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PKM Community Empowerment through Cultivation of Rosella Flowers in Ban Village, Kubu District, Karangasem

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A B S T R A C T

Ban Village is a village located in Kubu District, Karangasem Regency. Most of the people's livelihoods are farmers, breeders and coffee processors. Despite its shortcomings in terms of land conditions, Ban Village has a variety of natural potential that needs to be developed in the agricultural, livestock, fishery and crop processing sectors. The potential for re-development of rosella flowers which were cultivated before the Covid-19 pandemic by the community. Cow dung and litter can be used as quality organic fertilizer. The aim of the activity is: increasing the knowledge and skills of partners in cultivating roselle plants and processing cow dung and litter as organic fertilizer and touching on technology for cultivating roselle flowers and processing cow dung and litter.

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INTRODUCTION

Enhancing individuals' capabilities is a collective obligation essential for advancing towards a thriving society. The government plays a crucial role in mobilizing communities through empowerment initiatives. According to RO Law Number 6 of 2014, Village Community Empowerment aims to significantly enhance the quality of life and welfare of rural populations (Rauf et al., 2021). Additionally, village community empowerment is described as a strategy to foster community independence and well-being by improving knowledge, attitudes, skills, behaviors, awareness, and resource utilization through the implementation of policies, programs, activities, and support that align with the primary issues and needs of the community (Wijaya et al., 2021). Consequently, empowerment efforts should be uniformly distributed across various community groups, including the residents of Ban Village.

Ban Village is situated in the Kubu District of Karangasem Regency. The majority of the residents engage in agriculture, livestock breeding, and coffee processing, all of which present opportunities for further development. The village has a population of 11,858 individuals, comprising 6,184 males and 5,674 females. Covering an area of 7,095 hectares, Ban Village consists entirely of dry land. The land is allocated into a residential zone of 106.446 hectares and a community plantation area of 6,962.85 hectares.

The geographical position of Ban Village is situated to the west of Central Tianyar Village, to the east of Sukadana Village, to the north of East Tianyar Village, and to the south of the Kintamani District Protected Forest. This village is categorized as being in a mountainous region, characterized by an annual rainfall of 2,138 mm and an elevation of 500 meters above sea level. The distance from Ban Village to the District Capital is approximately 20 kilometers, while the distance to the Regency Capital is around 49 kilometers, which can be traversed in about 60 minutes from the center of Karangasem city. Ban Village comprises 16 hamlets, which include: Bukit Hamlet, Ban Hamlet, Panek Hamlet, Cucut Hamlet, Bonyoh Hamlet, Temakung Hamlet, Darmaji Hamlet, Cegi Hamlet, Pucang Hamlet, Dlundungan Hamlet, Daya Hamlet, Jatituhu Hamlet, Bunga Hamlet, Pengalusan Hamlet, Dusun Manikaji, and Belong Hamlet.

Ban Village, despite its limitations regarding land conditions, possesses significant natural potential that warrants development in the agricultural, livestock, fishery, and crop processing sectors. The village's remote location results in community activities being largely confined to the area. Among the notable food products produced by the residents of Ban Village are Lontar Sugar, Cashew Nuts, Soroh Coffee, Siwalan, Balinese cattle, goats, Balinese chickens, pigs, and capture fisheries. Additionally, there is potential for the redevelopment of rosella flowers, which had previously been cultivated by several community members prior to the Covid-19 pandemic.

The significant potential of Ban Village, particularly in the upper region where Brazilian mango plants and various other mango varieties are currently cultivated, presents an opportunity for the development of roselle flower cultivation. This could be pursued either through intercropping with mangoes or as a monoculture. The cultivation of roselle is particularly appealing due to its numerous health benefits. According to researchers Nurnasari and Ahmad (2017), various parts of the roselle plant—such as the leaves, fruit, seeds, stems, and roots—contain valuable phytochemicals. These phytochemical compounds encompass phenolic compounds, alkaloids, tannins, flavonoids, saponins, and organic acids. The pharmacological and physiological properties of roselle include antibacterial, antifungal, anti-inflammatory, anti-diabetic, antioxidant, and anti-hypertensive effects. The diversification of roselle products can include items such as roselle extract nanocapsules, natural dyes, functional foods, herbal medicines, feed additives, cosmetic ingredients, cooking oil, paint, and biofuel. Continuous technological innovation in the production processes for these diverse roselle products is essential to enhance their value and maximize the utilization of the bioactive components found in the plant. Furthermore, Malinda and Adi (2020) highlighted that roselle flower petals possess considerable potential for development as an anti-aging preparation, primarily due to the presence of anthocyanin compounds, which are known for their antioxidant properties.

The advantages of roselle flowers are numerous; however, there is a need to enhance cultivation techniques, particularly through the use of organic materials to ensure high-quality products. Researchers Fau and Darmawan (2022) recommend the application of gebagro 77 organic fertilizer at a dosage of 12 grams to facilitate the successful growth of roselle plant seeds. Additionally, Sari (2011) noted that the incorporation of manure into the soil positively affects its physical properties. Regular application of manure enriches the soil with organic matter and improves its water retention capacity, thereby promoting the formation of groundwater. This is beneficial for plants, as it aids in the efficient absorption of nutrients necessary for their growth and development.

