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Effect of Group Dynamics on Environmentally Friendly Innovation (Case Study of Empowerment of Group of Dairy Cattle Farmers In Ngantru Village Ngantang Subdistrict Malang Regency East Java Province, Indonesia)

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This study examines the dynamics of the group on environmentally friendly innovations through the Empowerment of Dairy Farmer In Ngantru village Ngantang Subdistrict. This study uses mixed methods that are a blend of quantitative and qualitative. Quantitative data was collected using a questionnaire, while qualitative data was obtained from interviews with farmers. Quantitative data was analyzed using the Generalized Structural Component Analysis (GSCA) approach. The research findings obtained a positive relationship between group dynamics towards empowerment and environmentally friendly innovation. The findings indicate that group goals, group fostering and development, pressure in groups have a relationship with the empowerment of dairy farmers who join the group. Other findings are group structure, group task function, group cohesiveness, group atmosphere, and group effectiveness are very important in applying environmentally friendly innovation. Utilization of biogas technology by farmers as fuel in household needs. In addition, some farmers also use the energy produced as light when there is a power outage. While the utilization of biogas waste by farmers is used as fertilizer which is processed into compost, sold, or thrown away because it does not have media for further processing. Future studies further examine the empowerment of farmers based on environmentally friendly innovations that have a major impact on society.

Keywords: Group dynamics, environmentally friendly innovation, empowerment, dairy farmers, Biogas.

INTRODUCTION

Dairy products are important food products for health due to the nutritional content contained in them. Dairy cow is one type of livestock whose main yield is milk. The dairy cattle business that produces fresh milk is very prospective because there is still a large gap between milk availability and demand. The need for animal protein derived from milk in Indonesia is 5 kg/capita year but only

around 32% is fulfilled from domestic production while the remaining 68% is still imported (Londa et al., 2013). In producing dairy products, it cannot be separated from the role of dairy farmers.

Maintenance of dairy cows in folk farmers still uses simple technology and based on experience. Adoption of innovation is an effort to increase business productivity, because the adoption of innovation is expected to improve the quality and

quantity of products which will then have an effect on business income and progress. Similarly in dairy cattle business, farmers must be able to conduct the adoption of innovations that can empirically increase livestock productivity. The appropriate strategy for increasing the adoption of innovations is needed to maximize production (Mulatmi et al., 2016).

The implementation of group-based joint business development in the highly dynamic agricultural sector is the development of dairy cattle business, as part of the livestock sub-sector business of the agricultural sector develop through the management of joint ventures, namely the Dairy Cow Farmer Group / Kelompok Peternak Sapi Perah (KPSP) which later in several regions, successfully developed into a Dairy Cow Cooperative / Koperasi Peternak Sapi Perah.

In line with the development of the times, the wheel of development continues to reach a point of hope that is always shifting according to changing needs and developments in the situation (Van de Ven, 1995; Redclift, 2005). The development of human resources in the global era should be prioritized, because during these periods the application of super-sophisticated technology has penetrated all aspects of human life (Sutrisnowati and Hadi, 2018). Groups have diversity in many ways, namely size, duration, values of purpose, scope and most importantly diversity in group size (Falo, 2016).

Group dynamics is a branch of social science that studies human behavior in groups or knowledge that studies the personnel who work in groups, find the cause, and what the consequences for individuals and groups (Amir, 2009). Adding that group dynamics is actually a part of social science that emphasizes more attention to human interaction in small groups. In various references, the term group dynamics is also called group processes. It is clear from this terminology that the understanding of group dynamics or group processes describes all things or processes that occur in groups due to the interaction of individuals in the group (Maas, 2004).

Groups become strong if they can be managed properly. Strength in meeting needs, developing potential, and self-actualization of its members. In groups, humans experience the process of socialization and education. The group also functions as a working room, study room, playroom, and joking room. Conversely, if the group cannot be managed properly, of course it

can be a weakness (Makawekes et al., 2016). The success of a group essentially lies in group dynamics (Forsyth, 2010 ; Chambers, 2018; Barr and Mintz, 2018; Group dynamics is a force that is contained within a group that affects members and groups in achieving goals. So that the dynamics of a group can be viewed from group strength (Smith et al., 2018; Edley and Litosseliti, 2018). Dairy farmers in a region are very dependent on the existence of dairy cooperative institutions as an institution that facilitates business activities of farmers (Minot, 2018; Zhong et al., 2018). Farmers as members of cooperatives in developing dairy cattle areas need to be facilitated, especially in strengthening of the planning, strengthening of the cooperation and partnerships, strengthening of the facilities and infrastructure, strengthening of the human resources, strengthening of the institutions, accelerating the technology adoption and developing the downstream industries (Priyono and Priyanti, 2015). The group dynamics are important to study because in the presence of these things will form a dynamic group. The dynamism will also be marked by the existence of clear objectives, complete structure and the existence of task functions as administrators and members, namely as information, cohesiveness that is a strong attachment between members so that they consider themselves as a part of it (Triwahyuni, 2016). The purpose of community empowerment is to arouse all existing abilities in the community to achieve the goals of motivation, initiative, creative growth and appreciation and recognition for those who excel (Wijaya, 2002) in Haqqie (2016).

