIMINARY FINDING: HOW THE GROWTH OF TRANSPORT-STOP NODE ON DA

In order to test the hypothetical explanation that have been theorized above, it has been conducted data collecting and analysis, base on the chosen cases. The main case is the transport-stop node along arterial road of Bandung-Tasikmalaya in West java, Indonesia (as development axis which linking Bandung to other National centers and sub national center to the east), that represent as transport-stop node which success to grow to be larger settlement. For 22 years, the first node that grow driven by existence of “Baitul Amanah mosque”, has growth from agriculture land with built area about less then 1000 m2 in spread-enclave become urbanized area with built area about 30 Ha. This growth is so fast in the phenomenon of growth of node that originally from transport-stop node naturally. The second case is the node of Al-Mahdiyyin Mosque and arround, which is as the case that the grow of the node can be categorized as “not success to grow” or “grow slowly”.

From exploration of the case, it can be seen that the first main stimulation of growth is the existence of the mosque of Baitul Amanah that built in the 1990. The springing of many informal trading (cadger) in font of the mosque and the rising of the hawkers (asongan) that oriented to regional flow of people at DA that decide to stop at the mosque node at the first year of the existence of the mosque, as well as the development of the formal trading around the mosque at the later time, were the strong evidences. Since 1960s till 1990 before the operation of the mosque, the increasing of built area at the node that cover about 500 meters at the left and right side and in front of the mosque at the same distance along the arterial road, could be said as so slowly growth. There were a few building at the node (less then 1000 m2). So it can be said that before existence of the mosque, the growth of built area at the node was very slowly, almost without growth. In just 5 years after existence of the mosque, the growth of the node were very fast, and at the end of first interval of five years the built area were approximately more than 25 Ha. Figure 5 can draw about the speed of growth at the first interval of five years, at the transport-stop node driven by existence of the mosque that is as facility oriented to traveller trough the arterial road in front of the mosque. The mosque at this case can be called as “first main attraction” at the node.

Then it is made staging to the phenomenon of growth of transport-stop node based on the real process of the growth. It can be stated that there are five stages of growth. At the first stage, the development of first main attraction and the springing of the informal business/service oriented to traveler that provided by local resident near the node is the main situation. From the case of Baitul amanah mosque and around, the springing of the cadgers and hawkers in front of the mosque or around the mosque, that can be categorized as informal business/service oriented to traveller, is the first stage of growth. The existence of the mosque and services providing from the cadgers and hawkers on side of arterial road made the node more preferable to be stop node, and then made more people decide to stop there. The more
people / traveler stop at the node invited local middle to big entrepreneur to establish his formal business oriented to traveller around the mosque too.

At the second stage, there are development of formal middle-big business/service-oriented to traveler. The formal mid-big business were built at the node with concern in many component of attractiveness, such as quality, diversity, parking, design, infrastructure, confortability, security, and treatment to land morphology. At the same time with the existance of the formal mid-big business oriented to traveller, the new house was built behind or near the formal business.

At the third stage, the growth of formal mid-big business/ services-oriented to traveller stimulate the informal business oriented to traveller, to organized them by themself and then to raise their component of attractiveness, such as quality, diversity, infrastructure, design, confortability, security, parking, and other component of attractiveness at the location of informal sites. The organization of informal bussines-oriented to traveler make cooperation with formal businesses-oriented to traveler at the node, and then make many cooperation with stakeholders outside the node, especially to the firm or business that have transport mode pass trough or potential-pass trough the arterial node (as development axes), to stop at the node.

All of the component of attractiveness that shared by formal big businesses and informal business oriented to traveler, then make the raising of attractiveness of the node. Then the attractiveness of the node stimulate the growing of the new formal and informal business-oriented to traveler. The increasing of the new formal and informal business make the increasing the new dwelling too. Related to the informal business, the increasing of the actor of the informal business then stimulate the number of rental house in the node or location at the edge of the node. When the node is dwelled by many resident, it will stimulate creating of the business-oriented to traveler and to local resident. The business at this category is business-oriented to local or mixed orientation (for local resident and traveler). At the next step, agregate of attractiveness of the node will stimulate the creating of new business/service/facility-oriented to traveller that formally or organized informally at the node. The increasing of the new business/service/facility accompanied by its attribute of attractiveness, will increase the value of attractiveness of the node at the next period. And then the process of growth is circular and cumulative causation to influence the next period of growth. The new value of the attractiveness of the node at this period will influence the development of new formal mid-big business/service-oriented to traveller and increasing of the organized informal business-oriented to traveler. The increasing of the organized informal business-oriented to traveler will strengthen the organization of informal business-oriented to traveler. This process is the fourth process of the growth. And from the case that success to grow, it can be see that the first stage until fourth stage can be occur at the first of five years.

