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Influence of Natural Resources on the Income of Regional Development

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Abstract: Development of the region is highly dependent on natural resources owned by the region and demand for commodities produced from the power source. The more resources that can be processed for the commodity, the faster growth in the region will be.

The research objective was to analyze the influence of natural resources (SDA) which is the height of water volume/ha, the width of irrigated land and the length of farm roads, directly and through the main activities of agribusiness in regional development to increase the income of farmers. The research method using primary data out of 100 farmers applied simple random sampling where the data were analyzed using structural equations model method (SEM).

The research result of the structural equations model estimation showed that natural resources (SDA) which is the height of water volume/ha, the width of irrigated land and the length of farm roads does not have significant influence on the increase of paddy farmers' income. And through the main activities of agribusiness, it gives significant influence on the the increase of paddy farmers' income.

Keywords: Natural resources, Farmer's Income and Regional Development.

1. INTRODUCTION

According to Zen (1980) development of the region depends primarily on three main elements, namely: 1. availability of natural resources, 2. Ability of human resources and 3. the use of technology. The agricultural sector that utilizes natural resources other than as a provider of food is also expected to contribute significantly to the income growth of public society and to the national economy. Improving the living standard is obtained by farmers by increasing the incomeof farmers. Income indicates the amount of the payments received by a person or household for a certain period.Income is derived from the acceptance of labor wage, the income from wealth such as rent, interest, dividends and transfer payments or receipts of the government's social security or unemployment insurance (Samuelson and Nordhaus, 1997).

According to Hadi (2004) the threat of decline in rice production in Indonesia is getting serious because farmers began to leave the crop staples and they switched to oil plantation and palm oil. The use of a layout in rice crops irrigated land for five years according to BPS from 2008 to 2012 in Serdang Bedagai showed that every year there is a conversion of rice crops irrigated land which keeps reducing, then resulting in reduced rice production and income. Furthermore, this description will lead to the problem formulation. Is there any influence of natural resources (SDA) which is the height of water volume/ha, the width of irrigated land and the length of farm roads, directly and through the main activities of agribusiness in regional development to increase the income of farmers?

2. REVIEW OF LITERATURE

2.1. Regional Development

The purpose of regional development contains two sides that are interrelated. Social side of economic development is an effort to provide welfare of region's quality of life, such as creating production centers, providing infrastructure and logistics services. On the other hand, the ecological development of the region also aims to maintain the balance of the environment as a result of human intervention on the environment (Triutomo, 2001).

According to Sukirno (2001) when viewed from the aspect of economy, regional development can be defined as a process which causes the increasing of public income in the long term. From such understanding, it can be seen economic development has characteristics, such as:

a) As a process, it means that the changes occur continuously.

b) Efforts to increase the level of public income, and

c) The increase in income is set to continue for a long term.

Regional development target for long-term is economic growth and social welfare improvement (Tarmizi, *et al*, 2017). With the target, a scenario was designed so the shortcomings encountered can be pursued through the utilization of resources, the problem when speaking in the context of regional development in Indonesia emerged, problems such as deficiencies of the technology for the processing of abundant resources. At the same time, the population as human resources is more directed to social dimention. The social dimension is important. Every society has a certain pattern to respond to the results of the technology (Sasmojo, 2001).

According to Zen (1980) the development of Indonesia in the next two or three decades will largely depend on its ability to direct the three main elements, such as (1) the availability of natural resources, (2) the ability of human resources, and (3) the use of technology, all of which should be devoted primarily to the welfare of society. The relationship of these three elements can be seen in Figure 1.

2.2. Natural Resources (SDA) on Regional Development

2.2.1. The Height of Water Volume/Ha

The availability of water in Indonesia tends to decrease along with the increasing population and increasing standard of living. Allocation of water which is mostly used for irrigation will increasingly compete with

