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## Factors Affecting Buffaloes' Farmers Commitment toward Accessibility of Resources in Pemalang District, Central Java, Indonesia

Krismiwati Muatip\*, Hermin Purwaningsih, Alief Einstein, Oentoeng Edy Djatmiko, Sri Mastuti, Nunung Noor Hidayat, Rahayu Widiyanti, Yusmi Nur Wakhidati, Lis Safitri, and Danang Nur Cahyo

Faculty of Animal Science, Universitas Jenderal Soedirman, Purwokerto, 53123, Indonesia

### ABSTRACT

This study was aimed to measure the farmers' commitment, accessibility of resources (information, capital, and assistance), and the correlation between those variables. The research method used in the current study was the survey method. The location was purposively selected in Pemalang Regency, the regency with the largest buffalo population in Central Java Province. Three subdistricts (20%) with formal and informal farmers' groups were selected, and there were Taman, Pemalang, and Belik subdistricts. One Village was selected for each subdistrict. Respondents for informal groups were taken by census method. Respondents in formal groups were taken by random sampling, and the number of respondents followed the number of informal groups. There were 136 farmers selected as respondents. (69 from each formal and informal groups). The data were analyzed using the descriptive and rank Spearman correlation methods. The results showed that the farmers' commitment of formal group and informal group members was in the moderate and low categories respectively based on the percentage score interval scaling method. Resources accessibility of formal and informal members of the farmers' group was in the low to moderate category, but the member of formal groups was slightly better. There was a strong correlation between the accessibility of resources with the commitment in the formal groups, whereas in the informal groups there was a moderate to strong correlation between the accessibility of resources with the commitment of buffalo farmers. Based on the conclusion, this study recommend that the government should assist the informal farmer group to establish formal group with the result that would increase farmers accessibility toward information, support, and capital. That condition would increase farmers commitment to continue their buffalo farm business in Pemalang Regency.

Keywords: Buffalo farmers, Farmers' commitment, Formal groups, Informal groups  
Resources accessibility

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\* Corresponding author:

Telp. +62 813 2870 8063

E-mail:

krismiwati.muatip@unsoed.ac.id

### Introduction

Pemalang Regency is one of the administrative areas located in the northern part of Central Java Province with a population in 2021 was 1,484,209 people. Based on the classification of Pemalang Regency Statistical Office, most of the area in the Pemalang regency is rural, with 134 of 222 villages in the Pemalang Regency. Geographically, Pemalang Regency has three different zones based on the area height from the sea level: coastal zones in the north, lowlands in the center, and highlands in the southern part. Therefore the Pemalang Regency citizens have variants of livelihood and one of which are farmers (BPS Pemalang, 2022).

The farmers in Pemalang Regency run various animal agribusiness, such as buffalo, poultry, beef cattle, and also food crops such as rice, corn, soybean, mungbean, etc. Based on the

report of the Pemalang Regency Statistical Office, this Regency has the highest population of Buffalo in Central Java Province (BPS Pemalang, 2022) with 8267 heads of buffaloes which is 13,55% form the Central Java total population.

Buffaloes' farming in Pemalang regency not only have an economic background, but also held an cultural aspects. Historically, the farmers utilize buffalo as a "workers", to plow the rice fields or as carriage tow. The number of buffaloes farmed by the farmers showing their social status. The higher quantity of farmed buffaloes result in the higher social status they hold. There so many activities in Pemalang regency involves the Buffaloes, such as cultural ritual and traditional food served during the ritual. Based on this fact, the buffaloes farming can not be lost from the Pemalang regency, although currently beef meat could substitute some of meat based traditional food.

Most of the farmers run their crops and livestock business synergically. They used the buffalo to plow their field, used the crops waste as the buffalo feed, and used the livestock manure as a fertilizer. The traditional farmers in Indonesia still remain used buffalo to plow their fields and one of the advantages of this method was pollution-free (Prasiasa and Widari, 2019). Although they have been running integration farming, the buffalo farmers in Pemalang regency did not yet run their livestock business properly. Most of the farmers raise the buffalo with semi-intensive methods by building group cages near the river banks, so the buffalo could do their natural behavior, which was wallowing. They created farmers' groups to coordinate with fellow farmers to share information and maintain social tied among the buffalo farmers.

