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DAIRY FARMER RESOURCE COMPETENCY DEVELOPMENT MODEL IN SUPPORTING THE DEVELOPMENT OF TOURISM VILLAGE AREA

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Abstract. The purpose of this study was to evaluate good dairy farming practices and good milking practices in dairy farms in Tajur Halang Village, to determine the perceptions of farmers, village administrators, and local governments towards the development of dairy farmer competencies for the development of tourist villages, and to formulate a livestock resource development model. This study was designed as a descriptive research. The instrument used in this study are a 4-point Likert scale questionnaire, and Good Dairy Farming Practices (GDFP), and Good Milking Practices (GMiP) evaluation form. Data collection was conducted through interviews with 45 dairy farmers, village administrators, and local governments, Focus Group Discussions (FGDs) on the solidarity of alumni of the Indonesian People's Animal Husbandry School (SASPRI), while the formulation of a model for improving dairy farmer competencies was carried out using the Participatory Rural Appraisal technique (PRA). The results showed that the GDFP and GMiP values of dairy farms in Tajur Halang Village were in the "Good" category. Stakeholder perceptions showed a high level of suitability for efforts to develop dairy farmer competencies. The formulation of the livestock farmer competency development model yielded three main pillars: tourism village development, program development, and training and mentoring. Based on these findings, dairy farmers already possess strong competencies in livestock farming. However, these competencies are not sufficient for them to play an active role in tourism villages, as they still need to master social and tourism competencies.

Keywords: farmers competencies; good dairy farming practices; good milking practices; tourist village

I. INTRODUCTION

Dairy farming has great potential to be developed in the agribusiness sector, especially the source of milk production and its derivative business products. Dairy cows have the best efficiency in digesting feed into animal protein and calories compared to other types of cattle [1]. In 2024, the population of dairy cattle in Indonesia reached 485,809 heads, which increased by 4.70% from 2023 [2]. One of the efforts to develop the livestock sector is to integrate it with tourism. In recent years, more and more tourists have an interest in tourism that presents nature and rural life. Based on dairy farming has great potential to be developed in this regard, today many tourist attractions have sprung up called tourist villages.

Tourism village development is also an alternative tourism activity based on the potential of the village with aspects of environmental sustainability, existing traditions, culture inherent in the community, and focus on community empowerment [3]. Farmer competence is needed to adapt in the tourist village area. Competence is the ability of an individual to carry out a job correctly and has an advantage based on aspects concerning knowledge (Knowledge), attitude (Attitude), and expertise (Skill) [4]. The role of breeders is important as an alternative in responding to the demands and urgency of sustainable tourism development.

Tajur Halang Village is located in Cijeruk District, Bogor Regency, West Java Province. Tajur Halang Village has suitable climatic conditions for the cultivation and development of dairy farming, and has a strong attraction as a tourist area. Tourism development in Tajur Halang Village is still focused on commodities other than livestock. Meanwhile, the potential of dairy farm-based tourism has not been maximized, even though this sector has a high educational appeal through farm to table activities. This study aims to evaluate aspects of good dairy farming practices and good milking practices, perceptions of farmers, village government, and local government in developing farmers' competencies, and formulate a model for developing farmers' resources.

II. RESEARCH METHODS

The research was conducted in November - December 2024. Located in Tajur Halang Village, Cijeruk District, Bogor Regency. The equipment used during the research process were stationery, clerical boards, laptops, questionnaires, GDFP and GmiP assessment forms/rubrics, Microsoft Excel software, and SPSS 29 software. The

Volume 09, Number 02, Page 143-148
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materials used were primary data from filling out questionnaires and evaluation forms, and secondary data in the form of literature studies obtained from various relevant literature. This study uses a 4-point Likert scale to determine respondents' perceptions. The 4-point scale is used to emphasize the choice of assessment, so that there are no answer options (neutral / undecided / sufficient) [5]. The measurement scale used is presented in Table 1.

