

Analysis of the Effect of Agricultural Roadway Infrastructure after the Eruption of Mount Sinabung towards the Income of Community in Tanah Karo District of North Sumatera

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Abstract

Tanah Karo district is an agricultural area where most of its population (73.5%) works in agriculture. Many roads in this area were dirt roads that turned to muddy roads when the rain fell. Hence, in the rainy season, most of the people had difficulty to go to their fields as those roads were the main access. The purpose of this study is to analyze the model of agricultural infrastructure development and the effect of agricultural infrastructure development after the eruption of Mount Sinabung towards the income of the people in Tanah Karo district. This study took 100 samples in 4 sub-districts in Tanah Karo district with purposive sampling technique. Path Analysis model was used as the Analysis method and multiple linear regression was used to process the data. The results shows that the quality of road infrastructure negatively affects the transportation costs of marketing agricultural products, the quality of road infrastructure positively affects the marketing system of agricultural products, and the quality of road infrastructure positively affects the income of the people in the district of Tanah Karo in level of 95%.

Keywords: *Infrastructure; Transportation; Marketing Systems; Income; Path Analysis*

1. INTRODUCTION

Mount Sinabung (Karonese: Deleng Sinabung) is a volcano situated in the highlands of Tanah Karo District in North Sumatra - Indonesia. Mount Sinabung and Mount Sibayak, located next to Mount Sinabung, are not only the two active volcanoes in North Sumatra but also the highest mountains in this province. Mount Sinabung is 2,460 meters high. The eruption of this mountain had never been recorded since 1600. But it suddenly became active again and erupted in 2010. The latter eruption of this mountain occurred in September, 2013 and continues until now.

From the record of National Disaster Preventive Department/Badan Nasional Penanggulangan Bencana (BNPB), the total loss from this disaster is around Rp. 1.49 Billion. This loss includes damage in agricultural, farming, plantation, fishery, trading, microenterprise and industrial. Moreover, another loss is infrastructural, housing and death of 26 people.

Eruption of Mount Sinabung gives effect to the fluctuations in commodity prices of vegetable in Karo. Research by Wahyuni (2009) obtained the result that each infrastructure have a positive influence on the productivity of economies with different elasticity. Instead, according to Ginting (2014), Program of Social Infrastructure Economic Region (RISE) by The Regional Development In District Naman Teran Karo encourages the creation of conditions of self-reliance in creating initiatives and a real need for improvement of the performance of poor families in each village through various instruments discussion group sector, group discussion between sectors, village community organizations, group of use and maintenance to increase local institutions emerging and society at the regional level. Research by Tarigan and Syumanjaya (2013) obtained results as follows: the effect of the road infrastructure quality to the cost of transportation is negative; the effect of the road

infrastructure quality to the marketing system is negative; and the effect of the road infrastructure quality to the price of agriculture products is positive in District Dolok Silau.

Agricultural Infrastructure is the infrastructure that functions as the marketing of agricultural products (village market). This infrastructure plays a role in stimulating the growth of the economy as it will facilitate the public in buying and selling agricultural products. The development of rural market infrastructure will contribute to the increasing number of new areas because of the volume of purchasing increases (Hanafie, 2010).

Agricultural commodity from the local market is essential for rural agribusiness growth. The local market development is important to make sure the staple from farmers equally priced. The main road is necessary to open up rural economics so that the interaction to the outside trading created.

The agricultural sector is dominating economic structure at Kabupaten Karo in 2014. This is proven by the fact that agricultural sector gives the considerable amount in PDRB of District Tanah almost 56.61% or as equal as **Rp. 7801.41 billion**. In the other hand, the minor contribution comes from electrical and gasses sector around 0.06%.

Apart from the need to develop the agricultural infrastructure, the development of transportation infrastructure is also needed to open the access beyond the village border. The development of roadway infrastructure has been undertaken since 2009 and is expected to increase public accessibility that consequently will increase the income of the people and development of the district of Tanah Karo.

1.1 Purpose of Research

To analyze the effect of road infrastructure development in agriculture after the eruption of mount Sinabung towards the income of the people in Tanah Karo District.

