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Application of Management Information System to Strengthen Community Livestock Business of Goat and Sheep Farmers

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ABSTRACT

Sheep and goat farming is one of the superior livestock products of Malang Regency. This goat and sheep farming business is a livestock business carried out by breeders in 12 villages in Wagir District, Malang Regency as the main supporter of starting a goat and sheep center. Farmers still did not have historical livestock data so it may be difficult to trace livestock history. Therefore, it is necessary to record data using the application of a digital management information system. The method used was a participatory action and learning system approach which includes Focus Group Discussion (FGD), training and direct practice, mentoring and field monitoring of the results of the transfer of livestock management information system technology in 12 villages. The results of the implementation of the activities showed that the training and mentoring activities went very well and received a very good response from the community. The economic and social impact in the form of increasing farmers' income and skills related to livestock management recording increased from 15% to 83%. The activity showed a significant increase in awareness, knowledge and skills of sheep and goat breeders in using livestock management information systems to strengthen community livestock business management.

Keywords: Business Management, Livestock, Management Information System, Record Livestock, Sheep and Goat Farming.

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INTRODUCTION

Malang Regency is one of the districts in East Java Province which has great potential as a producer of goats and sheep, one of which is currently developing is goat and sheep farming in Wagir District. Wagir District is one of the sub-districts in the Regency with a high population of goats and sheep. The goat population in Wagir District is 4,113, while the sheep population is 2,661 spread across 12 villages (Kusumawati et al., 2024). Sheep and goat farming is one of the superior livestock products of Malang Regency as stated in the Medium Term Development Plan for Malang Regency for 2021-2026 (Pemerintah Kabupaten Malang, 2021). This goat and sheep farming business is a livestock business carried out by breeders in 12 villages in Wagir District, Malang Regency as the main supporter of starting a goat and sheep center.

The problem of productivity of ruminant farming, especially sheep and goats, has become the attention of the implementing team in the last decade because these two types of livestock have good levels of productivity, the potential for sheep and goat farming and the level of consumption of animal protein from goats and sheep is very high in Indonesia, and Raising sheep and goats can be carried out in a community manner because it does not require large areas of land, production and harvest are faster than cows/buffalo, and production costs are relatively lower.
East Java Province is one of the provinces in Indonesia which is a mainstay supplier of ruminant meat, especially beef cattle, goats and sheep. Data on the development of the ruminant livestock population is presented in Figure 1 with a significant increase each year in the last 5 year period (2016-2020). Raising goats and sheep has several advantages, including not requiring large capital because they do not require a large area of land to raise, the ability of goats and sheep to adapt highly to any conditions, both in the highlands and lowlands, the number of children per birth is more than one, and the birth interval is short.

In the development planning deliberation activity in Wagir District (8 February 2023) which is presented in Figure 1, the village head said that livestock farmers really need assistance, training and development of technology that supports modern management of sheep and goats, so it is hoped that practitioners and academics can collaborate and play a role in increasing the knowledge and skills of breeders. Currently the livestock rearing system that farmers apply is still traditional without (34%) or with (65%) standard operational procedures, only 1% or 1 person out of 120 people stated that they had implemented a modern system in raising goats/sheep, such as which is stated in Figure 2.

Figure 1. Development Plan Deliberation Activities in Wagir District, Malang Regency

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Source: Author Data (2023)