One form of effective empowerment of farmers is through a form of group empowerment (McCarthy et al., 2018; O'Hara et al., 2018; Benjamin et al., 2018; Markantoni et al., 2018; JIAO et al., 2018; and Teixeira et al., 2018). The group approach has advantages because of its wider range of capabilities, and in accordance with the culture of more communal rural communities. The group also has functions such as a forum for learning and vehicles in cooperation among communities (Bryson, 2018).

MATERIALS AND METHODS

Location and Time of Research

This research was conducted in Ngantru Village, Ngantang Sub-District, Malang Regency, East Java Province, from August to November 2018. The method for determining the location of

research in both villages, sub-districts and districts was determined purposively. Sugiyono (2012) explains that purposive sampling is a technique of determining samples with certain considerations

Determination of Sampling Methods

The method of determining respondents in this study is the saturated sampling method or better known as the census term, according to Sugiyono (2012) census is a sampling technique if all members of the population are used as samples. The population in this study were members of the independent dairy farmer group and farmer groups assisted by Sumber Makmur Village Cooperative in Ngantru Village, Ngantang District.

Method of collecting data

Data collection in quantitative research using a questionnaire. Questionnaires are a number of written questions that are used to obtain information from respondents in the sense of reports about the person, or things he knows (Arikunto, 2002). The advantage of using a questionnaire is that in a relatively short period of time it can get a lot of data, little energy is needed and the respondent can answer freely without the influence of others. While the weakness of the questionnaire is a questionnaire that is rigid because the questions that have been determined and the respondent does not give an answer that is in accordance with his situation just read and then write the answer.

Statistical analysis

Based on the problem, the design of this study using mixed methods that are a blend of quantitative and qualitative. Quantitative data was collected using a questionnaire, while qualitative data was obtained from interviews with farmers. This study uses 3 (variables), namely: group dynamics, empowerment and environmentally friendly innovation. Qualitative data in this study analyzed using equation modeling structural models with the Generalized Structured Component Analysis (GSCA) approach.

RESULTS

Analysis of Relationships between Research Variables

The inferential statistical method used in the analysis of relationships between research variables is *Generalized Structural Component Analysis* (GSCA). The reason for using GSCA is

by considering that the causal relationship formulated in this study uses a one-way (recursive) causality model with measurement of formative variables, Solimun (2012).

Test of Validity and Reliability

The Unidimensionality Test of each construct is conducted by looking at the convergent validity of each construct indicator. Characteristic Variables of Respondents do not need to conduct a test of Validity and Reliability because it is an ordinal scale. Testing is done by conducting Discriminant Validity and Composite Reliability.

Discriminant validity

Discriminant validity, is a measurement of reflexive indicators based on cross loading with its latent variables. Another method namely by comparing the *square root of average variance extracted* (AVE) value of each construct, with correlations between other constructs in the model. In this regard, the recommended measurement value must be greater than 0.50. Furthermore, the testing results of Discriminant validity can be seen as the visualization of Table 1. Table 1, shows the results of discriminant validity testing where all values of Average variance extracted (AVE) are greater than 0,50. Thus it can be concluded that this measurement meets the Convergent Validity requirement based on the value of Average Variance Extracted (AVE).

Composite Reliability

The composite reliability test results can be seen as visualization of Table 2.

Based on Table 2. above, it can be explained the results of composite reliability testing which shows satisfactory value, where all latent variables have been reliable because all variable values have composite reliability values $\geq 0,70$. In other words, the questionnaire used as an instrument in this study is reliable or consistent. Thus it can be concluded that, all indicators indeed become a measure of their respective constructs.

Goodness of Fit Model

The theoretical model on the conceptual framework of the study is said to be fit if supported by empirical data. There are two indications to see whether the model used is good, namely goodness of fit structural model and goodness of fit overall model.

Table1. Testing Results of Discriminant validity

Variable	Average variance extracted (AVE)
Group Dynamics (X1)	0,725
Community Empowerment (Y1)	0,809
Environmentally Friendly Innovations (Y2)	0,929

Table2. Testing Results of Composite Reliability

Variable	Composite Reliability	Description
Group Dynamics (X1)	0,952	Reliable
Community Empowerment (Y1)	0,889	Reliable
Environmentally Friendly Innovations (Y2)	0,961	Reliable

Source: Data processed (2019)

Table 3. Testing Results of Goodness of Fit Overall Model

Criteria	Cut-of value	Model Results	Description
SRMR	≤ 0,08	0,084	Marginal
GFI	≥ 0,90	0,997	Good Model

Source : Data processed (2019)

Table4.Results of Hypothesis Testing of Direct Influence

Direct Influence	Path Coefficient	Standard Error	Critical Ratio	Description
Group Dynamics ->Empowerment	0.739	0.043	17.0*	Significant
Group Dynamics ->Innovation	0.456	0.014	31.45*	Significant
Empowerment -> Innovation	0.283	0.031	9.16*	Significant

CR* = significant at .05 level

Source: Data processed (2019).

The results of testing the goodness of fit structural models and overall models in accordance with the results of the GSCA analysis are presented in the Appendix.