Table 1. Measurement scale

Likert scale	Interval	Category
4	3.26 – 4.00	Strongly Agree
3	2.56 – 3.25	Agree
2	1.76 – 2.50	Disagree
1	1.00 – 1.75	Strongly Disagree

The Participatory Rural Appraisal (PRA) approach is a participatory data collection method that places the community as the main subject in the process of identifying problems, potentials, and needs for regional development. In this study, the PRA approach was applied specifically to groups of breeders to explore their perceptions of the plan to increase competence through training and mentoring activities directed at supporting the active role of breeders in the tourist village area. PRA has 3 pillars, namely:

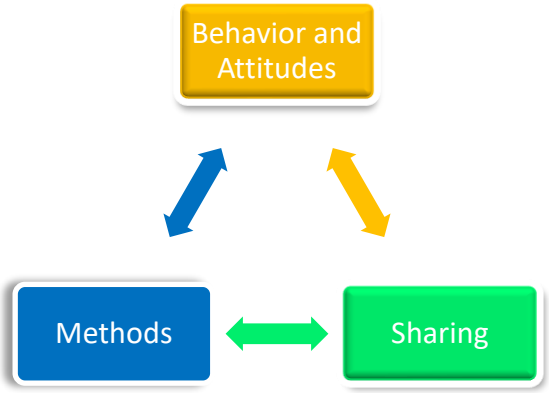

Figure 1. Pillar Participial Rural Appraisal [6]

Through the PRA approach, village communities have experienced a change in status from objects that only receive development programs from the government (top-down) to development subjects who are involved in designing development programs from below (bottom-up) [7]. The formulation of the human resource development model was carried out by referring to the results of the identification of training and mentoring program needs obtained through FGDs. This process begins with mapping the specific needs of farmers. Once these needs are identified, the next step is to design a model of human resource development.

Evaluation of the implementation of good dairy farming practices (GDFP) and good milking practices (GMiP) is done using a form or rubric. The assessment of GDFP and GMiP is done by giving an assessment score of 1 to 4 according to the conditions found in the field, then given a quality score [8]. The results of the GDFP evaluation are shown in Table 2.

Table 2. Observation score value of GDFP and GMiP

Value	Quality value	Category
1.0 – 2.0	D	Poor
2.0 – 3.0	C	Fair
3.0 – 3.5	B	Good
3.5 – 4.0	A	Very Good

GDFP and GMiP evaluations were conducted on dairy farms in Tajur Halang Village to farmers who are members of 4 livestock groups. The PRA was conducted through interview techniques with 45 farmers who are members of 4 livestock groups, namely, kania, mandiri sejahtera, bina mandiri, and muda berkarya as well as Focus Group Discussions (FGDs) with the solidarity of alumni of the Indonesian School of Animal Husbandry (SASPRI). Interviews were also conducted with the village government and local government to provide perceptions from policy makers on the plan to develop the competencies of breeder resources in Tajur Halang Village. Observation was conducted by systematic observation and recording of things seen or visible on the object of research.

The variable studied in this research are :

1) Aspects of good dairy farming practices include breeding and reproduction, feed and drinking water management, management, housing and equipment, animal health, and animal welfare.
2) Aspects of good milking practices include procedures before milking, during milking, and after milking.
3) The competency development aspect of farmer resources includes competencies in tourism, livestock management, environmental management, sustainable management, product processing, entrepreneurship, workshops, financial recording, communication, use of technology, digital marketing, and K3.

The data obtained were analyzed and presented descriptively. Descriptive analysis is a method used to describe, summarize, and explain the characteristics of the data that has been collected with the aim of providing a clear picture of the characteristics of the data analyzed in the study.

