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Empowerment of Livestock Farmer through Graduate Program to Build a Village on Dynamics of Beef Cattle Farmer Groups Level of Gaduhan Model (A Case Study in the District of Toli-Toli, Central Sulawesi)

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Abstract
This study aimed to determine (1) the influence of farmer resources (financial , technological s, economic , physical, and social resources) and susceptibility to levels of farmer group dynamics and (2) the most dominant factor affecting the dynamics of farmer groups (sustainability of the group). The method used in this study is the method of survey and sampling was arranged through census. Results showed (1) farmer resources consisting of financial , technological , economic , physical , social (resources) and vulnerability context (seasonal and vulnerability of security) simultaneously affect the level of farmer group dynamics. Partially, financial , technological , and physical resource positively and significantly affect the level of farmer group dynamics. This means the higher the role of resource farmers, the higher the level of group dynamics. Vulnerability negatively and significantly influence level of group dynamics, meaning that the lower the level of vulnerability, the higher the farmers group dynamics, and (2) the most dominant factor influencing level of farmer group dynamics (sustainability of the group) was technological resources
Keywords: Dynamics, resources, farmers, beef cattle, Gaduhan

1. Introduction

Beef cattle are one of the important commodities in national development. In Indonesia beef cattle plays an important role as sources of animal protein, income and fertilizer, labor resources, utilization of agricultural waste, and as savings for farmers. About a third of world meat production is contributed by ruminants, including cattle (FAO, 2004). Department of Agriculture (2007) reported that the Indonesia beef demand far exceeds the total beef production. Therefore, beef imports became a solution. To overcome the problem, the Indonesian government through the Directorate General of Livestock, Ministry of Agriculture launched a "program to accelerate the achievement of Self-Sufficiency in beef" (In Indonesia Called P2SDS).

The program of P2SDS is also targeted to reduce dependence on imported beef and beef cattle, to save foreign exchange, as well as to create jobs, which in turn, to reduce poverty. Currently, Indonesia is only able to meet 72% of national beef consumption and the rest is still dependent on imported supplies. If this situation is left unmanaged, the level of dependence in 2015 will be 50%.

Directorate General of Livestock Department of Agriculture and Animal Husbandry Department in 2007, in charge of the Provincial Livestock functions together with 22 universities, has recruited Bachelor graduate to build village, (called SMD program) which acts as an agent of a pioneer farm. Bachelor graduate to build village, consisting of bachelor graduates of the Faculty of Animal Husbandry (graduate Diploma and bachelor) and Faculty of Veterinary Medicine served primarily to increase the empowerment of groups of livestock farmers as a supervised farmer. In 2007 and 2008, the objective of SMD program focused on developing beef cattle farmer groups to support the the P2SDS.

Institutional strengthening of livestock farming, initiated by the SMD is intended to foster the entrepreneurial spirit and independence for the group members and the surrounding community in the livestock farming so that this farming has high competitiveness and sustainability. In general, the strengthening of capital is still being an obstacle for the livestock farmers in developing their livestock farming business. Therefore, SMD which has great potential to develop livestock farming with their supervised livestock farmers and the surrounding farmers, became pioneers in their respective areas (Achmadi, 2009)

Siswoyo (2002) reported the results of his research that the impact of partnership in broiler chickens business on bargaining power and income of farmers in Malang was not always profitable for farmers compared with non partnerships farmers. This became evident that chicken mortality rate is still high and the weight of the harvested chicken is still low. Nevertheless there are some things beneficial for the partnership farmers, such as having opportunity to breed the livestock on a larger scale and more efficient feed technology.

Partnerships in the field of dairy cows, Thamrin in Soenardi (2009) has conducted a research in the Girijaya and

Pangalengan villages, Bandung, West Java. In that study the author concluded that the dairy cooperation business provided hope of equitable distribution of income among small-scale dairy farmers.