In the goodness of fit structural model is seen from the values of FIT and AFIT. In this model, the FIT value is obtained at 0.616 which means that the research model formed can explain all existing variables equal to 0.616. The Diversity of Respondent Characteristics, Group Dynamics, Farmer Community Empowerment, and Environmental Friendly Innovation which can be explained by the model amounted to 61,6% and the rest (38,4%) can be explained by other variables which not included in the research.

To find out that the hypothetical model namely the goodness of fit overall model supported by empirical data is presented in Table 3.

The results of the *Goodness of Fit Overall Model* testing based on Table 3 show that GFI has fulfilled the cut off value, so the GSCA model in this study is suitable and feasible to use, so that the interpretation can be made for further discussion.

Goodness of Fit Structural models measured using FIT and AFIT. FIT formed from structural models is equal to 0,616. So, the model formed can explain all existing variables equal to 0,616. The Diversity of Respondent Characteristics, Group Dynamics, Farmer Community Empowerment, and Environmental Friendly Innovation which can be explained by the model amounted to 61.6% and the rest (38.4%) can be explained by other variables which not included in the research. Means that, if viewed from the FIT value obtained, the model formed can be said to be quite good.

Adjusted from AFIT is almost the same as FIT. However, because the variables that affect the performance not just one but five variables so it would be better if the interpretation of the accuracy of the model using AFIT. AFIT formed from the structural model is 0,604. So, the model formed can explain all variables equal to 0,604. The diversity of respondent characteristics, group dynamics, farmer community empowerment, and environmentally friendly innovation that can be explained by the model amounted to 60,4% and the rest (39,6%) can be explained by other

variables. Means that, if viewed from the AFIT value obtained, the model formed can be said to be still quite good.

Hypothesis Testing Results

In the structural model, nine hypotheses of relationships between variables (direct effect) were tested. The results of testing the relationship between the research variables in detail are presented in Table 4.

The results of the analysis in Table 4 show that the relationship among variables on the direct effect shows significant. Testing the hypothesis are explained:

Hypothesis 1: Effects of Group Dynamics on Community Empowerment.

Testing the hypothesis with the GSCA approach produces path coefficients of the effect of Group Dynamics on Community Empowerment has a significant effect with path coefficients of 0.739 and the values of CR 17. Because $CR > 1.96$, then there is enough empirical evidence to accept H1: which states that Group Dynamics has a significant and positive effect on Community Empowerment. The coefficient with a positive sign indicates that the better the Group Dynamics (X1), the better will be the Community Empowerment (Y1).

Hypothesis 2: Effects of Group Dynamics on Environmentally Friendly Innovations

Testing the hypothesis with the GSCA approach produces path coefficients the influence of Group Dynamics on Eco-Friendly Innovation has a significant effect with a path coefficient of 0.456 and the value of CR 31.45. Because $CR > 1.96$, there is enough empirical evidence to accept H1: which states that Group Dynamics has a significant and positive effect on Eco-Friendly Innovation. The coefficient with a positive sign indicates that the better the Group Dynamics (X1), the better the Eco-Friendly Innovation (Y2).

Hypothesis 3: The Effect of Community Empowerment on Eco-Friendly Innovations

Testing the hypothesis with the GSCA approach produces a path coefficient of the influence of Community Empowerment on Eco-Friendly Innovation has a significant effect with

path coefficients of 0.283 and the value of CR 9,16. Because $CR > 1,96$, then there is enough empirical evidence to accept H1: which states that the Community Empowerment has a significant and positive impact on Eco-Friendly Innovation. The coefficient with a positive sign indicates that the better Community Empowerment (Y1), the better the Eco-Friendly Innovation (Y2).

In addition to the testing of the direct effects, in the GSCA is also known the indirect effect. Indirect effect is the result of multiplying 2 (two) direct influences. Indirect effect is declared significant if the two direct effects that make it up are significant. The results of testing for indirect effects are presented in Table 5.

Indirect effect between Group Dynamics on Environmentally Friendly Innovation through Community Empowerment, obtained indirect effect coefficient of 0.209. The direct influence (Group Dynamics on Community Empowerment and Community Empowerment on Environmentally Friendly Innovation) both of them are significant, it can be concluded that there is a significant indirect effect between Group Dynamics on Environmentally Friendly Innovation. Community Empowerment is a partially mediating variable. This means that the higher the value of Group Dynamics, the higher the value of Environmentally Friendly Innovation, if the value of Community Empowerment is also high.

In addition to testing of direct effect and indirect effect, in the GSCA also known the total effect. Total effect is the sum result between direct influence and indirect influence. The total effect is used to find out exogenous variables that have the greatest influence on endogenous variables. The results of the total effect test presented in Table 6.

Based on Table 6, the results of the testing of the total effect of the structural model are described as follows: The total effect coefficient between Group Dynamics on Environmentally Friendly Innovation in multivariate modeling namely equal to 0,665. The total effect is obtained by summing the direct effect of the influence of Group Dynamics on Eco-Friendly Innovation (0.456) with indirect effects, namely Group Dynamics on Eco-Friendly Innovation through Community Empowerment (0.209).

