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Effect of Highway Network Connectivity on Regional Development in the North Zone of Aceh H Fithra¹, Sirojuzlam², S M Saleh³ and Erlina⁴ 1 Doctoral Program of Regional Planning, University of Sumatera Utara, Medan, Indonesia, 2 Doctoral Program of Regional Planning, University of Sumatera Utara, Medan, Indonesia, 3 Department of Civil Engineering, University of Syiah Kuala, Banda Aceh, Indonesia, 4 Doctoral Program of Regional Planning, University of Sumatera Utara, Medan, Indonesia ABSTRACT The geographical area of the province of Aceh which is bordered by the oceans and only has land connection with the province of North Sumatra has made Aceh depends greatly on this neighboring province.

In fact, The zone aceh Lhokseumawe North Regency Bireuen crossed by Sea Lane of Communication (Sloc), the Malacca Strait has geo-economic advantages. This study aims to analyze assess correlation between Highway Connectivity Development the zone. This research was done by conducting field surveys, interviews, questionnaires and data analysis on the The zone aceh, Lhokseumawe, Bireuen, Meriah Central Aceh districts. analysis done using Equation / Weight show that the relationship between Highway Network Connectivity variable and Region Development is 0.546.

study that Highway Connectivity the or significant relation to Regional Development activities, therefore it can be suggested for the Aceh provincial, district and governments the network to oriented the development new zones supporting implementation Special Zones Arun Lhokseumawe. Keywords: Sloc, Aceh, Arun Lhokseumawe. INTRODUCTION Aceh is one of the provinces in Indonesia which has special autonomy status in 2001 through Law No. 18 of year 2001 on Special Autonomy for the Province of Nanggroe Aceh Darussalam. Currently, Aceh is highly dependent on the province of North Sumatra.

Not only in the aspect of connecting transportation through the highway network, but also almost in all aspects of economy. This can be seen from the fact that Aceh plays a role more as a consumer rather than a producer. Food, clothing, housing, and industrial needs are still imported from Medan by trucks. Aceh as an agricultural and fishery area also sends the products by trucks 1.

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Therefore movement goods Aceh dominated highway (up 95%), rest transported by using sea and air transportation due to the lack of availability of infrastructure and facilities and the weakness of the system and regulation which made the movement of goods through highway considered as more efficient option 2. Aceh to date has a national highway length of about 1,803,354 km consisting of 538,251 km of arterial highway, and 1,265,103 km of primary collector highway. The km westbound the km of central highway and 532.2 km of eastern route and 161.7

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of cross and cross Stability of in Aceh quite at connectivity becomes a key element of development strategy in Aceh. In addition to the highway, other infrastructure projects should be further developed to improve connectivity between regencies in Aceh. To the economic in Aceh, in north of one the indispensable factors is good highway network 286 Indian Journal of Public Health Research & Development, December 2018, Vol. 9, No. 12 connectivity in order to accelerate the development of region.

highway connectivity located in Aceh's North Zone is divided into 3 main groups: Highway of - KKA Jamuan Sp. - (2) - - (3) KrueungGeukueh - Lhokseumawe - Lhoksukon - Panton Labu. General Description of the North Zone of Aceh In developing the transportation system in the Aceh region 1), on geographical and strategic development plan of Aceh region, several working (Transportation were as can be seen below Figure 1. Map of Aceh 1.

Central Zone, consisting of Sabang Municipality, Aceh Besar Regency, Pidie Regency, Pidie Jaya Regency and Banda Aceh Municipality; 2. North Zone, consisting of Aceh Utara Regency, Lhoksumawe Municipality, Bireuen Regency, Bener Meriah Regency and Aceh Tengah Regency; 3. East consisting Aceh Regency, Langsa Municipality and Aceh Tamiang Regency; 4. West Zone, consisting of Aceh Barat Regency, Nagan Raya Regency and Aceh Jaya Regency; 5.

South - Southeast Zone, consisting of Aceh Selatan Regency, Aceh Barat Daya Regency, Simeulue Regency, Regency, Tenggara Regency, Subulussalam Municipality and Singkil Regency. Based on the purpose of this study, the highway network for the development of the area in the north zone Aceh be at Port support the Arun Lhokseumawe Special Economic Zone.

METHODOLOGY This analyzed existing network connectivity the zone Aceh, Lhokseumawe, Aceh Utara, Bireuen, Bener Meriah and Aceh Tengah regency by taking into consideration several aspects including performance of structure pavement, geometric design of the highway, highway maintenance, traffic volume, traffic flow, and supporting infrastructure. The development of the area that occurs with existing highway network connectivity and transportation of goods is based on the aspect of economic growth, human resources improvement, management of land use environmental This development is in to out connection between the two variables.