In addition to utilizing packaged organic fertilizers, locally sourced materials such as cow dung can be readily obtained from rural areas. Research conducted by Ribeiro et al. (2017) indicated that applying cow manure at a rate of 30 tons per hectare significantly enhanced soil chemistry, leading to improved soil fertility and increased plant yields, as measured by the dry weight of sun-dried seeds per plant. Moreover, Wijayanti et al. (2013) reported that a combination of cow manure, goat manure, and chicken manure, each supplemented with 200 kg of Urea per hectare, resulted in superior growth and yield of chili plants compared to other manure combinations with varying Urea doses. Additionally, Prasetyo's study (2014) revealed that the application of 90 tons of cow manure resulted in the highest production of red chili, averaging 302.58 grams per plant, although this was not significantly different from the outcome of applying 36 tons of chicken manure per hectare.

The Community Partnership Program (PKM) will collaborate with community organizations that demonstrate a strong commitment to advancement and effective business management, comprising 25 members. This initiative will focus on the cultivation of rosella plants and the appropriate utilization of cow dung to enhance plant productivity. It is anticipated that the community service, funded by Warmadewa University in partnership with UiTM Malaysia, will enable the residents of Ban Village to improve their skills in cultivating roselle plants and processing natural resources, particularly cow dung, thereby fostering optimal growth and development of rosella flower plants.

The objective of this initiative for the partners and community of Ban Village is to enhance the knowledge and skills of the participants in the cultivation of roselle plants and the processing of cow dung into organic fertilizer, thereby reducing reliance on inorganic fertilizers within the community. Additionally, this approach presents an opportunity for surrounding communities to utilize cow dung as a viable source of organic fertilizer for their crops. The integration of technology in the cultivation of roselle and the processing of cow dung is expected to significantly increase the value added for the partners and community, particularly in terms of the cultivation and quality of roselle flowers, the quality of the organic fertilizer produced, and the overall income of the partners and community members.

IMPLEMENTATION AND METHODS

To ensure the effective execution of community service activities, several stages are implemented. In the planning of this community service, various methods will be employed to facilitate and enhance the understanding of the material.

1. Methods of interviewing and discussion to identify the challenges encountered by colleagues in the workplace.
2. The counseling approach involves direct, in-person interaction, enabling students to acquire knowledge about the appropriate and effective techniques for cultivating the roselle plant. This includes the processing of cow dung and litter into high-quality fertilizer through fermentation using compost bags. Additionally, the method emphasizes improved organizational management, the development of an entrepreneurial mindset, and business management skills, while also motivating groups of roselle farmers to resume their cultivation of the roselle plant.
3. The provision of materials and tools to students serves as a means to enhance the application of technology in the utilization and processing of cow dung waste and litter. This initiative aims to ensure the production of high-quality products that are consistently available, thereby contributing to the improvement of roselle cultivation.

4. Instructors with expertise in their respective fields will oversee direct practice, ensuring that students are equipped to cultivate roselle plants effectively. Additionally, they will learn to produce high-quality cow dung and litter compost, which are beneficial for plant growth. This approach aims to achieve production outcomes that not only meet expectations but also promote sustainability.
5. The activity proposer will conduct ongoing monitoring and mentoring to guarantee the successful development of the business by the partner. During this phase, an analysis will be performed to identify any potential issues faced by partners in their business operations, followed by efforts to devise appropriate solutions. Upon completion of the monitoring process, a comprehensive evaluation will be undertaken regarding the service materials utilized and implemented by the members of the roselle farming group, as well as the application of cow compost and litter in agricultural and residential areas, aimed at enhancing the income of the members.

RESULTS AND DISCUSSION

Warmadewa University, recognized for its commitment to the Tridharma principles, actively engages in community service through the PKM program. This initiative aims to empower the academic community to support local residents, particularly the rosella farmers in Ban Village, Kubu District, Karangasem Regency. In response to the challenges encountered by the roselle farmer group, a partnership with UiTM Malaysia has facilitated the transfer of technology and the provision of materials and equipment. Consequently, tangible solutions have emerged for each identified issue.

1. Warmadewa University, recognized for its commitment to the Tridharma principles, actively engages in community service through the PKM program. This initiative aims to empower the academic community to support local residents, particularly the rosella farmers in Ban Village, Kubu District, Karangasem Regency. In response to the challenges encountered by the roselle farmer group, a partnership with UiTM Malaysia has facilitated the transfer of technology and the provision of materials and equipment. Consequently, tangible solutions have emerged for each identified issue.
2. The partner group is equipped to leverage emerging technologies for the effective and accurate cultivation of roselle plants. Nurseries play a crucial role in the cultivation process by ensuring the preparation of high-quality seeds. With the recent introduction of "trays" available in the market, the process of seed preparation has become more efficient and manageable. Members of the partner group, who previously relied on basic methods for seed preparation, can now embrace advancements in tools and materials that facilitate faster seed growth and improved adaptability. This includes the formulation of seedling media using a variety of fertilizer mixtures, encompassing both inorganic and organic options. All

members of the farmer group are fully prepared to implement new technologies in their roselle planting practices.