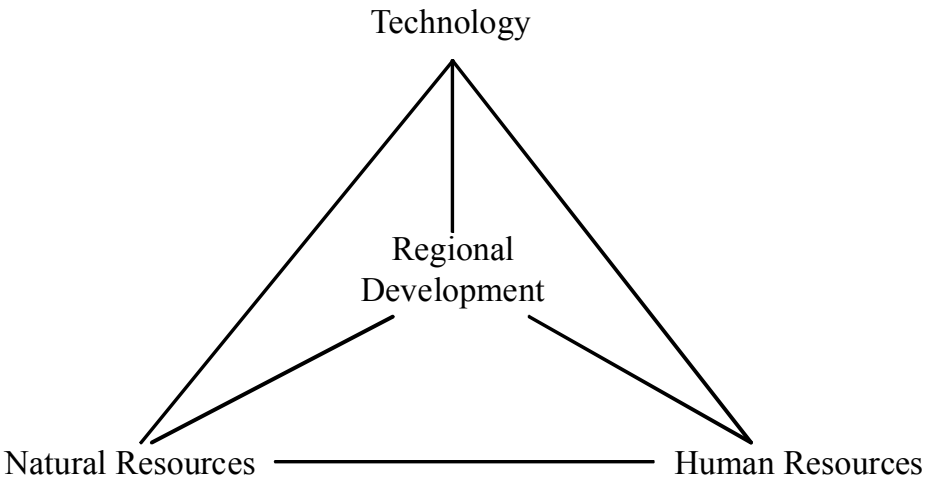

Figure 1: Three Pillars of Cantilever of Regional Development Studies

the use of water for non-agricultural sectors that are growing rapidly and which are the potential for future conflict (Sayaka and Efendi, 1996).

The water used to irrigate the fields comes from sources that have been determined by the authorities (Department of Irrigation and Department of Agriculture) with the water flow that is not heavy. Stagnant water at the desired height can help the growth of rice plants prevalently on the rice fields (Action Agriculture Doubleday, 1990). According Sumaryanto (2006) irrigation water is a strategic agricultural resource. Unlike the other inputs such as fertilizer and pesticides whose dimensional role is relatively limited in the production process that has been selected, the role of irrigation water has broader dimension. These resources not only influence the productivity but also influence the spectrum utilization of agricultural commodities.

Water potential in our country comes from rainfall and can be utilized only about 15-35 percent. The effective use of water can be enhanced through the creation of large reservoirs. Irrigation water requirement can also be fulfilled by utilizing ground water. Nevertheless irrigation from ground water is only about 2-3 percent of its total.The role of irrigation to support agriculture is mainly directed to maintain self-sufficiency in staple foods. These activities can increase the technical irrigated land, semi-technical and simple one which in turn increase the harvested area and production of rice (Sayaka and Efendi, 1996).

2.2.2. The Width of Irrigated Farming Land

The potential development of wetland area in North Sumatra is quite broad, so support for the broad expansion of paddy field for 4 years is capable of generating vast area of 4302.5 hectares of paddy fields with details in 2008, 365 ha of area was covered; in 2009 287.5 hectares of area was covered; in 2010, 450 hectares of area was covered; and in 2011 3,200 Ha of area was covered. Starting from 2008 until 2011 the expansion of paddy fields has been implemented, therefore many new fields were formed covering 4302.5 hectares of an area with productivity 3 tons/ha so that the benefits of expansion activity of rice area in the form of the increasin of rice production (North Sumatra Provincial Agriculture Office, 2011).

Cultivated land is strongly linked to paddy farmers'income and it has significant and positive influence on farmers' income. It is necessary that the management of paddy fields is done with the agricultural

cultivation technology that takes into account an nvironmentally friendly way (the use of organic fertilizer) so that the potential of soil fertility is maintained and balanced, and the efficiency of the management of the cultivated land in increasing farmers' income can be achieved and sustained (Sutrisno, 2009). According Cahyono, et al, (2002) the the width of land tenure influences the income of farmers, especially smallholders, while comprehensive landowners have started to not depend on the land. Smallholders try to avoid risk by diversifying their farm and it is different from those performed by comprehensive landowners who tend to use the land on dry land.

The relation between the agribusiness of paddy and the regional development of natural resources is that the width of irrigated land, where the farming land, where the plan as a growing medium certainly has the width of orrigated land by hectares. The wider the irrigated land for paddy field, the higher the production which will be harvested. Therefore, there is an influence on the increasing of production and the farmer's income.

2.2.3. Width of Farm Road

Farm roadis the transportation infrastructure in the agricultural area to facilitate the mobility of agricultural machinery, transport of inputs to the agricultural land and transport of agricultural products from the land to the temporary place of collection (Directorate General of Infrastructure Ministry of Agriculture (a), 2011). The use of shared resources is an integral part of the social order, so that people cannot manifest their freedom to the fullest, regarding the understanding of freedom and the control of the use of public space called spatial rights (Natalivan, 2007).

The farm road in Technical Guidelines of Farm road Development is a transport infrastructure in the area of agriculture in order to facilitate the transport of the production facilities, production yield and mobility of agricultural machinery. The purpose of making farm road is to accelerate the transportation of production facilities and agricultural machinery from residential areas to farmland and accelerate the transport of agricultural products from the fields of business to the processing and marketing centers (Ruauw, *et al.*, 2010).

The geographical distribution between spatial as well as the capacity and location of transportation facilities is combined together to get the volume and pattern of traffic flow. The transportation network will have feedback effect on the new layout and the increasing of transportation facilities is needed (Tamin, 2007). Construction of farm roads in the form of compacted soil deposits of certain size has been set in the planning (design). To strengthen the construction, *siring* construction (retaining wall) of wood or bamboo on both sides could be done. As a complementary building, farm road is a bridge in the form of wood or permanent masonry/concrete construction (Directorate General of Infrastructure Ministry of Agriculture (a), 2011).