1.2 Literature Review

1.2.1 Infrastructure

Basically, infrastructure has several meaning depends on the context. Generally, it is understood as physical products, such as roadway. Roadway is the infrastructure which is needed for transportation or the land distribution. The function of the roadway is to connect one area with other areas. Hence, it has important role in national economy. The government as the major player in the provision of roadway infrastructure should maintain the continuity in the national development plan hence the road infrastructure could be improved both in quantity and quality. Moreover it needs more integrated approach in infrastructure development to ensure synergy between sectors and regions (Bulohlabna, 2008).

“Development” was said to be evidenced by increases in output, employment or investment. Infrastructure consists of different transportation modes and the provision of communications, water supply, industrial premises, energy supply and community facilities. Social infrastructure concerning investment in education and training within the community was not included in the review. The remit also included a hope that evidence of cost effectiveness in the provision of infrastructure for regional development purposes would arise (Diamond, 2009).

1.2.2 Income Theory

According to Hernanto (1996), the amount of income that will be achieved from an activity depends on some factors, like land expanse, level of productivity, identity of the entrepreneur, planting, and efficiency of the manpower. Price and productivity are the source of uncertain factors, hence if price and productivity change the farmer's income will change too (Soekartawi, 2006).

1.2.3 Family Income

According to Mosher (1985), this numbers obtained by computing income from other sources that the farmer earns aside from the main activity. The household income classified into two sectors, which are agriculture sector and non-agriculture sector. The source of income from agriculture sector can be specified again into income from farmers, livestock, farmer workers, renting the land, and profit sharing. The source of income from non-agriculture sector can be divided into domestic industry, trading, employee, service, non-agriculture worker and other agriculture subsector worker.

The size of income used to measure the level of family welfare is the household income earn from working. Each family member in their working age in household will be motivated to work for their family well-being.

1.3 Research Methodology

This research is a descriptive research with description and quantitative approach.

1.3.1 Research Area and Time

This research was conducted in the District of Tanah Karo which included 4 districts. The study took in June 2016 to Oktober 2016.

1.3.2 Data Collection Technique

The research used data collection Techniques as follows: Questionnaire, Interview, and Observation

1.3.3 Research Variable

To explain the identified variable, we present operational variable in table 1:

Table 1: Operational Variable

Variable	Operational Definition	Indicator	Scale
Income (Y)	Household income is the total income from agricultural work and another income outside the agricultural work	- Agricultural work - Household	Ordinal
Infrastructure quality (X ₁)	Physical facility needed by public agents for economic and social purpose	- Physical - Non Physical	Ordinal
Transportation cost (X ₂)	Transportation cost is the cost paid to make sure the transportation service works, this cost includes facilities, infrastructure and transport operations	- Facilities - Infrastructure - Transport operation	Ordinal
Marketing systems (X ₃)	Individual activity directed to fulfill the need and urge through exchange	- Place - Promotion - Distribution	Ordinal

1.3.4 Population and Sample

The population was used in the study were the number of households in the District of Tanah Karo. The Sampel is the part of population. This study used 4 (four) districts in Tanah Karo with 100 people as the sample. The sample data was taken by using purposive

sampling (Sugiyono, 2012) and for data description was taken in 4 (five) districts as the sample.

Table 2: Population and Sample Research

No.	TANAH KARO DISTRICT NAME	SAMPLE
1.	Berastagi	25
2.	Merdeka	25
3.	Simpang Empat	25
4.	Naman Teran	25

Source : Badan Pusat Statistik Kabupaten Karo (Processed Data)

This study used a statistical method which took the path analysis as the analysis tool, and was completed by using SPSS software. Path analysis is an analytical method in collecting the data systematically, analyze and interpret the data to describe the nature of something which was going on at the time of the research was done to find out the conclusion. Path analysis model was used to analyze the patterns of relationships between variables in order to determine the direct or indirect effect of a set of independent variables (exogenous) to the dependent variable (endogenous). The model of path analysis used the pattern of causality (Sarwono, 2007).

