The Profiling of the Farmers with Semi-Intensive and Intensive Cattle Production Systems in South Konawe District, Southeast Sulawesi Province

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Abstract. The study aimed at determining the profile of the beef cattle farmers with semi-intensive and intensive production systems in South Konawe district. It was expected that the results of the study could be information source for stakeholders and policymakers in developing farming resources. It was conducted in July-August 2019 using participatory rural appraisal method and involved 105 farmers selected using purposive sampling and considering production system and minimum cattle ownership. Data were quantitatively described and analyzed using independent T-test. The mean age, the cattle farming experience, the number of family members, and the cattle ownership of the farmers were not significantly different. The cattle farming motivations as savings and insurance were higher among the farmers with semi-intensive production system (P<0.05), which were 2.98±0.13 vs. 2.72±0.45, but those as primary livelihood and manure producer were higher (P<0.05) among the farmers with intensive production system, which were 2.28±0.45 and 1.46±0.50 vs. 1.62±0.53 and 1.09±0.29. The participation of the family members of the farmers in the cattle farming activity was not significantly different. It was concluded that the cattle production system related to farming motivation. The farmers with the semi-intensive production systems used cattle more as saving and insurance, while those with the intensive production system used cattle as primary source of income and manure producer.

1. Introduction

South Konawe district is situated in Southeast Sulawesi province with the biggest number of the beef cattle population of 69,907 beef cattle [1]. Generally, cattle in the area are raised extensively and traditionally using a grazing system in natural grazing land [2]. The increase in population and the extensive land use for agricultural purpose in addition to the increasingly wider range of land functions for example for housings result in decreasing grazing land. The farmers in the South Konawe district apply a semi-intensive and intensive production systems in beef cattle farming [3].

The semi-intensive and intensive production systems of beef cattle have different production objectives, which are breeding and fattening. The semi-intensive system is applied by releasing cattle
on grazing lands, which are owned by the farmers and free lands representing the lands that have not been used by their owners. Additionally, the semi-intensive system enables the farmers to obtain calves through natural mating. Grazing is organized in the morning and in the afternoon, while the cattle are housed and fed at night. The primary objective in the intensive system is fattening. The cattle are fattened in a house or a cowshed and are not released on grazing land. The feed and drinking water are provided by farmers. The difference in cattle production systems results in different products in terms of body weight gain of the cattle and the calf crop so that it will have significant impact on the livelihood of the farmers, especially on their income [4].

Farmers in South Konawe district have long been raising cattle from generation to generation as one of the pillars of their life [2]. Studies [5–8] show that the objectives and the motivations of the farmers in organizing cattle farming are economic security (cattle as saving), source of income, and manure production for their agricultural activity in field. They suggest that the economic security (cattle as saving) is the most important motivation in cattle farming because when a financial problem faces them, they will use cattle as a solution. The majority of them raise cattle as their primary livelihood, especially to meet their financial needs, while they use the manure as a source of side income. Cattle are raised in as good way as possible to produce meat and calves by optimizing all of the resources necessary to get maximum profit, including the production of the manure as by-product. Therefore, the study aims at determining the profile of the beef cattle farmers with semi-intensive and intensive production systems in South Konawe district of Southeast Sulawesi province. It was expected that the results of the study could be used as information source for stakeholders and policy makers in developing farming resources and sustainable farming.

2. Materials and Method

2.1. Study area

The study was conducted from July to August 2019. The samples of the study were 105 cattle farmers with semi-intensive and intensive production systems in South Konawe district. The sampling technique was based on the condition of the production system. The biggest cattle population based on survey data was the reason why the districts and its villages were suitable for the study. Based on [1] and the results of the survey and direct information from relevant agencies, Konda subdistrict had the total population of 5,915 cattle with semi-intensive and intensive production systems and West Ranomeeto subdistrict had the population of 3,183 cattle with semi-intensive production system. Both subdistricts met the requirements of the study. The West Ranomeeto subdistrict was represented by a village, which was Sinden Kasih village with semi-intensive production system and 30 respondents. The Konda subdistrict was represented by three villages, which were Alebo, Lambusa, Morome villages. The number of the respondents in Alebo village was 30 farmers, Lambusa village 10 farmers and Morome village 10 farmers with intensive production systems, while the number of the respondents in Morome village was 15 farmers and the number of the respondents in Alebo was 10 farmers for semi-intensive production system.

