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PKM Production Improvement Rabbit Farmer Group in the Bedugul Tourism Area, Tabanan-Bali

Anak Agung Ngurah Mayun Wirajaya[1*], Made Sri Yuliartini[2], I Gusti Agus Maha Putra Sanjaya[3], I Gusti Bagus Udayana[4], Ida Bagus Komang Mahardika[5], Putu Gede Janardhana Dusak[6], I Ketut Suwarmadi Putra[7], Komang Gede Mertayasa[8]
[1, 2, 4, 5, 6,7,8]Program Studi Agroteknologi, Fakultas Pertanian, Universitas Warmadewa
[3]Program Studi Peternakan, Fakultas Pertanian-Universitas Warmadewa
Corresponding Author: Anak Agung Ngurah Mayun Wirajaya mawir61@gmail.com

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A B S T R A C T

Bedugul tourist attractions with the lake and the attractive Beratan Temple, the "Eka Karya" Botanical Gardens, a place to enjoy impressive nature in Candikuning Village, are favorite tourist destinations for domestic tourists and foreign tourists visiting BaliMost of the people of Candikuning work in the agricultural sector as their livelihood and source of livelihood, requiring fertilizer to increase soil and plant fertility. Currently, most of the organic fertilizer used is chicken manure, which is purchased from outside the village, while the potential for developing rabbits in Candikuning Village as a potential source of fertilizer is still underutilized. The objectives of this activity for partners are: increasing partners' knowledge and skills in rabbit cultivation, using solid and liquid manure as organic fertilizer to substitute for the use of inorganic fertilizer, meeting increasing market demand by adding production facilities to support product quality, increasing quantity and continuous production.

INTRODUCTION

Bedugul tourist attractions with the lake and the attractive Beratan Temple, the "Eka Karya" Botanical Gardens, a place to enjoy impressive nature in Candikuning Village, are favorite tourist destinations for domestic tourists and foreign tourists visiting Bali. Apart from beautiful views and natural landscapes and fertile soil, this tourist area is a center for producing horticultural products which are dominated by fruit and vegetable crops. The area of Candikuning Village is 2,666.32 ha, rainfall is 1,200 mm, the number of rainy months is 6 months, the average daily temperature is 230C. This is a hilly area with an altitude of 1,200 m above sea level, very suitable for the development of horticultural crops.

Candikuning Village is administratively part of Baturiti District, Tabanan Regency, Bali Province. The location of Candikuning village can be reached by road, a distance of around 55.1 km from Denpasar city. The administrative area boundaries of Candikuning Village based on the Village and Subdistrict Profile (2021) are as follows:

North Boundary : Pancasari Village
Southern Boundary : Batunya Village
West Boundary : Pohen Hill
Eastern Boundary : Pelaga Village

Candikuning Village consists of 6 (six) banjars/hamlets, namely: 1). Banjar/Batusesa Hamlet, 2). Banjar/Pumuteran Hamlet, 3). Banjar/Bukitcatu Hamlet, 4). Banjar / Candikuning Hamlet I, 5). Banjar/Hamlet Candikuning II and 6). Banjar/Kembangmerta Hamlet.

Most of the people of Candikuning Village depend on the agricultural, livestock and plantation sectors for their livelihoods. In the agricultural sector, the commodities developed by farmers are mostly horticultural plants which grow and develop well and are supported by the surrounding climate. Most farmers plant horticultural crops in the form of potatoes, broccoli, lettuce, carrots, peppers, leeks and others.

Horticultural plants that grow, develop and produce in Candikuning Village, most of the farmers' agricultural products are sold to fulfill tourism needs in addition to being sold in traditional markets throughout Bali and outside Bali. Working in the agricultural sector is a source of livelihood with plants cultivated on farmers' land or rented land, requiring fertilizer to increase soil fertility and plants still using organic and inorganic fertilizers. Until now, the organic fertilizer used for chicken manure to fulfill the planting area is mostly purchased from outside the Candikuning Village area, while the potential for developing rabbits in Candikuning Village as a very potential source of fertilizer is still underutilized by farmers.