2.3. Income

In its operation, farming business aims to obtain income used for fulfilling the needs and fund for activities outside of farming business. To obtain the expected level of income, farmers should consider the price of production. Perform calculations on all elements of cost and determining the cost of farming results cannot be done by farmers alone. Therefore, the effectivity of farming business gets lower (Hernanto, 1993).

Maryatmo and Susilo (1996) stated that income is the sum of all money received by the family or a person over a certain period which is usually in one year. From above explanation, it can be concluded that public income is the sum of all receipts received by the public in one particular year, either from agricultural production or from industrial production and trade as well as from other sectors. Along with that, Soekartawi (1995) declared that farm income is the difference between income and expenditure in the farming. Income is strongly influenced by the amount of production sold by farmers so that the more the number, the higher the production of the income.

2.4. Conceptual Framework of Research

Regional development is an act of developing the area/building area or region in the attempt to improve the welfare of the society life. The targets must be translated into the national development framework and the Republic of Indonesia whose aims are to achieve rapid growth in per capita income, provide enough employment opportunities, generate the income, reduce the difference between the level of income, wealth, and the ability in inter-regional development, and establish the economic structure so it will not be biased (Hadjisaroso, 1994).

In the endeavor to increase the income of the farmers on the regional development, it will upgrade the extra value for their farming so their income will increase as well. To analyze the infleunce of regional development in natural resources, the research variables are the total of water volume/ha, the width of irrigated farming land and the length of farm road towards the increase of farmers' income. In this research, it will be analyzed using SEM (Structural Equation Modeling) model which is a statistical method using hyphothesis testing or what is known as Confirmatory. This program applied AMOS 19 (Analysis of Moment Structure).

2.5. Hyphothesis

There is positive significant influence on natural resources consisting of the height of water Volume/Ha, the width of irrigated farming land and the length of farm road through agribusiness main activitiy in regional development towards the increase of farmers' income.

3. RESEARCH METHOD

To analyze the positive significant influence on natural resources directly is in the height of water volume/ha, the width of irrigated farming land and the length of farm road through agribusiness main activitiy in farming such as production cost, width of harvest, and price of the unhulled rice towards the increase of farmers' income.This research was analyzed using SEM Model = Structural Equation Modelling which is a statistical method of Moment Structure).

3.1. Structural Measurement Equations and Specifications

The influence of natural resource factor on the regional development towards the farmers' income in Serdang Berdagai, North Sumatra can be described in this equation:

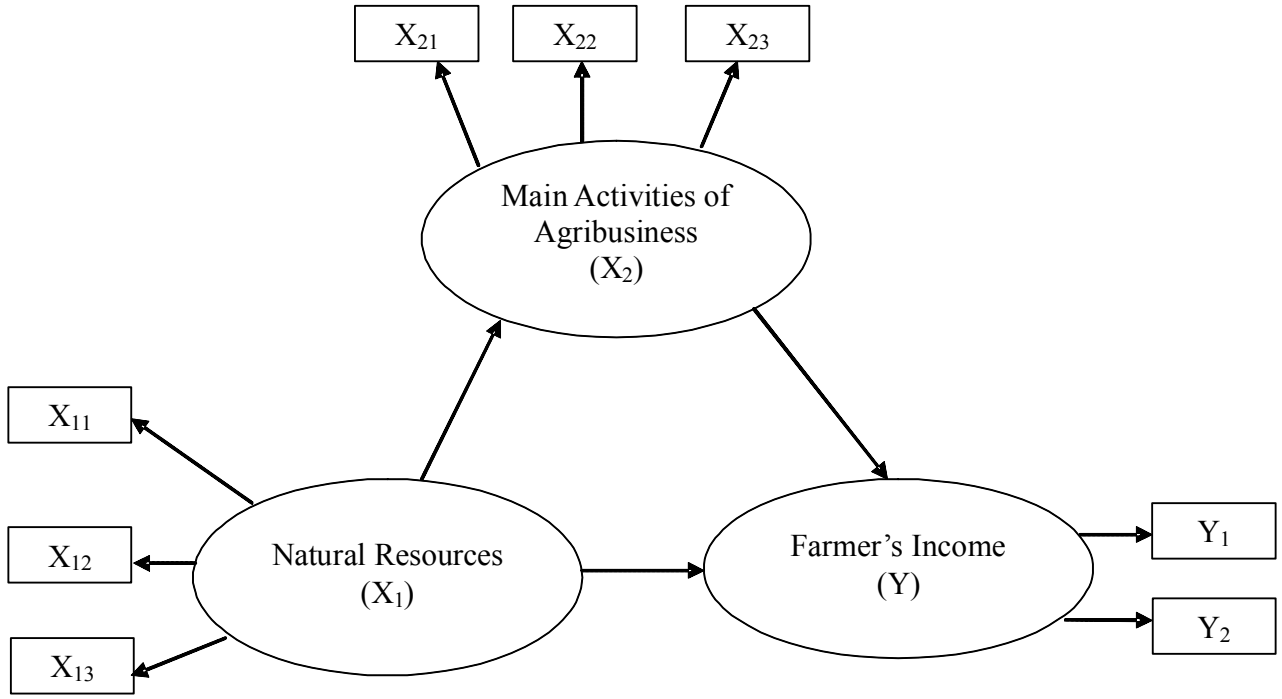

Figure 2. There is positive significant influence on natural resources directly and through agribusiness main activitiy in regional development towards the increase of farmers' income

3.1.1. Structural Measurement Equation

3.1.2. Equation for Exogenous Variables Measurement:

1. Natural resources (X_1), consist of the height of water volume(X_{11}), the width of irrigated land (X_{12}) dan the length of farm road (X_{13})

$$X_{11} = \lambda_{=11}\, \eta_{11} + e_1$$
$$X_{12} = \lambda_{=12}\, \eta_{12} + e_2$$
$$X_{13} = \lambda_{=13}\, \eta_{13} + e_3$$

3.1.3. Equation for Endogenous Variables Measurement

1. The main activity of farming agribusiness (X_2) consistes of production cost (X_{21}), harvest width (X_{22}) dan price of unhulled rice (X_{23})

$$X_{21} = \lambda_{=11}\, \eta_1 + e_1$$
$$X_{22} = \lambda_{21}\, \eta_1 + e_2$$
$$X_{23} = \lambda_{31}\, \eta_1 + e_3$$

2. Farmers' income (Y) consists of production (Y_1) and land productivity (Y_2)

$$y_1 = \lambda_{4\cdot 2}\, \acute{\eta}_2 + \varepsilon_4$$

$$y_2 = \lambda_{5,2}\, \acute{\eta}_2 + \varepsilon_5$$

3.2. Measurement Model Specification for Each of the Constructs/Latent Variables

The analysis of confirmatory factor for measurement model can generate coefficience called as loading standard or lambda value (λ). Lambda value is used to assess the compatibility, suitability, or uni-dimensionality of the instruments in forming a factor.

3.3. Evaluation Test of Structural Model Assumption

3.3.1. Evaluation of Data Normality

Evalution of normality can be used by criteria of critical ration skewness value for ± 2,58 on the signifance level of 0.01. The distribution is normal if the critical ratio skewness value is under the absolute price of 2.58. Normality can be tested by looking at picture of hystogram data or it can be teste using statistical test, by observeing Skewness value and kurtosis. To test the normality, Z-value will be used as being generated from this formula:

$$Nilai - z = \frac{Skewness}{\sqrt{\frac{6}{N}}}$$

Notes :

N = Sample Size

If the value obtained is Z >, it is suspected that the distribution is not normal. The critical value can be obtained based on expected signifance level, for example the critical value is ± 2,58 (signifance level is 0.01 (1%) which means that we can refuse the assumption of normality of probability level (Hair *et al,* 1998).

3.3.2. Evaluation of Outliers

Outliers test is conducted to remove the extreme values on observation result. If there is any outliers, the concerned data will be taken out of futher calculation. In *multivariate* analysis, outliers can be tested by comparing the mahalanobis distance squared value with the X^2- table on certain amount, and the level of p is < 0,001 (Hair *at al,* 1998 and Muda *et al*, 2016; 2017). The criteria used are based on Chi-Square value on significant level p > 0.001. The mahalanobis distance value of X_2 (34,0001) = 66,25. It means that every case has bigger mahalanobis distance from 66.25 is the multivariate outliers.

3.3.3. Evaluation of Multicollinearity

The small determinant is or the one closed to 0 would indicate multicollinearity or singularity, so that the data can not be used for research. The multicollinearity can be seen through determinant of covariance matrix.

3.3.4. Evaluation of Residual value

The essence of SEM is the suitability between *restricted covariance matrix* [" (0)] and covariance matrix sample (S). The difference of those two values is reflected in the value of residual covariance matrix. Amos 19 provides output of unstandardized and standardized residual value. Standardized residual value is fitted residual value divided by standard error, therefore, it is the analog of Z value. The value of standardized residual is > 2.58 (Ghozali, 2008).