III. RESULTS AND DISCUSSION

Aspects of Good Dairy Farming Practices

Good Dairy Farming Practices (GDFP) is one of the guidelines for dairy cattle cultivation that aims to increase the productivity of dairy farming by considering several aspects. The aspects of the GDFP consist of breeding and reproduction, feed and drinking water management, management, housing and equipment, animal health, and animal welfare [9]. The implementation of GDFP not only focuses on increasing productivity, but also ensures that the milk produced is of high quality, safe for consumption, and comes from healthy cows [10]. Table 3 presents the GDFP evaluation results of dairy farms in Tajur Halang Village.

Volume 09, Number 02, Page 143-148
e-ISSN: 2598-120X; p-ISSN: 2598-117X

Table 3. GDFP evaluation result

No	Determining factor	Value GDFP	Quality Value	Category
1	Breeding and reproduction	3,5	A	Very good
2	Feed and water management	3,6	A	Very good
3	Management	3,3	B	Good
4	Housing and equipment	2,5	C	Fair
5	Animal health	3,5	A	Very good
6	Animal welfare	3,5	A	Very good
	Average	**3,32**	**B**	**Good**

Assessment of the six aspects of the dairy farming system showed that most aspects met the GDFP standard. The average quality score obtained is in the "Good" category, indicating that the overall quality of farm management practices meets the standards. However, improvements in some aspects are still needed to achieve maximum value in farming practices. Professional farm management is one of the efforts to optimize milk production in dairy cattle and maximize livestock productivity [11].

The application of good animal husbandry practices is important in realizing a dairy farm tourism village that is not only attractive to tourists, but also meets cultivation standards and business feasibility. The total population of dairy cattle in Tajur Halang Village is 298 heads with the highest population of lactating female cows of 106 heads. However, the percentage of existing lactation is still low at only 49.88. This finding is due to the large population of male cattle kept by farmers to prepare for Eid al-Adha as annual savings. Therefore, strengthening these aspects of cultivation needs to continue to ensure the sustainability and competitiveness of the tourism area to be developed.

Aspects of Good Milking Practices

Good milking practices (GMiP) are guidelines or procedures for good and correct milking to avoid contamination that can reduce milk quality [12]. The milking process is one of the stages that allows milk to be easily contaminated by pathogenic bacteria if not done properly [13]. The problem that often occurs in smallholder farms is the GMiP aspect that has not been implemented properly. The value of GMiP implementation of dairy farms in Tajur Halang Village is presented in Table 4.

Table 4. GMiP evaluation result

No	Determining factor	Value GMiP	Quality value	Category
1	Before milking	3,3	B	Good
2	During milking	3,3	B	Good
3	After milking	3,2	B	Good
	Average	**3,27**	**B**	**Good**

The overall implementation of milking practices is categorized as good, indicating that milking procedures have been carried out in accordance with applicable standards. The three stages before, during and after milking obtained consistent quality scores in the good category, reflecting uniformity in the application of procedures that support the quality of production. The ability of dairy cows to produce milk both in quality and quantity is influenced by genetic and environmental factors. Genetic factors affect 30% of milk production while environmental factors affect 70% [14].

Quality stability in milking practices is an important indicator of farmers' technical readiness to support the development of tourism villages. In the context of dairy farm tourism village development, the milking process can be used as one of the educational attractions that provide direct experience to tourists about milk production activities. Good and hygienic practices will increase tourists' trust in the quality of products and farm governance run by farmers.

Table 5. Milk quality at dairy farms in Tajur Halang Village

No	Description	Persentage
1	Protein	3,2
2	Fat	3.4
3	SNF	8,9
4	Berat Jenis	1,0308

Sustainability and quality improvement of milking practices not only contribute to production efficiency, but also have strategic value in strengthening the attractiveness of the tourism village. There is a need for ongoing mentoring and technical training to ensure that quality standards are maintained and even improved as the integrated tourism village between the livestock and tourism sectors develops in Tajur Halang Village.