Seeing that there is still a lot of potential for waste from animals that can be used as organic fertilizer and the need for organic fertilizer is quite large, quite a lot of rabbits are kept by rabbit farmers in the Candikuning Village area, which is an alternative to fulfill the need for organic fertilizer from rabbit waste. According to the Tabanan Regency Central Statistics Agency (2018), the number of rabbits in Candikuning Village was recorded at 1,164, which were bred by several breeders, most of whom were looking for baby rabbits to sell and had not processed rabbit droppings as a source of organic fertilizer intensively.

The nutrient elements from rabbit waste contain better content than some other organic fertilizers/manures, which actually gives farmers hope to manage rabbits well and utilize their droppings as much as possible to increase crop production and farmer income. The research results of Karo et. al. (2014) stated that the planting technique using silver colored plastic mulch above and the technique of providing rabbit urine by watering it can increase potato production, especially the percentage of large grade potatoes (47.21%). From the results of laboratory tests, it was found that the contents of solid rabbit fertilizer include organic C 21.18%, total N 2.64%, available P 877.69 ppm, available K 675.76 ppm, DHL 15.37 mmhos/cm (Science Laboratory Land, Faculty of Agriculture, Udayana University, Denpasar, 2023). Erika and Paiman (2011) highlight that aside from rabbit urine, rabbit feces also possess valuable content. A rabbit over two months old, or weighing around 1 kg, produces approximately 28.0 grams of soft feces daily. This feces contains 3 grams of protein and 0.35 grams of nitrogen, with the nitrogen from bacteria equivalent to about 1.3 grams of protein. Increasing the use of organic fertilizers, such as rabbit feces, is essential. Not only does it enhance soil fertility, but it also plays a significant role in promoting a sustainable agroecosystem that is safe for human health (Zulkarnain, 2009).

The results of using rabbit manure on potato and cabbage plants on average increase production by 23.5% compared to sheep fertilizer (Sajimin et. al., 2005). The research results of Ruminta et.al. (2017) giving 5 tonnes/ha of rabbit manure treatment provided the best independent effect on panicle length, panicle weight per hill and seed weight per plant. Meanwhile, the treatment of 5 tonnes/ha of manure + 7.5 ml rabbit urine/plant provided the best independent effect on the shedding yield. Researchers Wirajaya et.al. (2023) found that the highest production per hectare of chili plants was obtained in the rabbit fertilizer formulation with the addition of cow fertilizer, namely 7.30 tons ha-1, not significantly different from rabbit fertilizer with the addition of chicken manure with a value of 6.92 tons ha-1 and different Really only with rabbit fertilizer the value is 5.55 tons ha-1. By looking at the nutrient content and the role of fertilizer from rabbit droppings in increasing crop yields/production, it is necessary to increase the quality, quantity and continuity of production in order to meet market demand which has begun to develop by preparing supporting production facilities.

Implementation of the Community Partnership Program (PKM) will partner with 1 (one) group of livestock farmers who have a strong will to progress and manage their business well, namely the "LESTARI" group which consists of 5 members and is chaired by Kadek Sutama with a total of 75 rabbits kept. with a simple cage. This program will be directed at efforts to maintain and utilize rabbit droppings properly, creating drying house facilities, preparing planter bags for efficiency and effectiveness of fermentation, repairing existing fermentation sites, managing the rabbit droppings business in the form of solid organic fertilizer and fertilizer. Liquid Organic as additional product.

Most members of the partner livestock farming groups engage in both livestock farming and horticultural crop cultivation. It is hoped that entrepreneurial activities in various fields will help families increase their income. The underutilized rabbit droppings present a promising opportunity to profitably fill time. With community service funding from Warmadewa University, the people of Candikuning Village, particularly the "Lestari" livestock farmer group, are expected to see improvements in plant cultivation and natural resource processing, especially in maximizing the use of rabbit manure.