1.3.5 Model Formation

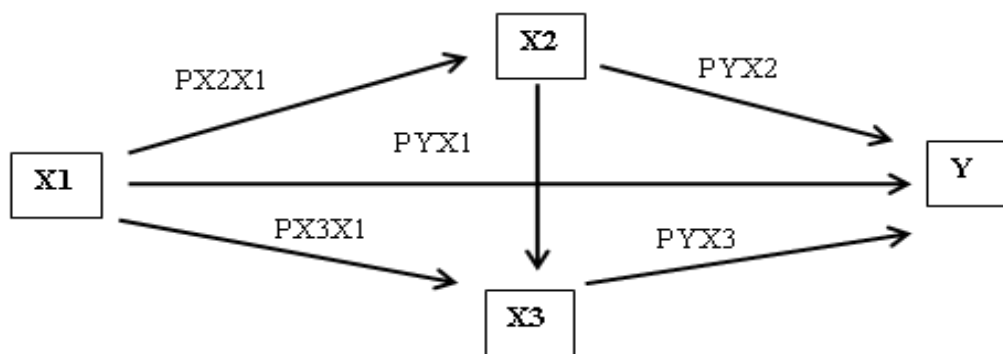


Figure 1: Framework Analysis Model Line

Structural equation I:

$$X2 = PX2X1$$

Structural Equation II:

$$X3 = PX3X1 + PX3X2$$

Structural Equation III:

$$Y = PYX1 + PYX2 + PYX3$$

Information:

Y = income

PY = coefficient

X1 = the quality of infrastructure

X2 = transport cost

X3 = marketing system

2. RESULTS AND DISCUSSION

2.1 Geographical Condition

Geographically Tanah Karo District is located between 2°50' – 3°19' North Latitude and 97°55'- 98°38' East Longitude with an area of 2127.25 km² or 2.97 percent of the area of North Sumatra Province.

District Tanah Karo resides in Bukit Barisan and the area mostly highland. Two active volcanoes located in this region make it prone to volcanic earthquakes. Karo regency is located at an altitude of 200-1500 M above sea level. The northern side is bordered by the Langkat and Deli Serdang, south to the Dairi and Samosir regency, east to the Deli Serdang and Simalungun and west by the Province of Nanggroe Aceh Darussalam. This area climate is tropical with the average temperature around 16.4°C – 23.9°C. There are two seasons in Karo, one is rainy season and another one is the dry season.

2.2 Circumstances of Infrastructure

More than 9,000 hectares of agricultural land in Karo District have been affected by the eruption of Sinabung volcano, which continued to be active in recent years. 741 hectares of the 9,000 hectares of this agricultural were damaged. The largest area of the farm that was affected in Tanah Karo was in four districts, including: Sub-District of Simpang Empat, Naman Teran, Berastagi and Merdeka. First, In Sub-district of Simpang Empat, the affected agricultural areas by the eruption reached 4,677 hectares, which 371 hectares of it was damaged. While in Sub-District of Naman Teran, 1,795 hectares of farm was affected by the eruption and 225 hectares was damaged.

Then in the District of Merdeka, the affected agricultural area reached 1,782 hectares and 145 hectares exposed destructive. Finally in District of Berastagi affected area of farm by the eruption as much as 802 hectares. From the results of the research in four Sub-districts of Tanah Karo Districts, it can be determined that the number of samples from each district was: District of Simpang Empat took 25 people, District of Naman Teran took 25 people, District of Merdeka took 25 and Berastagi took 25 people.

From the result of Focus Group Discussion (FGD) by interviews and surveys, Sinabung eruption destroyed villager planting in District Tanah Karo, and decreased their income drastically. Almost 80% of the villager is a farmer and their tourism sector also affected.

For infrastructural and purpose the development can be equaled into the development of flat as general. Besides its efficient and effectiveness, the flats developments cost lower budget compared to a development of housing. Moreover, the refugees demand for another facility to be included in their home such as farming field, establishment irrigation (clean water pipe), school for elementary level and junior high school level, restoration of the main road, establishment of church/mosque, government office, jambur/big hall to gather or to held traditional event, bus station, drainage and electricity.

