Analysis of Effect Socio-economic Factors on Integrated Farming System based on Paddy Rice and Regional Development in Parlilitan District Humbang Hasundutan Regency

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Abstract :The aim of research to analyze the effect of socio-economic factors on integrated farming system based on paddy rice and regional development in Parlilitan District. The method of researh is Structural Equation Modeling (SEM) with IBM® SPSS® Amos 22 software. The result of research are; a) Socio-economic factors have a positive and significant impact on integrated farming system based on paddy rice, with path coefficient 0,54 (CR 5,487> 1,96, p (***) <0.01), b) Socio-economic factors have positive and significant impact to regional development with path coefisien is 0,64 (CR 4,4614 > 1,96 and *p (***)* < 0.01), c) Variables of education, farm experience, social capital, venture capital, input prices and output prices are predictors of socio-economic factors that contribute to farmers' perceptions of integrated farming systems and regional development, a statistically significant with standardized regression weight (*p*) of each indicator, *p* <0.01, d) Direct effect of socio-economic factors to regional development in Parlilitan District is 0,64, while indirect effect of socio-economic factors on development regional through integrated farming system is 0.34, the meaning is that socio-economic factors positively and significant to development regional through integrated farming systems, e) Increasing of predictors socio-economic factor is dominant factor to determine the success of integrated farming systems will be able to increase the development regional. Variable of farmer education, farmer experience, capital venture are predictors of socio-economic factors is important role in eradicating rural poverty as one indicator of regional development.

1 INTRODUCTION

1.1 Background

Agricultural development is very important for national development. The development of agriculture in Indonesia has an important role, where: the large and diverse natural resource potential, the substantial share of national income, the large share of national exports, the size of Indonesia's dependent population on this sector, its role in the provision of community food and growth base in the countryside.

The goals of national development include several aspects, namely economic growth, equitable distribution of community income and employment opportunities and the preservation of potential resources. The success of development in Indonesia requires cooperation and support from various parties and the role of each sector. One sector that is expected to support economic development goals is the agriculture sector.

In the development of a region required proper planning because with proper planning will lead the development on a goal to be achieved and a positive impact on the area itself. Proper planning is a plan that is built on the potential or superiority of the area itself. The concept of regional planning is a continuation of the planning activities carried out because of differences in interests, issues, characteristics and potential of each region / region that requires the intervention of the government at the regional level.

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Based on statistical data Humbang Hasundutan (2012), convey the agricultural sector has a large contribution to GRDP Humbang Hasundutan Regency, namely; 60.61% (2007), 60.11% (2008), 59.08% (2009), 58.01% (2010), 57.85% (2011). Agriculture is also a sector with the greatest growth source to the total economic growth of Humbang Hasundutan Regency in 2007-2011. The increasing contribution of the agricultural sector to total GDP growth was supported by increased production of all subsectors (except for the forestry sub-sector in 2007). Agricultural sector in Humbang Hasundutn Regency such as food crops (rice, corn, sweet potato and cassava), vegetables (potato, cabbage, carrot and chilli), fruits (citrus, banana), plantation crops, palm oil, chocolate, coffee and incense).

Future agricultural development should be an effort to improve the welfare of farmers, and able to encourage the realization of regional economic development through various productive activities and high competitive. So farmers as the smallest agribusiness unit achieve a rational added value according to the scale of its farming (integrated farming system).

Agus (2006); Ugwumba (2010), said the integrated farming system (IFS) can improve the productivity of rice farming and can increase farmers' income. Rice production may increase from 5-6 ton/ ha to 7.6-8 ton/ ha. The productivity of chili can be increased from 0.5 kg / plant to 0.7 kg/ plant (Nurcholis, 2011), even integrated farming system (IFS) more reliable if the constituent components are local resources (Salikin, 2003).

Sutanto (2002); Supangkat (2009) stated that integrated farming system (IFS) has the advantage of both ecological and economic aspects, namely adaptive to habitat changes, eco-friendly farming, energy saving, high biodiversity, higher product diversification, healthier products, better labor absorption and sustainable.

The advantages of this system, external inputs are minimal because of the waste cycle among their constituent organisms, biodiversity increases with the use of local resources, crop resistance to higher pest organisms and byproducts can serve as biogas fuel for households (Rodriguez and Preston 1997; Preston, 2000).