Table 5. Structural Model of GSCA Result of Indirect Effects

Indirect Effects	Direct Effect Coefficient		Indirect Effect Coefficient	Description
X1 → Y1 → Y2	X1 → Y1 = 0.739	Y1 → Y2 = 0.283	0.209	Significant

Source: Data processed (2019)

Table 6;Structural Model of GSCA Result of Total Effect

Direct Effect	Indirect Effect	Total Effect
X1 → Y2 = 0,456	X1 → Y1 → Y2=0,209	0,665



Figure 1. (a). Feed fermentation from cassava. (b). Chopper machine. (c). Biogas installation (d). Automatic drinking water (water ad libitum.) (e) Automatic milking machine



Figure 2. (a) The process of handling sick cattle. (b).Handling of cows give birth

DISCUSSION

Relationship of Group Dynamics with Empowerment

Based on hypothesis testing shows that there is a relationship between group dynamics on the empowerment of dairy farmers in group assisted by KUD Sumber Makmur. Group dynamics in this study were measured from group goals, group structure, group task functions, group fostering and development, compactness, group

atmosphere, pressure in groups, group effectiveness and group hidden intentions. Based on the measurement model, group cohesiveness/compactness indicators most strongly measure group dynamics in Group Assisted by KUD Sumber Makmur. The findings show that group goals, group fostering and development, pressure in groups have a relationship with the empowerment of dairy farmers who are members of a group. Clear goals in the group will make the empowerment process run smoothly because goals can be used as a basis for conducting activities. The group fostering

and development that is always carried out will accelerate the empowerment process which conducted in groups and if there is no internal or external pressure in the group, then the empowerment process will not be hampered.

The purpose/ goal of the group assisted by KUD Sumber Makmur is to improve the quality of good livestock raising so that it can produce good milk production and quality. This goal has been understood by all group members so that it can be used as a group reference in preparing activities, besides that it is also used to measure the progress of their business. The activities carried out that already in accordance with the group's goals namely to hold routine activities to exchange opinions among members so that they get the best way to apply. All members' goals basically lead to the desire to make a profit from better production and quality of milk. The goals in the group have also been able to foster motivation and help in the problems of group member farms. To achieve a group goal there is no specific time limit for achievement directed by KUD.

The group of dairy farmers fostered/assisted by Sumber Makmur Village Unit Cooperative in Ngantru Village has clear goals and has been understood by all members. The purpose of this group namely to improve the quality of the cattle so that it can produce high quality and quantity production. With the clarity of the main goal to be achieved, then it easier for group members to strive for achieving goals, so that the dynamics of this group can also be better and stronger. The purpose/goal of the group can also be used as a group reference in preparing activities, besides that it can also be used to measure the progress of the business. This was revealed by Suyono as a group member who said that :

"All members have understood the common goal namely for improving the quality of milk and also improving the livestock raising system" said Suyono when met at his residence.

During the meeting, discuss about the activities of the group as an effort to achieve group goals. Clear group goals are needed so that members can do something according to the needs of the group. In addition, group goals support the achievement of group member goals. If the group's goals support the goals of its members, the group becomes strong in its dynamics. Activities carried out in the form of monthly routine activities and human resource development activities to increase the capacity of farmers.

"Every month we have a meeting that begins

with yasinan and tahlilan together," he added.

All farmers who deposit their milk production to the Sumber Makmur Village Unit Cooperative/ KUD sumber Makmur are directed to join the group. So that there are no independent efforts of farmers who want to join the group. Even so, all group members feel positive comfort and benefits in the group. The response was known from several group members interviewed saying that :

"Yes, I like being in the middle of a group, can add friends, relatives, and can exchange opinions with one another" said Suprayitno, who is

currently a member of the group assisted by Sumber Makmur Village Unit Cooperative/ KUD Sumber Makmur.

All goals of group members basically lead to the desire to seek profit from better production and quality of milk. The goals in the group have also been able to foster motivation and help in the problems of group member farms. So that efforts to achieve these goals are always carried out continuously without specific time limits. According to Slamet (2002) the relationship between group goals and member goals has five possible forms namely: 1) completely contrary; 2) partly contradictory; 3) neutral; 4) in the same direction and 5) identical. A good group goal must be related to the members' goal so that the results can benefit members. Clarity of goals possessed and understood by members can support the progress of the group. So that group goals can be a reference in determining activities, making decisions, and fostering members' sense of responsibility towards achieving group goals. In accordance with Azhari's research (2016) which shows that each informant has different steps, but the same goal is to increase cattle population and group members not only want assistance in the form of material but also information that is useful for cattle raising activities, and they want to have cattle support facilities such as widening cages, extensive lawn gardens, and efforts that have been made such as doing natural mating for adult male and female Pasundan cattle.

In the effort of the Group Assisted by KUD Sumber Makmur to run the group fostering and development, there are several things that have been implemented, make an effort to foster and develop the group. Division of tasks in groups has been measured according to the ability of members. The group also provides facilities to support the activities carried out, either facilities that are material and non-material, so the group can run as expected.

The group development efforts carried out are

still limited to develop material aspects (in this case in the form of group cash). Whereas the development of the quantity of members has never been carried out, because the dairy farmers who are in each village in the Subdistrict of Ngantang and sell their milk in the KUD are directly members of the group. Efforts to develop group cash are carried out by running a savings and loan program with low interest rates for group members.

