The Role of Village-Owned Enterprises in Agriculture Sector in Enhancing Community Welfare in Tampahan District, Toba Regency, North Sumatra, Indonesia

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Abstract. The farming business needs to obtain support to increase the income and welfare of farmers. This study aims to analyze the role of village-owned enterprises (BUM Desa) in agriculture sector in enhancing community's welfare. The research was conducted in Gurgur Aekraja Village, Tampahan District, Toba Regency, from January to April 2021. A number of 66 farmers were determined as respondents using a simple random sampling. Respondents' perceptions of variable indicators were measured using a Likert scale. The role of BUM Desa is measured based on the effect of the independent variables on the dependent variable with multiple linear regression model. Farmers' perceptions of variable indicators are in the very good category, with a score 4.34 for the establishment of BUM Desa, 4.43 for BUM Desa activities, and 4.42 for community welfare. Based on multiple regression analysis, it was concluded that the establishment of BUM Desa activities plays a significant role in improving community welfare. The contribution of this research is as a consideration for the establishment of BUM Desa in the future that the aspirations and needs of rural communities are the most important things in developing new institutions at local level. Furthermore, a collaboration of communities, village governments, facilitators, and other stakeholders; can determine the core business of BUM Desa based on the potential of unique local resources.

Keywords: activities; agriculture; BUM Desa; establishment; Toba Regency; community welfare

INTRODUCTION

Local economic development in rural areas aims to improve the welfare of rural communities. The welfare of rural communities can be measured through indicators of increasing people's income, employment opportunities, and other productive economic activities that follow productive activities in rural areas. Based on Law Number 6 of 2014, village development is an effort to improve the quality of life of the village community.

Rodriguez-Pose (2001), as referred to Rogerson (2009), states that local economic development strategies in rural areas are pursued. among others, by driving development with initiatives that arise from the bottom, action with a locality approach, maximizing regional potential to and stimulate a progressive local economic system. Mahanani et al. (2021) concluded integration between communities, that practitioners and government agencies is important for supporting and building abundant resource potential. These resources can have a significant influence on local

economic development. Regional development strategies can provide opportunities for communities to manage human and natural resources actively. In addition, the strategy can encourage local economic growth to improve people's welfare in a unique local environment.

Saragih et al. (2021) stated that local economic development priorities should be based on regional potential. Thus, these development activities can encourage productive economic activities at the local level. Furthermore, Saragih (2018) states that three main indicators measure the performance of local economy in rural areas: increasing people's income, employment opportunities, mutually supporting and economic activity.

Based on Law Number 11 of 2021, Village-Owned Enterprises, referred to as BUM Desa, are legal entities established by a village or several villages. The function of BUM Desa is managing a business, utilize assets, investment and productivity, provide services and business for the community's welfare. While the objectives of BUM Desa include (1) carrying out economic business, as well as investment development and productivity, and village potential; and (2) carrying out public service through the provision of goods and services, and managing village food storage. BUM Desa is an alternative community initiative, utilizing the village's natural resource, developing village potential, and optimizing human resources.

Harahap et al. (2022) stated the importance of the agricultural sector growth, among others, where the growth of the agricultural sector makes a major contribution to poverty alleviation through increasing farm income and income encourage non-agricultural sector activities in rural areas.

Tampahan District, Toba Regency, North Sumatra Province, is one of the subdistricts with potential in the agricultural and smallholder plantation sectors. Based on the agreement of the village community of Gurgur Aekraja Village, the BUM Desa with the name Toko Tani was established on September 3, 2018, through the Regulation of the Village Head of Gurgur Aekraja, Tampahan District, Toba Samosir Regency Number 04 of 2018 concerning the Establishment and Management of Village-Owned Enterprises.

After being established for more than two years, the research aims to analyze the views or perceptions of the Gurgur Aekraja village community regarding the existence and activities of their BUM Desa. This perception study is used as initial input to see an overview of the role of BUM Desa in the community. Thus, this study aimed to analyze the role of the aspects of establishing BUM Desa and the activities of BUM Desa on the welfare of village communities.