2.2. Data Collection and Analysis

Data were collected using participatory rural appraisal (PRA) method [9] to explore farmers’ profile. The data obtained through discussions, field surveys, and direct interviews with farmers using questionnaires. The types of questions asked related to the farmers’ profile, including name, age, education level, occupation, cattle farming experience, the number of family members, the number of cattle in their ownership, cattle farming objectives and motivations, and the participation of family members in cattle farming activity. The cattle farming objectives and motivations were used to analyze the difference between two different production systems. Each breeder gave a rating of the importance of cattle farming. Motivation questions related to the functions of livestock as savings, primary livelihood and income, and manure production. There were three ratings given by the breeders. They were first rating of 3 (very important), second rating of 2 (important), and third rating of 1 (not important). The participation of family members in cattle farming activity was
analyzed in a similar way to the analysis of the ratings of cattle farming motivations. The scale of interest consisted of three activity levels (3 = very active, 2 = active, and 1 = inactive). The data were statistically analyzed using independent t-test in order to find out the difference between the two production systems. The results of the analysis were described quantitatively.

3. Results and Discussion

3.1. General Information of Study Area

South Konawe district with the capital city of Andolo is an expansion area of Konawe district. The district officially was established on the Act No. 4 of 2003 and consisted of 11 subdistricts, and then the new district was split up in 2018 into 25 subdistricts. Based on 2010 census, the population of the district was 264,587 people with 90% of their livelihoods of being farmers. Based on 2018 survey, the population increased to 309,298 people at the growth rate of 1.97% [10]. Geographically, South Konawe district is situated in the southern part of the equator, right across the North-South area at 3°58.56’ South latitude, stretches from West to East between 121.58° and 123.16° East longitude. The land area of the South Konawe district is 451,421 ha or 11.83% of the land area of Southeast Sulawesi province, while the total area of sea is 9,368 km². Topographically, the land is in general mountainous and hilly flanked by lowlands, which is very potential for the development of agricultural sector, has two seasons, which are dry and rainy season. The rainy season usually occurs from November to March and the dry season occurs from April to October. The rainfall in the South Konawe district in 2018 reached 3,179 mm in 194 rainy days. The mean ambient temperature is 28 °C and humidity is 77% [10]. The area of the study was West Ranomeeto subdistrict with the territory of 76.07 km² or 1.69%. The topography was non-coastal plain at the altitude of 112.8 above sea level, with the temperature of 23-34 °C and the humidity of 83%. The subdistrict consists of 9 villages and the area of the village for Sindan Kasih observation site is 8.55 Km². Konda subdistrict has the territory of 21.37 km². The topography of the subdistrict is plain at the altitude of 22.06 above sea level, with the temperature of 23-34°C and the humidity of 81%. The subdistrict consists of 17 villages and the observation site included Alebo village with the territory of 2.30 km², Morome village with the territory of 2.57 km², and Lambusa village with the territory of 4.80 Km² [1].

3.2. Farmers’ Profile

Profiles of beef cattle farmers with the different production systems in the South Konawe Regency are presented in Table 1. The mean age of the farmers with semi-intensive and intensive production systems ranged from 25-62 years. The age factor had significant impact on the working productivity of the farmers. The results of the study showed that the age of the farmers was not significantly different. The farmers with intensive production system were about 1.13 year younger than those with semi-intensive production system. It related to the fact that the intensive production system was applied by younger farmers for fattening purpose, while the semi-intensive production system was applied by many older farmers for breeding purpose. It was usually easier for the young farmers to receive information both from counseling and other activities in the villages. Productive age was very important because people spent their time to work in the period of time [6]. Cattle farming experience was one of the important factors in improving cattle farming management to increase livestock production [7,8]. The experience of the farmers with the semi-intensive and intensive system was not significantly different. The range of the cattle farming experience in the study was from 10 to 20 years. The cattle farming experience of the farmers handed over from generation to generation and generally they improved their cattle farming management themselves [2].

