Dairy Cattle Waste Management as an Effort to Increase the Income of Producer Cooperative Members (Case Study on KPSBU Lembang, West Java Province)

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Abstract. KPSBU keeps trying to help its members make more money through the businesses it runs that are related to their interests. These include the Milk Production and Marketing Business, the Concentrate Feed Business, the Milk Processing Business (which turns milk into yogurt and sterile milk), the Waserda Business, and the Dairy Cattle Breeding Business. Because there was a lot of dairy cow dung, KPSBU took the initiative to help its members make more money and get rid of the waste. The Hayami Method and the AHP (Analytical) Method are used in the Case Study Method. Hierarchy Process) to figure out and compare the benefits seen from added value, how well waste is absorbed, and market opportunities. Based on the results of the calculations for the two methods, it can be seen that dairy cow manure would be better as vermicompost because members could make more money from it, even though the waste would be absorbed less well. a level below compost. KPSBU must provide information and persuade members that dairy cow manure can be used as vermicompost, which has a higher economic value to increase member income because it is cheaper as a growth fertilizer. Worms are needed, among other things, to make drugs, cosmetics, and things that break down dead things.

Keywords: Role-1; Producer Cooperative-2; Income-3; Waste Management-4

1 Introduction

The Cooperative Law declares that cooperatives aspire to improve members' and society's welfare and build a national economic order to produce a developed, just, and successful society based on Pancasila and the 1945 Constitution. Cooperatives must promote their economy and improve their human resources through ongoing education and training to make members more professional and able to adapt to economic change [1].

KPSBU (North Bandung Cattle Breeder Cooperative) in Lembang Bandung, West Province, is a multi-business cooperative. Starting with Milk Production and Marketing, Concentrate Feed, Milk Processing (Yogurt and Sterilized Milk), Waserda, and Dairy Cattle Breeding. All KPSBU business units help member businesses. Through more efficient production inputs and better output marketing, the goal is to enhance members' nominal and real income. However, KPSBU's commercial possibility is inseparable from waste's impact. 22,400 cows live in nine Lembang Villages. If each cow produces 10 kilograms of manure per day, the Lembang Region might produce 224 tons of cow dung every day (www.rmoljabar.com, accessed online on April 23, 2019). PPP members own 19,837 of Lembang District's 22,400

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cows. The PPP has 7,606 dairy farmers, 19,837 cows, and 145 tons of milk per day. 2019 PPP Annual Report.

It is known that cow dung can be of economic value if it is processed into biogas, vermicompost, or compost. This is a good alternative option, in the sense that if it is done, it can increase the income of cooperative members, as well as solve the waste problem. Based on this, to assist PPP in making decisions related to efforts to increase member income on the one hand, and on the other hand can also solve the problem of cow dung waste, research was conducted on the role of PPP as a Producer Cooperative in determining alternatives to waste management into biogas, or vermicompost or compost which can have the most impact on increasing member income while solving this waste problem. This research focuses on 1) How the role of PPP in increasing the income of members of dairy farmers; 2) The extent of the role of PPP in increasing member income through the utilization of dairy cow dung waste; and 3) Efforts a...

2 Literature Review

The first goal is a goal on a micro scale, while the next goal is more towards a macro goal. Macro goals will be difficult to achieve if the micro goals have not been achieved. Based on this idea, the analysis of cooperative objectives is more centered on the analysis of the micro-objectives of cooperatives, namely advancing the welfare of members [2]. Cooperative enterprises' economic functions must focus on solving member households' economic issues. Cooperative members buy, process, and sell production inputs and products as producers. The Cooperative assists members in inputting, generating, and marketing production outcomes. Members grow and maximize operating revenues.

Hayami, et al [3] stated that added value is the difference between the commodity that gets treatment at a certain stage and the sacrificial value used during the process. The selling value of the product will increase after processing. The more engineering work on product design, the added value attached to the processed product will increase very quickly so that it forms added value in a multilevel manner. It is also possible to determine the output value, production productivity, and amount of service to the owner of production components such as capital, other input contributions, business profits, and labor [3], [4].