The rural's farmers in Indonesia shared a common problem, including the buffalo farmers in Pemalang Regency. Their problem is a lack of resources. Resources are one of the important variables to grow the business. Capital, information, and support are important variables that farmers need to expand their businesses. The farmers' group is one solution to increase the accessibility to reach the resources above. The advantage of farmers' group existence is an increase in the accessibility of government and private sector support (Ediset and Anas, 2019). Farmers primary information source is an extension workers and then the experienced farmers roled as the secondary information source. But in the informal group, the experienced farmers was the primary informan. The information is very important for the farmers to improve knowledge, ability, and attitude (Lamarang *et al.*, 2017). Kharis and Rizal (2019) added that government and private sector support was helpful in improving farmers' economies. There are two types of groups of buffalo farmers in Pemalang Regency based on the administration, formal and informal groups. Formal farmers' groups have some differences from informal groups. The formal group has an explicit organizational structure and legal authority, at least from the village head's certificate. Based on pre-research activities, we found that the formal group had more livestock and was more productive than the informal group. This condition was possible because formal livestock groups receive more assistance from the government, including providing livestock from the government, housing assistance, feed assistance, information assistance, etc. It was suspected that the two different groups also had different resource accessibility and that was inspected in the current study.

The different types of groups suspected could affect the behavioral differences, like the farmers' commitment. Organizational commitment according to (Tania, 2013) was a condition when the member of an organization supports the goals of the organization and maintains the membership. Many studies reported that the commitment of the worker could affect performance. Devendra (2013) reported that long-term commitment was important

to achieve the goals of the system. Magu and Kibati (2016) recommended that more commitment was needed by management to solve the agricultural problem in Kenya Farmers Association (KFA). Because of that, this study also inspected the commitment of farmers from formal and informal groups. Based on the statement above, this research aimed to study the accessibility of resources and the farmers' commitment to raising the buffalo from the farmers who were members of formal and informal groups.

## Materials and Methods

The method of the current research was the survey method with the cross-sectional approach. This research target was buffalo farmers in Pemalang Regency, Central Java. The Pemalang Regency was selected purposively due to located in Central Java Province, which has the largest Buffalo population. Three subdistricts in Pemalang Regency, namely Taman, Pemalang, and Belik subdistricts were selected. Three subdistricts were selected to represent 20% of the total subdistricts in Pemalang Regency. The reason that those three subdistricts were selected in this study is based on the condition that there was both formal and informal farmers' group in the subdistrict. One village which had the largest buffalo population from each subdistrict was selected to collect the data. Respondents were obtained by censusing all farmers belonging to formal and informal groups in the village.

The buffalo farmers who were incorporated in the formal and informal groups was the respondent of this research. The farmers from informal groups from each village were censused as the respondent, whereas the member of the buffalo farmer formal group, the member was randomly sampled as the respondent. Formal farmers' group was described as a farmers' organization that has legal authority, explicit organizational structure, and the rights for developing, maintaining, and dissolving relationships (McEvily *et al.*, 2014). The informal farmers' group was a group without official management and legalization by the village government's letter of statement. The primary data was collected from 136 buffalo farmers who were members of formal and informal groups (69 farmers each groups) through the questionnaire and personal interviews.

The variables of this research were the buffalo farmers' commitment and the accessibility of resources, specifically information, capital, and support. The operational definition of information resources is information regarding technology and buffalo farming from livestock extension officers. The operational definition for assistance is assistance from the government in the form of livestock, feed, cages, livestock insurance, artificial insemination, and breeder meeting halls. The operational definition for capital is assistance to access financial capital from banks. The operational definition of commitment's variable was

referred by previous study (Allen and Meyer, 1990) which mention there were three organizational commitments, consisting of affective, normative, and continuance commitment. The three aspects of organizational commitments were able to measure the personal commitment of agricultural workers (Lau *et al.*, 2017). The level of those variables was measured by the 4-point Likert scale (Chyung *et al.*, 2017). The collected data of this research are presented in percentages (%) based on the maximum scale to categorized the resources accessibility and commitment of the farmers. The formula to determine shown below:

$$\text{Percentage score interval} = \frac{\text{Highest score} - \text{Lowest score}}{\text{Number of interval}}$$

The data that have been collected were descriptively and statistically analyzed. The statistical analysis used in this research was Spearman's rank analysis. Spearman's rank analysis was used to analyze the correlation between variables. This analysis was conducted in the study of (Muatip *et al.*, 2019) who analyzed the correlation between group leaders' leadership and motivating ability with farmers' commitment. Spearman rank correlation in this research was conducted to measure the correlation between the farmers' commitment and the accessibility of information, capital, and support. The Spearman rank correlation and assessment criteria following the statement of (Sugiyono, 2014).

$$\rho = 1 - \frac{6 \sum b_i^2}{n(n^2 - 1)}$$

Notes:

$\rho$  = Spearman rank correlation coefficient.