3.4. Suitability Test and Model Statistic Test

Table 1
Goodnest of fit Test

No.	*Goodness of Fit Index*	*Information*	*Cut-of Point*
1	X^2- Chi Square	Chi-square value that was relatively high to the degree of freedom shows that the covariance or correlation matrix observed with the predicted one was significantly different and it indicates that input covariance matrix between predictions with actual observations did not differ significantly.	
2	Probability	Significance test to the difference in the covariance matrix of data with the estimated covariance matrix	≤ 0,05
3	RMSEA (the Root Mean Square Error of Approximation)	A measure which is trying to improve the chi-square statistic tendency to reject a model with a large number of samples. RMSEA empirical test result was suitable for the confirmatory test models or competing strategy model with large sample size	0,05 0,08
4	GFI (good of fit index)	It is a measure of non-statistical value ranging from 0 (poor fit) to 1.0 (perfect fit). High GFI value indicates a better fit and how the value of GFI can be accepted as a decent value has no standard yet, but many researchers recommend a value of over 90% as a measure of good fit.	0 1,0 or> 0,90
5	AGFI (Adjusted Goodness of fit indices)	It is the development of GFI adjusted ratio degree of freedom for the proposed model with a degree of freedom to null models	≥ 0,90
6	CMIN/DF (the minimum sample discrepancy function)	It is chi-square value divided by the degree of freedom. Some authors suggest to use this size ratio to measure fit. Value ratio of 5 or less than 5 is a reasonable size. Other researchers propose that this ratio value <2 be a fit size.	≤ 5 or< 2
7	TLI (tuckler lewis index)	It was first proposed as a means to evaluate the factor analysis, but now developed to SEM. Thissize combines the parsimony size into the index comparison between the proposed model and the null model and the TLI values ranging from 0 to 1.0. TLI recommended value is equal to or> 0.90.	0 1,0 or> 0,90
8	CFI (comperative fit index)	The test of model feasibility that is not sensitive to sample size and complexity of the model	≤ 0,94

Source: Ghozali (2008), Sirojuzilam, *et al* (2016) and Tarmizi, *et al* (2016).

After the model is estimated, the residual must be small or close to zero and the frequency distribution of the residual covariance must be symmetric. In this content, residual is not the residual of the score as in other multivariant modeling, but a residual of covariance. The frequency distribution of residual asymmetric is a signal on a a poorly fitting model and it is shown in the estimation process. When the model has been accepted, the investigator could consider doing modification model to improve theoretical explanation or goodness-of-fit. Modification of the initial model should be done after much deliberation assessed. If the model is modified, the model must be cross-vilidated (estimated by a separate data) before the modified model is accepted.

The model measurement can be performed with modification indices. The value of modification indices is equal to the decline of Chi-squares if the coefficient is estimated. The value equal to or > 3.84 indicates that there has been a decline in chi-squares significantly. Indication of the mis fit model can be seen from the modification index (MI) that can be conceptualized as chi-square statistics (X2) with a degree of freedom = 1. Specifically, it is for every determined parameter. Amos provides MI which is X^2 statistic value which will be reduced if the parameter is in covariance. It should be considered that in the covariance, error must correcttheoretically and logically, without the model theoretical base, it will not do any good. If the researcher decided to estimate the model, the analysis will not be called as confirmatory analysis, but exploratory analysis. The confirmatory analysis will stop after the proposed hypothesis is refused or not be able to be refused (Ghozali, 2008).

3.5. Hypothesis Testing and Causal Relationships

The direct influence is observed on the standardized regression weights, with significance testing comparative value of CR (Critical Ratio) which is equal to the t-calculate value and t-table, if t-calculate is bigger than t-table,it will be significant (Muda, *et al*, 2016). From the output of Amos 4.01 program, causal relationships between variables will be observed by looking at the direct, indirect total influences.

4. RESEARCH RESULT

4.1. Equation of Structural and Specification Measurement

4.1.1. Equation of Structural Measurement

$$\eta = \eta_{x1}\, \xi_{x1} + \gamma_{x2}\, \xi_{x2} + \zeta$$

4.1.2. Equation of Exogenous Variable Measurement.

1. Natural resources (X_1), consist of the height of water volume (X_{11}), the width of irrigated land (X_{12}) and the length of farm road (X_{13})

$$X_{11} = \lambda_{1.1}\, \zeta\, 1 + \delta 1$$

$$X_{12} = \lambda_{2.1}\, \zeta\, 1 + \delta 2$$

$$X_{13} = \lambda_{3.1}\, \zeta\, 1 + \delta 3$$

4.1.3. Equation of Endogeous Variable Measurement.

1. The main activity of farming agribusiness (X_2) consists of production cost (X_{21}), width of harvest (X_{22}) and price of unhulled rice (X_{23}) .

