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Empowering Triyagan Village: A Comprehensive Service Program for Advancing Fisheries Cultivation and Aquaponics in Mojolaban District, Sukoharjo Regency

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Abstract

The service program is carried out by holding activities to help develop and improve fisheries cultivation and aquaponics activities in Triyagan Village, Mojolaban District, Sukoharjo Regency. The methods used to achieve the intended goal are providing education regarding the importance of cultivating in the yard, training on cultivating fish in buckets, and training on aquaponic cultivation. Training on the aquaponic cultivation system, a combination of raising fish in buckets and vegetables, can increase partners' knowledge of cultivating fish in buckets. And aquaponics of kale. Partners can immediately practice Budikdamber and Aquaponik, cultivation management, and Budikdamber and Aquapoik business management. The author hopes that promoting cultivation around the home yard will increase family food security.

Keywords*: budikdamber, catfish, kale, charcoal*

1. INTRODUCTION

Narrow land does make gardening activities less flexible, especially in urban housing, but by utilizing space vertically, gardening becomes more enjoyable, and the quantity can be increased. Housing that does not have a yard but still has open space around the building can still be used as a plant producer.

One agricultural system that was relatively easy to implement on limited land was the system of cultivating fish in buckets combined with an aquaponics system. The planting medium combines hydroponics and freshwater aquaculture (Xi et al., 2022). The planted types include vegetables, fruit, and ornamental plants. Urban agriculture is an effort to utilize minimalist space in urban areas to be used to produce production. This production is related to meeting food needs, living comfortably amidst urban air pollution, and providing an aesthetic feel to city homes (Poulsen et al., 2017).

Aquatic plants are very suitable for aquaponic systems because they can absorb nutrients dissolved in water (Colt et al., 2022). Several types of aquatic plants can be used in aquaponic systems. According to (2017), kale and mustard greens are two types of plants that can be used in aquaponic systems. Kale and mustard greens can grow well in an aquaponic system.

Mojolaban District is located in the highlands, with a height of 104 m above sea level, and is 11 km from the capital of Sukoharjo Regency. The amount of rainfall in 1 (one) Mojolaban District year is 3256 mm. with an average rainfall in 1 (one) year of 20 mm. The area of the Mojolaban sub-district in 2018 was recorded at 3,554 Ha or around 7.62% of the area of Sukoharjo Regency (46,666 Ha). Palur Village is the village with the most significant area, namely 409 Ha (11.51%), while the smallest in the area is Triyagan Village at 168 Ha (4.73%) (Badan Pusat Statistik, 2020).

Triyagan Village is one of the villages in Mojolaban District where the majority of the population generally has a livelihood in the private sector. Then, as civil servants, farmers, and laborers. The rest are entrepreneurs, retirees, teachers/lecturers, and services. Most of the land in Mojolaban District has good potential for developing crops, livestock, and land fisheries.

2. METHODOLOGY

Efforts to develop aquaponics are currently experiencing several obstacles. The obstacle faced by aquaponic farmers was minimal cultivation knowledge. An aquaponic system needs to grow various plants and fish to function well. The creativity of aquaponic farmers in making aquaponic plants needs to have aesthetic value. Plant lovers will be more interested in the arrangement of beautiful plants because they are generally used as decoration in the house. Based on the analysis of residents' situation and problems, the community service team offers possible solutions for women farmer groups to implement: Providing education about the importance of cultivating in the yard, training on cultivating fish in buckets, and training on aquaponic cultivation. The location of the service was carried out in Triyagan Village, Mojolaban District, Sukoharjo Regency. This location was chosen because Triyagan Village was dominated by residential areas with minimal land availability in areas near urban areas. Activities are divided into several stages. The preparation stage begins with a request from the Mutiara Asri women's farmer group and the village government to assist in increasing food security in the community. The training activity was conducted on January 8, 2024, at 09.00 WIB using presentation, question and answer, and practice methods.

3. RESULT AND DISCUSSION

Following the problems faced by community members in Triyagan Village, Mojolaban District, Sukoharjo Regency concerning efforts to utilize local and regional resources to obtain alternative healthy vegetables for the family and increase family income, this community service program is carried out in the form of knowledge transfer and technology carried out in the form of socialization, training on how to cultivate hydroponics in small areas and analysis of farming businesses.

The implementation of extension and practice of cultivating plants on narrow land using polybags, narrow land, business management, and cost analysis has been carried out since January 2024. Extension and practice were implemented in Triyagan Village, Mojolaban District, Sukoharjo Regency, an area near urban areas. Triyagan village residents practice using yard land. There were 60 participants in counseling and cultivation practices. Activities are divided into several stages. In the preparation stage, an initial survey began in Triyagan Village, an urban area where settlements are already quite densely populated. Information from sub-district officers was obtained that Triyagan village is a densely populated urban area around Triyagan District. The team then prepared outreach and training materials such as posters and teaching aids. The implementation of counseling and surveys is carried out by paying attention to Health protocols. Mothers' partners are expected to provide a positive response and provide a conducive place for training. An evaluation that can be carried out is to look at the number of training participants and the cultivation results of the training participants. The socialization then continued with training on tips and tricks for cultivating catfish.

