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Processing Livestock Waste into Organic Fertilizer in the Kelompok Usaha Bersama (KUBE) Rare Angon Goat Farming in Temesi Village, Gianyar Regency

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A B S T R A C T

The community partnership program at Kelompok Usaha Bersama (KUBE) Rare Angon Goat Farming aims to increase the productivity of goat livestock to support livestock and agricultural businesses in partner groups, especially in terms of providing a technological touch in processing livestock and agricultural waste into solid and liquid organic fertilizer of high quality and economic value.Goat farming is one of the livestock commodities that produce meat and milk which has great potential to be developed Target What is achieved from the activity is that partners can look after goats well and can independently make quality organic fertilizers that have economic value. Apart from that, an increase in the economic value of livestock waste was also achieved by up to 20%. The able in this activity is This activity is also able to reduce environmental pollution by up to 40%.

INTRODUCTION

Goat farming is one of the livestock commodities that produce meat and milk which has great potential to be developed because it can provide family income even though it is cultivated on a small/household scale (Kusumastuti, 2012). Goats breed faster than other ruminant livestock (cattle), can produce 1 to 3 children per birth, milk (0.5 to 2 liters/day) and prices are more stable (Rusdiana, et al., 2014). In livestock cultivation, including goat farming, it always produces waste. Goat livestock waste consists of solid waste (dung and leftover feed) and liquid waste (urine) (Bain et al., 2021). If this waste is left alone and not processed, it will be very difficult for plants to absorb it because goat manure is very hard, the longer it is left, the harder it will be, can pollute the surrounding environment and has a lower economic value than waste that has been processed. Goat waste has the potential to be used as organic fertilizer, can increase organic matter content, improve soil structure, and increase its economic value (Londra, 2008)(Pamungkas and Pamungkas, 2019).

Consequently, the government of Temesi Village is using village funds to enhance the goat farming business through a food security program. The goal is to increase farmers' capacity and the production of goat farming, which is provided to several community members under the auspices of the Kelompok Usaha Bersama (KUBE). One of the groups targeted by the program is the KUBE Rare Angon Goat Farming in Temesi Village. Temesi Village is located in the district of Gianyar, in the Regency of Gianyar. It is 35 km from the provincial capital, 3 km from the district capital, and 3 km from the subdistrict capital. The livestock (pigs, goats, and cattle) and agricultural (food crops like rice and flowers) sectors have the greatest potential to develop and support the family income of the people of Temesi Village (Temesi, 2023). However, the development of livestock businesses, especially goats, and the farming of food crops like rice and flowers, is still done conventionally.

Currently, the Temesi Village Rare Angon Goat Farming has 15 members who earn their living as farmer breeders. As farmers, all members develop agriculture, especially rice and flowers, the waste can be used as organic fertilizer, but productivity is low due to pest and disease attacks. This is also caused by the cultivation system which is still conventional. Meanwhile, the livestock business is carried out on a small/household scale which is developed by each member, namely goats. With ownership ranging from 2 to 20 goats, the partner group feels the benefits of raising goats because this becomes the basis/support for the family's income. Because goat farming produces goats that can be sold and livestock waste in the form of feces and urine can have economic value. Currently, 1 sack containing 30 kg of goat dung is sold for Rp. 20,000 (Rp. 650/kg) and the urine is just wasted, so if given a touch of technology, compost from goat dung can be worth Rp. 45,000 (Rp. 1,500/kg) and liquid organic fertilizer from urine it can cost IDR 15,000/liter. However, currently the productivity of goats is still low and the death rate is also high and the waste has not been processed into organic fertilizer. This is inseparable from the factor that partner members do not understand the knowledge and skills of raising goats properly and correctly and do not know how to process solid and liquid livestock

waste into organic fertilizer. So far, partners have never had any knowledge and skills regarding the above matters so they are simply sold very cheaply. If the waste is processed with a touch of technology, it can become an organic fertilizer of high quality and economic value (Tonga et al., 2022).

The partner group is currently developing rice and flowers whose productivity is still low due to pest and disease attacks and the use of fertilizer is very low because the price is expensive. If partners can produce solid and liquid organic fertilizer from goat waste, they will be able to overcome the problem of pest and disease attacks on flowers from liquid fertilizer and will be able to increase productivity with cheaper solid fertilizer (Yan Tonga, et al., 2021). Based on the conditions and situation above, it is necessary to design community partnership activities/programs at the Rare Angon Goat Farming to increase the productivity of goat livestock in supporting livestock and agricultural businesses in partner groups as well as provide a touch of technology in processing livestock and agricultural waste into solid organic fertilizer. and liquid of good quality and economic value, (Sutapa et al., 2015)(Sutapa et al., 2017) (Tonga et al., 2023). This fertilizer can later be used to increase the productivity of rice plants and flowers.

IMPLEMENTATION AND METHODS

The methods used in implementing PKM activities are survey, discussion, counseling, training, practice, and demonstration plots. This PKM activity is carried out through the following implementation stages:

1. Field surveys to determine partner locations, organize, and plan activity stages that lead to solutions to problems faced by partners and output targets.
2. Counseling and training on efforts to increase goat livestock productivity and livestock waste handling technology
3. Providing assistance with tools and materials related to the application of livestock and agricultural waste processing technology into organic fertilizer.
4. Producing quality and economically valuable organic fertilizer products as well as applying fertilizer to demonstration plots.
5. Monitoring, evaluation, periodic assistance, and reporting.