The goals of this initiative are to enhance the partners' knowledge and skills in rabbit farming, to utilize both solid and liquid rabbit waste as organic fertilizers in place of inorganic fertilizers, and to meet the growing market demand by improving production facilities. This will help improve product quality, increase quantity, and ensure continuous production. Furthermore, using rabbit manure as an alternative organic fertilizer, alongside the commonly used chicken manure, can enhance crop cultivation. By incorporating technology into the processing of rabbit manure, significant value can be added, improving manure quality and boosting income for partner livestock farmers.

IMPLEMENTATION AND METHODS

This community service initiative will be implemented within the "Lestari" livestock farmer group, running from March to October 2024. To ensure the activities proceed smoothly, a series of stages will be executed. In planning this service, specific methods will be employed to facilitate and enhance material absorption, including the following steps:

1. Interview and discussion methods to find out the problems faced by work partners
2. The counseling method involves face-to-face interactions, allowing students to learn about the application of technology in utilizing rabbit waste to produce solid and liquid organic fertilizers. The sessions emphasize the importance of drying houses for solid fertilizer materials, proper and sustainable rabbit farming practices focusing on quality, quantity, product continuity, efficiency, and effectiveness, as well as the use of composting bags. Additionally, the counseling covers improving organizational management to foster an entrepreneurial spirit and enhance business management skills.

3. Handing over materials and tools to students, which can be used as an implementation tool to improve the application of technology for utilizing & processing rabbit waste so that the product can be of high quality and continuously available.
4. Direct practice will be guided by instructors who are competent in their fields so that students can understand and produce quality solid and liquid organic fertilizer products that are useful for plants so that plants can produce according to expectations and be sustainable.
5. Monitoring, mentoring, and evaluation: The activity proposer will conduct regular monitoring and mentoring to ensure the success of the business being developed by the partners. During this phase, an analysis will be conducted to identify any potential issues faced by the partners and work on finding solutions. Following the monitoring process, an evaluation will be performed on the service material provided and its implementation by the livestock farmer group members, focusing on its application in horticultural crops in fields/gardens and home gardens, as well as efforts to increase members' income.

RESULTS AND DISCUSSION

As part of its commitment to the Tridharma, Warmadewa University, through its Community Service Program (PKM), encourages its academic community to support local populations, especially the "Lestari" livestock farmer group in Candikuning Village, Baturiti-Tabanan. In response to the challenges faced by these farmer groups, solutions have been developed and successfully implemented through a series of discussions, counseling sessions, hands-on practice, and mentoring, including the following approaches:

Delivery of material during counseling

The community in Candikuning Village actively engages in agriculture, cultivating various horticultural crops suited to the area's potential, alongside serious rabbit farming endeavors. Enhancing both natural and human resource potential is essential to align with current technological advancements. The Sustainable Livestock Farming Group, comprising farmers and livestock breeders, has organized itself to optimize the use of available resources and foster collective development. Improving the capacity of members of livestock farmer groups with technology transfer is carried out by providing counseling and practice regarding, among other things: 1). how to cultivate horticultural crops and cultivate rabbits properly and correctly so that plants can grow well and rabbits can develop and be healthy, 2). how utilize rabbit manure into quality compost, can be produced according to expectations in quantity/quantity and how it can be available continuously, the product can compete in the market and be in demand by consumers, 3). increase the efficiency of rabbit manure by combining it with cow manure and chicken manure which are abundantly available and use of compost bags, 4). how to market the current product. The outcomes achieved by the partner group and members are motivated to increase understanding and implement the cultivation of horticultural plants and rabbits properly and correctly as well as increasing the efficiency and effectiveness of the

mixture of cow and chicken manure but the resulting compost has nutrient content that can meet the needs of plants and utilizes compost bags , how to market products. 100% of partner group members have carried out the cultivation of horticultural crops and rabbits properly and correctly and understand the other information provided. The healthier the plants and rabbits will affect production.