All of the circular process at both side of business (formal and informal) will influence the aggregate value of the attractiveness at next period. This circular process and cummulative causation occur continously till the node become larger settlement even the town or city. This process
doesn't always cause the node grow fast, because there are at least three factor besides external factor that will influence the increasing of the aggregate value of the attractiveness of the node to continuou the growth at the next period. The three factors are: 1) the increasing of value of component of attractiveness at the formal business site; 2) the increasing of value of component of attractiveness at the location of informal site; and 3) cooperation among stakeholders intra node, and between intra and extra node in creating of innovative attractiveness.

At the fifth stage, the government intervention and the increasing of finance firm/banking at the node is occur. The increasing of value of attractiveness of the node (which as the result of the increasing of the development of formal and informal business) and the increasing of the resident/population at the node will make financial firm sited their business at the node. And also government make intervention in the aspect of infrastructure providing and the empowerment of the actor especially the informal actor. At the later time, government intervention can be done in spatial planning and development.

The growth of local nodes along arterial node in West Java are not in the same growth. Zone which sprung early (like as zone of Mosque of Al-Mahdiyyin and around that operated in 1987) has grown in slower speed than the zone of Mosque of Baitul Amanah and around. It is the evidence that the attractiveness of node that can influence the traveler to stop at the node, is not a given factor that always exist at each of the nodes, but a dynamic factor which depend on the effort of the actor in the node. It also can be seen that the fastest of growth of Baitul Amanah zone is at the first of five years phase.

Point to the case of node that not success to grow or grow slowly, the circular process like we draw on figure 5, can not occured smoothly. The first and second stages of growth are occur at the node/zone. But the third, fourth, and fifth stages have not been occur till now after 25 year the mosque of Al Mahdiyyin built and operated. The third stage is not occur because the strengthening of the organization of informal business-oriented to traveller were restricted by the operator of the mosque. The restriction are: 1) closing the gate to the mosque at the side of the arterial road, which the informal business were sited; 2) pointing the traveler to the parking area that provided by mosque operator; 3) forbidding of other informal business sited in the parking area (just for family of the operator of the mosque); 4) restrict just a few hawkers that can trade their product in the parking area. Also lend tenure at the location around the mosque at the wide area is owned by one operator of the mosque. The land tenure in just single big owner then make barrier to other actor to involve at the node. So the growth of the node at the later period is influenced by the financial capacity of the single operator, significantly. This situation is sharp contrast with the situation at the node of Baitul Amanah mosque and around, that the number of mid-big actor at the node is many actors.

It can be seen on the figure 6 and the process of growth at the node which 'success to grow' that the potential to reach the success to grow can be identified at the first of five years. If the first to fourth stages of growth have not been occured at the first of five years, it indicate that the node will grow slowly. It can be evidence that the one of
discriminant indicators of the success of node become larger node is on the speed of growth in the first of five years phase (growing phase). And the speed to grow just indicate the staging of growth that have been occured at the node. It can be noted that the land tenure around the main attraction is also maybe become significant factor as constraint to grow.

5. CONSEQUENCE OF THE UNDERSTANDING TOWARDS IMPLEMENTING STRATEGY OF LOCAL DEVELOPMENT ON DEVELOPMENT AXIS OR DEVELOPMENT AXES

Regarding to the understanding, it can point out the way for government in implementing the new strategy of local development that exist on DA. The way can direct the government to put the right way when government want to develop TSN on DA as the core of local node development. At least, the way can be as answer of all the questions below:

A. How is the way if government want to Develop Local Node on DA?
B. What should the first thing be built at the TSN on DA?
C. What something should be developed and Managed at all the time in developing local node at DA
D. When should government intervent to the TSN on DA?

Description below will be guidance for government in implementing the strategy of development TSN on DA as core of local node development, based on the new understanding (theoretical understanding and explanation from preliminary analysis). While development of DA is part of responsibility of Center Government, the local government that be passed by the DA, can utilize the DA which avalible in its region as the great resource to build many TSN along DA. In order to get succes in developing TSN along DA, local government should be able to facilitate the raising of value of attractiveness component of TSN which hoped to be developed, and can prevent to control land acquisition not in little number of owner/holder. Development strategy using this understanding, will spent resources more economically because government just do little stimulation, and then the TSN will grow naturally. So it is needed by local government in the decentralized era that local government is required to be more economically in managing its financial resources.

A. HOW IS THE WAY IF GOVERNMENT WANT TO DEVELOP LOCAL NODE ON DA?

If there is Development Axes joining the two or more development center/growth pole/national/sub national activity center, so government can build many Transport-Stop Node along the DA, in the place which has natural resources that available to be managed / packaged became one of attractiveness component of TSN. And also have possibility to provide more other component of attractiveness. Such as possibility in parking availability, en-route sign availability, security, and infrastructute availability. More preferable if the TSN on DA close to old kampong that provide initial inhabitant of the TSN on DA.

Regarding to the impact of land tenure and number of middle to big entrepreneur, which can be constraint of the growth of TSN on DA, so if government want to develop local node along DA, government should prevent large party of land tenure in one or little holder/owner. Land bank-
ing and then selling to the many midle to big entrepreneurs will raise the possibility to create and to develop the TSN that success to grow.