The results of several relevant previous research were used as a reference in this study. Syafrida (2018) concluded that the role of BUM Desa is considered to have been running effectively in community empowerment. Sakdiah (2018) stated that the existence of BUM Desa could help advance village community businesses through capital assistance. Rambe (2018) concluded that BUM Desa was empowering rural communities economy, especially the poor, through the provision of agricultural equipment. Utami et al. (2019) examined the role of BUM Desa in the social value dimension of three indicators, namely: (1) the existence of social entrepreneurship, (2) BUM Desa develops village potential, and (3) BUM Desa assists the community in various financial transactions.

Based on the background, this study aims to analyze the role of BUM Desa in improving community welfare. The influence of aspects of the establishment of BUM Desa and BUM Desa activities on the welfare of the village community approaches the role.

METHODS

The research was conducted in Gurgur Aekraja Village, Tampahan District, Toba Regency, North Sumatra, from February to April 2021. From a population of 394 farmers' households, 66 households were determined as research samples using the simple random sampling method. The role of BUM Desa is measured based on the influence of the independent variables (Establishment of BUM Desa, X_1 and Activities of BUM Desa, X_2) on the dependent variable (Community Welfare, Y). Statistical Package for the Social Sciences (SPSS) version 24 is used as a tool for data analysis through multiple linear regression equations. The research variables, variable indicators, and measurement of indicators are presented in Table 1.

Appropriate data analysis methods are used to answer the research objectives. The validity of the indicators is measured using Pearson's correlation. Instrument reliability is determined by Cronbach Alpha value. The validity test is used to see the ability of each statement in the research instrument to measure the indicators being measured accurately. The validity test was carried out using the output of the SPSS version 24. The study's validity used the Corrected Item-Total Correlation method (Pratisto, 2009). Corrected Item-Total Correlation is a representation of the correlation coefficient (r). If the r is greater than the r-table, then the statement items in the instrument are considered valid (Fridayanthie, 2016). The reliability test is used to see the consistency of research instruments in measuring what is being measured. The reliability level of the instrument is determined based on the Cronbach Alpha value from the SPSS version 24 output, based on criteria as presented in Table 2.

 Table 1. Variable and research indicators

Variable	Variable Definition	Indicator	Measurement
Establishment of BUM Desa (X ₁)	The establishment of BUM Desa is the background and justification for establishing BUM Desa.	 The establishment background is based on the aspirations or needs of the village community. Establishment of BUM Desa based on village potential. The preparedness of the village community supports the establisment of BUM Desa. The establishment of BUM Desa is supported by the village government apparatus. 	Likert scale
Activities of BUM Desa (X ₂)	BUM Desa activities are all activities that carried out to serve and facilitate village communities.	 BUM Desa services the community in the field of procurement of agricultural facilities. Assist in the processing of agricultural products. BUM Desa services the community in the field of capital. BUM Desa contributes to village income. BUM Desa activities support the success of BUM Desa. 	Likert scale
Community Welfare (Y)	Community welfare is an aspect of improving the welfare felt by the village community.	 Farming income increased. Household consumption or expenditure increases. Living conditions are getting better. Living facilities are getting better. Opportunity to obtain health services increases. Opportunities for children to go to a higher level of education have increased. 	Likert scale

Table 2. Level of i	instrument reliability
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Cronbach Alpha value	Reliability level
0.0-0.2	Less reliable
>0.2-0.4	Moderately reliable
>0.4-0.6	Reliable enough
>0.6-0.8	Reliable
>0.8-1.0	Very reliable

Source: Hair et al. (1998) in Arif dan Santoso (2016)

Through a questionnaire, respondents were given five alternative perceptions of statements regarding the variable research indicators: scale 1 (strongly disagree), 2 (disagree), 3 (quite agree), 4 (agree), and 5 (strongly agree). Then the scale range is calculated, namely the highest score less than the lowest score divided by the number of scales: (5-1)/4 = 0.8. Thus, the criteria for respondents' perceptions of variable indicators are determined by the following categories (Saragih, Ritonga, & Harmain, 2022):

 $1.0 < x \le 1.8$ (Very not good) $1.8 < x \le 2.6$ (Not good) $2.6 < x \le 3.4$ (Good enough) $3.4 < x \le 4.2$ (Good) $4.2 < x \le 5.0$ (Very good)

where x is average score with the formula:

$$\mathbf{x} = \frac{\mathbf{f}_i \, \mathbf{w}_i}{\sum \mathbf{f}_i} \qquad (1)$$

where *fi* is the number of respondents who answer a particular scale, *wi* is a certain weight or scale.