Stakeholder Perceptions of Competency Development Factors

Based on the evaluation results of Good Dairy Farming Practices (GDFP) and Good Milking Practices (GMiP), farmers in Tajur Halang Village have demonstrated good competence in aspects of dairy farming. However, to be able to play an active role in the development of the tourism village area, additional competencies are needed beyond the technical skills of animal husbandry, especially those related to the tourism sector. Therefore, this study developed an instrument in the form of a perception questionnaire using a Likert scale to explore the competency development needs of farmers, especially in the form of training and mentoring that can prepare them to participate in the tourism village program. Farmers' perceptions were obtained through interviews and discussions using a Participatory Rural Appraisal (PRA) approach specifically applied to ensure their active involvement in expressing their needs and views in a participatory manner. In addition, perceptions from the village government and local government were also collected as supporting information to enrich the analysis and formulate development strategies that are more integrated and responsive to the local context.

Table 5 shows the average scores of stakeholders' perceptions of the 12 aspects of competencies in the context of livestock and tourism integration. The scores are in the range of 2.71-3.63, which shows that almost all aspects are

Volume 09, Number 02, Page 143-148
e-ISSN: 2598-120X; p-ISSN: 2598-117X

rated as agree to strongly agree by stakeholders. The overall averages for each group were for livestock farmers (3.22), village government (3.22) and local government (3.38). Local governments tended to rate the need for competency development higher than farmers and village governments. Dairy farming requires knowledge, experience and proficiency in adopting technology and skills [15].

Table 6. Stakeholder perceptions on dairy farmer competency development

No	Statment	Skor		
		Farmers	Village administrator	Local government
1.	Tourism	3,27	2,71	3,38
2.	Livestock management	3,27	2,86	3,63
3.	Environmental management	3,04	3,29	3,25
4	Suistainable management	3,22	3,29	3,50
5	Product processing	3,27	3,14	3,38
6	Enterpreneurial ability	3,20	3,29	3,50
7	Workshop	3,22	3,14	3,50
8	Financial recording	3,22	2,71	3,25
9	Communication	3,20	3,57	3,25
10	Technology utilization	3,18	3,57	3,00
11	Digital Marketing	3,24	3,57	3,50
12	Occupational safety and health	3,33	3,57	3,50
	Average	**3,22**	**3,22**	**3,38**

Local governments gave the highest scores to aspects of farm management (3.63), sustainable management (3.50), entrepreneurship (3.50), workshops (3.50), and digital marketing and OSH (3.50). This indicates that local governments see high urgency in managerial and technological aspects as key to the success of dairy farm-based tourism villages. Farmers, on the other hand, gave relatively lower scores on technology use (3.18) and communication (3.20), reflecting limited access or confidence in the adoption of new technologies and interaction with tourists.

Although the average score of each aspect is in the "Agree" category, there are some aspects such as environmental management (3.04), technology use (3.18), and communication (3.20) that received the lowest scores among farmers. These aspects are weak points that could potentially hinder the quality of the traveler experience and business sustainability. Meanwhile, high scores on the OHS aspect (3.33 farmers; 3.57 local government) indicate awareness of the importance of occupational safety and health in the dairy farm tourism village area. Through the PRA, farmers actively identified the needs and challenges they face, while assessing the importance of strengthening competencies in various fields such as tourism, farm management, entrepreneurship, and digital technology.

These results indicate the need for specialized breeder resource development to improve the capacity of breeders. Meanwhile, collaboration with village and local governments in organizing training and mentoring will strengthen the readiness of farmers to face the dynamics of the tourism market. Training and mentoring programs can be designed cross-sectorally, integrating technical knowledge of animal husbandry with tourism to encourage the successful development of a sustainable tourism village of Tajur Halang Village.

farmer Resource Development Model

Figgure 2. Human resource development model

The first step of the model focuses on the development of tourism awareness groups (POKDARWIS) as community institutions that are the main actors in the development of tourism villages. At this stage, integration between the livestock and tourism sectors is formulated. Farmers become part of the Pokdarwis, so that the vision for the development of a dairy farm tourism village can be discussed and determined together. This approach adopts the principle of community-based tourism (CBT). Community-based tourism (CBT) uses a bottom-up approach that gives the main role to local communities as initiators [16].