In addition, there are about 2590 households or approximately 9300 people who become refugees and are covered by the government, spread over 9 post evacuation point. The 9 point evacuation post is located at 9 Village, Desa Tiga Pancur, Desa Sukanalu, Desa Pintu Mbesi, Desa Sigarang-Garang, Desa Jeraya, Desa Kuta Rayat, Desa Kuta Gugung, dusun Lau Kawar, Desa Mardinding, Desa Kuta Central.

A few facilities that provided for the refugee is drinkable water, health post, logistic (food, vegetable, and side dishes), public kitchen (provide with stove and kitchen utensils) and for school-age children, the government tries to found the nearest school and provide school bus shuttle service for them. The government also builds temporary residential (HUNTARA) for handling refugee residing in the post. The purpose is to make sure the refugee will not

stay in the post or jambur, however, they can live normally in simple housing. The development process of temporary residential is described from table 4.

Table 3: Progress of Temporary Residential (Huntara)

No.	HUNTARA Location	Area (m2)	Refugee Origin	Land Clearing
1.	Desa Ndokum Siroga Kec. Simpang Empat	9,696	GBKP Ndokum Siroga (Desa Pintu Mbesi dan Dusun lau Kawar)	100%
2.	Terung Peren Jandimeriah	3,890 3,500 3,000	Gudang Konco (Desa Mardinding)	50 %
3.	Desa Sukandebi	7,477	Korpri (Desa Kuta Gugung)	Not yet implemented
4.	Desa Ndokum Siroga Kec. Simpang Empat	10,720	Gudang Jeruk Surbakti (Desa Jeraya)	Not yet implemented
5.	Desa Ndokum Siroga Kec. Simpang Empat	6,442 3,937	GPDI Ndokum Siroga (Desa Kuta Tengah)	Not yet implemented
6.	Desa Linggajuli	17,000	GBKP Simp VI(Desa Sukanalu)	Under Negotiaition

Source: Badan Pusat Statistik Karo, 2015

Another offered countermeasure from government is build a dam to suppress cold lava spreads and provides heavy equipment in order to clean and to repair cold lava path. The blocked cold lava path is a problem because it will spread and block the road. In the worst case, a house might be drifted away within cold lava.

Among 25 respondents from the District of Berastagi, 100% of respondents admitted that the government's efforts in improving the quality of roadway infrastructure in these districts is done through roadway asphaltting which is being on going now. Among 25 respondents from the District of Merdeka, 100% of respondents admitted that the government's efforts in improving the quality of roadway infrastructure in the village is done through the asphaltting of roads which is being doing now. Then, among 25 respondents from Simpang Empat District, 100% of respondents admitted that the government's effort in improving the quality of roadway infrastructure in the village is done through stone road which is being unending now. Lastly, among 25 respondents from the District of Teran, 100% of respondents admitted that the government's effort in improving the quality of roadway infrastructure in these districts is done through stone road and it is being continuing now.

The respondent was divided into five groups based on the age, there were: 25 years old - 34 years, 35 years - 44 years, 45 years - 54 years, 55 years - 64 years and above 65 years. From the research results can be seen that the age group of 25 years - 34 years old were 27 people (27%), the age group of 35 - 44 years were 28 people (28%), age group of 45 - 54 years were 26 people (26%), age group of 55 - 64 years were 14 people (14%), and over 65 years were 5 people (5%). Then, the characteristics of the respondent based on gender, this research found out that the number of male respondent was the most as much as 99%.

Next, the educational backgrounds of the respondents were Elementary, Junior High, Senior High school, and D1. The Respondent who had a background in Primary School was 39% of the respondents (39 people), 22% of respondents (22 people) had Junior High School Background, 38% (38 people) the respondent whose background was Senior High School was 38% (38 people), and 1% (1 people) majored in D1 or 1 year of Diploma. Thus, The most respondents in this research was Primary School background while the least respondents had D1 or a year of Diploma background based on latest education.

The research has been done to 47 respondents (47%) who have 0-2 dependants, 50 respondents (50%) who have 3-5 dependants, and 3 respondents (3%) have more than 5 dependants.