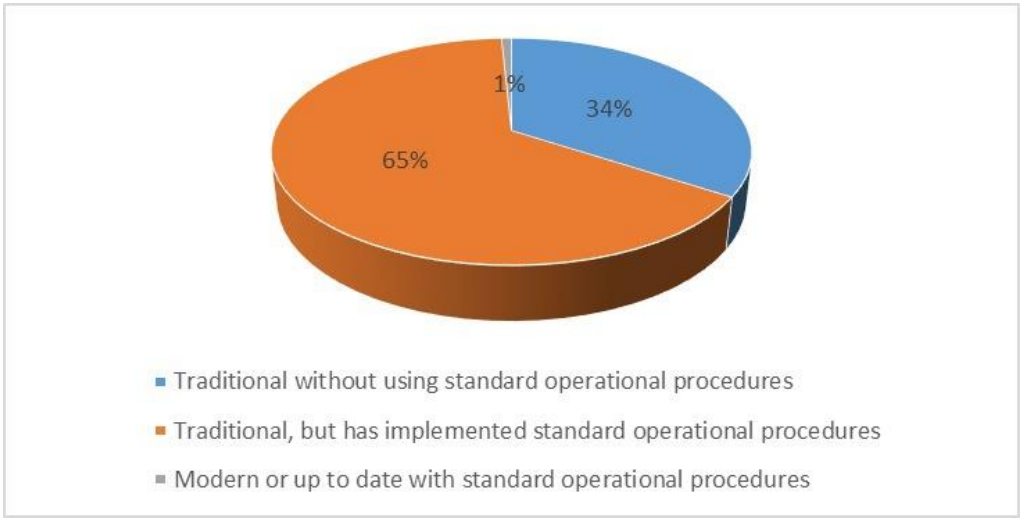

Figure 2. Livestock rearing system used by farmers
Source: Author Data (2023)

The survey results show that the aim of breeders in Wagir District, Malang Regency in raising goats and sheep is dominated by breeding purposes (55.8%) to produce lamb or livestock seeds. Meanwhile, the percentage of fattening to produce beef livestock is small (11.7%) as shown in Figure 3.

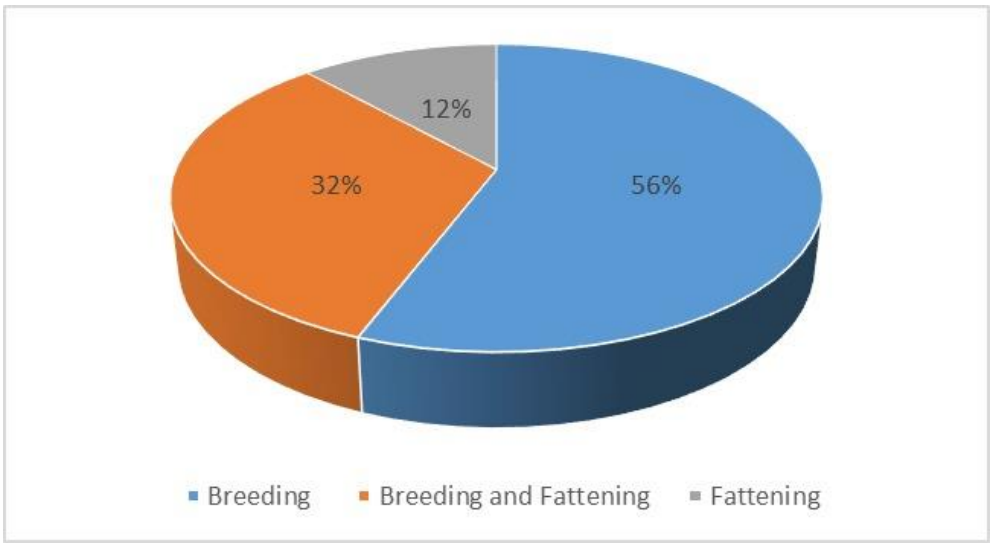

Figure 3. Farmer's Goals for Raising Goats/Sheep
Source: Author Data (2023)

The problems faced by farmers are related to seeds, feed and livestock production management. Farmers still do not have historical livestock data so it may be difficult to trace livestock history. Livestock recording cannot be accessed easily and quickly in a system. Recording is very necessary to avoid inbreeding of livestock (Karisman et al., 2024). Recording is very necessary to avoid inbreeding of livestock. For example, when recording artificial insemination of livestock, the source of semen must be clear so that inbreeding does not occur (Kusumawati et al., 2024). This can result in not yet optimal integrated production management (artificial insemination, sexing,

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breeding, feeding and maintenance). Therefore, it is necessary to record data using the application of a digital management information system. The livestock management information system has been created by the service and the copyright has also been registered (Kusumawati et al., 2023).It is hoped that using the livestock management information system can help resolve these problems.