The role of BUM Desa as measured by the effect of the independent variables on the dependent variable is analyzed using multiple linear regression, with the equation:

$$Y=a+b_1X_1+b_2X_2$$
(2)

where Y is the community's welfare measured by a total score of the indicators, X_1 is the establishment of BUM Desa measured by a total score of the indicators, and X_2 is the activities of BUM Desa measured by a total score of the indicators.

The relevant test is carried out on multiple linear regressions, namely the coefficient of determination (R^2) , with the formula:

$$R^{2} = 1 - \frac{\sum e_{i}^{2}}{\sum y_{i}^{2}} = 1 - \frac{\sum (Y_{i} - \widehat{Y}_{i})^{2}}{\sum (Y_{i} - \overline{Y}_{i})^{2}} \dots (3)$$

The F-test for simultaneous test is performed by calculating the statistic F:

$$F = \frac{R^2/(k-1)}{(1-R^2)/(N-k)} \dots (4)$$

where R^2 is the coefficient of determination, k is the sum of independent variables (including constant), and N is the sum of samples.

More practically, the Sig value of statistic F can be used without comparing statistic F with the F-table. If the sig value is < 0.01, it can be concluded that all the independent variables as simultaneously have a very significant effect on the dependent variable at the level of α =1% (99% confidence level). The t-test was conducted to test the significant level effect of independent variable individually. If the statistic t > from t-table at α =5% and degree of freedom n – k [n=a number of samples, k=

a number of independent variables (including constant)], then the independent variable has a significant effect on the dependent variable. The formula determines the statistic t:

where b_i is the coefficient of regression, and

where s_{bi} is the standard error of the regression coefficient of the independent variable, and

$$s_{bi}^{2} = \frac{1}{n-1} \sum (X_{i} - \overline{X})^{2} \dots (7)$$

where s_{bi}^2 is a variant of the regression coefficient of an independent variable, *n* is sample size, *Xi* is sample data, and is the average value of the variable *X*.

Based on the probability, if the p-value (sig) of the independent variable is <0.01 or <0.05, then the independent variable has a very significant or significant effect on variable dependent variable. Operationally, data is processed using SPSS version 24.

RESULTS AND DISCUSSION

Overview of Toba Regency

Toba Samosir Regency was originally the territory of the North Tapanuli Regency in 1998. Toba Samosir Regency is an autonomous region in North Sumatra Province that was split from North Tapanuli Regency with Law Number 12 of 1998. In 2020, Toba Samosir Regency changed its name to Toba Regency based on Government Regulation Number 14 of 2020. The formation of the Tampahan District was based on the Toba Samosir Regency Regional Regulation Number 17 of 2006 concerning forming a new sub-district. Tampahan District was expanded from Balige District, Nassau District from Habinsaran District, and Siantar Narumonda District from Porsea District.

The area of Toba Regency is 2,021.8 km², consisting of 16 sub-districts with a population of 208,754 in 2021. As many as 60% of the population over 15 years working in the agricultural sector. Agriculture is the primary sector driving the regional economy, contributing to the Toba Regency's GRDP as 31.13% of the total GRDP in 2021.

Tampahan District consists of six villages and 25 hamlets. Gurgur Aekraja Village is the capital and administrative center of the Tampahan District. Gurgur Aekraja Village is the village with the most significant area, namely 9.60 km² or 39.26% of the total area of the Tampahan District. At the same time, Tarabunga Village is the smallest village, namely 1.89 km² or 7.73% of the total area of the sub-district. The primary source of income for residents in Tampahan District is the agricultural and smallholder plantation sectors. The community's main crops are rice, corn, peanuts, cassava, sweet potatoes, arabica coffee and frankincense. The principal livestock commodities are buffalo, pigs, chickens and ducks.