After the tourism awareness group institution and integration mechanism were established, the next stage was mapping the competency needs of the breeders. Based on the mapping results, there are 12 main topics that should be included in the training plan. These needs were explored through perception surveys and focus group discussions (FGDs) with farmers, village government and local government. This mapping is important to ensure that the training materials to be developed are truly relevant to the competency needs that exist in the field, both in the technical aspects of livestock cultivation and the additional skills needed in tourism activities.

In the context of animal husbandry, human resource management plays a crucial role in increasing productivity through quality, efficient management of human resources, which includes technical skills, work welfare, and workforce motivation [17]. This design involves curriculum, learning methodology (workshop, field practice, simulation), and

Volume 09, Number 02, Page 143-148
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measurable success indicators. Thematic training and mentoring planning strategies need to be designed in a participatory and communicative manner so that they can be understood and accepted by various parties, ranging from farmers, village governments, to local governments. Multi-stakeholder collaboration in the preparation of human resource competency improvement programs in tourist village areas is important to create programs that are relevant, applicable and sustainable. There are many things that need to be prepared to maintain the sustainability of a tourist village, namely 1) integration between sectors, in this case the tourism sector with the agricultural sector, plantations, home industries and so on; 2) Building a village brand image in accordance with local wisdom; 3) developing tourism village management management by strengthening village institutions and 4) developing collaboration with various stakeholders both at the regional level to the central level and even the private sector and NGOs [18].

The implementation phase includes organizing training and mentoring on 12 competency topics. Each topic will be made into training and mentoring themes needed to develop breeder competencies. Each topic will be elaborated in specific themes that suit the needs, addressed to breeders as the main participants, and guided by presenters who have expertise in their respective fields. One strategy in the development of agritourism based on community-based tourism is to provide basic tourism training to the community of tourism village actors [19]

This model emphasizes the importance of synergy between local communities (breeders and Pokdarwis), village governments, and local governments. The village government acts as a facilitator that bridges communication between the community and local government, and supports the technical implementation of the program at the local level. The village government also has an important role in mobilizing village resources, such as the village fund budget or local institutions such as village-owned enterprises to support the training program. Meanwhile, the local government acts as the main coach with the authority to set policy direction, develop a competency standard-based training curriculum, and provide resource persons, trainers, and budget support through local development programs. With a well-coordinated and mutually supportive collaboration, increasing the competence of local resources can be achieved.

The entire series of stages is directed at building farmer resources that are not only competent in livestock cultivation, but also adept at managing tourism operations and attractions, communicating with tourists, and marketing products digitally. Thus, this model makes farmers as agents of change in the development of tourism villages in Tajur Halang Village, creating a sustainable and competitive tourism village, a livestock sector that has good productivity, and provides a positive economic impact for the entire village community.

IV. CONCLUSIONS

The value of good dairy farming practices (GDFP) and good milking practices (GMiP) of farmers in Tajur Halang Village is already in the “Good” category with a quality score of B. Perceptions of farmers, village government, and local government showed high agreement on the need for competency development in 12 competency aspects, especially in sustainable management, entrepreneurship, digital marketing, and OHS that will support the integration of animal husbandry with tourism. The community-based tourism (CBT)-based breeder resource development model consists of 3 main pillars, namely tourism village development, program preparation, and implementation of training and mentoring that must be carried out with multi-stakeholder collaboration for breeder competency development so that breeders have an excellent ability to increase livestock productivity within the tourism village area and Tajur Halang Village is able to grow as a sustainable educational tourism destination with livestock tourism.

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Volume 09, Number 02, Page 143-148
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