Fostering or motivating group members is more directed at improving livestock business, while group development involves increasing the capacity of members of livestock groups, especially in carrying out their functions and duties.

Fiedler (1996) that groups function as a medium to provide management training to leaders. Improving leadership communication skills must also be an important component of the training. The results of (Poluan's et al., 2017), (Noguera-Mendez et al., 2016) on the elements of group development and fostering, the conclusion of the answers from respondents, namely in maesaan waya farmer groups always make efforts in developing and fostering groups, both through socialization and training to add insight and increase group creativity as well as an efforts to provide facilities in carrying out activities in achieving group goals (Stewart and Shamdasani, 2014; Krueger and Casey, 2014).

The interview results explained that in the livestock groups assisted by KUD Sumber Makmur they did not have internal or external pressure. This opinion was conveyed by Siswanto's informant as a group secretary who said that conflict was used as motivation to be more advanced rather than as a pressure that inhibited. Viewed from the style of language, gestures, and facial expression of the informant when the interview took place. Informants tell stories casually using polite and orderly, relaxed, straightforward, and confident language. His relaxed style does not show anything to hide.

Farmers in this group have realized that the challenge of increasing dairy cattle production is getting heavier. So that efforts to improve the quality of human resources need to be improved. Furthermore, farmers will be ready to face challenges in the business sector in the future. This shows that the group has been able to analyze the pressures and challenges that can cause problems in the future.

Fair weather and Keating (1990), West (2002), Romadhon (2017), Murphy (2012), Borges

and Lansink (2015), states that the pressures in the group cause tension in the group, giving rise to encouragement or motivation in achieving group goals. The group pressure function is to help the group achieve its goals, maintain itself as a group, help group members strengthen their opinions and strengthen relations with their social environment. Pressure on groups is a challenge for groups that can be sourced from within and from outside the group. In growing pressure on the group must be careful and precise. The accuracy of growing group pressure will dynamically the group. Pressure will encourage action to achieve group goals, while external pressure can appear on its own or be sought in the form of challenges for increased achievement or criticism from outside the group. (Sari et al., 2014) results in the field due to the absence of pressure given and carried out by farmer groups both from inside and outside the group, such as giving awards to outstanding members, and competitions in or between farmer groups.

Relationship of Group Dynamics On Environmentally Friendly Innovations

Based on hypothesis testing shows that there is a relationship between group dynamics towards environmentally friendly innovation at group assisted by KUD Sumber Makmur. The research findings show that group structure, group task function, group cohesiveness/compactness, group atmosphere, and the effectiveness of group ownership are indicators related to environmentally friendly innovations.

This finding shows that the group has a clear structure so that the division of tasks in groups is also clear, so that someone in the group can play in focus to expand innovation adoption on the group members. Task functions in groups have been carried out well, the function of the task in disseminating information, coordinating, solving problems, spreading knowledge and technology has been carried out through the KUD and the independence of farmers. In addition, the atmosphere and cohesiveness in both groups that already good causing fellow members to motivate each other to implement biogas technology. According to Putra (2015), a good relationship between members and comfort among members led to a high level of acceptance of biogas technology. The effectiveness in groups plays a role in the adoption of biogas innovation adoption by farmers (Rantala et al., 2018; Yan et al., 2018; Zeng et al., 2018; Loos et al., 2018; Bekchanov et al., 2018; Kibue et al., 2018).

The group structure formed by livestock groups assisted by / KUD Sumber Makmur is very clear starting from the task structure, authority structure, communication structure. Clarity of structure makes interaction in groups better so that all members have the means to interact (availability of meeting rooms and communication) groups. In accordance with the research of (Runtunuwu et al., 2016), Rosenberg et al., (1994) which states that all group members distribute work tasks equally with their respective abilities, roles and positions, the structure of communication between leaders and members is established and takes place well, and always holds meetings to discuss developments and problems that occur in groups (Hoffmann et al., 2007; Machethe et al., 2004).

The results of interviews with informants, whenever there is information or deliberation, group administrators are also involved in the decision making process. So that problems in groups can be resolved quickly and efficiently. The speed of decision making can show strong group dynamics. Communication between members and group administrators has been well established. Every message received by members and administrators arrived at all members. The smoothness of this communication led to the strengthening of group cohesiveness. So that it can be said that the clarity of this interaction structure makes the interaction in the group smooth so that all members have the means to interact (the availability of meeting rooms and communication) groups.

(Campion et al., 1993), Barry and Stewart (1997), (Lvina et al., 2018), (Anand et al., 2018), Magala et al., (2018) stated that effective group performance is highly dependent on group size and composition. A group can consist of at least two people (giving credibility to the statement that "two heads are better than one"), or as many as three or four hundred. To be effective, the size of the group must be kept to a minimum without endangering the workload and achievement of goals. Larger groups increase the possibility of conflict because of a variety of perspectives, few opportunities for the development of social relations, a decrease in the level of participation, and a lack of opportunities for individual recognition. Evaluation in this group is conducted once a year. This evaluation is limited to discussing group cash development. Whereas the evaluation from the UPTD of the Ngantang Sub-District Animal Husbandry is to monitor the development of cattle donations carried out

regularly every four months.