The management of manure waste into biogas, vermicompost and compost is an alternative solution to reduce the impact of pollution while producing economic added value. Biogas can be used as a fuel substitute for LPG gas (LPG) for daily cooking needs. According to Atmodjo (2014), in Rani Puspita (2018), biogas production with a slurry residence time of 20 days and the addition of slurry as much as 14.5 liters per day will produce biogas as much as 0.56-0.68 m3 / day of biogas which is equivalent to 0.26 kg of LPG gas. Biogas manufacturing technology can be designed portablely with a construction cost of Rp. 910,000 and will return in less than two years. Meanwhile, the residue from the use of biogas, namely slurry, can be used as fertilizer which is also of economic value.

Manure waste can be used to grow helminth animals as well as biogas and compost. Earthworm marketing is improving. Earthworm entrepreneurs sell earthworms and vermicompost, which is feces (former worms). Earthworm products are used in animal feed, fish feed, pharmaceuticals, and earthworm breeding. Earthworms also decompose trash and replace fishmeal imports [5].

3 Research Methods

This study used the case study technique, an exploratory research method that examines a social unit's history and environment in greater detail. Observation and informant interviews collected data. This study calculated the added value of dairy farm waste management via biogas, vermicompost, or compost using the Hayami Method. Excel data management and analysis [3].

Then, the decision-making process is used to come up with better and more effective ways to deal with livestock waste. The decision-making process is mostly a way to choose between two options. The main tool of the Analytical Hierarchy Process (AHP) is a functional hierarchy, and human perception is the main source of information. When a complicated, unstructured problem is broken down into groups, the groups are then put into a hierarchical order [6]. Purposive sampling is used to choose respondents for the AHP. Respondents are actors who are thought to understand the problems and informants who can help make policies..

Problems with making decisions can be difficult due to the presence of multiple goals and criteria in the decision-making process. The Analytic Hierarchy Process (AHP), which was established by Thomas L. Saaty, is one example of a tool that is appropriate for candidate selection or prioritization. This issue can be represented using a hierarchical model similar to the AHP model shown below.

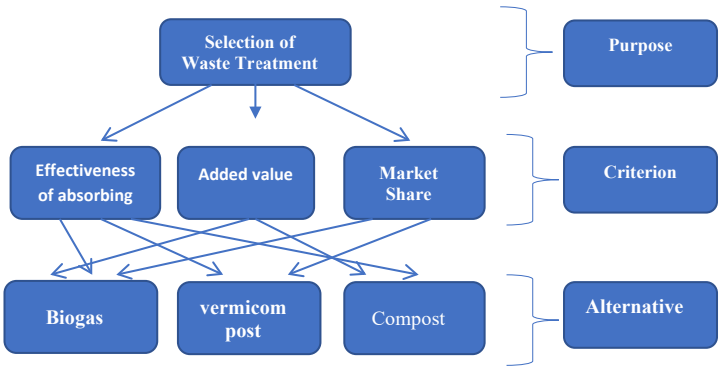

Fig 1. Structural and Hierarchical Forms of Decision Elements

The model shows a hierarchy of levels/rows. Goals are on top. Sub-criteria and criteria follow. The lowest level indicates contenders for selection. AHP uses pairwise comparison matrix to weight criteria and alternatives. The importance of each criterion to achieving goals will be compared. The value-added effectiveness and waste absorbing parameters will be compared to how significant they are for biogas manure management. For alternative waste management, biogas, vermicompost, and compost will be examined in pairs (and matrices) for market prospects. Pairwise comparison matrices should use these values:

1 : equally important (equal)
3 : more important a little (slightly)
5 : more importantly strongly (strongly)
7 : more importantly very strongly (very strong)
9 : more important to the extreme (extreme)

Other values are 2, 4, 6, and 8. These values show the odd values' interests. If importance is inverted, we can use those values' reprisocal numbers. Criterion 3 is more essential than criterion 1 since their pairwise comparison is 1/5. Each level with the same superior hierarchy needs a pairwise comparison matrix.

This study used the case study method, which explores a social unit's history and surroundings. Observation and informant interviews collected data. This Hayami Method study estimated the value of dairy farm waste management via biogas, vermicompost, or compost. Excel analysis.