Overview of BUM Desa

Tampahan District has six villages, and several BUM Desa were formed based on the potential of each village. Gurgur Aekraja Village has potential agricultural products. Through village meetings, the community expressed their aspirations to form a BUM Desa engaged in agriculture, providing agricultural production facilities (seeds and fertilizers), agricultural tools and machinery, and financial services. BUM Desa Toko Tani was established on September 3, 2018, through Village Head Regulation Number 04 of 2018 concerning the Establishment and Management of Village-Owned Enterprises. The main objective of BUM Desa is empowering village potential for village communities welfare.

Characteristics of Respondents

The age of the respondents in the study area is still relatively young, with an average age of 46 years (Table 3). According to Asih (2009), the age range of 25 to 50 years is the age of productive farmers who can devote optimal physical labor.

Table 3.	Characteristic	of res	pondents
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able 5. Characteristic of respondents			
No.	Characteristic	Average	
1	Age (year)	46	
2	Education (year)	14	
3	Sex (%):		
	Man	62	
	Woman	38	
4	Work (%):		
	Farmer	47	
	Farmer-livestock	24	
	Farmer-small merchant	23	
	Farmer-private employee	3	
	Farmer-government employee	3	

The education level of the respondents is in the range from junior high school to university graduates, with an average of 14 years. Productive age and higher levels of education are supporting factors for the development of BUM Desa activities in Gurgur Aekraja Village. Farmers have become more dynamic and receptive to new changes and innovations with higher education. Suryani et al. (2017) stated that a person's behavior in rational consideration to receive information and decision making about new things is determined by the level of education.

The main occupation of the people of Gurgur Aekraja Village is 47% as farmers, 24% as farmers and breeders, 23% as farmers and traders, 3% as farmers and entrepreneurs, and 3% as farmers and civil servants. This data shows that BUM Desa activities can serve all village communities.

Validity of Indicator

The validity test was conducted to determine whether the specified variable indicators were valid as identifiers for the research variables. The validity of the indicator is determined based on the value of the corrected item-total correlation (r), where if the coefficient correlation is > r-table (0.204), then the indicator is declared valid, and vice versa. The validity test is presented in Table 4.

Table 4. Validity of indicators

Indicator	Corrected Item- Total Correlation	Validity	
X1.1	0.802	Valid	
X1.2	0.938	Valid	
X1.3	0.935	Valid	
X1.4	0.937	Valid	
X2.1	0.881	Valid	
X2.2	0.867	Valid	
X2.3	0.749	Valid	
X2.4	0.901	Valid	
X2.5	0.858	Valid	
Y.1	0.846	Valid	
Y.2	0.917	Valid	
Y.3	0.912	Valid	
Y.4	0.908	Valid	
Y.5	0.880	Valid	
Y.6	0.938	Valid	

Notes: r-table (α =5%, df=64) = 0.204

Table 4 shows that all indicators of the independent variable X_1 or the establishment of the BUM Desa, and variable X_2 or the activities of the BUM Desa, have a coefficient correlation is > than the r-table at α =5%. Thus, the statements in the research instrument, which are indicators of the variables for the establishment of BUM Desa and BUM Desa activities, are declared valid. Likewise, all indicators of the dependent variable Y or community welfare, also have a coefficient correlation is > than the r-table at α = 5%. Thus, the indicators in the research instrument are valid.

Reliability of Instrument

Based on the Reliability Statistics with a total of 15 indicators, a Cronbach Alpha value of 0.983 was obtained. This Cronbach Alpha value is in the very reliable category (Hair et al., 1998 *in* Arif and Santoso, 2016). Thus, the research instrument or questionnaire used in this study was stated to be highly reliable.

Community Perception

Village community perceptions of the independent variables studied, namely the establishment of BUM Desa and BUM Desa activities, are measured by the average scores of indicators and variables. Based on Table 5, it was found that the perceptions of the village community regarding the background to the establishment of the BUM Desa and BUM Desa Toko Tani activities were with very good criteria. The perception of the village community regarding the dependent variable, namely community welfare, is also very good criteria.

The Role of BUM Desa

Based on the coefficient of determination value (\mathbb{R}^2) of 0.952, it means the establishment of BUM Desa and activities of BUM Desa can explain 95.2% of the variation in community welfare. The R^2 value means that the identification of the independent variables can fully describe the determinants of increasing community welfare in the research area. Thus, this multiple linear regression equation is a fit model and can be used to estimate the regression coefficient and determine the effect of all independent variables (both simultaneously and partially) on the dependent variable. The high R^2 value indicates that the two independent variables (establishment of BUM Desa and activities of BUM Desa) are very important in determining community welfare in rural area, specifically at the location of this study.