Soedarsono (2005), states that group structure is a form of relationship among individuals in a group that is adjusted to the position and role of each individual. Clarity of the task structure makes the division of tasks evenly according to ability, so that all members participate in the activity. A clear communication structure can increase interaction and group coordination more smoothly so that the message reaches all members. Subekti (2015), also added that the number of members, group structure and assets, management credibility, and institutions is a hierarchical arrangement of relationships based on the role and status of each group member in achieving goals.

In the decision making process, the group also involves all its members. In each problem, group administrators coordinate in advance to avoid conflict with the group. The decision-making mechanism is carried out in deliberation openly at the meeting. If there is a difference of opinion between members, then democratically will conduct the voting election, if many do not agree then the decision cannot be made, as stated by Brother Sama'i:

"Brother Sutopo, sir, if there is anything conveyed in front of the forum, ask for opinions in the forum, but before we discuss the three (group administrators), "he said when interviewed.

In the meeting, it was also revealed that each member who joined had the same rights and obligations, namely carrying out each agreed decision. This shows that the group has carried out a structural function that gives satisfaction to members.

Soedarsono (2005), states that group structure is a form of relationship between individuals in a group that is adjusted to the position and role of each individual. Clarity of the task structure makes the division of tasks evenly according to ability, so that all members participate in the activity. A clear communication structure can increase interaction and group coordination more smoothly so that the message reaches all members. Subekti (2015), also added that the number of members, group structure and assets, management credibility, and institutions is a hierarchical arrangement of relationships based on the role and status of each group member in achieving goals.

From the 8 indicators in the group task function, the group assisted by KUD Sumber Makmur only has seven task functions that have been running optimally, namely the function of

providing information, information technology dissemination function, coordination function, problem solving function, member satisfying function, and function provide an explanation regarding the things that become problems. While the group task function in inviting member participation cannot be said to be fully successful. Because, from the 75 members who joined, only 45-50 members attended a group activity while the other 25 very rarely participated in the activities. This was conveyed by the group leader (Suyono) below.

"In group activities not all were present, those present were only around 50 from 75 members. But even though there were many who were not present, we tried to keep the information forward," he added.

This shows that this group has carried out group functions as an informant. Besides that, it can also be said that group function as a coordination function has been running well. In accordance with a study from Slamet (2002) which said that the purpose of the task function is to facilitate and coordinate group efforts involving shared problems and in order to solve these problems.

The function of the group as a medium for disseminating knowledge and technology to the group was carried out through assistance from the KUD Sumber Makmur. KUD Sumber Makmur provides training facilities to improve the quality of human resources for dairy farmers. The training is carried out every time there are new innovations from the KUD which will be implemented to farmers, so that this activity is incidental. The delivery of knowledge was also carried out by veterinarians and the Development and Sharing Project division of the KUD. The functioning of this group can increase the dynamics that will be able to change behavior, knowledge, and accelerate the dissemination of technological innovations. Technological innovations currently applied by group members include: Fermented feed, Biogas, Water Adlibitum, and some livestock equipment that can support farmer activities as shown Figure 1. The success in carrying out the functions of the groups mentioned above has a positive impact. The impact is shown by the group that has now been able to grow the initiative of the members. Members are often actively involved in various activities, either in the decision-making process and provide positive input to the group.

The input of the above group members plays a large role in group assignments as a media that can help explain and resolve existing problems.

Both problems in group scale and problems faced by members. Some below show that in solving problems, members not only give positive suggestions and input, but play an active role in collaborating to help solve them. Figure 2. (a) The process of handling sick cattle. (b). Handling of cows give birth.

Falo (2016), said that unity and integrity in groups which are one bond of strength and are exclusive. In relation to group dynamics, these feelings can be a warm and loyal group atmosphere, mutual respect and acceptance, full of hospitality, which allows members to fill each other and feel unity, inseparable or otherwise the atmosphere of a group that are suspicious of each other.

The interview results show that the livestock groups assisted by Sumber Makmur Village Unit Cooperative / KUD Sumber Makmur have been running effectively. This is seen from the goals that have been understood by all members, the existence of a clear structure, freedom of expression, flexible decision making, a sense of loyalty, a sense of loyalty and ability from a good leader, leader or chairman of this group is very open and supportive efforts to improve the management of dairy farming directed by the KUD, such as being willing to try new things in feed technology, biogas technology so that members will also be motivated to implement, the support of members, the trust and satisfaction of members towards the group.

In line with the study of Romadhon (2017) who said that groups have been said to be effective when the process of providing work motivation is carried out continuously to achieve efficient group goals and can achieve specific goals set together. Members of livestock groups will not be effective in carrying out their duties and obligations without any control, direction, and cooperation with the leader. This means that a relationship like this is an opportunity to communicate the results of thinking between leaders and members. The effectiveness in this case is the provision of work motivation that is directed to the planning and preparation of group activities and their implementation that is effective and can be resolved according to the expectations of members.