Parlilitan District is one of the region in Humbang Hasundutan Regency with potential for the development of paddy rice farming spread over 20 villages. In 2013 the widest paddy rice is located in Simaninggir Village covering an area of 237 ha with production of 1,864 tons, with an average production of 7.86 tons/ ha (BPS, Kecamatan Parlilitan Dalam Angka, 2015). The average production of paddy rice commodity in this Parlilitan District is higher when compared to productivity of paddy rice of Humbang Hasundutan Regency.

In 2014 recorded area of paddy rice in Parlilitan District is 2,791 ha with average production 5,89 ton/ha a bigger than with productivity of paddy rice of Humbang Hasundutan Regency that is 5,27 ton/ha, so it needed more comprehensive agriculture development according to the potential and condition of this agro-ecology region in order to increase the income of farmers in this region, thus this research with title the analysis of effect socio-economic factors to integrated farming system base on paddy rice and regional development in Parlilitan District of Humbang Hasundutan Regency.

1.2 Research Purposes

Based on the background description, the purpose of this study is to analyze the influence of socio-economic factors on integrated farming systems based on paddy rice and regional development in the District of Parlilitan Humbang Hasundutan Regency.

2 RESEARCH METHODS

2.1 Research Sites

The location of this research is Parlilitan District of Humbang Hasundutan Regency, determined purposively. The region is a very potential area for the development of the agricultural sector in the framework of regional development. The population in this study are farmers who cultivate the paddy rice and livestock business on integrated scale in 20 villages with population 468 family head. The sample was determined using Slovin formula;
Where; nc = sample size, e = error interval (0,1), N = total of population.

$$n_c = \frac{N}{1 + Ne^2} \qquad (1)$$

Total of samples obtained based on the formula are 100 samples. The samples interviewed by each region were determined proportionally, and distributed proportionally to 14 villages, as follows; Pusuk II Simaninggir 7 samples, Pusuk I and Sionom Hudon 7 each 11 samples, Baringin 9 samples, S Hasugian Tonga 8 samples, Sionom Hudon Selatan 13 samples, Sionom Hudon Timur and Sionom Hudon Runggu each 3 , Sionom Hudon Julu 12 samples, Sionom Hudon Tonga and Sionom Hudon

Toruan and S Hasugian Hasbinsaran each 5 Samples, and Hutanapa and S Hasugian Dolok II each 4 samples.

2.2 Types and Data Sources

The data used in this researh are; primary data and secondary data. Primary data is data obtained from the respondents through interviews using a questionnaire. Secondary data is data obtained from the publication of Biro Pusat Statistik (Central Bureau of Statistics)/ (BPS) of Humbang Hasundutan Regency and various journals, research results and other official publications.

2.3 Research Variable

In facilitating the measurement of variables it must be able to explain the parameters or indicators in the form of numbers. In this researh the variables analyzed are; a) exogenous latent variable socio-economic factors (X1) with 7 indicators (measurable variables) that is education level (X1.1); social capital (X1.2); farming experience (X1.3); venture capital (X1.4); input prices (X1.5); output price (X1.6); b) Endogenous latent variables of integrated farming system (Y1) with 3 indicators (measurable variables), that is increase in income (Y1.1); improvement of food security (Y1.2); Cultural preservation (Y1.3); c) Endogenous latent variables of regional development (Y2) with 3 indicators (measurable variables), that is environmental impact reduction (Y2.1); poverty reduction (Y2.2); increased market access (Y2.3).

2.4 Data Analysis Method

The methods of analysis data in researsh to analyze the socio-economic factors on integrated farming system base on paddy rice and regional development in Parlilitan Distric were analyzed by Structural Equation Modeling (SEM) using IBM® SPSS® Amos 22 software.

The modeling process in this research is done through several steps (Shek and Yu, 2014), that is; 1) Model specifications; 2) Model identification; 3) Model estimation (part 1), ie modify the model by considering model fit and index modification. 4) Model estimation (part 2), perform structural model analysis. 5) Evaluation model is evaluation of goodness-of fit model. 6) Modification of model that is model respesification based on model matching model.

In this researh used the overall fit assessment model. The match criteria for the measurement model and structural model in shown Table 1.

Table 1: Matching criteria for measurement model and structural model.

