The Effect of Road Network and the Freight Transport Operation to the Development of the Region and Welfare of the Society in Langkat Regency

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Abstract. This study aims to determine the effect of the road network and the implementation of freight transportation on regional development and the community welfare in Langkat Regency. This type of research is associative and explanatory research whose data are obtained through surveys. The study population was drivers of motor vehicles transporting goods in Langkat Regency. The number of samples is 305 respondents by means of probability sampling and data analysis techniques using Structural Equation Modelling (SEM). The results showed that the road network variables did not significantly influence the community welfare, but the road network had a significant and positive effect on the community welfare through the development of the Langkat Regency. The implementation of freight transportation has a significant and positive effect on the community welfare partially, directly and through the development of the Langkat Regency. Regional development has a significant and positive effect on the community welfare of Langkat Regency.

1. Introduction

Data from the Central Bureau of Statistics in Langkat Regency in 2018 shows that Langkat Regency is a center for agricultural production of food crops, livestock, plantations, fisheries, and mining. Gross Regional Domestic Product (GRDP) at the Current Price in 2018 amounting to Rp. 39,818.55 billion. The agricultural sector, as the primary contributor in the formation of Langkat Regency GRDP of 38.9 percent is dominated by plantation products such as oil palm and rubber, then food crops such as rice, crops, and horticulture. Plantation crops are the leading supporter of the agricultural sector in generating foreign exchange, where the export of the primary commodities of this region is the results of plantations such as rubber, palm oil, tea, coffee, tobacco [1]. Potentials that can be explored and developed are marine and fisheries commodities, which are quite potential if supported by better and adequate facilities and infrastructure so that they can compete with other regions that have similar commodities both in terms of quality and quantity. Whereas in the mining
sector, Langkat Regency is the only area in North Sumatra Province that has an oil mine managed by Pertamina and is currently under exploration looking for petroleum resources in Langkat Regency.

The National Transportation Destination Origin Survey conducted by the Ministry of Transportation in 2001, 2006, 2011 and 2016 showed that almost 90% of freight movements were carried out by land (road) mode, 7% by sea mode, and the rest by other modes (such as railroad, airplanes, river transportation, and crossings). The National Transportation Destination Origin survey results also showed that 9.5% of goods transportation from North Sumatra Province to all parts of Indonesia originated from Langkat Regency [2]. The movement of origin and destination of goods transportation in the province shows that of 33 regencies/cities in North Sumatra Province, Langkat Regency is in the 3rd (three) position as the area that has the most area (origin) and is attractive (destination) freight transportation is under Deli Serdang Regency and Medan City.

The position of Langkat Regency as the centre of agricultural production of food crops, livestock, plantations, fisheries, and mining is in line with the third position as the region that generates the most (origin) and attracts (the destination) the transportation of goods in North Sumatra province is not directly proportional to the level of welfare of the people of Langkat Regency. Public welfare indicators published by Langkat District in 2018 include: (1) population, (2) health, (3) education, (4) employment, (5) level and consumption patterns, (6) housing, and (7) poverty shows that Langkat district people's welfare has not yet been achieved [3].

The economic growth rate of Langkat Regency in 2012 until 2016 has decreased every year and is below the average of North Sumatra Province. In 2017 the economic growth rate of Langkat Regency increased by 5.05 percent, however, in 2018 it decreased to 5.02 percent which remained below the North Sumatra Province by 5.18 percent [4].

One of the strategic issues in developing Langkat Regency as stipulated in the Langkat Regency Spatial Planning (2013-2033) is the lack of connectivity between regency development areas so that regional development in Langkat Regency is uneven, and dependency between regions is not served. In addition to connectivity issues, the quality of construction and road surfaces in Langkat Regency is a strategic issue that requires the Government's attention to expedite the mobility of people, goods, and services [5].