All activities carried out by livestock groups assisted by Sumber Makmur Village Unit Cooperative / KUD Sumber Makmur are based on family principles, namely from members, by members and for members All activities carried out by livestock groups assisted by Sumber

Makmur Village Unit Cooperative / KUD Sumber Makmur are based on family principles, namely from members, by members and for members. From interviews with informants of livestock groups assisted by Sumber Makmur Village Unit Cooperative / KUD Sumber Makmur said that groups do not have any activities that are not known by the members, so this group does not have hidden intentions from both members and administrators. So, it can be said that the group's level of trust is quite high. The level of group trust can improve group dynamics. In line with the results of a study from John (1996) on Lestari (2011) who said that selfish behavior affects the achievement of tasks at the expense of the group. Activities that identify selfish behavior are as follows: a) Dominate and by showing a lack of respect for others, cutting them off, controlling: not listening, and restating the suggestions of other members with different meanings; b) Blocking: by paralyzing lines of thought, and changing the topic of conversation from a point of view or returning to its own interests; c) Manipulate: by giving selfish information, or a single point of view designed to reach decisions that are consistent with their position; d) Underestimating: through put-down, pouting at the point of view of others, or making jokes about the contributions of other members; e) Separating hair: by picking, looking for insignificant details that delay solutions, or damage other people's perspectives.

According to Walgito (2007) cohesiveness needs to be considered in group dynamics, because one of the problems in group dynamics is related to group cohesion or group unity. Group members to stay and prevent them from leaving the group. In line with the study of Romadhon (2017) who said that groups have been said to be effective when the process of providing work motivation is carried out continuously to achieve efficient group goals and can achieve specific goals which set together. Members of livestock groups will not be effective in carrying out their duties and obligations without any control, direction, and cooperation with the leader. This means that a relationship like this is an opportunity to communicate the results of thinking between leaders and members. The effectiveness in this case is the provision of work motivation that is directed to the planning and preparation of group activities and their implementation that is effective and can be resolved according to the expectations of members.

From the results of the research, the reasons for the members to maintain the group and want

to be in a group are as follows, 1) the existence of openness principle in the group, 2) honesty owned by the group leader, 3) social activities carried out 4) Want to regenerate and create a group legal entity, 5) feeling comfortable in the group.

According to Soedarsono (2005) who states that group effectiveness has a reciprocal influence with group dynamics. Effective groups have a high level of dynamics, dynamic groups will effectively achieve their goals and vice versa. Effectiveness can be seen in terms of productivity, morals and member satisfaction. Achieving group goals can be used as a measure of group productivity. The enthusiasm, and the attitude of the members are used as moral measures. The success of members achieving personal goals is used as a measure of member satisfaction. The more successful the group reaches its goals, the more proud the members associate with the group and the members become more satisfied because their personal goals are achieved. Thus groups will be more effective and group dynamics will be even higher.

According to Lumentut (2017), group effectiveness is influenced by leadership, good leaders are those who can communicate positively to influence groups to move towards group goals. According to Jalaluddin (2004) group effectiveness can be seen from the level of group cohesiveness which is an inherent state between members in the group. The attachment that occurs can only be felt in people who have similar backgrounds, likes, fates and so on. Group cohesiveness consists of aspects of interpersonal members 'attachment to one another, members' interest in group activities and functions and how far the members are attracted to the group as a tool to satisfy their personal needs.

According to Herlianto (2012), group cohesiveness is wherein group members like each other and depend on each other and there is an encouragement that causes members to stay in groups. A group is said to be cohesive if it has the following characteristics 1) each member is highly committed to his group; 2) interaction in groups by collaboration, not competition; 3) groups have goals related to each other and according to the development of the destination time; 4) there is interest among members so that the relationships formed strengthen the network of relationships within the group. While the factors that affect the cohesiveness among others : 1) the size of small groups is usually more cohesive because there is less tendency for conflicts

among members; 2) objectives to be achieved by the group 3) member expectations for the group ; 4) threats from other groups that can interfere with group goals; 5) member commitment to the group itself.

According to Soedarsono (2005) who states that group effectiveness has a reciprocal influence with group dynamics. Effective groups have a high level of dynamics, dynamic groups will effectively achieve their goals and vice versa. Effectiveness can be seen in terms of productivity, morals and member satisfaction. Achieving group goals can be used as a measure of group productivity. The enthusiasm, and the attitude of the members are used as moral measures. The success of members achieving personal goals is used as a measure of member satisfaction. The more successful the group reaches its goals, the more proud the members associate with the group and the members become more satisfied because their personal goals are achieved. Thus groups will be more effective and group dynamics will be even higher.

This is in accordance with research conducted by Putra, et al. (2015) there is a positive relationship between group dynamics towards environmentally friendly innovation. The existence of a significant correlation between group dynamics and the level of adoption of biogas innovation reinforces the notion that group dynamics is an important key for farmers in making decisions as the achievement of the success

Marchaim (1992), (Mshandete et al., 2009), Mårtensson and Westerberg (2007), (Alberdi, et al., 2018), (Westerholm et al., 2018), (Porté et al., 2018) states that in the management of biogas energy must involve the community actively starting from the processing, maintenance, and repair of biogas production machinery. The active involvement of the community in these four matters is expected to be able to maximize the energy output produced and minimize damage to production machinery so that the community's energy needs are met and the savings in the use of fuel oil / bahan bakar minyak (BBM) is achieved.