METHODS

The service activities were carried out in Wagir District, Malang Regency, East Java from June 2023 to 2024. The total number of activity participants was 48 people consisting of 36 breeders from 319 breeders and 12 village officials from 12 villages in Wagir District. Each village is represented by 3 breeders assigned by each Village Head. The data is processed and combined from samples that represent a population (Adiyanta, 2019; Kusumawati et al., 2024).

The method used in this service activity was a participatory action and learning system approach (Karyasa et al., 2021). The first stage was an offline Focus Group Discussion (FGD) which was held at Universitas PGRI Kanjuruhan Malang on July 5 2023 which was attended by 12 representatives of the Village, PT KTHR, BUMDesMa Wagir Berkah and the service team as well as the Regional Research and Innovation Agency of Malang Regency.

The second stage was training activities and direct practice in using the livestock management information system. The training activity was carried out at the BUMDesMa Wagir Berkah Office, which was attended by 48 participants from 12 villages. In this training activity, a pre-test and post-test were also carried out to evaluate the activity. The impact of service activities is carried out using a population survey method before and after the activity takes place with indicators: (a) level of participation of target audience partners, (b) level of partner satisfaction with the implementation of community service activities, (c) commitment, knowledge and skills of partners in implementing them effectively.

The third stage was mentoring and field monitoring of the results of the transfer of livestock management information system technology in 12 villages. This service activity also involved 13 students from the Faculty of Animal Husbandry, Universitas PGRI Kanjuruhan Malang and was supported by the the Regional Research and Innovation Agency of Malang Regency.

RESULTS AND DISCUSSION

In the FGD activity (Figure 4) which was held on July 5 2023 at Universitas PGRI Kanjuruhan malang, an agreement was reached that all Village Heads in Wagir and the Malang Regency regional government supported the Empowerment of Regional Featured Product Business Partners (PM UPUD) activities in realizing Wagir as a Goat Center Sheep. Village heads also accompany and monitor the results of activities in their respective villages and allocate funds from village food security. PT KTHR Indonesia will provide support in the form of assistance and livestock management assistance services. BUMDesMa Wagir Berkah provides assistance with meeting facilities and marketing of livestock products. The Regional Research and Innovation Agency of Malang Regency provides strengthening assistance and full support to establish a goat and sheep center.In this FGD, a schedule for implementing training activities and practices on livestock management information systems as well as evaluating program implementation was also determined. All invitees were 100% present at this FGD activity including 12 Village representatives, PT KTHR, BUMDesMa Wagir Berkah and the service team as well as the Regional Research and Innovation Agency of Malang Regency. The number of FGD participants is in accordance with the ideal FGD standards (Purnama, 2015).

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Figure 4. Focus Group Discussion (FGD)
Source: Data processed, 2023

Further respective development of science and technology of animal farming after breeding is the advancement in animal fattening dan farming management. Both advancement is highly correlated leading to efficiency and productivity of meet production, for instance in a fattening farm, positive relationships were found between economic efficiency and feeding frequency, fattening period, existence of a management record, contacts with extension services and credit use (Kusumawati, 2021a). This potential can be seen in goat commodities whose market demand is always growing exponentially. In order to achieve optimal livestock production, farmers must understand livestock business maintenance management, including understanding livestock data recording activities. According to (Bishoftu, 2020), recording livestock data has three benefits, namely to assist in making decisions regarding financial planning, to provide data for administration and government counseling purposes, and to assist farmers in determining livestock rearing management decisions. Field facts in Indonesia found several weaknesses in the goat livestock data collection or recording management system. Livestock recording in Indonesia still applies conventional methods with individual ownership using paper (Sholicha et al., 2023). Recording or livestock records are very necessary in carrying out livestock selection (Gichohi, 2020; Kusumawati, 2021b). Livestock recording can be made more efficient by utilizing modern technology (Insani et al., 2017). Data digitalization training, implementation and assistance activities will be held on 15-20 August 2023 at PT KTHR Indonesia and BUMDesMa Wagir Berkah. Training activities were carried out on August 15 2023 (Figure 5), while implementation and assistance was carried out from August 16-20 2023. This training activity also used the livestock management information system guidebook (Figure 6) which had been prepared by the service team.