The geographical position of Langkat Regency which borders with Nanggro Aceh Darussalam Province and several regencies/cities in North Sumatra Province is an opportunity that can be utilized to support regional development and community welfare in Langkat Regency in addition to the negative impact in the form of a decrease in the level of road services due to mixed traffic flow that operates in Langkat Regency area (internal-internal, internal-external or vice versa) with continuous traffic flow (external-external).

Trucks as a land transportation mode used for the distribution of goods have different characteristics from other vehicles. Some things from the transportation of goods, which become a problem are: (1) the characteristics of the vehicle and the type of cargo; (2) characteristics of transportation infrastructure and overload; and (3) operating and institutional characteristics. Freight vehicles often face problems relating to traffic congestion, road network, parking, loading, and access [6].

The solution to the problem of freight transportation can be pursued by (1) meeting the needs of road infrastructure through road construction; and/or (2) optimizing road infrastructure through traffic management and engineering. Some of the actions that have been and will be taken to increase the area of roads and the capacity of transportation infrastructure are: (1) construction of new roads, (2) improvement of infrastructure capacity, and (3) traffic engineering and management [7].

Research is needed to find out the influence of the road network and the implementation of freight transportation on regional development and community welfare in Langkat Regency. Based on these considerations, researchers are interested in conducting research with the title "The Effect of the Road Network and the Implementation of Goods Transport Against Regional Development and Community Welfare of Langkat Regency".
2. Research and Methodology
The methodology of this research consists of several stages as follows:

2.1. Determination of Research Locations and Respondents Samples
The research location is located in three provincial roads and three Langkat regency roads in three district development areas. The study population is Langkat Regency residents who work as driver in freight transportation which are known from the results of a classified traffic counting survey on provincial and district road sections in three Langkat Regency development areas, namely Langkat Hulu, Langkat Hilir and Teluk Haru Determination of the number of sample respondents at each survey location on provincial and district road sections using the Slovin formula based on the percentage of each type of vehicle. The number of samples was 305 respondents.

2.2. Instrument of Data Collection
The instrument of data collection were survey forms, interview guidelines, and research questionnaires. Classified traffic counting survey form for transporting motorized vehicles to determine the size of the study population, interview guidelines for digging in-depth information through the questions raised to stakeholders in the field of transporting goods and economic businesses, questionnaires or often called questionnaires are research instruments containing a list of questions that have been provided alternative answers relating to the road network, the implementation of freight transportation, regional development, and community welfare. Because research instruments will be used to make measurements with the aim of producing accurate quantitative data, each instrument must have a scale. The measurement scale in this study uses a Likert scale, which extends from the scale: 1 = strongly disagree, 2 = disagree, 3 = doubtful, 4 = agree, and 5 = strongly agree.

2.3. Primary and Secondary Data Collection
Primary data obtained through observation and interviews with freight transportation driver and stakeholders in the field of transporting goods and economic entrepreneurs, while secondary data obtained through searching and reviewing libraries, dissertations, journals, downloading literature related to Research topics via the internet and data from related agencies such as Central Bureau of Statistics, Langkat District Transportation Agency and the Ministry of Transportation of the Republic of Indonesia.

2.4. Data Analysis Tool
Data analysis consists of descriptive analysis and structural equation modeling (SEM) using IBM SPSS Amos 22 software. Descriptive analysis is used to determine the average response of respondents to the road network, the implementation of freight transportation, regional development, and community welfare. Determination of the average value of the respondents followed the Three-box method [8].

| No. | Development area/roads | Type of Vehicle | Volume (Unit) | %   | Sample Amount (unit) |
|-----|------------------------|----------------|--------------|-----|----------------------|
| 1.  | Langkat Hulu Region     |                |              |     |                      |
| a.  | Province roads,         | 2 axis         | 225          | 17.5| 53                   |
|     | Kuala - Selesai        | 3 axis         | 52           | 4.04| 12                   |
|     | Combination            | 9              | 0.70         |     | 2                    |
| b.  | Regency Roads          | 2 axis         | 81           | 6.30| 19                   |
|     | Namu Ukur – the border of | 3 axis       | 1            | 0.08| -                    |