Relationship of Group Empowerment On Environmentally Friendly Innovations

Based on hypothesis testing shows that there is a relationship between empowering the dairy farmers towards the environmentally friendly innovations at group assisted by the Sumber Makmur Village Unit Cooperative / KUD Sumber

Makmur. Empowerment of dairy farmers is seen from the increase in knowledge, attitudes and skills. The measurement model shows that the indicator of knowledge improvement is the strongest measure empowerment at the group assisted by the KUD Sumber Makmur. Yoon, et al., (2009), Laroche et al., (2001), knowledge is recognized in consumer research as a characteristic that affects all stages of decision making

Brother Suyono as a farmer who has applied biogas since 2007 described the benefits obtained from the use of biogas.

"I used to feel confused sir to dispose of cow manure because my house is in the middle of a village far from the river," he said.

When met at his home, Suyono showed that the cage that was built was in the middle of the settlement of Ngantru Village. So he was confused in processing and disposing of livestock waste. With this technology he feels helped in processing, then biogas waste can also be sold as raw material for compost. Livestock waste which is initially thrown into rivers or into manure. Nowadays it can be better utilized. Currently the use of biogas reaches 1.504 units from 3.100 farmers in Ngantang SubDistrict.

The community that used to use wood as fuel and had to go to the forest to get it, now facilitated by biogas. Another benefit that felt namely, 1) can replace other fuels, 2) can be a source of lighting when the light off, 3) cheaper than other fuels, 4) save time compared to looking for firewood, 5) more practical in its use than firewood, as said by Brother Elok.

"Until now I am still very happy to use the biogas sir, besides being able to cook it, it can also be used as a lighting source when the lights off, and I also use biogas waste for organic fertilizer"

Efforts to increase biogas capacity have never been carried out by farmers, this is because farmers have estimated the number of livestock so that the volume of biogas reactors has been calculated. The perception of family members of the group on the biogas development program is mostly positive (beneficial). Based on the results obtained in the field through interviews, the public perception of the biogas development program was mostly positive (beneficial). Farmers who gave positive comments after feeling the impact that could save farmers' expenditure for household fuel fulfillment. In addition, the community can process livestock manure until it has more benefits. This was revealed by 8

informants who were members of a group of farmers in Ngantru Village.

Although many people have been helped by biogas technology, there are still many farmers who do not use this technology. There are several reasons that make the community not apply this innovation. Among other things namely surrender to the condition of the land that is not sufficient for installation. If viewed the age of the farmer and the level of education, farmers who are more than 50 years old and have low levels of education tend to be conservative (Sutrisno, 2002). The attitude of farmers like this will hinder the acceleration of farmers' empowerment (Regan, 2019; Kabbiri et al., 2018). The process of innovations adoption which conducted become difficult to apply to the community (Guerin & Guerin, 1994; Nath, 2001; Mulgan et al., 2007; Shiferaw et al., 2009; Senyolo et al., 2018; Smidt, 2018; Dentoni et al., 2018; Abeele, 2018).

The author also found that some people who have used biogas technology are still reluctant to use it as fuel for cooking food. The use of biogas is only limited to cooking or processing animal feed. There are a number of reasons expressed as revealed by the wife of Brother Suyono as follows:

"The use of biogas, I use it for lighting when the lights off and cook for cow food, if I cook food for people I feel that the cooking smells of dirt so no one wants to eat because it is disgusted"

This still shows that there are still people who have a negative perception of the use of biogas. Farmers still think that cooking cooked using biogas will smell like cattle dung. She also said that if cooking using biogas always imagine the processing. This perception, if not changed, will have a negative impact on the development of adoption of biogas technology innovation as an alternative energy source.

CONCLUSION

Based on the findings of this study concluded that group dynamics had a positive relationship to empowerment based on environmentally friendly innovation. The findings show that group goals, group fostering and development, pressure in groups had a relationship with the empowerment of dairy farmers who are members of a group. Other findings are group structure, group task function, group cohesiveness, group atmosphere, and effectiveness of groups are important in the implementation of environmentally friendly innovations. Biogas technology is very important to help the community in their daily lives. Farmers

can reduce the negative impact caused by livestock manure, namely 1) cause odor, 2) pollute the environment, 3) impurities become useless, 4) difficulty removing manure.

The study recommends the importance of group dynamics on the empowerment of group of dairy farmers based on environmentally friendly innovation. This study has limitations but has a large impact on the community in the use of biogas. With the existence of this biogas technology, people feel very helped and are satisfied using it. After applying this technology, farmers can save on fuel and fertilizer. Members of livestock groups that have applied biogas technology until today feel very satisfied and happy. Future studies examine more about group dynamics towards empowerment based on environmentally friendly innovation.

CONFLICT OF INTEREST

The authors declared that present study was performed in absence of any conflict of interest.

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AUTHOR CONTRIBUTIONS

The article is part of the Dissertation of Doctoral and all the authors have contributed: SW data collection, data analysis and writing manuscript, Prof. YY, Prof S and Prof SK contributed to review of manuscripts.

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