3. Partner groups are knowledgeable about and capable of utilizing compost bags, which enhance the efficiency and effectiveness of fermenting cow manure and litter in the area, leading to the production of higher quality compost. As noted by Destiasari et al. (2024), a Composting Bag serves as a compost container designed for a straightforward composting process employing aerobic methods. Constructed from UV-resistant materials with a textured cavity, the Composting Bag is resilient against various weather conditions, ensuring the stability of the composting process while facilitating adequate air exchange, which is crucial for aerobic composting. Additionally, Composting Bags offer a practical solution for limited spaces. Notably, 90% of group members successfully utilized compost bags as fermentation containers and engaged in sustainable practices.
4. Effective communication between management and members is crucial for the successful execution of activities within organizations. As noted by Masmuh (2008), the transmission and reception of information in complex organizations must be clear. In the Ban Village Roselle Farming Group, the members have demonstrated proficient organizational management, ensuring that interactions among members remain harmonious. The counseling results indicate that 90% of the partner group members have a solid understanding of organizational management.
5. The successful cultivation of the roselle flower is significantly enhanced by the availability of necessary materials and tools. The farmer group in Ban Village, which is resuming the development of roselle plants, requires more advanced materials and tools that align with contemporary technological advancements. These improvements are expected to enhance the efficiency and effectiveness of utilizing existing organic materials. With the provision of these materials and tools, it is anticipated that the cultivation will yield superior flower production and high-quality compost for the cultivation process. All required materials and tools have been supplied to partners for use in the cultivation and fermentation of cow dung and litter, ensuring higher quality and sustainability, ultimately leading to increased income for the farmer group.members.

Figure.1 Welcome from the Ban Village Workshop and Symbolic Handover of Materials and Tools

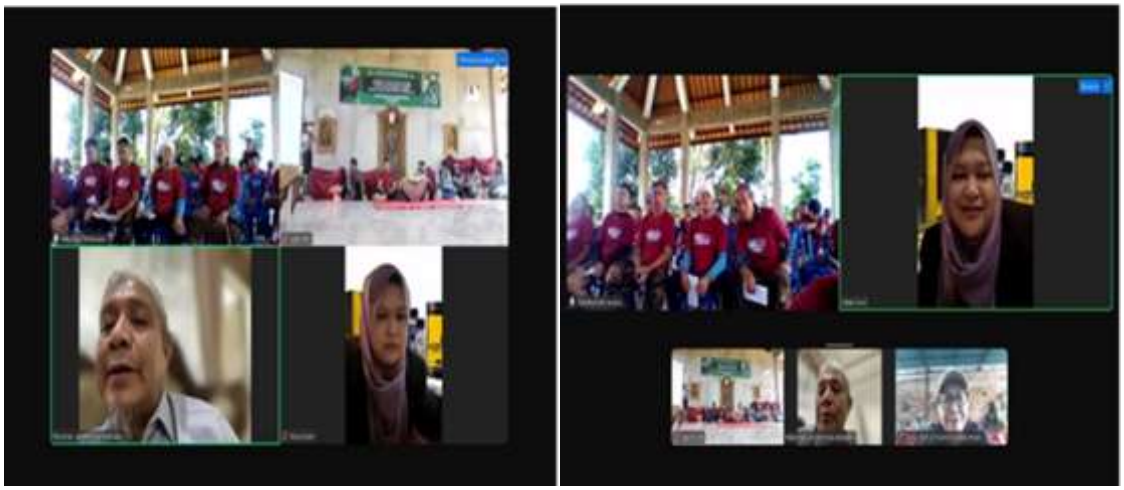

Figure.2 Delivery of material online with UiTM Malaysia and offline in Ban Village

Figure.3 Field Practice of Growing Roselle, Processing Cow Dung and Using Compost Bags

CONCLUSIONS AND RECOMMENDATIONS

The Roselle Farmers Group located in Ban Village, Kubu District, Karangasem Regency has successfully implemented all the materials presented in this PKM. This achievement can be evidenced by several factors.

1. The members of the partner group have shown a committed approach to engaging in counseling, actively participating in discussions, applying their skills in practical settings, and providing mentorship.
2. Members of the partner group are inspired to resume the cultivation of roselle due to their previous successes prior to the Covid-19 pandemic.
3. Currently, effective and accurate cultivation techniques for roselle are accessible, including the use of compost bags designed to enhance the fermentation of organic materials derived from cow dung and litter. This approach ensures that the production of compost meets the quality, quantity, and consistency requirements of roselle farmers.
4. The organization will be managed more effectively by groups and their members.
5. Support in the provision of materials and tools will enhance group activities aimed at achieving quality, quantity, and consistency in the production of roselle flowers, thereby contributing to an increase in agricultural output.

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