Respondents Income was grouped into less than 1 million to more than 4 million. The research found that the most respondents earn 2 million to 3 million for totally 64 people (64%), the respondent's income from 2 million to 3 million was 22 people (22%), 9 people (9%) of respondents with an average income of 3 million to 4 million, respondents who have income below 1 was 3 people (3%) and the least is the respondents who have income above 4 million for totally 2 respondents (2%).

2.3 Results and Data Analysis

2.3.1 Estimation results of Structure Equation I

The estimation results of structural equation I based on the processing of data by SPSS 21.0 showed the following:

Table 4: Estimation Results of Structural Equation

Variable	Coefficient	t. Significant
XI	-14,546	0,000
F. Significant = 0.000		
R-Square = 0, 544		
Dependent variable = marketing system		

Source: Data Processed Data, 2016

Based on the results of structural equation I, it was interpreted as follows: coefficient Xi resulted -14.546. This meant that the quality of infrastructure effected negatively to the cost of transportation, the lower quality of the road, the higher transportation cost. The significance level was indicated by the significant estimates, based on the decision of the t-result, the significance was smaller than the α tolerance (t-significant = 0,000 < 0,05)

2.3.2 Estimation result of Structure Equation II

The estimation results of structural equation I based on the processing of data by SPSS 21.0 showed the following:

Table 5. Estimation Result of Structure Equation II

Variable	Coefficient	t. Significant
XI	0,032	0,000
X2	-0,012	0,000
F. Significant = 0.000		
R-Square = 0,869		
Dependent variable = marketing system		

Source: Processed Data, 2016

Based on estimates of structural II, it found that the coefficient X1 for the roadway infrastructure quality was 0,032. Meant the quality of roadway infrastructure influenced on the marketing system positively. The better of the quality of road infrastructure, the more

farmers who sell the farm produce to the market. The significance level was shown by the significant estimates, based on the decision of the t-value was significantly smaller than the tolerance α (t-significant = 0.000 <0.05), which meant that the quality of infrastructure significantly influence the marketing system at an error rate of 5%

Marketing system, the less of the transport cost, the more farmers sell their agricultural harvest to market center directly. The significance level was shown by the significant estimates, based on the result of the t-value, found that the significance was smaller than the tolerance α (t-significant = 0.000 <0.05), which meant that transport cost was significantly influence the marketing system at an error rate of 5%.

2.4 Estimation Result of Structural Equation III

The results of structural equation III were based on data processing through the program SPSS 21.0 showed the following:

Table 6: Estimation Results of Structural Equation III

Variable	Coefficient	t. Significant
X1	0,026	0,000
X2	-0,056	0,000
X3	0,018	0,095

F. Significant = 0.000
 R-Square = 0,795
 Dependent variable = public income

Source: Processed Data, 2016

The research results of structural equation III produced that coefficient of X1 was 0.026. This meant that the quality of road infrastructure has positively influence to the amount of people income in Tanah Karo District, the better the quality of roadway infrastructure, the easier the farmers to sell their crops and would increase the income of farmers. The significance level was generated by the significant estimates, based on the result of the t-significant value which was smaller than the tolerance α (t-signifikan = 0.000 <0.05), which meant that the quality of roadway infrastructure significantly influences the price of agricultural produce at an error rate of 5%.

Coefficient X2 of -0.056, indicating that the rate of transport cost negatively affected farmers' income, the higher the transport cost, will reduce the farmers income. The result of significance level was significant based on the finding of the t-significant value that was smaller than the tolerance α (t -signifikan = 0.000 <0.05), meant that the quality of infrastructure significantly effected to the price of agricultural produce at an error rate of 5%.

Based on the results of structural equation III, found that coefficients X3 was 0,018. This meant that the marketing system positively affects the farmer's income, if the marketing system was getting better, then it would increase the income of farmers. The significance level generated significant, which was based on the finding of the t-significant value smaller than the tolerance α (t-significant = 0.095 <0.10), which meant that the marketing system significantly influenced the price of agricultural products at an error rate of 10%.