$b_i$  = Variable Xi-Yi data ranking.

n = Number of respondents.

Table 1. Assessment criteria for the Spearman rank correlation

Scores	Rank Spearman correlation criteria
1	Perfect correlation
0.75-0.99	Very strong correlation
0.50-0.75	Strong correlation
0.25-0.50	Fairly weak correlation
0.00-0.25	Very weak correlation
0.00	No correlation between the two variables

## Results and Discussion

### Farmers' accessibility to resources

Term resources used in this research referred to information, capital, and support. The information referred to as a resource in this study was information related to efficient buffalo-rearing strategies to increase animal productivity to increase the farmers' income. The capital as a resource term in this study was access to capital assistance from the government. The support referred to in this study is business assistance from agricultural extension workers at the Pemalang Regency Agriculture Office, livestock insurance, buffalo donation from the government, etc. The accessibility of resources of buffalo farmers was shown in Table 2.

The result of this research showed that the accessibility of information, government support, and capital of farmers who were members of the formal group was in the moderate category. Formal groups had more access to direct information from the government because the group was legally recorded in government data. They usually became the target of government agricultural extension programs, and because of that, the information from the government was easily diffused to the group. The Pemalang Regency Agriculture Office in conducting mentoring programs for farmers is easier to assist formal breeders. Formal groups get more support because administratively the formal groups are legally registered and the program is more accountable. Formal groups that already have legal records also make it easier for them to access capital assistance from banks because their data is recorded making it easier to account for the capital assistance.

The Informal groups are not legally registered by the government as farmer groups. The absence of such legality obstructs the flow of information, support, and capital from the government. These obstacles have an impact on the difficulty of farmers from informal groups in getting access to these three resources. The more intelligent member of informal groups, such as the senior, experienced, and progressive young members sometimes joins the discussion with the formal groups and government. It gave more access to information and support. They also help each other to access feed in the dry season. They rent a truck to obtain forages from the outside of Pemalang Regency. Buffalo farmers with a high category of capital access reported having another business. They have a shop and worked as merchant, so they could easily access capital in the form of credit.

Buffalo farmers in Pemalang Regency, like most ruminant breeders in Indonesia, are rural farmers who did not operate buffalo farming as their primary source of income. Many farmers in rural Indonesia have limited resources, including access to information, networks, and economic capital. These three resources are the primary resources that can encourage the progress of the livestock business (Gayatri *et al.*, 2016). Chen *et al.* (2014) reported in their research to resolve the drought problem experienced by farmers in China, that government support is needed to resolve the condition. The required support includes technical, physical, and financial assistance. Distribution of resources from the government in the form of information, support, and capital to farmers is needed to increase their productivity. Decentralization of resources was carried out from the central government to local governments, including agricultural extension programs (Shrestha, 2014).

The requirement that farmers need to for receiving support from the government is to be part of a farmers' group because the farmers need to be serious about raising their livestock and having a

Table 2. Accessibility of resources of buffalo farmers in Pemalang Regency

Category	Information		Support		Capital	
	Number of farmer (person)	Percentage (%)	Number of farmer (person)	Percentage (%)	Number of farmer (person)	Percentage (%)
Formal group members						
Low	28	41.18	20	29.41	11	16.18
Moderate	37	54.41	33	48.53	36	52.94
High	3	4.41	15	22.06	21	30.88
Informal group members						
Low	30	44.18	30	44.18	58	84.29
Moderate	32	47.06	37	54.41	6	8.82
High	6	8.82	1	1.47	4	5.88

stable to raise their livestock (Siswoyo *et al.*, 2013). For example, a cattle breeding business credit program (KUPS) could be proposed by a company or cooperative if it has a partnership with a livestock group (Winarso, 2015). Based on these conditions, accessibility of resources for farmers from informal groups was more difficult than those from formal groups that are legally registered. That resulted in the value of resources accessibility category of this research which was in the low category for informal groups. According to (Muatip *et al.*, 2022a), buffalo farmers in Pemalang Regency had access to a smartphone and the internet, but they only used them to communicate with others and not used them to access information. This had an impact on the lack of farmers' access to capital, mainly from informal group members. In addition, farmers tend to take capital assistance according to the scale of their business (Habaora *et al.*, 2019).