A Research conducted by Soetanto et al, (1989) revealed that lending business of Panca Usaha Sapi Perah (PUSP) in Wonosari had highly economic value and the income generated was sufficient to meet the household needs. The economic calculation indicated that the Net Present Value (NPV) for beef cattle at PUSP was 28.80 (or 0.50%) for cows from non PUSP was 0.12%. The result suggested that credit of PUSP could increase household income provided that the management is executed properly.

Feder (1990) in his study concluded that there were two factors that must be considered when assessing the possible impact of the expansion of agricultural credit and those are: (a) not all farmers (only some farmers) are constrained by inadequate capital in agribusiness management, (b) the possibility of fraud (fungible) in the use of credit due to the fact that the credit was used as consumptive needs, so the effect of the use of credit became less effective than if it was used fully for productive activities.

In Central Sulawesi, the program of beef cattle farmer groups empowerment through mentoring needs to be improved, in relation to the above condition: (1) the government made the program of beef donation through the program of SMD for livestock farmers group formation that is believed to be one of the perfect solution to enhance the empowerment of the farmers in almost all areas of the district / town in Central Sulawesi, and (2) with the SMD program, various aspects of farmer resources (financial resources, technological mastery resources, economic resources, physical resources, and social resources to beef cattle group dynamics).

Based on the description of the background, the problem is then formulated as follows: (1) how are farmer resources (financial resources, technological mastery resources, economic resources, physical resources, and social resources) and susceptibility toward farmer group dynamics, and (2) which factors is the most dominant in influencing the dynamics of farmer groups (sustainability of the group).

Based on the formulation of the problem presented, the study aims to: (1) analyze the effect of farmer resources (financial resources, technological mastery resources, economic resources, physical resources, and social resources) and susceptibility to farmer group dynamics, and (2) analyzes the most dominant factor in influencing group dynamics (sustainability of the group).

From the background of the problem and previous research, hypotheses were made to achieve the objective of the study, namely: (1) financial resources significantly affect the level of farmer group dynamics, (2) technological mastery resources significantly affect the level of farmer group dynamics, (3) economic resources significantly affect the level of farmer group dynamics, (4) physical resources significantly affect the level of farmer group dynamics, (5) social resources significantly affect the level of farmer group dynamics, and (6) vulnerability context significantly affect the level of farmer group dynamics.

2. Materials And Methods

2.1. Determination of Location and Time of Research

The experiment was conducted in the province of Central Sulawesi, Toli-toli regency. The Toli-toli was chosen due to the fact that Toli-toli is the district with the largest number of beef cattle farmers who received assistance of SMD grants from the government for the development of beef cattle in Central Sulawesi. In the area of Toli-toli, the number district and farmers who receive financial aid were Dakopamean district, Galang District and Lampasio District, as shown in Table 1. The experiment was conducted for 3 months.

Table 1. The District, the village and the number of farmers who receive Financial Aid in Toli-Toli in 2010

No.	District	Village	Number of farmers
1	Dakopamean	Kapas	20
2	Galang	Lakatan	26
3	Lampasio	Tinading	30
4	Lampasio	Sibea	20
5	Lampasio	Salugan	15
Total			111

Source: Department of Livestock of Toli-Toli Regency, 2010

2.2. Determination of Respondents

The number of samples in this study were 111 farmers. Determination of the samples was based on census where sampling of the population was random without regard to existing strata in the population because the population is considered to be homogeneous.

2.3. Sources of Data

The data collected in this study derived from primary and secondary data. All primary data were collected by the survey and in-depth interview by using a questionnaire that has been prepared in advance. Secondary data were collected from institutions associated with the research. This study used survey method that systematically and

factually describe the phenomenon of the present and also described the relationship between phenomena, testing the hypotheses, making interpretations and geting the meaning of the studied phenomenon (Nazir, 1988).

2.4. Data analysis

Techniques of data analysis was executed to answer the research objectives. Techniques of data analysis in this study are as follows. To answer the first and the second goals, Structural Equation Model or Structural Equation Model (SEM) was used.