Table 1. Number of Population and Research Respondent Samples
Binjai City

| Combination | 0,00 | - |
|-------------|------|---|
| c. Regency Roads | 2 axis | 10,7 |
| Mancang – Kwala Begumit | 138 | 3 | 33 |
| 3 axis | 30 | 2,33 | 7 |
| Combination | 3 | 0,23 | 1 |

2. Langkat Hilir

| a. Province roads, Padang Tuaang – Tanjung Pura | 2 axis | 15,4 |
|-------------------------------------------------|-------|-----|
| 3 axis | 22 | 1,71 | 5 |
| Combination | 8 | 0,62 | 2 |
| b. Regency roads, Secanggang – Stabat | 2 axis | 117 | 9,10 | 28 |
| 3 axis | 10 | 0,78 | 2 |
| Combination | - | 0,00 | - |
| c. Regency roads, Pantai Cermin –Kampung | 2 axis | 70 | 5,44 | 17 |
| Lalong Tanjung Pura | Combination | - | 0,00 | - |

3. Teluk Haru

| a. Province roads, Pangkalan Susu – Simpang | 2 axis | 116 | 9,02 | 28 |
| Pangkalan Susu | Combination | 5 | 0,39 | 1 |
| b. Regency roads, Pematang Jaya – Batas Aceh | 2 axis | 51 | 3,97 | 12 |
| Tamitang | Combination | - | 0,00 | - |
| c. Regency roads, Skoci – Simpang Bukit Mas | 2 axis | 111 | 8,63 | 26 |
| Combination | 3 | 0,23 | 1 |

Total 1,286 100 305

Table 2. Respondent Answers Measurement

| No | Score | Measurement |
|----|-------|-------------|
| 1  | 1.00 – 1.80 | Very Bad |
| 2  | 1.81 – 2.60 | Bad |
| 3  | 2.61 – 3.40 | Adequate |
| 4  | 3.41 – 4.20 | Good |
| 5  | 4.21 – 5.00 | Very Good |

3. Result and Discussion

3.1. Variable and Research Indicator
In this research, the main components of the transportation system analyzed in relation to regional development and the welfare of the people of Langkat Regency are the road network (road transportation infrastructure) and the implementation of freight transportation (road transportation facilities). This road network variable (X1) will be seen from several indicators, namely: ease (X11), road design (X12), quality of road construction (X13), road maintenance (X14), determination of road class (X15), traffic signs and roads marking (X16), road user control (X17), road services (X18), and supporting facilities (X19). The variable of the organization of freight transportation (X2) can be seen from several indicators, namely: government guidance (X21), freight transportation services business (X22), tax and retribution (X23), type of freight vehicle (X24), completeness of the vehicle (X25), procedures freight transportation (X26), haulage (X27), heaviest axle load (MST)
(X28), and supervision of freight transport cargo (X29). Regional development variable (Y1) seen from several indicators, namely: economy (Y11), social culture (Y12), and institutional (Y13). Regional development variable (Y1) will be seen how much influence on the variable community welfare (Y2) consisting of indicators: income (Y21), business and employment opportunities (Y22), education (Y23), security and comfort (Y24), and health (Y25).

3.2. Validity and Reliability Test
Validity as a measure that shows the level of validity or accuracy of the instrument. The instrument is said to be valid if the instrument is able to measure what is desired and can measure the data examined precisely. When the correlation of each factor score with the total score of the factor is positive and the magnitude of 0.3 and above, then the factor is a strong construct so it can be concluded that the instrument has good construct validity [9,10]. While reliability testing is carried out to test the stability and consistency of the instrument in measuring concepts. An instrument is said to be reliable if it has a Cronbach-alpha value greater than 0.6 [10].