### Farmers' commitment

The Allen and Meyer's theory of organizational commitments, there were three categories of commitment, affective commitment, continuance commitment, and normative commitment. In this research, the affective commitment was the emotional connection of farmers, identification, and involvement of farmers in the buffalo business. Members with high affective commitment will continue to raise buffaloes of their own volition. Continuance commitment was a breeder's commitment based on consideration of what must be sacrificed when leaving the buffalo business. Individuals decide to keep raising buffaloes because they consider them capable of meeting their needs. Normative commitment, namely the farmer's belief about the responsibility to raise buffalo because they feel they have an obligation to continue raising buffalo. The commitment of buffalo farmers from the formal and informal group members was shown in Table 3.

The result of this research showed that the affective, continuance and normative commitment of farmers who were members of the formal group were in the high, moderate, and moderate categories respectively. Forty-three (63.24%) farmers showed a high emotional engagement category with their groups according to the affective commitment variable. As many as 42 (61.77%) farmers had a moderate category on continuance commitment, which meant they consider the value they had to pay if they left the organization. Thirty (44.12%) buffalo farmers showed that they had a sense of obligation to be responsible for the task and role assigned to their organization.

The result of this research showed that the affective, continuance, and normative commitment of farmers who were members of the informal group were in the low categories with the percentage of 75%; 64.71%; and 70.59%; respectively. The majority of the formal farmers' group member held a moderate to high commitment to continue and improve their buffaloes farm, the result was contradictory to informal farmers' group member commitment. Farmers from the informal groups showed low emotional engagement based on affective commitment. The result also showed that the farmers easily left the group, because there was only a small value that had to be paid when leaving the group. The farmers of the informal group also showed low responsibility regarding the task they need to do in their organization. The previous study by (Muatip *et al.*, 2022b) mentioned there were strong correlation between farmers motivation and commitment. Farmers motivation also influenced by the government support (Nurlaelah and Darwis, 2019). There were mentioned above that the farmers' formal group would get the governmental support rather than the informal one. Lack of support causing the low commitment in the informal farmers' group.

Table 3. The commitment of buffalo farmers in Pemalang Regency

Category	Affective		Continuance		Normative	
	Number of farmer (person)	Percentage (%)	Number of farmer (person)	Percentage (%)	Number of farmer (person)	Percentage (%)
Formal group members						
Low	1	1.47	8	11.76	20	29.41
Moderate	24	35.29	42	61.77	30	44.12
High	43	63.24	18	26.47	18	26.47
Informal group members						
Low	51	75.00	44	64.71	48	70.59
Moderate	16	23.53	8	11.76	12	17.65
High	1	1.47	16	23.53	8	11.67

The farmers' from informal groups showed a low category of commitment to continue buffalo farming. The reason informal groups' members did not yet formalize the group was that the member did not willing to be a group's managers. Another reason was the farmers had a traumatic problem with the groups' member's contribution and the government officer's visit.

Commitment had various definitions, there were even studies that note that there are twenty definitions of commitment Asah and Blahna (2013). Therefore, this study used the commitment definition based on the theory of Allen and Meyer (1990). Allen and Meyer's commitment theory has been widely used in social research in agriculture. Muatip *et al.* (2019) reported the usage of the commitment theory and its correlation with the length of leadership and the ability to motivate organizational members in a dairy farmer group in the Banyumas Regency. Research of Jeong and Jang (2020) reported a study on the relationship between organizational commitment, sense of community, and business performance of farmers in agricultural product processing centers. The study of farmers' commitment was necessary to conduct because commitment would affect the inclusive membership of farmers that finally would affect performance (Higuchi *et al.*, 2020). A previous study on buffalo farmers' formal and informal groups in Pemalang Regency from Suryani *et al.* (2022) showed that formal groups had higher group dynamics than informal groups. Good group dynamics produced positive interactions between members, positive interactions would further increase member involvement in the group to increase member commitment and group performance (Atika and Martin, 2020).

#### The correlation between farmers' accessibility of resources with commitment

The analysis results showed that there was a significant correlation between the accessibility of information, support, and capital among the farmers' who were members of formal farmers' groups. There was a very strong correlation between farmers' accessibility to information, support, and capital with the farmers' commitment by the correlation coefficient scores of 0,868; 0,850, and 0,864 respectively. Based on the results from Table 2 the majority of farmers who were members of formal farmers' groups had a moderate to high category of accessibility of resources and a

moderate to high category of commitment. The higher the farmers' accessibility to resources, the higher their commitment to the organization and to continuing buffalo farming.