Indicator	Defenition	Match rate acceptable description	Description
Chi-Square		The smaler (p-value ≥ 0,05)	The better
RMR	Root mean square residual	RMR ≤ 0.05	Good
GFI	Goodness of fit index	GFI ≥ 0.90 0.80 ≤ GFI < 0.90	Good Pretty good
NFI	Normed fit index	NFI ≥ 0.90 0.80 ≤ NFI < 0.90	Good Pretty good
CFI	Comparative Fit Index	NFI ≥ 0.90	Good
NCP	Noncentrality parameter (fixed parameter associated with DF)	The smaler	Pretty good
RMSEA	Root mean square error of approximation	RMSEA ≤ 0.01 0.01 < RMSEA ≤ 0.05 0.05 < RMSEA ≤ 0.08	Very good Good Pretty good

Source: Processed 2017.

If the model has not met the match criteria, the model is post-hoc specified. Based on theoretical compatibility and theoretical diagnostic information, the model is revised and reconciled with data to improve the goodness of fit model. The path in the model is said to be insignificant ($p > 0.05$), indicating incorrect factor load. Pruning will get a simple model with a greater degree of freedom so that the model is better. The next stage examines the relationship between socio-economic factors, integrated farming system based on paddy rice and regional development in Parliltian District of Humbang Hasundutan Regency.

The immediate effect is examined through the standard regeresi weights (path coefficients) between the latent variables. The direct effect is significant if the probability value of standard regression weight is significant ($p < 0.05$) or within the 95% confidence interval. The indirect effect is checked by taking into account the independent variables → the mediator mediator variable → the dependent variable in which the standard regression weight values for both paths (the value of the independent variable and the intermediate variable x the value of the intermediate variable and the dependent variable). Indirect effects must be higher than direct influence to show the effect of mediation occurs in structural modeling.

If the intermediate variable does not give a shift affecting the main factor ($p > 0.05$), it can be said that

mediation does not occur. A review of the probability value needs to be done after calculating the multiplication of the standard regression weight of the independent variable and the intermediate variable with the standard regression weight of the intermediate variable and the independent variable.

3 RESULT

3.1 The Effect of Socio-economic Factors on Integrated Farming System Base on Paddy Rice

Based on data analysis using structural equetion modeling (SEM), to see the effect of socio-economic factors on integrated farming system base on padyy rice in Parlilitan District obtained the results in show in Table 2.

Table 2: Regression weight of full structural equetion modeling (SEM).

			Estimate	*S.E.*	*C.R.*	*P*
Integrated _Farming_ System	←	Social_ Economic_ Factors	0.54	0.087	5.487	***
Regional_ Development	←	Integrated_ Farming _ System	0.53	0.075	6.323	***
Regional_ Development	←	Social_ Economic_ Factors	0.64	0.068	4.614	***

Source: Primary data, processed 2017.

Table 2 shows the probability of obtaining a critical ratio value of 5,487 in absolute value is less than 0.01, its means the regression weight for socio-economic factors in predicting integrated farming system base on paddy rice at the 0.01 (two-tailed) level. The critical ratio value of 4.614 in absolute value is less than 0.01, its means the regression weight for socio-economic factors in predicting regional development is significantly different from zero at the 0.01 (two-tailed) level.

The results of data analysis are presented in the form of statements as in Table 2, stated correctly in accordance with the standard weight regression estimation results obtained in Table 3.

Table 3: Regression standard weights.

Variable		Variable	Estimation
Integrated_ Farming_ System	←	Social_Economic_ Factors	0.54
Regional_ Development	←	Integrated_Farming_ System	0.53
Regional_ Development	←	Social_Economic_ Factors	0.64

Source: Primary Data, processed 2017.

Table 3 shows that if the socio-economic factor rises 1 standard deviation, the integrated farming system increases by 0.54 standard deviations. When integrated farming systems rose by 1 standard deviation, regional development increased by 0.54 standard deviations. As the socio-economic factors rose by 1 standard deviation, the development of the area increased by 0.64 standard deviations.

Based on result of data analysis with structural equetion modeling (SEM) show coefficient of socio-economic factor to integrated farming system based on paddy rice, equal to 0,54 with CR value 5,487 > 1,96 (Rusiadi, *et al*, 2013) and p (***) < 0.01 (Table 2), the results of this study indicate that the socio-economic factors have a positive and significant impact to integrated farming system base on padyy rice in Parlilitan District as in Figure 1.