The statistic F value of 623.96 is > than F-table = 4.959 (df₁ = 2, df₂ = 63, $\alpha = 1\%$), so the linear regression equation formulated is appropriate to analyze the variables. Thus, it can be concluded that establishing BUM Desa and BUM Desa activities simultaneously significantly enhance community welfare in Tampahan District, Toba Regency.

Partially, the role of each independent variable was carried out through the t-test. The Sig value for the independent variable X_1 or the establishment of BUM Desa is 0.001 and is less than α =1% or 0.01; it can be concluded that the establishment of BUM Desa has a very significant effect on community welfare. In other words, establishing BUM Desa plays a very significant role in enhancing community welfare (Table 6). The Sig value for the independent variable X_2 or BUM Desa activities was also obtained at 0.001 and is smaller than $\alpha=1\%$ or 0.01; it can be concluded that BUM Desa

activities significantly affect community welfare. In other words, BUM Desa activities significantly affect in enhancing community welfare.

Indicator	Indicator	Average	Perception criteria
symbol		score	-
$X_{1}.1$	The establishment background is based on the	4.26	Very good
	aspirations or needs of the village community.		
$X_{1.2}$	Establishment of BUM Desa based on village	4.39	Very good
	potential.		
X ₁ .3	The preparedness of the village community	4.33	Very good
	supports the establishment of BUM Desa.		
$X_{1}.4$	The establishment of BUMDes is supported by	4.39	Very good
	the village government apparatus.		
Variable X ₁	Establishment of BUM Desa	4.34	Very good
X ₂ .1	BUM Desa services the community in the field	4.26	Very good
	of procurement of agricultural facilities.		
X ₂ .2	Assist in the processing of agricultural products.	4.32	Very good
X ₂ .3	BUM Desa services the community in the field	4.62	Very good
	of capital.		
X ₂ .4	BUM Desa contributes to village income.	4.48	Very good
X ₂ .5	BUM Desa activities support the success of	4.50	Very good
	BUM Desa.		
Variable X ₂	Activities of BUM Desa	4.43	Very good
Y.1	Farming income increased.	4.55	Very good
Y.2	Household consumption or expenditure	4.36	Very good
	increases.		
Y.3	Living conditions are getting better.	4.47	Very good
Y.4	Living facilities are getting better.	4.38	Very good
Y.5	Opportunity to obtain health services increases.	4.36	Very good
Y.6	Opportunities for children to go to a higher level	4.39	Very good
	of education have increased.		
Variable Y	Community Welfare	4.42	Very good

Table 6. Regression coefficient, statistic t, and the Sig value

Variable	Coefficient	Standard error	Statistic t	Sig Value
Constant	0.734	0.768		
Establishment of BUM Desa	0.649	0.110	5.897	0.001
Activities of BUM Desa	0.653	0.097	6.738	0.001
~			01100	0.001

Dependent variable: Community welfare

t-table (α =1%, df=63) = 2.387

Based on the results of multiple linear regression analysis, it was found that partially, each independent variable had a very significant effect on the dependent variable. The establishment of BUM Desa had a very significant effect on community welfare in Gurgur Aekraja village. Likewise, BUM Desa activities also have a significant effect on community welfare. The results of this study support the research findings of (2021), Kerap et al. where the implementation of BUM Desa activities has a significant effect on village economic development and community welfare. The results of research in Toba Regency are also in line with Tarlani (2020) findings in Leles District, Garut Regency. BUM Desa has a positive contribution to village government, the socio-economic conditions of village communities, and directly impact reducing unemployment.

In this study, effect analysis was used to measure the role of BUM Desa's role in enhancing community welfare. Thus, the establishment of BUM Desa plays a very significant role in improving community welfare in the village. The indicators for the establishment of BUM Desa (such as village potential being better utilized, community readiness being increased, and village government support being increased) need to be maintained. Thus, rural communities can increase their income, consumption, and quality of housing and receive improved health and education services. It is essential to maintain village government support for BUM Desa. The research results by Asti & Cholid (2018) in Kendawangan District found that the village government has a positive view of BUM Desa. However, the village government's involvement in the development planning of BUM Desa is still optimal yet.