Figure 2 below is a conceptual framework of research. Figure 2. Conceptual research framework Source : Researcher Research Design This research is explanatory research in design, that is by the caused an object research and to causal to know if there is relationship between highway network connectivity development in north of Aceh 3. Furthermore, this research used a combination of quantitative and qualitative method.

Quantitative method is used when the problem investigated is more common with large scope and complex level of variation. Indian Journal of Public Health Research & Development, December 2018, Vol. 9, No. 12 287 With a quantitative approach, this study is a cause-effect study, in which research is conducted to the facts to prove empirically that Performance of Structure Pavement, Geometric Design of Highways, Highway Traffic and Supporting Infrastructure, Supply and demand are predictors in north zone aceh.

the aspect economic human resources improvement, management of land use environmental are for regional development. Sample and Population The in study was people the field of goods transportation by using the trucks, and in field construction. addition, traders, and truck drivers in the area of Lhokseumawe, North Bireuen, Meriah Aceh were involved. population for study the of north of in 2015 (1,547,832 . The are samples selected from each municipality and district in the the north zone of aceh: Table 1.

Population and sample No. Regency/ municipality Population Sample 1 Lhokseumawe 191,407 37 2 Aceh Utara 583,892 113 3 Bireuen 435,300 89 4 Bener Meriah 136,821 27 5 Aceh Tengah 200,412 39 Total 1,547,832 300 Source: Statistic data, 2015 (Calculated by the researcher) Research Indicators and Variables This involved (two) -Highway Network (X) exogenous variable (independent not measured) Regional (Y1) endogenous variable (dependent variable not directly measured) .

Highway Network Connectivity Variable (X) Chourmain 3 conceptual a brief, and definition research The Network a infrastructure that part a transportation system. The highway network is also called a milestone for regional economy, because it can increase economic growth and regional The of highway network will create inter-regional connectivity. The term connectivity is used to describe the connection and between (highways) the network. Connectivity is the key to success in the north zone of aceh to build a good system with three important dimensions: reduction, development and increased competitiveness.

Regional Development Variable (Y1) Regional is operatively an effort to spur socio-economic development in connection to spatial and regional arrangements, reduce inter- regional disparities and preserve the environment of a region emphasizes strengthening factors the (economic human improvement, environmental as driver the region's competitiveness. Analysis and Results Analysis of Respondents Response against Highway Network Connectivity Variable Responses of respondents to highway network connectivity measured six indicators, namely: of Structure; Trajectory; Traffic The Supporting Infrastructure and Supply and Demand which are shown in table 2. Below.

288 Indian Journal of Public Health Research & Development, December 2018, Vol. 9, No. 12 Table 2.
 Analysis of respondents responses against highway network connectivity variable No Indicator Category F Mode Mean score STS TS R S SS F % F % F % F % 1 Stability of highway structure 9 3.0 84 28.0 79 26.3 110 36.7 18 60 300 4 3.15 2 Highway trajectory 0 0 6 2.0 164 54.7 130 43.3 0 0 300 3 3.41 3 Highway maintenance 0 0 16 5.3 170 56.7 114 38.0 0 0 300 3 3.33 4 Traffic volume 1 3.0 57 19.0 185 61.7 57 19.0 0 0 300 3 2.99 5 Supporting infrastructure 14 4.7 145 48.3 105 35.0 36 12.0 0 0 300 2 2.54 6 Supply and demand 1 3.0 7 2.3 35 11.7 105 35.0 152 50.7 300 5 4.33 Total of Mean Score 3,29 Source: (Calculated by the researcher) Respondents Response Analysis against Regional

Development Variable Responses regional variable were from (4) namely: growth; human resource Improvement; improved land use; and environmental protection are shown in table 3 below. Table 3.

Respondents response analysis against regional development variable No Indicator Category F Mode Mean Score STS TS R S SS F % F % F % F % F % F % 1 Economic growth 1 3.0 7 2.3 122 40.7 159 53.0 11 3.7 300 4 3.57 2 Human resource 11 3.7 69 2.30 113 37.7 94 31.3 13 4.3 300 4 3.16 3 Improvement Improved land use 1 3.0 7 2.3

108 36.0 143 47.7 41 13.7 300 4 3.72 4 Environmental protection 3 1.0 8 2.7 109 36.3 122 40.7 58 19.3 300 4 3.75 Total of Mean Score 3,55 Source: (Calculated by the researcher) Indian Journal of Public Health Research & Development, December 2018, Vol. 9, No. 12 289 CFA Confirmatory Analysis of Highway Network Connectivity Variable An of confirmatory in latent of connectivity carried to be to all that up latent of network Figure the results of confirmatorial data analysis of highwaynetwork connectivity . Figure 3.