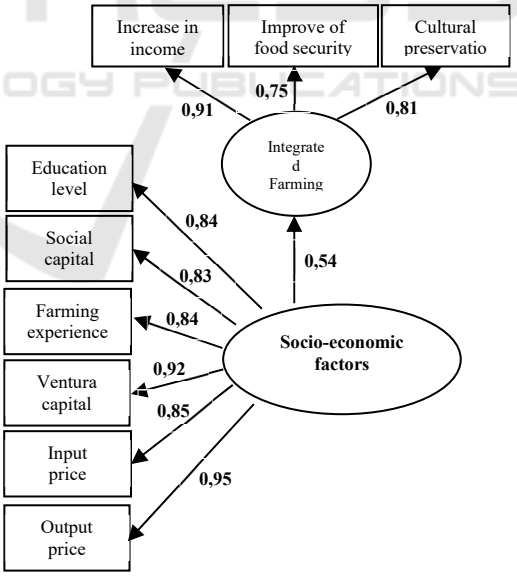

Figure 1. The effect of socio-economic factors on integrated farming system base on paddy rice.

3.2 The Effect of Socio-economic Factors on Regional Development

Based on the result of data analysis by using structural equetion modeling (SEM) obtained coefficient of socio-economic factor impact to the regional development in Parlilitan District with value 0,64 , CR 4,4614 > 1,96 (Rusiadi, *et al*, 2013) and *p* (***) < 0.01 (Table 2), the results of this analysis indicate that the socio-economic factors have a positive and significant effect on the regional development in Parlilitan District as in Figure 2.

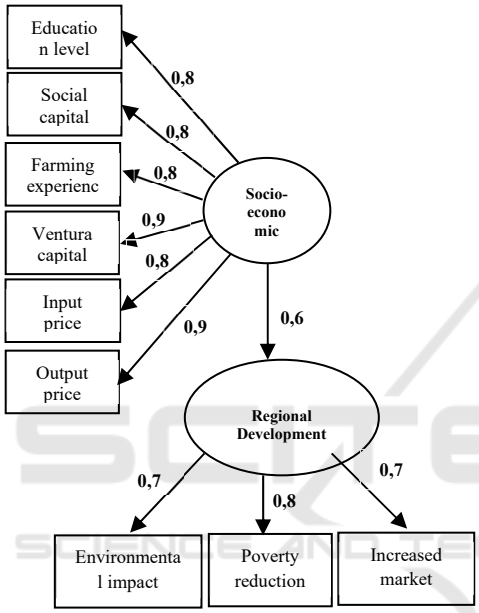

Figure 2. The Effect of socio-economic factors on the regional development in Parlilitan District.

3.3 Effect of Socio-economic Factors on Regional Development through Integrated Farming System

Based on the results of data analysis, the direct effect of socio-economic factors to the regional development in Parlilitan District is 0.64. The indirect effect of socio-economic factors to the regional development through the intermediate integrated farming system base on paddy rice is 0.64×0.54 = 0.34. The total effect of socio-economic factors of farmers on the regional development is (0.34) + (0.53) = 0.87, thus the socio-economic factors of farmers have a positive and significant impact on the regional development in Parlilitan District of Humbang Hasudutan Regency through integrated farming system base on paddy rice as in Figure 3.

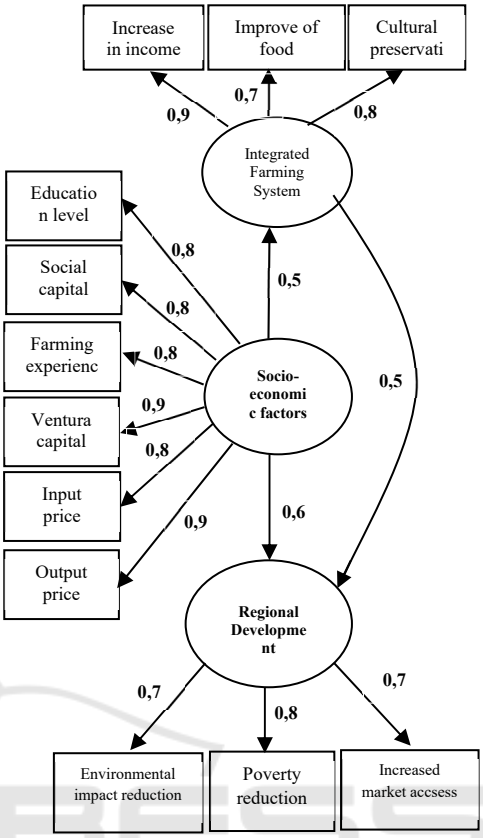

Figure 3. Effect of socio-economic factors on regional development through integrated farming system base on paddy rice.