Table 1. Profile of beef cattle farmers with semi-intensive and intensive production systems in the South Konawe district, Southeast Sulawesi Province.

| Parameters         | Semi-intensive production system | Intensive production system | Sig.  |
|--------------------|----------------------------------|-----------------------------|-------|
| Farmers (N)        | 55                               | 50                          |       |
| Age (years)        | $46,89 \pm 8,11$                | $45,76 \pm 8,81$           | 0.49  |


Table 1 showed that there was not any significant difference in the number of the family members of the farmers with the semi-intensive and intensive production systems, which ranged from 3-5 individuals. The number of the family members of a family could also be a determinant factor in economy. The more members were in a family, the more dependants would be. On the contrary, the fewer members were in a family, the fewer dependants would be. [11] suggested that the number of dependants influenced farmers’ decision making or attitudes towards problems related to the economy. Also, farmers' decision-making or attitudes are influenced by the number of cattle in their ownership.

Both formal and non-formal educations represent the influencing factors of people’s views and ways of thinking. The education level of the farmers in the study was still very low. The majority of them only completed elementary education, although some of them had graduate education level. [7] suggested that the farmers with higher education levels would more quickly implement innovation. On the contrary, those with low education levels tended to avert innovation. The education level would also directly influence the mindset and the behavior of the farmers in doing business. The farmers with low education level would tend to be receptive so that it was necessary in such condition to continuously give them coaching session.

There was significant difference in the motivation of the farmers with the semi-intensive and intensive production systems (P<0.05). The main motivations of the farmers with the semi-intensive production system were as saving and insurance. Meanwhile, those with the intensive production system considered cattle farming as their primary livelihood and income. The farmers with the intensive production system (50%) usually fattened the cattle and raised them for a maximum period of 6-18 months so that economically, it provided them with a quite good profit, especially when they sold the cattle before Eid al-Adha as Qurban or sacrificial animals. The motivation as savings among the farmers with the semi-intensive production system was still relevant because of their primary job as farmers, while cattle farming served only as side job. The cattle served as savings because the farmers could sell them any time when they need ready cash and it was still the dominant function of the cattle. There was significant difference in the motivation of the farmers between those with the two production systems in raising cattle as manure producer. Considering the importance of the cattle as manure producer, manure production was not the primary motivation of the farmers. The majority of the farmers with the intensive production system processed the manure by collecting and aerating it and then selling it to get ready cash and the market for the processed manure was lucrative. Buyers
of the processed manure usually directly came to the farmers to buy it. On the contrary, there were still many farmers with the semi-intensive production system who have not processed the manure to add economic value to it. [5] reported that cattle as manure producers were very potential with 15 kg/day of fresh manure production on average in the intensive production systems.

There was not any significant difference in the family participation in cattle farming between the farmers with the intensive and semi-intensive systems. The most significant family participation in cattle farming is still dominated by the heads of the farmer families (husbands), while the participation of their wives was not significant. The insignificant participation of the wives took place because they played more significant role as housewives or were involved in other economic activities such as doing agricultural jobs, operating food stall business, and selling agricultural products. Children participation was also insignificant because they focused more on attending school so that they did not have enough time to involve in the cattle farming activities.

4. Conclusion
It was concluded that the cattle production system related to the objectives and the motivations of the beef cattle farmers. The farmers with the semi-intensive system used the cattle more as saving and insurance, while those with the intensive system used the cattle as the primary source of income and manure producer.

5. References
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