4 Results and Discussion

4.1 The Role of PPP in Increasing the Income of Members of Dairy Farmers.

Based on the results of observations and interviews, the role of PPP as a Producer Cooperative that strives in the field of dairy farming, so far has carried out: a) Facilitating the procurement of production inputs by running a concentrate feed business unit, seeking land for forage grass plants, and dairy cattle breeding business; b) Holding a business unit for processing milk into yogurt and sterilized milk in an effort to increase the absorption of member production and as an effort to increase bargaining position, especially in determining the price of fresh cow's milk in the IPS market; c) Marketing member produce to IPS; d) Providing health services for member dairy cows; e) Providing education and training in order to increase knowledge about business and cooperatives; f) Carrying out efforts to prevent river pollution continuously by reminding farmers to feed livestock with grass fertilized with cow dung and some farmers collaborating with vegetable farmers who need cow dung fertilizer; and g) Providing training on the utilization of cow dung into biogas and has been widely practiced by farmers. There are about 1,250 farmers who participated in the biogas program using technology from Nepal with a total of 1048 biogas digesters. Some farmers have also used cow dung for worm livestock media (PPP Report, 2019).

4.2 The Role of PPP in Increasing Member Income Through Dairy Manure Waste Management.

Carrying out waste management efforts into useful forms, namely into biogas, vermicompost, or compost to be effective in increasing income while reducing the amount of waste.

Facilitating research activities to determine the most effective waste management is seen from three aspects, namely the value-added aspect, the effectiveness aspect of waste absorption, and the market opportunity aspect. Referring to the results of Rahmadani's research [8] entitled Analysis of Decisions on The Management of Dairy Cattle Manure Waste into Biogas, Vermicompost, and Compost, states that: When viewed from the aspect of economic added value, based on the calculation results using the Hayami Method, the highest value for waste management into Vermicompost is obtained, where 1 kg of feces can produce an added value

of IDR 1395.55, then compost IDR 422.24 and biogas IDR 148.48. This means that the prospect of adding the highest added value is to make Vermicompost.

When viewed from the aspect of effectiveness in reducing waste, compost has the first order with an average value in the alternative comparison matrix of 0.52 and the second place is Vermicompost with an average value of 0.40 and the third is Biogas of 0.07. Biogas is considered small because in the final process it still leaves waste in the form of bioslurry with a large enough amount, so it still has to be reprocessed on the bioslurry.

When viewed from market opportunities, based on the alternative comparison matrix, the highest to lowest average value is Vermicompost 0.64; Compost 0.28 and Biogas 0.07. The weighting is taken from interviews with farmers where vermicompost has a higher prospect compared to others because the nutrient content is much better than compost fertilizer, it is more efficient to use it as a growth fertilizer and of course the prospects in terms of worm needs include as an ingredient in making drugs, cosmetics, and as a decomposer. If recapitulated, the results of the analysis are as follows:

Table 1. Recapitulation of Waste Management Analysis Results Based on Economic Added Value Aspects, Waste Absorption, and Market Opportunities.

Aspect Output	Economical Added Value	Waste Absorption	Market Opportunity
Biogas	IDR. 148.48	0.07	0.07
Kascing	IDR. 1,395.55	0.40	0.64
Compost	IDR. 422.24	0.52	0.28

Source: Rismayanti (2021)

4.3 Efforts that Must be Made by PPP to Increase the Income of Members of Dairy Farmers through the Use of Dairy Cow Dung Waste

Constantly informing, persuading and reminding members that utilizing cow dung waste by making Vermicompost has added value that can increase revenue while solving the problem of waste impact. Providing education and training for members continuously both in the field of cooperatives and in terms of dairy waste management efforts. Improving the services of business units that have been carried out continuously, especially the dairy cattle breeding business unit which is currently experiencing a decline. Re-promoting the cow dung utilization program for biogas that has been practiced by farmers. (There are about 1,250 farmers participating in the biogas program using technology from Nepal with a total of 1048 biogas digesters. Some farmers have also used cow dung for worm livestock media (PPP Report, 2019).

5 Conclusion

Based on the results of the study, it can be concluded that the role of PPP in increasing member income has been carried out in a planned manner, it can be seen from the business units run by KPSBU that all support the efforts of its members as dairy farmers. The business units run by KPSBU include the Milk Production and Marketing Business Unit, Concentrate Feed, Milk Processing, Waserda, and Cattle Breeding Business Unit. Based on the calculation results using the Hayami method and the AHP method, waste management that has a greater contribution to increasing income while being able to solve the waste problem is the management of cow dung waste into Vermicompost.

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