4 DISCUSSION

4.1 Effect of Socio-economic Factors on Integrated Farming System Base on Paddy Rice

Based on the results of data analysis as shown in Figure 1, it shows that education level, social capital, farming experience, business capital, input price, output price are predictors of socio-economic factors that contribute to the perception of farmers on integrated farming system in Parlilitan District.

The results of this study are in line with Burhansyah (2014) research, which conveyed that the respondents' educational level significantly affected the acceleration of technology adoption in gapoktan in Kalimantan. Thus the implications of these findings provide clues that to develop an integrated farming system in District of Parlilitan Equality is to

increase farmers' education to accelerate the adoption of technologies eg; with a field school.

Education for farmers is very important to improve the knowledge and personality of the farmers themselves. Farmers who have higher levels of education will more easily even adopt technological change.

The results of Diwyanto & Priyanti (2005) revealed the same thing that states that besides agro-ecological conditions, community culture becomes an important consideration in determining the types of commodities grown in an integrated farming system. In addition, social capital factors significantly contribute to farmer perceptions of integrated farming systems. This finding is supported by research by Dewi, Utama, and Yuliarmi (2017) which shows that social capital has a positive and significant effect on farm productivity and the success of integrated farming system in Klungkung Regency.

Based on the results of data analysis as in Figure 1, shows that; social capital, farm experience, business capital, input prices and output prices are also predictors of socio-economic factors that contribute to farmers' perceptions of integrated farming systems in Parlilitan District and a statistically significant with the standard regression weights (*p*) indicator, $p < 0.01$.

The results of this study are in line with the research (Aryana, *et al*, 2016) which states that the higher the level of peasant experience, the easier it will be to increase production to achieve maximum profit. This study is in accordance with the Sanjaya (2013) study, which states that one of the main indicators of the perfection of farmer-breeder quality variables is the experience of farming that affects the cattle breeding business, the application of food crops, and the application of cattle waste processing business.

Similarly, research conducted by Iski, *et al* (2015), which conveyed that the capital of good business sourced from credit significantly influence on increasing production and income of coffee farmers in Aceh regency. The addition of a good amount of capital in the form of credit will increase the use of coffee and coffee production labor. Increased production will directly increase the income of organic arabica coffee farmers in Central Aceh District.

The result of Kasiyati research (2010), conveyed that the policy of subsidized fertilizer price by government so that the price of input of affordable fertilizer production, causing sector in economy in Jawa Tengah can increase its output.

4.2 The Effect of Socio-economic Factors on Regional Development

Based on the results of data analysis as presented in Figure 2, shows that; social capital, farm experience, venture capital, input prices and output prices are also predictors of socio-economic factors that contribute to farmer perceptions of regional development in Parlilitan District, a statistically significant with standard regression weight (*p*) of each indicator, $p < 0.01$.

The result of this research is in line with research of Purnami and Saskara (2016) which conveys that the variables of regional development seen from economic growth through education variables participate in the implementation of development oriented on the distribution of people's income. Even the results of this study indicate that the agricultural sector has a positive and significant impact on economic growth, so it is expected that local governments through the regional regulation can protect the sustainability of land and limit the wise land transfer of land for agricultural business is maintained.

Research Lubis (2014) stated that the level of labor education in the positive and significant impact on economic growth that describes the development of a region. This indicates the importance of education in increasing labor productivity.

From the data analysis, extension factor is important in increasing the experience of farmers which is one of the predictors of socio-economic factors contributing to the development of the region in District of Parlilitan. These results are in accordance with the statement Mangkuprawira (2010) that agricultural extension through the process of assistance is needed in the development of the region because it has a function as a tool of problem analysis as well as problem solving.

In the long term, counseling aims to improve farmers 'standard of living so that the welfare of farmers' lives is guaranteed. This is in line with the statement of Van den Ban (1999) that the government's goal of agricultural extension is to increase food production, stimulate economic growth, improve the welfare of farm families and villagers, and promote sustainable agriculture.