Construction of a drying house

The availability of solid rabbit manure compost as a raw material is crucial for meeting market demands in terms of quality, quantity, and consistency. However, the rapidly shifting weather in the Bedugul area often disrupts raw material availability, hindering processing at the required scale. To expedite drying before chopping and fermentation, a drying house is essential. The construction of this facility will enable farmer groups to prepare materials more swiftly, in greater quantities, and more effectively, even with the area's unpredictable weather.

A representative drying house has thus been established, enhancing the preparation of dry raw materials. Supported by the research of Solichin et al. (2018), compost is dried by spreading it on prepared tarps and using sunlight, a process that takes 10–15 days. As a result, dry raw material preparation has grown from 1–2 tons per month to 3–4 tons, significantly benefiting 100% of the partner groups and members. With this increased production enabled by the drying house, the Lestari livestock farmer group is now well-positioned to confidently expand its production capacity in the future.

Technology Transfer Process for Using Compost Bags

The rabbit farming activities within the Lestari livestock farming group are conducted on relatively limited land. This limited space necessitates an efficient layout that accommodates all production processes to achieve high-quality products, adequate quantity, and continuous production. Although chopped rabbit manure is ready for fermentation, limited fermentation space poses a challenge. However, advancements in technology have introduced practical tools for storing processed materials, such as composting bags readily available in the market.

According to Destiasari et al. (2024), Composting Bags serve as effective containers for simple aerobic composting. Made from UV-resistant material and designed with a textured cavity, these bags withstand varying weather conditions and facilitate optimal air exchange, which is essential for aerobic composting. Composting Bags also provide a compact solution for small spaces. Due to the limited availability of dry, chopped rabbit manure, combining it with cow and chicken manure in a 1:1 ratio can enhance nutrient content while ensuring efficiency and quality. All partner groups and members have successfully used compost bags and have mastered creating optimal mixtures, increasing the added value of rabbit compost products.

Increasing Group Management Capabilities

Farmer groups are grassroots organizations that must be managed effectively to ensure their sustainability. Since human resources are critical to the success of planned programs, improving their management skills is essential. The ability of members to manage the group and its activities is still limited and requires improvement through technology transfer to strengthen partner institutions and organize management. This will enable the livestock farmer group to operate efficiently and successfully through effective communication. According to Masmuh (2008), communication enables coordination of activities to achieve common goals, but it involves more than just transmitting information. Currently, 90% of the partner groups have successfully collaborated and established effective communication, developing their members to become leaders who can continue to pass on their knowledge to the surrounding community.

Assistance with materials and tools

Materials and tools are essential in business activities to support the production of high-quality products that meet quantity demands and are consistently available. Technological advancements encourage farmers to conduct their activities efficiently and effectively, utilizing accessible materials and tools from the market. Currently, the partner group faces a shortage of resources necessary to produce competitive products. To address this, 100% of the required materials and tools have been provided to partners, facilitating the cultivation and processing of high-quality, sustainable solid and liquid rabbit manure products.

Figure.1 Counseling and Delivery of Materials/Equipment

Figure.2 Drying House and Raw Materials to be Dried

Figure.3 Process of Mixing Raw Materials and Utilization of Compost Bags for Fermentation

Figure.3 Fermentation Process of Liquid Manure and Packaged Solid Rabbit Manure Compost

CONCLUSIONS AND RECOMMENDATIONS

The "Lestari" Livestock Farmer Group in Candikuning Village, Baturiti District, Tabanan Regency in this PKM has been able to adopt all the material provided. This can be demonstrated, among other things:

1. Partner group members have demonstrated seriousness in participating in counseling, interacting during counseling, practicing in the field, mentoring.
2. Partner group members are motivated to carry out more active activities to utilize rabbit manure to be processed properly and correctly and increase the efficiency and effectiveness of rabbit manure mixed with cow and chicken manure.
3. There are drying houses and compost bags available to increase the amount of raw materials that are available and can be fermented so that production with quality, quantity and continuity can meet market demand.
4. Groups and members can run the organization better..
5. Assistance with materials and tools will be able to support group activities to obtain quality, quantity and continuity of the compost products produced and support increased agricultural production.
6. Increased income of farmer groups from sales of products produced.

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