3. Results and Discussion

3.1. Assessing Fitted Model Research

The main method of analysis in this study was by Structural Equation Model (SEM). Testing is done with the help of SmartPLS program. Data processing techniques was conducted by using the method of SEM-based Partial Least Square (PLS), that require 2 stages to assess Fitted Model of a research model. The stages are:

3.1.1. Assessing the Measurement Model (Outer Model).

Smart PLS was used for data analysis techniques. There are four criteria for assessing the outer models, those are Convergent Validity, Discriminant Validity, average variance extracted (AVE) and Composite Reliability. Convergent validity of the measurement model with reflexive indicators was assessed by the correlation between the score item / score component which are estimated by PLS Soflware. Size of individual reflexive was high if the score of correlation is more than 0.70 with the construct being measured, but according to Chin, (1996) in Ghozali (2006), loading value of 0.5 to 0.5 were regarded to be sufficient for preliminary study of measurement scales development.

Measurement Models in this study consisted of financial resources variables (FR), Technological mastery resources (TMS), economic resources (ER), physical resources (PR), social resources (SR), the context of vulnerability (CV), and the level of group dynamics (GD), which are described by each valid indicator. The outer loading results test could be recommendable when the value of outer loadings > 0:50 and a cross correlation value loadings with latent variables was greater than the correlation with other latent variables.

Criteria of average variance extracted value (AVE) which is the recommended was greater than 0.5 and good value of composite reliability criteria was above 0.7 (Wiyono, 2011).

Tabel 2. AVE value, *Composite Realibility*, R *Square*, dan *Cronbach's Alpha*

Variabel	AVE	Composite Reliability	R Square
GD(group dynamics)	0,728514	0,914662	0,769559
CV (countext of vulnerability)	0,512241	0,878049	
ER (economic resources)	0,566275	0,927781	
FR(financial resources)	0,650096	0,880165	
PR	0,646172	0,947876	
TMS	0,691822	0,898507	
SR	0,673953	0,942451	

Source : Output SmartPLS 2.0

Table 2 shows that the average variance extracted (AVE) of financial resource variables (FR), Technological mastery resources (TMS), economic resources (ER), physical resources (PR), social resources (SR), the context of vulnerability (CV), and level of group dynamics (GD) were > 0.5. This indicated that all the variables were already sufficient of the model adequacy.

Table 2 shows that the composite reliability of financial resource variables (FR), Technological mastery resources (TMR), economic resources (ER), physical resources (PR), social resources (SR), the context of vulnerability (CV), and the level of group dynamics (GD) were > 0.7. This indicated that all the variables were already reliable on the adequacy of the model.

3.1.2. Testing the Structural Model (Inner Model)

Testing the inner models orstructural models was done to determine the relationship between the variables, the values of significance and R-square of the research model. Assessment models with PLS was initiated by looking at the R-square for each dependent latent variables. R-square value can be used to assess the substantive effect of the certain latent variables on dependent latent variable.

Table 2 shows that the R-square value of financial resources variable constructs (FR), technological mastery resources (TMR), economic resources (ER), physical resources (PR), social resources (SR), the context of vulnerability (CV), and the level of group dynamics (GD) was greater than 0.6. The higher the R-square value, the greater the ability of the independent variables to explain the dependent variable so that the better the

structural equation. The value of construct R-square was 0.7696, which means that 76.96% of financial resources independent latent variables (FR), technological mastery resources (TMR), economic resources (ER), physical resources (PR), social resources (SR), and vulnerability context (CV) are able to explain the dependent latent of GD variable while the rest is explained by other variables outside the research model.

3.2. Hypothesis Testing

Hypothesis testing was done by comparing the values of the t-test and t table at level α error of 5% with degrees of freedom (df) of 105. Significance of the estimated parameters provided very useful information about the relationship between the study variables. Limits to reject and accept the hypothesis is 1.659 (t table value at α 5%, 105 df), when the t value is in the range of values -1.659 and 1.659, the null hypothesis would be accepted, which means independent latent variables did not significantly affect the variable latent dependent on the error rate of 5%.