The development of the region as a planned social change can not only be explained quantitatively by economic or environmental approach, but there are socio-cultural aspects that also influence people's understanding in exploiting the opportunities that exist. This is in line with Sultani (2016) stated that regional development should be raised internally by

recognizing and involving local wisdom. The close relationship between culture and the environment is very clear to the people of Humbang Hasundutan Regency. They have a spiritual, cultural, social and economic relationship with their traditional territory in the form of customary laws, traditions and practices that describe the bondage of land and the responsibility to preserve the traditional territory for the needs of the next generation.

One important element in the successful achievement of regional development, especially rural areas to support agricultural development is social capital. Sultani (2016) states that the development of the region by incorporating social capital in every development activity can foster a sense of responsibility in each individual towards the implementation of development in all fields. In addition, with regard to social capital in the context of regional development, Sunarsih *et al.* (2014) argues that social capital rooted in tradition, which includes socialization and regeneration in agriculture plays a role in maintaining the relationship between man and man, man with nature, and man with its creator in the community because of its inward nature.

4.3 The Effect of Socio-economic Factors on Regional Development through Integrated Farming System

The result of data analysis as shown in Figure 3, although the increase is done on the predictors of the internal condition of agriculture which is also the determinant factor of the success of integrated agriculture system, did not significantly increase the development of the region.

The results of data analysis show that the increase in socio-economic factor predictors is the dominant factor determining the success of integrated agriculture system will be able to increase the development of the region. Farmer education, farmer experience, venture capital are predictors of socio-economic factors an important role in eradicating rural poverty where the extent of extension success is closely linked to increased productivity and increased incomes in the agricultural sector itself.

Social capital variable its contribute to regional development in Parlilitan District , farmers generally have a low quality of social capital resulting in minimal access to information such as information on the quality of agricultural produce required. Coupled with the lack of information provided by the entrepreneurs to the commodities they plant, thus also affecting the resulting agricultural products. In this case, what the farmers need is the ease of the market. The farmers suffered a lot because of being controlled by middlemen. This is as a result of market access and low output prices so that the market is monopolized by the action of the middlemen.

On the other hand, the adoption of new knowledge or technology in agriculture is often influenced by socio-cultural issues. Changing a habit always takes time and special effort to do it. In addition, the main obstacles of farmers in Humbang Hasundutan Regency in developing their business are limited capital and lack of access to capital resources.

As income increases, economic growth will also increase. Simatupang *et al.* (2000) stated that the achievement of the development goals of success should be measured by two levels, namely the level and stability of growth. High growth is a requirement of necessity, while steady stability is a requirement of adequacy, show that result of research of Purnami and Saskara (2016) convey that education variable and contribution variable of agricultural sector have positive and significant influence to economic growth of regency/city in Bali Province.

5 CONCLUSION

Based on the results of data processing and discussion can be concluded;

1. Socio-economic factors such as; level of education, social capital, farming experience, venture capital, input price, output price have positive and significant effect to integrated farming system based on paddy rice in Parlilitan District with path coefficient value 0,54 with CR value 5,487> 1,96 and p (***) <0.01.
2. Socio-economic factors such as; level of education, social capital, farming experience, venture capital, input price, output price have positive and significant effect to the regional development with path coefficient value 0,64 with CR 4,4614> 1,96 and p (***) <0.01.
3. Socio-economic factors such as; social capital, farm experience, venture capital, input prices and output prices are also predictors of socio-economic factors that contribute to farmer perceptions of regional development in Parlilitan District and a statistically significant with standard regression weight (*p*) of each indicator, p < 0.01.
4. The direct effect of socio-economic factors to the regional development in Parlilitan District is 0.64 and the indirect effect of socio-economic factors

to the regional development of through the integrated farming systems based on paddy rice is 0.34 and the total effect of socio-economic factors on regional development is 0.87, so that the socio-economic factors of farmers have a positive and significant impact on the regional development in Parlilitan District through integrated farming system.

5. Increasing socio-economic factor predictors is the dominant factor determining the success of an integrated farming system will be able to increase regional development. Variable farmer education, farmer experience, business capital are predictors of socio-economic factors an important role in eradicating rural poverty as one indicator of regional development.

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