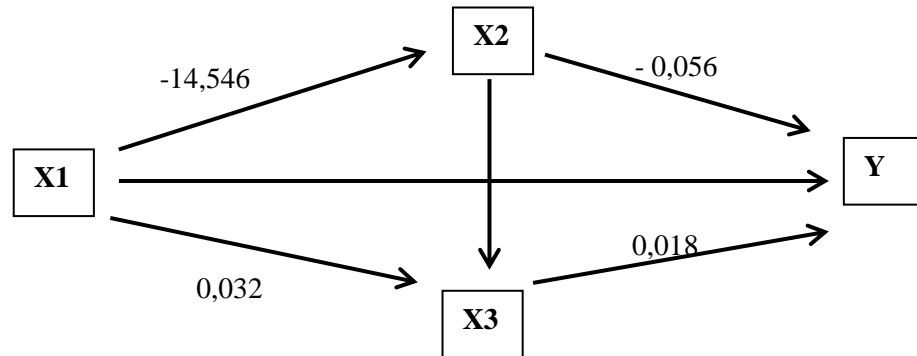
2.5 Effect and Indirect Effect

2.5.1 Direct Effect

The influence between the direct variables was as follows;

$$1) X1 \rightarrow X2 = PX2X1 = -14.546$$

The influence of the quality of infrastructure roadway (X1) to transportation cost (X2) directly was -14.546. Directly, the quality of roadway infrastructure is negatively related to the cost of transportation, and quality of infrastructure will reduce transport cost.



2) $X1 \rightarrow X3 = PX3X1$
 $= 0,032$

The influence of the quality of roadway infrastructure (X1) to the marketing system (X3) directly was 0,032. Meant directly the quality of infrastructure is positively associated with the marketing system, the good quality of infrastructure would increase the interest of the farmers to sell their goods directly to the market, since the more sellers (farmers) came to the market to sell their agricultural produce directly; it has forms the competitive price.

3) $X1 \rightarrow Y = PYX1$
 $= 0,026$

The quality of infrastructure positively affected to the income of farmers directly, about 0.026. A good quality of infrastructure would increase the income of agricultural.

4) $X2 \rightarrow X3 = PX3X2$
 $= -0,012$

The Influence of transport cost in direct marketing system was -0.012. The High transportation cost would reduce the interest of traders who want to buy produce directly.

5) $X2 \rightarrow Y = PYX2$
 $= - 0,056$

Transportation cost has a negative correlation to the farmer's income about -0056, Directly high transport costs would reduce the income of farmers.

6) $X3 \rightarrow Y = PYX3$
 $= 0,018$

The marketing system has a positive connection to the price of agricultural products about 0.018, the more traders move toward the village to buy the agricultural products, the price of agricultural products would be more competitive.

2.5.2 Indirect Effect

The influence of indirect variables was as follows:

1) $X1 \Rightarrow X2 \Rightarrow X3 = (PX2X1) (PX3X2)$
 $= (-14,546) (-0,012)$

$$= 0,174552$$

The indirect effect of the road infrastructure quality through the marketing system to transport cost, was 0.174552

$$\begin{aligned} 2) X1 \Rightarrow X2 \Rightarrow Y &= (PX2X1) (PYX2) \\ &= (-14.546) (-0.056) \\ &= 0.814576 \end{aligned}$$

The indirect effect of the road infrastructure quality to public revenue through transportation cost, was 0.814576

$$\begin{aligned} 3) X1 \Rightarrow X3 \Rightarrow Y &= (PX3X1) (PYX3) \\ &= (0.032) (0.018) \\ &= 0.000576 \end{aligned}$$

The indirect effect of the road infrastructure quality to the public revenue through the marketing system, was 0.000576

$$\begin{aligned} 4) X2 \Rightarrow X3 \Rightarrow Y &= (PX3X2) (PYX3) \\ &= (-0.012) (0,018) \\ &= -0.000216 \end{aligned}$$

The indirect effect of transportation cost to public revenue through the marketing system, was -0.000216