3.2.1. Road Network Variable (X1)
Valid and reliable indicators are: ease (X11), road design (X12), quality of road construction (X13), road maintenance (X14), determination of road class (X15), and traffic signs and road markings (X16).

3.2.2. Variable of Transportation of Goods (X2)
Valid and reliable indicators are: government guidance (X21), taxes and levies (X23), types of freight vehicles (X24), completeness of the vehicle (X25), procedures for transporting goods (X26), and supervision of freight cargo (X29).

3.2.3. Regional Development Variable (Y1)
All indicators are valid and reliable, namely: economic (Y11), social and cultural (Y12), and institutional (Y13).

3.2.4. Community Welfare Variable (Y2)
All indicators are valid and reliable, namely: income (Y21), business and work opportunities (Y22), education (Y23), security and comfort (Y24), and health (Y25).

3.3. Descriptive Analysis of Research Variables
The average value of the variable indicators of the road network (X1), the implementation of freight transportation (X2), regional development (Y1), and community welfare (Y2) are categorized as adequate and good.

| Table 3. Mean Scores of Respondents' Responses Description Towards Research Variables |
|---|---|---|---|
| No. | Variable | Indicator | Mean Score | Category |
| --- | --- | --- | --- | --- |
| 1. | Road network (X1) | Ease (X11) | 3.39 | Adequate |
| | | Road Design (X12) | 3.23 | Adequate |
| | | Road Construction Quality (X13) | 3.05 | Adequate |
| | | Road Maintenance (X14) | 3.27 | Adequate |
| | | Road Class Designation (X15) | 3.43 | Good |
| | | Signs and Marks (X16) | 3.02 | Adequate |
| 2. | Implementation of Freight Transportation | Government guidance (X21) | 2.97 | Adequate |
| | | Tax and retribution (X23) | 3.06 | Adequate |
3. Regional Development

(Y1)

- Economy (Y11): 3.29, Adequate
- Social culture (Y12): 3.49, Good
- Institutional (Y13): 3.54, Good

4. Community Welfare

(Y2)

- Business and work opportunities (Y21): 3.40, Adequate
- Education (Y23): 3.53, Good
- Security and comfort (Y24): 3.24, Adequate
- Health (Y25): 3.46, Good

3.4. Structural Equation Modelling (SEM) Analysis

3.4.1. Evaluation of SEM Assumptions

Evaluation of multivariate outliers using Mahalanobis Distance is to show the distance of an observation from the average of all variables in a multidimensional space [11]. To calculate the Mahalanobis distance based on the chi-square value at free degrees of (20 indicators) at the level of p < 0.001 is $\chi^2 (20, 0.001) = 45.318$ (based on the distribution table $\chi^2$). From the results of data processing it is known that 6 (six) samples were found to have outliers because the Mahalanobis distance was greater than 45.318. Therefore, to avoid data abnormalities in this study, the six observations should be excluded from the sample so that the remaining sample size is 299 samples (still meeting the minimum sample SEM of 200 samples).

Indications of multicollinearity and singularity can be determined by the determinant values of covariance matrices that are insignificant, or close to zero. From the results of data processing the determinant value of the covariance matrix is:

$$\text{Determinant} = 409666688,948$$

From the results of data processing, it can be seen that the determinant value of the sample covariance matrix is far from zero. Thus it can be said that the research data used do not have multicollinearity and singularity.