Regarding to the role of the existence of informal bussiness oriented to flow of people at DA, if government want to develop TSN as TSN which success to grow, government should be able to empower the informal bussiness since at the fourth stage of growth till the fifth stage of growth and the next circular process and cummulative causation.

B. WHAT SHOULD THE FIRST THING BE BUILT AT THE TSN AT DA

Regarding to the preliminary understanding of the growth of TSN on DA, it can be said that the transport facility or service as the first main attraction which have much component of attractiveness, should be built at the first period if government want to be first stimulator of growth of TSN on DA. Component of attractiveness that should be concerned by government in building the the first transport service or facility, are: 1) quality; 2) diversity; 3) parking’ 4) site design; 5) infrastructure; 6) functional connectivity to the End Point; 7) agglomeration; 8) en route sign availability; 9) security; 10) natural resource packaging. But functional connectivity is more difficult to be conducted, and this component is not as significant factor that determine TSN success to grow or not.

C. WHAT SOMETHING SHOULD BE DEVELOPED AND MANAGED AT ALL THE TIME IN DEVELOPING LOCAL NODE AT DA?

Regarding to the theoretical hypotetical understanding and the preliminary finding, it can be stated that something should be created, developed, attempted, improved, and managed time by time at the TSN on DA, is the real attractiveness of the TSN. So all of component of attractiveness of TSN should be created, developed, improved, attempted, and managed time by time by the inhabitant or actor at the TSN. If the government want to support in order that certain TSN will success to grow, the government should empower informal bussiness oriented to flow of people at DA, and give facilitation in infrastructure availability at least at fifth stage of growth of TSN, as well as availability of en-route sign of the TSN.

D. WHEN SHOULD GOVERNMENT INTERVENT TO THE TSN AT DA

In order to raise the possibility to create and to develop TSN on DA which ‘success to grow’ government can intervent to the TSN, at the time below:

- At the first stage of growth, if government want to be stimulator before TSN on DA is developed by any other. At the first stage, government should build transport facility or service along DA as the first main attraction (with concern to the component of attractiveness).
- At least at the fifth stage of growth of TSN on DA, on empowerment of informal bussiness oriented to the regional flow of people.
- In order to prevent large party in land tenure which can be constraint to the speed of growth of TSN, so government should acquire the closest land (around the main attraction), and then sold to the many actor of midle to big entrepreneur.

4. CONCLUSION AND RECOMMENDATION

It is concluded that the growth of transport-stop
node is initiated by the existence of great transport facility or service on development axis. The new transport service/facility at the TSN on DA as main attraction that will contribute to the aggregate value of “Attractiveness” of the TSN that will influence the flow of people along DA make decision to stop at the TSN. The growth of TSN on DA will occur in 5 stage of growth, with circular and cumulative causation principle is occur since fourth stage of growth. And the “Real Attractiveness” is the significant factor of growth which have been able to be created, attempted, improved, managed by inhabitant/actor of the TSN at DA. And also number of mid-big actor with great financial resources and land tenure can be constraint factors to the speed of growth of the TSN on DA. Development strategy using this understanding, will spent resources more economically. So it is needed by local government in the decentralized era that local government is required to be more economically in managing its financial resources.

It is recommended that the explanation of growth of transport-stop node such as drawn on the figure 6 can be used as base of development of new strategy in local node development along DA, by using existence of DA in local government authority. More continued research also needed at the side of Transport System, especially on the travel behavior.

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6. REFERENCES


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The theorizing is built by benchmarking principles of cumulative causation model (circular process, and cumulative causation), concept of attractiveness on LUTS frame (Santoso, 2012b). The node should have condition without great natural resource, not articulation point, not transhipment point, and before existence of industry or firm oriented to export.
Location of Node of Almahdiyyin mosque and around is in Desa Cijolang, Kec. Nagrek, Bandung Regency. Location of Node of Baitul Amanah mosque and around is in Desa Tanjung Mekar & Desa Sindang Raja.

FIGURE 4: THE CADGERS WHICH GROW FIRST AFTER OPERATING THE MOSQUE OF BAITUL AMANAH.

(Source: Purboyo, 2012, Santoso, 2012a)

The picture draw the condition cadgers of the third stage of growth of the node, after organized by local organisation called as “Koperasi Pedagang Jamanis” and had improve its component of “attractiveness”, such as quality, diversity, design, infrastructure, comfortability, parking, and security.

FIGURE 5. PROGRESS OF LAND USE AT ZONE/NODE OF MOSQUE OF BAITUL AMANAH AND AROUND FROM 1990 TO 2012

(Source: Purboyo, 2012, Santoso, 2012a)

Figure 4: The process of growth on the figure is at five years interval, not categorized by the real staging of growth.

Add.: Staging of growth on the figure is at five years interval, not categorized by the real staging of growth.

FIGURE 6: THE PROCESS OF GROWTH OF TRANSPORT-STOP NODE BECOME LARGER SETTLEMENT

(Source: Santoso, 2012a)

Add.: The diagram was developed after preliminary analysis from qualitative data of the cases.

(FOOTNOTES)

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