Procedures for making solid and liquid organic fertilizer from goat cultivation waste are as follows.

1. Solid Fertilizer

   Solid waste in the form of goat dung and leftover feed is prepared then spread out and stacked in several layers. Each layer is sprayed with a mixture of water, molasses, and starter as needed until the humidity is sufficient. Cover with a tarpaulin so it's airtight and doesn't get rainwater. Fermentation was carried out for 4 weeks. Every week, it is turned over for a while and closed again). In the fourth week, the lid is opened and the fertilizer can be harvested. The next process is smoothing with machines, packaging, weighing, and stitching. The fertilizer is ready to be marketed and applied.

2. Liquid Fertilizer
   All ingredients prepared include goat urine and dung, rice washing water, chopped banana stems (source of mineral K), animal feed plants (source of protein or N), coconut fiber (source of mineral P), pineapple peel, starter, molasses, and anti-microbial. All ingredients are put into a vat, stirred until mixed, then closed tightly and fermented for 3 – 4 weeks. Every week the lid of the barrel is opened for a few moments and the ingredients are stirred so that the gases that form come out, then close it again. At the end of fermentation, the vat is opened, and the liquid fertilizer can be harvested. Filter the liquid fertilizer then package it in bottles and ready to be marketed and applied.

RESULTS AND DISCUSSION

Results of Activity Implementation

Activities were carried out on May 3, 2024. Community service began with a reception at the Temesi Village office, followed by outreach activities regarding good and correct goat cultivation and the importance of handling waste produced in livestock businesses. The number of group members who attended this activity was 16 people.

Figure.1 Counseling About Organic Fertilizers Activities

The problems faced by partners are that they do not have sufficient knowledge about goat cultivation, the growth of some goats is not optimal, and the group has not handled the waste produced from goat cultivation. Goat feces and urine are left scattered under the cage and are not collected or processed. Therefore, the community service team provides education on waste handling properly and appropriately so that it has an impact on a clean and comfortable cage environment, has an impact on the health of livestock and breeders, and also has a social impact.

Fiure 1. Practical Activities for Making Fertilizers

After the counseling activities, it was continued with the practice of making quality Liquid Organic Fertilizer and Solid Fertilizer in the stable area, as well as demonstrating equipment and materials donated to the group such as equipment and fermentation materials, measuring tools, filter tools, fertilizer grinding machines, sack sewing machines, bottles are equipped with labels, and several packaging sacks are equipped with labels for solid fertilizer. The group is very interested and active in carrying out activities.

Figure 2. Handover of Supporting Tools for Making Organic Fertilizers

Figure 3. Fertilizer Monitoring and Processing

Figure 4. Packaging and Labeling of Solid and Liquid Organic Fertilizers

Next, the community service team carried out monitoring on June 17, 2024. The community service team and partners saw the results of the liquid organic fertilizer and solid organic fertilizer that had been made. Partners are also given knowledge about fertilizer packaging and labeling techniques so that solid and liquid organic fertilizers are ready to be marketed. The group members were very enthusiastic and eager to take part in the activities and the group members thanked the community service team for transferring knowledge and skills as well as donating equipment and materials needed by the group. The group leader hopes that in the future the team will continue to develop their group so that it can produce solid and liquid fertilizer continuously and can market the fertilizer that has been produced.

The target achieved from the activity is that partners can independently make quality organic fertilizer and have economic value. The economic value of livestock waste increases by up to 20% and there is a reduction in environmental pollution by up to 40%.

Figure.6 Solid and Liquid Organic Fertilizer Produced by the Kelompok Usaha Belajar (Kube) Rare Angon Goat Farming

Figure 5. Application of Solid Organic Fertilizer to Plants (Demplot)

Manure from goats that are properly processed will not cause pollution but is something beneficial for plants. Goat manure organic fertilizer that is of high quality, processed with special technology, and processed using a decomposer (Biostarter), will be able to produce quite large profits (Ratriyanto, et al., 2019). When making solid organic fertilizer, the turning process is very important because the pile requires a periodic influx of oxygen (Fany et al., 2022). According to the results of the analysis that has been carried out (Ichwanto et al., 2022), goat manure compost contains nutrient elements with N of 2.5%, P nutrients of 1.48%, and organic C of 15.39%. Apart from having nutrients that can support plant growth, adding organic material to the soil can also improve the chemical properties of the soil. According to Setyorini et al., (2006), the application of organic matter can increase cation exchange capacity or nutrient content, which is important for soil recovery due to changes in soil pH and storing important nutrient reserves in the soil. The use of organic goat manure fertilizer also aims to improve soil structure, increase the life of soil microorganisms which will change the balance of nutrients in the soil for the better, neutralize toxins due to the presence of heavy metals in the soil, and help neutralize soil pH (Rihana et al., 2013).

CONCLUSIONS AND RECOMMENDATIONS

The conclusion that can be drawn from this activity is that community service activities have run smoothly. The group can independently make quality and economically valuable organic fertilizer. The group was able to increase the economic value of livestock waste by up to 20%. Apart from that, through this activity, we have been able to reduce environmental pollution by up to 40%. Farmers' income has increased from selling goat manure, which originally cost IDR 650/kg, but after getting a touch of technology, fertilizer from goat manure can be sold for IDR 1,500/kg. The team is expected to continue assisting the group until the group can market and produce quality organic fertilizer continuously.

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