$$X_{21} = \lambda_{1.1}\, \acute{\eta}_1 + \varepsilon_1$$
$$X_{22} = \lambda_{2.1}\, \acute{\eta}_1 + \varepsilon_2$$
$$X_{23} = \lambda_{3.1}\, \acute{\eta}_1 + \varepsilon_3$$

2. Farmers' income (Y) consists of production (Y_1) and land productivity (Y_2)

$$y_1 = \lambda_{4.2}\, \acute{\eta}_2 + \varepsilon_4$$
$$y_2 = \lambda_{5.2}\, \acute{\eta}_2 + \varepsilon_5$$

The model analysis of this line can be written in mathematical/structural equation as follows:

Notes:

λ = Standard loading = coefficient which shows the influence

δ = Measurement error of exogenous variable (free variable)

ε = Measurement error of endogenous variable (bound variable)

can be stated in this structural equation :

$$\acute{\eta}1 : \gamma 1.1\ \zeta 1 + \gamma 1.2\ \zeta 2 + \gamma 1.3\ \zeta 3 + \gamma 1.5\ \zeta 5 + \varsigma 1 \qquad (2.1)$$

$$\acute{\eta}1 : 0{,}767 + 0{,}213 + -0{,}025 + 0{,}002 + 0{,}000 + \varsigma 1 \qquad (2.1)$$

$$\acute{\eta}2 : \gamma 2.1\ \zeta 1 + \gamma 2.2\ \zeta 2 + \gamma 3.3\ \zeta 3 + \gamma 4.5\ \zeta 5 + \beta 2.1\acute{\eta}1 + \varsigma 2 \qquad (2.2)$$

$$\acute{\eta}2 : 0{,}280 + 0{,}686 + -0{,}274 + 0{,}023 + 0{,}103 + - 0{,}146 + \varsigma 2 \qquad (2.2)$$

Notes:

$X_{11}\ X_{12}$	=	Natural resources variables
$X_{21}\ X_{23}$	=	Main activity of farming agribusiness
$Y_1\ Y_2$	=	Varible of farmers' income
λ (lambda)	=	The amount of influence for exogenous variable on endogenous variables
ζ (Zeta)	=	Regression Residual value
ς (sigma)	=	The amount of error vector in structural relation among among variables

4.2. Specification of Measurement Model for Each of the Constructs/Latent variables

Confirmatory factor analysis for the measurement model will be produced by a coefficient so-called standard loading or lambda value (λ). The lambda value is used to assess the compatibility, suitability, or uni-dimensionality of instruments in forming a factor.

The Result of Regression Weight

The output apperance of Regression Weight on Estimate part shows the covariance between latent variable and its indicator. If the probability value is (P)<0.1, H_0 is rejected and H_a is accepted. On P coloumn, it is

presented that P value is ***. This indicates that P number is far below 0.1. Therefore H_a is accepted and H_0 is rejected. The loading factor (estimate coloumn) shows estimation above 0.5. This means that all indicates can explain that the constructs exist. Techonology has positive influence on main activity of farming agribusiness. This is shown by the estimate value of 0.539.

Each indicates shows the estimate value above 0.5 and below 0.5. Furthermore, p is >0.1 and <0.1. This indicates that each indicator which is from X_{11} until X_{12} has positive and significant influence on technology. Moreover, techonology (X_1) has significant positive influence on the income through main activity of farming agribusiness with the estimate value of 1.618 and it has no significant positive influence on the indicators which are from X_{11}until $X_{12}$with the estimate value is unsignificantly positive.

4.3. The Evaluation Testing of Structural Model Assumption

4.3.1. Evaluation Result of Normality Data

There are two major parts of above output related to normality test data. First can be looked from the value of c.r skewness and second can be seen from the value of c.r kurtosis. Distribution is called normal if the data does not deviate to the right or left (called symmetric with the value of skewness is 0), and it has an ideal kurtosis (kurtosis number is 0). However, the ideal number is hard to get in practice, so a datum will be called normal if the number or c.r. skewness and the number of c.r. kurtosis are between -2.58 until +2.58. If looking as a whole, the c.r skewness and c.r kurtosis value from X_1until X_{30} is between -2.58 until +2.58. The multivariate number is also between -2.58 until +2.58 which is the average of 2.223. This means the data can be called normal.

4.3.2. The Evalution Result of Outliers.

The numbers in the outlier evaluation table shows how far the distance of a a datum from certain central point. A datum can be said as having outlier if it has p1 and p2 numbers which are less than 0.1. The distance *mahalanobis* value is (34,0.0001) = 66.25. In outlier evaluation table the p1 and p2 numbers are above 0.1, which means that there is no outlier in the data.

4.3.3. The Result of Multicollinearity Evaluation

Multicolinearity is viewable through matrixs determinant of covariance. Determinant value highly indicates the presence of multicollinearity or singularity problem, so that the data can not be used for research. AMOS output results provide determinant value of the covariance matrix sample = 171.685 so that it can be concluded that there are no issues of multicolinearity and singularity on the analyzed data.