The results showed a significant correlation between the accessibility of information, support, and capital with the farmers' commitment within the informal groups. The correlation between the accessibility of information and support with farmers' commitment was in the fairly weak category, with correlation coefficient values of 0,387 and 0,492 respectively. There was a very strong correlation between the accessibility of capital with farmers' commitment (0,843). Most of the farmers from informal groups had a low to the moderate category of accessibility of resources and a low category of commitment. These conditions caused the correlation between the accessibility of information and support with the commitment to show a fairly weak correlation. Because the farmers had a low category on the accessibility of capital and a low category in commitment, the correlation between the two variables was very strong.

The commitment was strongly related to people's behavior and performance (Suliman and al Kathairi, 2013; Agustin *et al.* 2022) added that commitment and workability had a positive and significant effect on work performance. This condition also applied in the scope of agro-complex. High commitment would provide good agricultural productivity, which in turn had an impact on the welfare of farmers. This research showed that there was a very strong relationship between the accessibility of resources and the commitment of farmers so increasing the commitment of farmers could be done by increasing the accessibility of livestock business resources to them. The findings in our study were in line with the research of (van der Schoor and Scholtens, 2015) that local groups with high commitment have the initiative to strengthen their organizations through formalization. Increasing the intensity of communication and the use of technology is also carried out by groups that have a high commitment. This is the initial process towards change.

Increasing the accessibility of resources is one solution to improve their performance in raising livestock. Based on research by Prasetyani and Daerobi (2016), increasing the accessibility of resources in the form of education, health, agricultural production facilities, and assistance is

Table 4. The correlation between farmers' accessibility to resources with the commitment of formal group members

Correlation	Correlation coefficient	P value	Conclusion
The accessibility of information with farmers' commitment	0,868	0,000	Very strong correlation
The accessibility of support with farmers' commitment	0,850	0,000	Very strong correlation
The accessibility of capital with farmers' commitment	0,864	0,000	Very strong correlation

Table 5. The correlation between farmers' accessibility to resources with the commitment of informal group members

Correlation	Correlation coefficient	P value	Conclusion
The accessibility of information with farmers' commitment	0,387	0,001	Fairly weak correlation
The accessibility of support with farmers' commitment	0,492	0,000	Fairly weak correlation
The accessibility of capital with farmers' commitment	0,843	0,000	Very strong correlation

needed to increase the participation and commitment of stakeholders in the development of agricultural communities. Increased commitment will improve the performance of farmers and subsequently institutional performance has a positive effect on the group's economic and social resources (Amam *et al.*, 2020). (Fatimah *et al.*, 2021) added that access to resources was needed to increase stakeholder commitment to collaborative government in empowering women farmers in Wajo Regency.

Amam *et al.* (2019) stated that farmers' accessibility to economic, environmental, and social resources affects the human resources of breeders which there is the motivation of farmers. Prihantoro (2015) added that motivation affects the commitment of farmers. Resources accessibility was a key to improving the farmers' commitment. Information was one of the resource variables used in this study. The development of information technology provided convenience for farmers in accessing information. Based on our observations, the majority of farmers only used information technology to communicate with their groups. Dissemination of information about knowledge of buffalo farming through social media groups could be done to increase farmers' access to information. The development and support of farmer groups who could independently manage and distribute information were needed to develop farmer groups in rural areas Ofuoku and Albert (2014). The participatory approach of livestock groups increased access to information based on information and communication technology (Barakabitze *et al.*, 2017).

Government support was one of the resources needed for farmers to develop their businesses. Accessibility of support through consistently assisting extension agents will increase access to information and further increase farmer commitment. Government assistance was continuously needed to maintain the consistency and commitment of farmers in implementing the information submitted (Muharastri *et al.*, 2015). The results of this study indicate that access to capital has a very strong relationship with farmer commitment. Distribution of capital is important for farmers to develop their businesses. Capital in the form of credit must be channeled to farmers who need it and show a commitment to developing a business (Anang *et al.*, 2016).

### Conclusions

There was a very strong correlation between commitment and accessibility of farmers to resources in formal farmer groups. The commitment of farmers from informal groups had a fairly weak relationship with accessibility to information and support, and the commitment had a very strong relationship with accessibility to capital. Development of livestock groups towards formalization can increase access to resources, especially capital to increase the commitment of buffalo breeders in Pemalang Regency

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