3.4.2. Confirmatory Factor Analysis

CFA testing in this study is needed to determine whether the indicators are representative or not, in forming each latent variable. From the results of the CFA analysis it is known that the CFA model for latent variables of the road network (X1), the implementation of freight transport (X2), regional development (Y1) and community welfare (Y2) shows all indicators declared valid and trusted to measure all research variables.
### Table 4. Research Variable CFA Output Analysis

| No. | Variable                          | Indicator                                      | Estimate | Category          |
|-----|-----------------------------------|-----------------------------------------------|----------|-------------------|
| 1.  | Road network (X_1)                | Ease (X11)                                    | .770     | Valid & Reliable  |
|     |                                   | Road Design (X12)                             | .690     | Valid & Reliable  |
|     |                                   | Road Construction Quality (X13)               | .835     | Valid & Reliable  |
|     |                                   | Road Maintenance (X14)                        | .933     | Valid & Reliable  |
|     |                                   | Road Class Designation (X15)                  | .659     | Valid & Reliable  |
|     |                                   | Signs and Marks (X16)                         | .897     | Valid & Reliable  |
|     |                                   | Government guidance (X21)                     | .590     | Valid & Reliable  |
|     | Implementation of Freight         | Tax and retribution (X23)                     | .613     | Valid & Reliable  |
|     | Transportation (X2)               | Type of freight vehicle (X24)                 | .979     | Valid & Reliable  |
|     |                                   | Completeness of the vehicle (X25)            | .975     | Valid & Reliable  |
|     |                                   | Procedures freight transportation (X26)       | .647     | Valid & Reliable  |
|     |                                   | Supervision of freight transport cargo (X29) | .846     | Valid & Reliable  |
| 2.  | Regional Development (Y_1)        | Economy (Y_{11})                              | .748     | Valid & Reliable  |
|     |                                   | Social culture (Y_{12})                       | .957     | Valid & Reliable  |
|     |                                   | Institutional (Y_{13})                        | .871     | Valid & Reliable  |
|     |                                   | Income (Y_{21})                               | .789     | Valid & Reliable  |
|     |                                   | Business and work opportunities (Y_{22})      | .780     | Valid & Reliable  |
| 3.  | Community welfare (Y_2)           | Education (Y_{23})                            | .836     | Valid & Reliable  |
|     |                                   | Security and comfort (Y_{24})                 | .418     | Valid & Reliable  |
|     |                                   | Health (Y_{25})                               | .741     | Valid & Reliable  |

#### 3.4.3. Results of Research Model Feasibility Analysis

Based on the results of the model that has been made and the fulfillment of a number of assumptions, the next step is to test the model or measurement model. The measurement model is a part of the SEM model, which consists of latent variables (constructs) and several manifest variables (indicators) [12]. The purpose of testing is to find out how precisely manifest variables can explain existing latent variables.
Figure 1. Measurement Model Before Modification

Figure 2. SEM Model After Modification
Table 5. Model Feasibility Test Before Modification

| Goodness of Fit Index | Cut off Value | Analysis Result | Model Evaluation |
|-----------------------|---------------|-----------------|------------------|
| χ² Chi-square         | sought to small value | 1176,173 | Bad |
| Probability          | >0,05         | 0,000          | Bad |
| RMSEA                | <0,08         | 0,142          | Bad |
| GFI                  | >0,90         | 0,699          | Bad |
| AGFI                 | >0,90         | 0,614          | Bad |
| TLI                  | >0,95         | 0,820          | Bad |
| CFI                  | >0,94         | 0,844          | Bad |

From the table above, it can be seen that the criteria for assessing the feasibility of the SEM model consisting of χ² - Chi-square, probability, RMSEA, GFI, AGFI, TLI, and CFI are bad. Where all the values from the analysis are far from the stated value. For this reason, the model must be modified so that later the required model will be obtained and better.