4.3.4. The Result of Residual Value Evalution

Tests on residual values indicates that significantly the model can be accepted and the determined residual value is at -2.58 to +2.58. The residual standardwas processed using AMOS program, so the conclusion is that the data used in this study can be accepted significantly due to its residual value of -2.58 to +2.58.AMOS output results show the output of unstandarized and standarized residual value. Nevertheless, fitted residuals depends on the unit of measurement. Standarized residual value is fitted residual value divided by the

standard error. Thus analogous to the Z score value is >2.58. From the results of error standartized value, it can be said that the residual value (in the annex) is in a good value that is> 2.58.

4.4. The Result of Suitability Test and Model Statistic Test

Table 2
Goodnest of fit Test Result

Goodness of Fit Index	*Cut off Value*	*Analysis Result*	*Model Evaluation*
X2-Chi Square	*Expected in low*	323,701	*Good*
Significance Probability	≥ 0,05	0,000	Good
RMSEA	≤ 0,08	0,0137	Good
GFI Good	≥ 0,90		0,000
AGFI	≥ 0,90	0,000	Good
CMIN/DF	≤ 5,00	2,829	Good
TLI	≥ 0,95	0,717	Less Good
CFI	*≥ 0,90*	*0,813*	*Less Good*

Looked from the result in Table 2, the result of absolute suitability test obtains the ratio or X2-Chi Square value = **323.701** so it is said that the model is good, with the significance value = **0.000**, so the model is also good, the RMSEA value = **0.0137** which means that the model is good, the GFI value = **0.000** showing that the model is good, AGFI value = **0.000** so the model is good, TLI value = **0.717** indicating that the model is marginal fit, the CFI value = **0.813** meaning that the model is marginal fit. HOELTER has value of 43, less than 200, which indicates that the model fits the existing data.

4.5. The Result of Hypothesis Test 6. Analyzing the Influence of Natural Resources Directly and Through the Main Activity of Agribusiness in the Regional Development on the Increasing of Farmers' Income

Table 3
Hypothesis

Influence / Relationship	*Value*	*Positive*	*Significant*
The influence of natural resources directly on the income increase	0,330	Positive	No
The influence of natural resources through the main activitiy of agribusiness in the regional development on the increase of the income	0,330 + 1,214 = 1,544	Positive	***

Looked from the result at Table 3, the direct influence of natural resources consists of height of water volume/ha, the width of irrigated land, the length of farm roads in the regional development towards the increasing of farmers' income has positive value, but not significant, of 0.330 with the assumption that if it can increase the farmers'income to Rp 10.000, it will increase the farmers' income as much as Rp 330,-

and through the main activity of farming agribusiness in the regional development towards the increase of farmers' income is significantly positive which is 1.544 with the assumption that if the farmers' income increases to Rp 10.000, it will increase the farmers' income as much as Rp. 1.544,-

4.5.1. The Result of Hypothesis Testing

The hypothesis of natural resources (X_6) has positive influence, but not significant, towards the increase of income (Y) directly with 0.330 value through the main activity of farming agribusiness (X_2) which has positive significant infleunce with the 1.544 of value and the result of above variance is 0.5. The next is natural resources (X_1) so the hypothesis is accepted that the natural resources has positive significant influence on the income through the main activity of farming agribusiness (X_4).

4.5.2. Direct Influence, Indirect Influence and Total Influence

4.5.2.1. Direct Influence

$X_1 \longrightarrow X_2 = 0{,}210$

The direct relation of natural resources towards the main activity of agribusiness in farming can increase the income to 0.210.

4.5.2.2. Indirect Influence

$X_1 \longrightarrow X_2 \longrightarrow -0{,}255$

The indirect relation of natural resources towards the main activity of agribusiness in farming can increase the income to -0.255.

4.5.2.3. Total Influence = Direct Infleunce + Indirect Influence

0,465 = 0,210 + - 0,255

The direct infleunce of natural resource relationship is added by the indirect influence of natural resources with the total influence of 0.465.

4.6. Discussion of Research Result

The research result shows that the amount of influence can be seen in Table 5.81 that the natural resources has direct influence consisting of the height of water volume/ha, the width of irrigated land, the length of farm roads towards the increase of farmers' income has positive value but not significant, which is 0.330 with the assumption that if it can increase the farmers' income to Rp 10.000, it will increase the farmers' income as much as Rp 330,- and through the main activity of agribusiness towards the increase of farmers' income is significantly positive which is 1.544 with the assumption that if the farmers' income increases to Rp 10.000, it will increase the farmers' income as much as Rp. 1.544,-

This is supported by Hayati (2013) that 0.25 and -2.5 cm flooding did not influence the growth of plant height, number of tillers, grain yield and yield components. The average productivity of rice for Ciherang variant in each flooding treatment ranging from 6.6 tons/ha to 6.9 tonnes/ha. Soil water availability

for plant growth are fulfilled indicated by soil moisture before irrigation which was not significantly different for all flooding treatments. -2.5 flooding can be applied in rice cultivation. Along with Chapagain and Eiji Yamaji (2010), by using the irrigation method of AWDI (Alternate Wet and Dry Irrigation) it will minimalize the use or irrigation water for 28% without influencing the grain production yield.