The training was carried out with socialization regarding fish cultivation in buckets. Partners were introduced to cultivating fish in buckets. This preparation stage was preceded by pre-survey activities carried out by the Service Team. Triyagan Village has the potential to develop fisheries cultivation. From discussions held with groups of women farmers, problems and obstacles, namely limited land, were discovered. So, budikdamber training is the right solution to the issues of fisheries groups in Triyagan Village.

Budikdamber training was carried out at the home of the female farmer leader. The training

begins first with a lecture method using posters and brochures. The things covered in this lecture are an introduction to budikdamber and information on the advantages of cultivating fish in buckets. The benefits of the technology presented by the Community Service Team are that budikdamber saves more electricity because it does not require pool water circulation. Of course, using a bucket instead of a pool will save space. Budikdamber can also save time rather than having to dig a pond. Another advantage is that it makes harvesting easier for farmers. The Farmer Women's Group was enthusiastic and tended to practice Budikdamber.

Fish management and plant management are essential aspects that need to be considered in determining the success of fish farming in buckets. Fish management includes media preparation and selecting fish types. Bucket media was chosen because of the advantages mentioned. The team makes buckets for fish cultivation by paying attention to ease of management for partners. Making holes and taps in the buckets is intended to make it easier for female farmer group members to see the progress of the fish, make it easier to feed them, and make it easier to drain the water from the buckets. It is recommended to choose catfish as a fish cultivated in buckets. According to Prasetyo et al. (2022), fish survival rates can be influenced by internal and external factors of the fish. Internal factors include age and the fish's ability to adapt to the environment. External factors consist of abiotic conditions, including food availability and the quality of living media. Aquatic plants can effectively utilize nutrients, so they have several advantages in terms of efficiency and reduced waste pollution from discharge into public waters. Hudaidah et al. (2023) also added that aquaponics in a recirculation system ensures that water quality can be maintained and provides opportunities for bacteria to grow and develop, breaking down organic and inorganic materials dangerous for fish survival. In other words, keeping media quality with an aquaponics system to improve water quality can affect the survival of catfish seeds. The type of planting medium used greatly influences plant growth and development (Rahmadhani et al., 2020). Every planting medium has advantages and disadvantages. This training uses charcoal as a planting medium because it is more resistant to sensitive plant roots. Charcoal is provided in plastic glass mineral water packaging for up to 80 percent of the packaging size. Water spinach plants were chosen because they require lower nutrients and are relatively resistant to stagnant water conditions.

Partners are taught that after making a bucket as a medium for growing fish, the bucket cannot be directly used for fish cultivation. The bucket must be washed first using a disinfectant or detergent to remove any remaining chemical substances that may be contained in the bucket. Water filling is done after the washing process. The addition of starter bacteria is also carried out at the same time as filling the water. After three days or after the water in the bucket is green, which indicates that good bacteria are living in the water, the fish are put into the bucket with an acclimation process first. The catfish suitable for cultivating fish in buckets is the Masamo catfish. Catfish feeding is given one day after putting the catfish in water. Feeding can be done twice a day. The best feeding is in the morning and evening. Leftover household food, such as moldy bread, can be given as additional food for catfish.

The Service Team practices Budikdamber directly. The tools and materials that have been prepared are a 60-liter bucket, used plastic cups, rock wool, kale seeds, and catfish seeds. One bucket can accommodate up to 60 catfish seeds. Meanwhile, the maximum number of plastic cups that can be installed is 8 cups, each containing 2-3 kale stem seeds. This can be seen in Figure 2. Maintenance can be done by changing the water every 3 to 6 weeks if a fishy smell comes from the bucket.

Meanwhile, the feed dose is given ad libitum or as much as desired. Catfish can be

harvested after two months of cultivation, while water spinach can be harvested four times. This can certainly increase the production and income of female farmer group members. In the next activity, the team from FP-UTP visited the house of a women's farming group member to see the development of fish in buckets and kale plants planted in the budikdamber system. The team controls the treatment and actions of fish raised and plants planted by partners to harvest the results.

Figure 1. budikdamber counseling

Figure 2. Submission of practice media

4. CONCLUSION

Training on aquaponic cultivation systems, a combination of raising fish in buckets and vegetables, can increase partners' knowledge of cultivating fish in buckets and aquaponics with kale vegetables. Partners can immediately practice Budikdamber and Aquaponik, cultivation management, and Budikdamber and Aquapoik business management. The author hopes that by introducing fish farming in buckets to groups of women farmers, it is hoped that they will be able to increase family food security through self-produced food.

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