Confirmatory analysisnetwork connectivity variable It find from analysis that model highwaynetwork considered All indicators were declared valid and trusted to measure highway network connectivity variable. The highway structure stability indicator is the largest loading factor and subsequent supporting infrastructure. Output result of CFA analysis of connectivity of the highwaynetwork variable is shown in table 4. CFA of Regional Development Variable The analysis of the confirmatory factor in the latent variable of Region Development was done to confirm all the indicators that make up the latent construction of Regional Development.

The results of CFA analysis can determine whether or the model Regional fit 5,6 Figure 4below shows the results of data processing, the results of Confirmatory analysis of Regional Development. Figure 4.Analysis of regionaldevelopment confirmatory Table 4. Output of CFA analysis of connectivity of the highwaynetwork variable Standardized Regression Wei ght (ber 1 - Default model) Estimate x1?1 x1?2 x1?3 x1?4 x1?5 x1?6 Highway _ network _ connectivity Highway _ netk _conneit Highway _ netk _conneit Highway _ netk _conneit Highway _ netk _conneit Highway _ netk _conneit 0 .768 0.406 0.334 0.465 0.696 0.344 Sourc (Analysis) 290 Indian Journal of Public Health Research & Development, December 2018, Vol. 9, No.

12 Based on the results of CFA analysis, it is known that CFA model for the development of the region is considered fit. indicators declared and believed measure variable Regional The Economic Growth Indicator is the greatest loading factor value and subsequent Environmental Protection. Results of Output of The CFA Analysis of Region Development Variable are shown in table 5. Table 5. Out of the CFA analysis of region development variable Standardized Regression Wei ght (ber 1 - Default model) Estimate y?1 y?2 y?3 y?4 Regional _ development Regi_devel Regi_devel Regi_devel 0.882 0.695 0.712 0.835 Sourc (Analysis) There are four indicators that were declared entirely capable of measuring regional development variable because has value factor > ie (economic with value (0.882); (Human Improvement) the of 0.695; Y1.3 (improvement of land use) with the value of (0.712); Y1.4

protection) the of variable-building would be used in the next full SEM processing. Result of Feasibility Analysis of Research Model Analysis of research model was doneusing the criteria Goodness Fit which summarized in table 6below. Results obtained wereaccording to desired GoF has fulfilled its entirety, and it is concluded the model is fit with the data used. Table 6. Index of modification of SEM model after modification

Goodness of Fit Index Cut-off Value Analysis Results Evaluation Model ? 2 - Chi - square Probability RMSEA
 GFI AGFI TLI CFI Expected to be low (df=116) =0, 05 =0,08 =0,90 =0,90 =0,90 =0,90 532,862 0,01 0,014
 0,889 0,861 0,884 0,915 Good Marginal Good Marginal Good Marginal Good Source: (Analysis) The table
 above shows that the criteria for assessing the of model of - square, RMSEA, AGFI, and generally that model
 fit the because in general, it is considered meeting GOF criteria and next it can be continued on the next data
 processing.

Furthermore, calculation the of influence regression was which would be used as the basis for answering
 hypotheses in this The of processing shown table 7. Indian Journal of Public Health Research & Development,
 December 2018, Vol. 9, No. 12 291 Table7. Regression weight Relation between variables Estimate P Result
 Highway Network Connectivity Region Development 0.546 0.014 Significant Source: (Analysis) Based on the
 results of regression weight, it can be the of significance the of each variable that impact on the development
 of the region in the North Aceh Zone. Highway Network connectivity also to a effect on success the
 Development the north of Data the weight shows the value is (0.014) and fit criteria is the of <0.05. This that
 Network has very relationship significantly the activities and success of the Region Development in the The
 zone aceh.

Network has a role or contributes to the success of the Region Development activity (0.546). So the Highway
 Network Connectivity has a significant effect on the development of the region seen from economic growth,
 human resource development, land use improvement and environmental protection. CONCLUSIONS Based
 the data and discussion results, it can be concluded that: The of network (X) formed from the highway structure
 consistency indicator (X1), highwayway condition (X2), highway maintenance (X3), volume supporting (X5)
 supporting (X6) that are proven to be valid and reliable in measuring their influence on regional development;
 Yield (Y1) from of economic (Y11), of resources improvement land (Y13) environmental (Y14) proven and
 reliable indicators in measuring their relation to highway network connectivity and transportation of goods;
 Highway network connectivity has also proved to a effect the of Development in the The north zone of aceh.

Recommendation Based on the discussion of results and conclusions of this study, some suggestions may be
 given as recommendations: The results of this study may serve as a reference for Aceh and governments in
 north of in highway policy, territorial development and transportation of goods; The of study also meaningful
 inputs for the Aceh government, the Lhokseumawe city government and the North Aceh district government in
 formulating the policy of the Special Economic Zone of ArunLhokseumawe, especially in preparing the
 development of a new economic region.

Conflict of Interest: Nil Source of Funding: Self Ethical IJRISSE Journal Reviewer Committee REFERENCES 1.
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