For the variable regarding the establishment of BUM Desa, the aspects that need to be maintained and even improved are community acceptance and support from the village government so that the existence of the BUM Desa Toko Tani can be maintained increased to carry out the agreed activities.

Similar to the establishment of BUM Desa, BUM Desa activities also significantly enhance community welfare in Tampahan District, Toba Regency. Thus, if BUM Desa activities are increased in the provision of agricultural facilities, processing facilitation, capital support, and contribution to village income; then the village community has an opportunity to increase farming income, consumption, and housing quality, obtain improved health and education services. Safa et al. (2023) and Ayuningtyas and Wibawani (2022) identified that providing agricultural facilities and infrastructure is also one of the BUM Desa activities in Bone Regency. Caya and Rahayu (2019) concluded that BUM Desa activities positively impacted children's education level and improve the community health status in Aek Batu Buding Village, Belitung Regency. Meanwhile, Anggraeni

(2016) found that the existence of BUM Desa increases the village-owned income, but the community cannot feel this income directly. The community of the village perceives that the existence of BUMDes does not bring significant benefits to improving community welfare.

This study confirms the Arindhawati and Utami's research (2020) in Klaten Regency. The existence of BUM Desa can improve community welfare, and the community supports the existence of BUMDes with a high social spirit to take part in advancing BUM Desa. The community has also felt a better chance after BUMDes. The results of research in Toba Regency are also in line with the results of Safa et al. (2023) research in Bone Regency, with the conclusion that BUM Desa plays a role in strengthening the namely improving people's economy, welfare. BUM Desa also plays a role in developing village potential as a source of the productive economy in rural areas.

For the BUM Desa activity variable, several aspects that need to be improved are (1) activities to provide agricultural facilities, processing facilitation, and support for farming capital; and (2) contribution to village income. In the future, it is hoped that further research related to improving the welfare of rural communities will use more measurable indicators, such as increasing rural community income in monetary terms, community consumption increasing in financial terms, as well as improving the quality of housing, health and education with more measurable indicators. In the subsequent development of BUM Desa, the role of BUM Desa in village development needs to be further optimized. Permatasari and Imaniar (2022) researched Banyuwangi Regency, and found that maximizing the role of BUM Desa in increasing village independence can be realized. The activities carried out have positively impacted creating opportunities, improving jobs the community's economy, and increasing the village income. Wahed et al. (2020) recommend that the management of BUM

Desa should be used as the primary foundation for developing the rural economy. Its existence must bring about significant economic and social changes in rural areas.

CONCLUSION

Community perceptions regarding the establishment background of the BUM Desa and the activities of the BUM Desa Toko Tani are excellent criteria. Village community perceptions regarding the role of establishing BUM Desa and BUM Desa activities to enhance community welfare are also excellent criteria. The average score of community perceptions regarding establishing BUM Desa is 4.34. The average score of community perceptions regarding BUM Desa activities is 4.43. The average score of community perceptions regarding the role of establishing BUM Desa and BUM Desa activities to enhance community welfare is 4.42. The establishment of BUM Desa has a significant role in improving community welfare. If the existence of BUM Desa is sustainable, village potential is better utilized, community readiness is increased, and village government support increases; then the community has the opportunity to increase farming income, consumption, housing quality, and improving health and education services. BUM Desa activities also play a very significant role in improving community welfare. Suppose BUM Desa activities are increased (such as providing farming facilities, processing facilitation, capital support, and contribution to village income). In that case, the village community can increase farming income, consumption, and housing quality, obtain better health and education services.

The limitation of this research is the use of scale data in the measurement of variable indicators. It is recommended that further research done for the same variable using numerical data. For example, the income and consumption in financial terms. Housing quality, health, and education in more quantifiable indicators. The contribution of this research is as a consideration for the establishment of other BUM Desa. Community aspirations and needs are the most important things in developing new local economic institutions. Furthermore, a collaboration of the community, village government, facilitator, and other stakeholder; can determine the core business of BUM Desa based on the potential of unique local resources.

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