It is also supported by Rajagukguk (2011) that there was significant differene between productiviy and farmers' income before and after the construction of irrigation net. The productivity and income after the construction of irrigation is higher than before the constructin of irrigation net.

Furthermore, according to Damayanti (2013), the income of farming was influenced by the width of land, seed price, urea fertilizer prices, fertilizer prices Phonska, prices of pesticides, farmer education, labor and irrigation, where irrigation can increase farm income by 1.44%. According to Datta, et al (2014) the impact of irrigation to the increasing crop production and income caused the decreasing economic inequality that occurred in the study area. And the construction of irrigation can have an impact on the economic, social and environmental sustainability. The relation of agribusiness to natural resources is from the farm road. Where farmers as managers of farming would require a good farm road and farm roadsoil is teeming with units of m. To facilitate the mobility of agricultural machinery and farm production yielf from and into farmland, to facilitate the movement from the house to farmland and from farm to the market, their products are easily and smoothly transported, certainly the farm road should be good.

In this case if farm road does not get better, such as the width of footpaths, damaged and not compacted roads, smooth transportation of farmers in working and transporting production facilities from the farmer's house to farmland and transporting the production yield from farmland to the market will be disturbed. If the farm roads are damaged there will be many products being transported falling on the street due to vehicle shocks and delays in the production to destination, so there will be no effect for the increasing of production and income for farmers.

It is supported by KMK, Rejang Lebong (2011) who said that the construction of farm roas will reduce the freight of farm yield. Prior to farm roads, the local people transported the harvest yield through the path that can only be traversed by human. Freight for a sack of rice could reach Rp 5,000/sack, just reaching the edge of a large road, then it will require further freight using public transport (motorcycle/ rural transport) to the house. After the road is constructed freight of transporting farm crop can be suppressed or reduced to Rp. 4,000/sack. This means that the freight is only Rp 1,000/sack.

The constructin of farm road serves ± 300 Ha of field with the number of ownership reaches 275 households. Therefore, the local people approximately have ± 1.09 Ha. The average of 1 ha of field generates 60 sacks of grain, so the freight can be saved by every farmer family. The freight prior to the construction of farm road was Rp 5.000 X 60 sacks = Rp 300.000. The freight after the constructin of farm road is Rp 1.000 X 60 sacks = Rp 60.000. Therefore, the freight can be saved up to Rp 240.000/ household. If in one year, paddy can be planted twice, the additional profit for each household will get to Rp 480.000. In other words, each household of farmer family will get the additional profit of Rp 480.00/ year.

Along with Ruauw, *et al.* (2010), the benefit of farm roads for the farmers can be seen from the farmers' income before and after the farm roads, which gets increasing. In this case, before the farm road, the incomr of farmer/ha from cabbage and carrot farm was Rp. 11.155.566 and the income of farmer/ha

after the farm road from those two branches of farming increases to Rp. 12.062.334 or there is an increase for 8.13%. The increasing of the income is due to the reduction of freight after the farm road constructed.

Based on this finding result, it can declared that the direct influence of natural resources and through the main activity of farming agribusiness in the regional development towards the increasing of farmers' income needs to be done along with the endeavor to increase the farmers' income in the regional development in Serdang Bedagai regency, North Sumatra Province.

5. CONCLUSION AND SUGGESTION

5.1. Conclusion

Natural resources like the height of water volume/ha, the width of irrigated land, the length of farm road does not indirectly influence significantly on the increasing of farmers' income. And through the main activity of agribusiness, it significantly influences the increasing of farmer's income.

5.2. Suggestions

Based on the conclusion of the research result, either in practical need or academical need, some suggestion can be explained as follows:

The farmers are expected not to be extravagant in the use of water. The regency government and the P3A organization administrator are expected to understand the importance of water, so the height of water volume/Ha in their field can be maintained. The government should make their regional regulation procted from the land conversion because the irrigation cost is quite expensive if the irrigation water can not be used for irrigating the field. The farm road must be constructed to facilitate the transportation of harvest yield. For the farmers whose field is requested to be turned into farm road, it is expected that they can let their land for the construction of farm road, so their land sale value will be increased as well.

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