The results of PLS SEM were shown in Figure 1 and Table 3.

Table 3. Coefficient and t statistic (t calculated)

Items	Coeficient	t-calculated	t-tabel (α 5%, df 105)
FR – GD	0,371	4,912*	1,659
TMR – GD	0,692	2,139*	1,659
ER – GD	-0,069	0,993	1,659
PR – GD	0,349	2,183*	1,659
SR – GD	0,053	0,368	1,659
CV – GD	-0,133	2,141*	1,659

Source : Output SmartPLS 2.0

* = significan at α = 5%

Table 3 gives the estimated output for testing the structural model. Table 3 shows that all of the independent latent variables significantly affected the dependent latent variables, except the variable ER - GD and variable SR – GD. Table 2 shows the resource variables of technological mastery was the strongest variable affecting the level of group dynamics.

3.2.1. Test of Hypothesis 1

Hypothesis 1 stated that financial resources (FR) significantly affect the level of group dynamics (GD). Table 3 shows the t value of 4.912 which was higher than t table of 1.659 at the 5% error rate. This suggests that null hypothesis was rejected, meaning financial resources (FR) significantly affected the level of group dynamics (GD). Coefficient of parameters of the influence of financial resources (FR) on the level of group dynamics (GD) was 0.371 (37.1%). This indicated that there was a positive effect of financial resources (FR) on the level of group dynamics (GD), where the higher the role of financial resources (FR), the higher the level of group dynamics (GD).

3.2.2. Testing Hypothesis 2

Hypothesis 2 states that the technological mastery resources (TMR) significantly affected the level of group dynamics (GD). Table 3 indicated that the t value of 2.139 was higher than t table of 1.659 at the 5% error rate. This suggested that the null hypothesis was rejected, meaning that TMR significantly affected the level of group dynamics (GD). Coefficient of parameters of the influence of TMR on the level of group dynamics (DK) was 0.692 (69.2%). This means that there is a positive effect of TMR on the level of group dynamics (GD). The higher the role of TMR, the higher the level of GD.

3.2.3. Testing Hypothesis 3

Hypothesis 3 stated that the economic resources (ER) significantly affected the level of group dynamics (GD). Table 3 shows that the t value of 0.993 was higher than t table = 1.659 at the 5% error rate. This suggests that null hypothesis was accepted, meaning that economic resources (ER) had no significant effect on the level of group dynamics (GD). This indicated that the data did not support the research model.

3.2.4. Testing Hypothesis 4

Hypothesis 4 states that the physical resources (PR) significantly affected the level of group dynamics (GD). Table 3 shows that the t value of 2.183 was higher than t table = 1.659 at the 5% error rate. This suggested that the null hypothesis was rejected. This means that physical resources (PR) significantly affected the level of group dynamics (GD). Coefficient of parameters of the influence of physical resources (PR) on the level of group dynamics (GD) was 0.349 (34.9%), meaning that there is a positive effect of physical resources (PR) on the level of group dynamics (GD), where the higher the role of physical resources (PR), the higher the level of group dynamics (GD).