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Figure 5. Training on implementing livestock management information systems
Source: Data processed, 2023

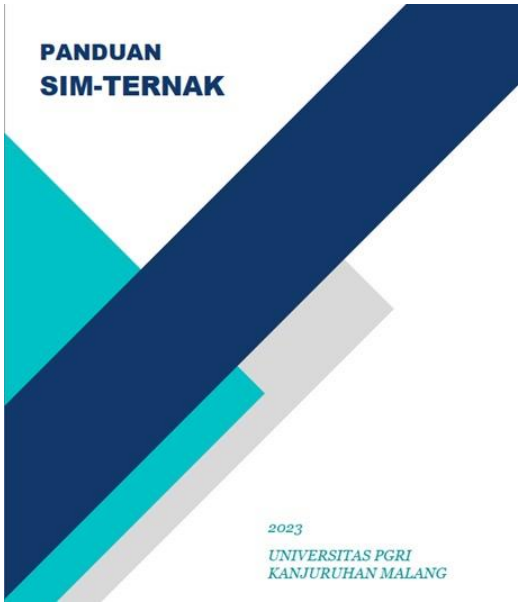

Figure 6. Livestock management information system manual
Source: Data processed, 2023

Based on the results of the pre-test and post-test, knowledge increased from 15% to 83%. The training participants were very enthusiastic about participating in the activity from start to finish.

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Participants in livestock management information system technology training at each stage of activity showed an increased level of participation. This is also in line with the results of research by Insani et al (2017) that improvements to Android smartphone-based recording software have been carried out in the same location. The results of the system improvements show a high level of efficiency. This is proven that all data can be input and accessed using an Android smartphone anywhere online and also via the website. Based on this increase in efficiency, it can be concluded that the use of an Android smartphone to improve the livestock recording system is highly recommended. Based on research by Resti et al (2024), it shows that most research attempts to develop digital recording tools that focus on production performance (PR), especially milk production, using the Internet of Things (IoT) and mobile phone applications. Additionally, various technologies, such as networking, desktop, and web applications, have also been invented. Given the widespread ownership of mobile phones among the general public, the use of mobile phones continues to be an attractive option as a recording device. To advance the progress of these tools, technological barriers need to be overcome, particularly those related to access and connectivity. Apart from that, it is also important to consider the continuity of data input and feedback obtained by farmers, so as to help them evaluate their farming operations periodically.

The third stage is mentoring and field monitoring activities which are also routinely carried out by service personnel (Figure 7). The results of the activities showed a significant increase in awareness, knowledge and skills in using livestock management information systems. This also has an impact on increasing farmer income due to systematic livestock management.