Table 6. Model Feasibility Test After Modification

| Goodness of Fit Index | Cut off Value | Hasil Analisis | Evaluasi Model |
|-----------------------|---------------|----------------|----------------|
| χ² - Chi - square     | sought to small value | 482,774 | Good |
| Probability          | >0,05         | 0,010          | Moderate |
| RMSEA                | <0,08         | 0,078          | Good |
| GFI                  | >0,90         | 0,868          | Moderate |
| AGFI                 | >0,90         | 0,808          | Moderate |
| TLI                  | >0,90         | 0,927          | Good |
| CFI                  | >0,90         | 0,947          | Good |

From the table above it can be seen that the criteria for assessing the feasibility of the SEM model consisting of χ² - Chi-square, probability, RMSEA, GFI, AGFI, TLI, and CFI generally show that the model is fitted with the data because overall it is deemed to have met GOF criteria and the next can be continued in the next data processing. Furthermore, the calculation of the coefficient of influence through regression weight will be calculated which will be used as a basis for analyzing the significance and magnitude of influence between research variables.

Table 7. Regression Weight and Standarized Regression Weight

| Relationship Between Variables | C.R  | P      | Estimate | Results |
|--------------------------------|------|--------|----------|---------|
| Regional development - Road networks | 4.087 | 0,000  | 0,425    | Significant |
| Regional development – Implementation of freight transportation | 5.353 | 0,000  | 0,524    | Significant |
| Community welfare – Regional development | 6.898 | 0,000  | 0,748    | Significant |
| Community welfare – Implementation of freight transportation | 3,315 | 0,000  | 0,305    | Significant |
| Community welfare – Road networks | -0,146 | 0,884  | -0,013   | Not Significant |

Based on the results of regression weight can be seen the results of significance on the influence of road network variables (X1) and the implementation of freight transportation (X2) on the development of Langkat Regency (Y1) and road network variables (X1), the implementation of freight
transportation (X2), and regional development (Y1) towards the welfare of the people of Langkat Regency (Y1) partially, directly and indirectly, i.e:

1. SEM analysis results show the coefficient of the road network path (X1) to the development of Langkat Regency (Y1) of 0.425 with a value of C.R 4.087> 2.0 and prob. 0.000 <0.05 indicates a positive and significant influence of the road network (X1) on the development of Langkat Regency (Y1). The coefficient of implementation of freight transportation (X2) to the development of Langkat Regency (Y1) is 0.524, with a value of C.R 5.353> 2.0 and prob. 0.000 <0.05 indicates a positive and significant effect of the implementation of freight transportation (X2) on the development of Langkat Regency (Y1). The estimated value of Squared Multiple Correlations (estimate = 0.867) shows the regional development variable (Y1) can be explained using the road network variable (X1) and the implementation of freight transportation (X2) of 86.7%.

2. SEM analysis results show the coefficient of the road network path (X1) to the community welfare of Langkat Regency (Y2) of -0.013 with a value of C.R -0.146 <2.0 and prob. 0.884> 0.05 shows there is no direct influence of the road network (X1) on the community welfare of Langkat Regency (Y2). The coefficient of implementation of freight transportation (X2) to the community welfare of Langkat Regency (Y2) is 0.305 with a value of C.R 3.315> 2.0 and prob. 0.000 <0.05 indicates a positive and significant direct effect on the implementation of freight transportation (X2) on the community welfare of Langkat Regency (Y2). The coefficient of regional development (Y1) to the community welfare of Langkat Regency (Y2) was 0.748, with a value of C.R 6.898> 2.0 and prob. 0.000 <0.05 shows that there is a direct positive and significant influence of regional development (Y1) on the community welfare of Langkat Regency (Y2).

3. SEM analysis results show the indirect effect of the road network (X1) on the community welfare (Y2) through the regional development of the Langkat Regency (Y1) can be calculated by the product of the road network path coefficient (X1) to the regional development (Y1) with the development path coefficient region (Y1) to the community welfare of Langkat Regency (Y2) in the amount of 0.425 X 0.748 = 0.318

4. SEM analysis results show the indirect effect of the implementation of freight transportation (X2) on the community welfare (Y2) through the development of the Langkat Regency (Y1) can be calculated by the product of the path of the implementation of freight transportation (X2) to the regional development (Y1) with the coefficient the path of regional development (Y1) to the community welfare of Langkat Regency (Y2) in the amount of 0.524 X 0.748 = 0.392.