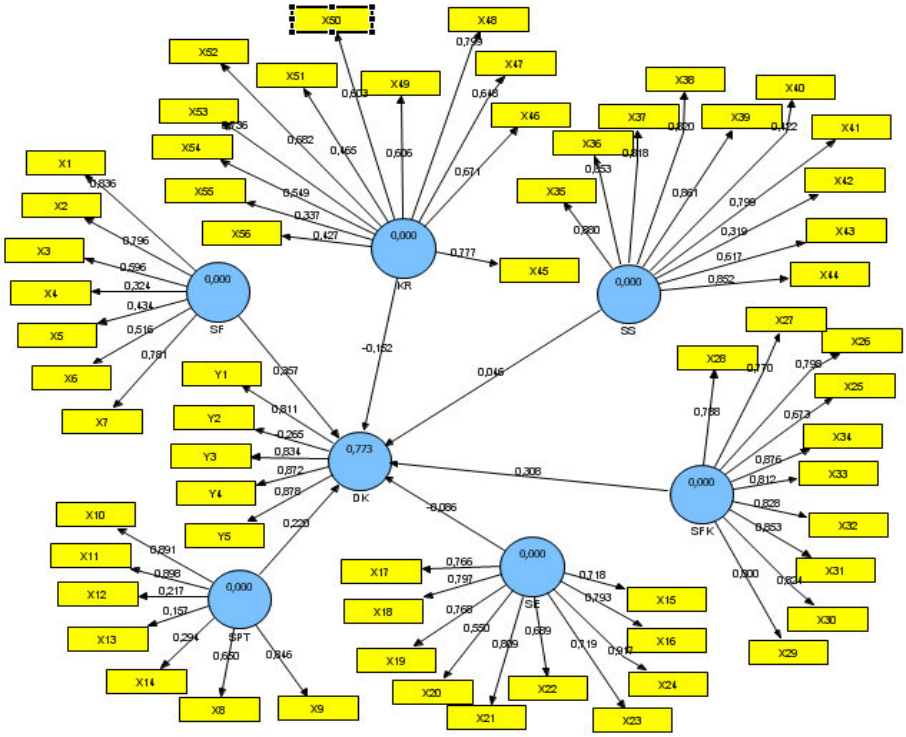

Figure 1. SEM Model of Testing GD

3.2.5. Testing Hypothesis 5

Hypothesis 5 states that social resources (SR) significantly affected the level of group dynamics (GD). Table 3 indicated that the t value of 0.053 was higher than t table of 1.659 at the 5% error rate. This suggested that the null hypothesis was accepted, meaning that social resources (SR) had no significant effect on the level of group dynamics (GD). This result showed that the data did not support the research model.

3.2.6. Testing Hypothesis 6

Hypothesis 6 states that the vulnerability context (CV) significantly affected the level of group dynamics (GD). Table 3 showed that the t value of 2.141 was higher than t table of 1.659 at the 5% error rate. This suggested that the null hypothesis was rejected, meaning that the CV significantly affected the level of group dynamics (GD). Coefficient of parameters of the influence of the CV on the level of group dynamics (GD) was -0.133 (13.4%), This means that there is a negative impact of the CV on the level of GD, where the lower the CV, the higher the level of GD). This shows that the vulnerability of the season (abnormal condition) and the security vulnerabilities (especially in the case of cattle theft) that would hamper the level of group dynamics. This phenomenon indicates that the better seasonal conditions and the lower the level of cattle theft indicate the better level of farmer group dynamics.

4. Conclusions and Recommendations

4.1. Conclusions

The resources of beef cattle farmer consisting of financial, technological, economic , physical , social and vulnerability (seasonal vulnerability and vulnerability of security) simultaneously affected the level of farmer group dynamics. (a) financial, technological mastery , and physical (resources) positively and significantly affected the level of group dynamics, where the higher the role of farmer resources, the higher the level of farmer group dynamics, (b) vulnerability significantly and positively affected the level of farmer group dynamics, where the lower the level, the higher the vulnerability of farmer group dynamics. (c) Economic and social resources produced non-significant effect on the level of farmer group dynamics, meaning that the data did not support the research model. The most dominant factor affecting the level of farmer group dynamics (sustainability of the group) is a Technological mastery resources and the least factor is context of vulnerability in the aspects of seasonal vulnerability and vulnerability of security.

4,2. Recommendations

1. Considering the facts of the increase in the whole farmer resources as the impact of the empowerment of "gaduhan" program in cattle, this empowerment program should be continued;
2. The results of the indicated that technological mastery resources is the most dominant factor influencing group dynamics / beef cattle agribusiness sustainability. Intervention to improve the accessibility of

technological mastery resources needs to be intensified through improved non-formal education and extensions. The supervision will improve the knowledge, skills and positive attitudes in beef cattle agri-business.

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