2.5.3 Total Effect

The total influence of independent variables to dependent variables was as follows:

$$\begin{aligned} X1 \Rightarrow X2 \Rightarrow X3 &= (PX2X1) + (PX3X2) \\ &= -14.546 + (-0.012) \\ &= -14.558 \end{aligned}$$

$$\begin{aligned} X1 \Rightarrow X2 \Rightarrow Y &= (PX2X1) + (PYX2) \\ &= -14.546 + (-0.056) \\ &= -14.602 \end{aligned}$$

$$\begin{aligned} X1 \Rightarrow X3 \Rightarrow Y &= (PX3X1) + (PYX3) \\ &= 0.032 + 0.082 \\ &= 0.114 \end{aligned}$$

$$\begin{aligned} X2 \Rightarrow X3 \Rightarrow Y &= (PX3X2) + (PYX3) \\ &= -0.012 + 0.018 \\ &= 0,006 \end{aligned}$$

2.6 Test Validity and Test Reliability

Value of validity test and reliability test was obtained by using SPSS version 21.0 as shown in the following tables:

Table 7: Validity Test of Procedure Factor

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
VAR00001	10.7158	1.844	.240	.104	.703
VAR00002	11.2105	1.679	.456	.228	.557
VAR00003	10.9684	1.584	.438	.299	.566
VAR00004	10.9684	1.435	.597	.371	.447

Source: Primary Data Processed, 2016

Based on the validity test results, this study stated that the 1st statement of was not valid because the value of Corrected Item-Total Correlation was less than 0.30 while 2nd, 3rd, and 4th statement was declared invalid because the value of Corrected Item-Total Correlation has positive value and greater than 0, 30. Furthermore it was necessary to do the reliability test; the results were shown in the following table of 6.

Table 8: Reability Test of Procedure Factor

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.645	.649	4

Source: Primary Data Processed, 2016

Based on the results of processing reliability test to 95 respondents, this research showed in column 1 (Cronbach's Alpha) obtained reliability test result of 0.645. this result was reliable, because it has a positive value and its balance above 0.60 in the process of test.

Table 9: Validity Test of Confidence Factor

	Scale Mean if Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
VAR00001	11.3579	2.317	.390	.197	.550
VAR00002	11.1368	2.056	.395	.199	.544
VAR00003	11.1579	2.262	.362	.185	.567
VAR00004	10.9684	1.861	.439	.225	.510

Source: Primary Data Processed, 2016

Based on the validity test results, this study stated that the statement of conviction factor was valid because the value of Corrected Item-Total Correlation was positive and greater than 0.30. While the 2nd, 3rd, and 4th statement declared invalid because the value of Corrected Item-Total Correlation has positive value and greater than 0, 30. Further, it needed to test the reliability of the results that could be seen in the following table of 8:

Table 10: Reability Test of Confidence Factor

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.614	.617	4

Source: Primary Data Processed, 2016

Based on the results of data processing of reliability test to 95 respondents, it could be seen that column 1 (Cronbach's Alpha) obtained the result of reliability test about 0.614. The result was reliable, because it has a positive value and its level above 0.60 in the process of test.

3. CONCLUSIONS

The research on the effect of the quality of road infrastructure to the price of agricultural products in the District of Tanah Karo, conclude the results as follows:

1. The results of the research qualitative data (Focus Group Discussion), it was found that the government handling the case by build a dam to suppress cold lava spreads and provide heavy equipment in order to clean and to repair cold lava path. The blocked cold lava path is a problem because it will spread and block the road. The government attempt to improve the quality of road infrastructure in the village were done through stone laying foundation, hardening and paving which currently underway.
2. The quality of roadway infrastructure negatively affected the transportation cost to carrying agricultural products in the district of Tanah Karo. The better quality of infrastructure brings the less expenditure of farmers for the cost of transportation.
3. The roadway infrastructure quality positively affected the marketing system of agricultural products in Tanah Karo District. The better quality of infrastructure, the more farmers sell their agricultural produce directly to the market.
4. The quality of roadway infrastructure positively influenced to people income in the District of Tanah Karo. The better quality of infrastructure, the more comfortable way for people to trade their harvest which lead to increase their income.

4. RECOMMENDATIONS

The citizen should keep maintain the roads infrastructure to smooth the agricultural distribution: provision and reconstruction of facilities and infrastructure to stimulate the economy, especially for people in risk area of damaged or lost due to eruption of Sinabung in the future and; Plan of recovery policies after the eruption of Sinabung should be able to facilitate the socio-economic recovery.

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