3.5. Discussion

3.5.1. Relationship between the road network and the implementation of freight transportation with the development of Langkat Regency

This research proves that the road network and the implementation of freight transportation have a positive and significant effect on the development of the Langkat Regency. The results of this study support the existing theoretical statements [7] that the infrastructure system and transportation facilities as basic infrastructure are fundamental preconditions for regional economic movements, where the support and driving system of transportation infrastructure plays a role in the efficiency and effectiveness of activities regional economy. The breakdown of the regional transportation system will hamper the investment mobility and economic activities of the community [13]. Transportation in regional development is the primary support that enables a region to develop [14]. Transportation activities provide positive benefits assessed from economic aspects, social aspects, and political aspects [15]. That transportation functions as a development support sector (the promotion sector) and the service provider (the servicing sector) for regional and economic development. [15,16]

3.5.2. The relationship of regional development with the community welfare of Langkat Regency

This research proves that regional development influences the community welfare of Langkat Regency, and this situation is in line with the theoretical statement [17] that regional development is an act of developing the region to improve the level of welfare of the community or promote and improve something that already exists. That regional development means increasing the value of the
benefits of the area for the people of a particular region to be able to accommodate more residents, with an average level of community welfare improving, in addition to showing more facilities/infrastructure, goods or services available and community business activities are increasing, both in terms of type, intensity, service, and quality [18].

3.5.3. Relationship between road network and the implementation of freight transportation with the community welfare through the development of Langkat Regency

This research proves that the road network and the implementation of freight transportation have a positive and significant effect on the community welfare of Langkat Regency through regional development supporting the theoretical statements [15,16] that transportation can advance economic and community welfare through the creation of accessibility and mobility in which the accessibility function to open up opportunities for less developed regions and the mobility function to spur developed areas. That the availability of road infrastructure has a very strong relationship with the level of regional development, which is characterized by the rate of economic growth and social welfare [19-20].

This research proves that the implementation of freight transportation has a direct influence on the welfare of the community based on the direct benefits that can be felt by the community with the implementation of freight transportation. In line with the theoretical statement [16] that transportation is an activity that creates or adds utility. The utilities created by transportation activities are place utilities and time utilities. Creating a place, related to transportation activities that move goods from one place to another. By moving an item from the production area, the use (value) of the item is higher, because it is needed by many consumers who are more consumers who can afford to pay a higher price, that is what is called the place value. The potential to have a direct positive effect on poverty. Transportation has an essential role in reducing poverty [21]. Reducing the number of poverty can be done by increasing income and reducing expenditure per population. Development of transportation facilities directly opens business opportunities and employment opportunities for the community welfare.

4. Conclusion

The results of this study found indicators of ease, road design, quality of road construction, road maintenance, determination of road classes, and traffic signs and road markings as valid and reliable indicators in measuring the influence of road network variables on regional development and community welfare. Find indicators of government guidance, taxes and levies, types of goods transport vehicles, completeness of driving, procedures for transporting goods, and supervision of freight transport cargo as valid and reliable indicators in measuring the effect of the variable implementation of freight transportation on regional development and community welfare. This research proves that the road network does not have a significant direct effect on community welfare. However, the road network has a significant and positive effect on the community welfare of Langkat Regency through regional development, the implementation of freight transportation has a significant and positive effect on community welfare directly and partially through regional development, and regional development has a significant and positive effect on community welfare.

The finding of valid and reliable indicators in shaping road network variables and the implementation of freight transportation and the proof of the influence of the road network and the implementation of freight transportation on regional development and community welfare can be a reference for the Regional Government in improving the function of transportation to (1) create accessibility and mobility of and towards the origin) and destination of transportation of goods, (2) as the promotion sector and the servicing sector for regional and economic development, (3) creating or increasing place utility and time utility.

5. References

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