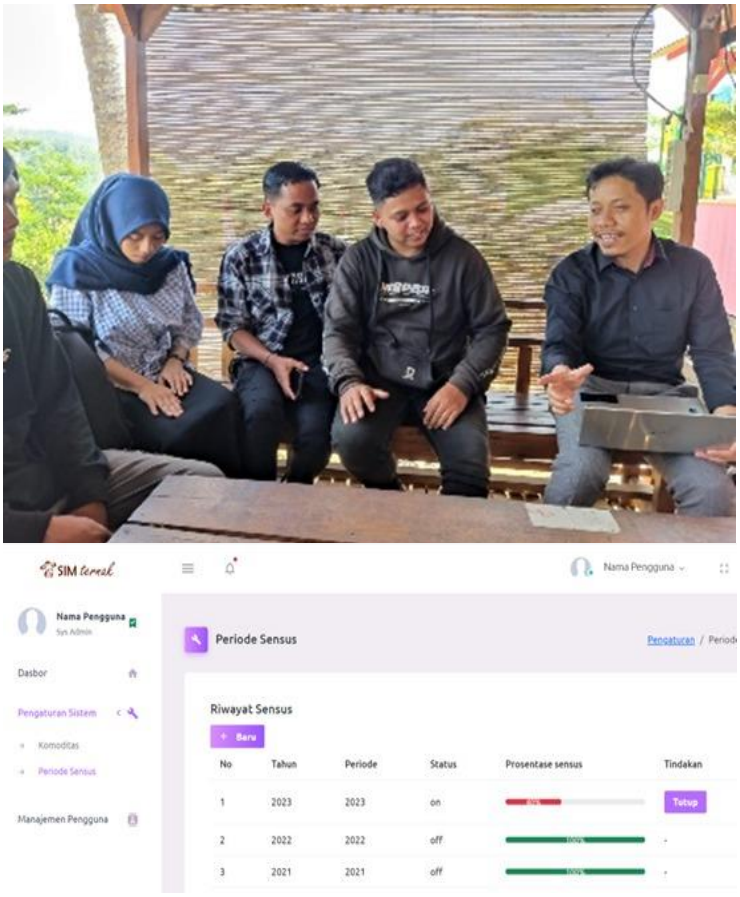

Figure 7. Support for livestock management information systems
Source: Data processed, 2023

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Table 1. Impact of Community Service Activities Implementing Livestock Management Information Systems

Indicator	Before the activity	After Activities
1. Level of participation of target audience partners	Fair (level 2 of 7 levels of participation)	High (level 6 of 7 levels)
2. Partner satisfaction level	Not measured	High (level 4 of 5 levels)
3. Commitment, knowledge and skills of partners in sustainably implementing livestock management information system technology	Low	Very high
4. Level of empowerment of the target community	Enough	High

The impact of service activities is carried out using a population survey method before and after the activity takes place with indicators: (a) level of participation of target audience partners, (b) level of partner satisfaction with the implementation of community service activities, (c) commitment, knowledge and skills of partners in implementing them effectively. Sustainable livestock management information system technology, and (d) the level of empowerment of the target community (members of PT KTHR and BUMDesMa Wagir Berkah) in the Wagir District area in strengthening community livestock business management in Wagir District, Malang Regency. Table 1 shows the portrait results before and after the activity regarding these impact indicators. The results of the service activities that have been carried out from start to finish have been successful.

The results of the implementation of the activities show that the training and mentoring activities went very well and received a very good response from the community. The economic and social impact in the form of increasing farmers' income and skills related to livestock management recording increased from 15% to 83%. One of the reasons for this is that the marketing chain determines profits (Wibow et al., 2016). Apart from that, the number of goats and sheep owned also influences income (Widiati & Kusumastuti, 2017). Goat and sheep farming also provides benefits for regional development (Budiarsana et al., 2016; Kusumawati et al., 2022). Solutions and follow-up include providing assistance and monitoring after activities as often as possible. Mentoring is carried out once a week and monitored once a month. The market opportunities for goats and sheep are very high and have export opportunities (Rusdiana et al., 2014).

CONCLUSION

Community service activities have been running very well and successfully with the support and cooperation of all partners and breeders in Wagir District and Malang Regency. This good cooperation needs to be maintained and further improved. The results of the activity showed a significant increase in awareness, knowledge and skills of sheep and goat breeders in using livestock management information systems to strengthen community livestock business management in Wagir District, Malang Regency. It is necessary to provide ongoing assistance and monitoring to partners so that this program can be continued periodically.

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