The Use of Limited Land through Hydroponics Technology for Ecogreen and Enhancing Entrepreneurship Motivastion to Improve the Family Economy Aisyiyah Cadres at PCM Jetis Yogyakarta

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ABSTRACT

Technological developments in agriculture are increasing rapidly every year. One of the technologies that deserves to be disseminated is hydroponic technology. This is because of the increasing scarcity of agricultural land as a result of the large number of industrial and service sectors, so conventional agricultural businesses are increasingly uncompetitive due to high land prices. Cultivation technology Agriculture with a hydroponic system is used as an alternative for people who have limited land or yard space so that it can be used as an adequate source of income. Entrepreneurship is one of the efforts of the pesantren to produce graduates who can have a personal independence. This community service program was carried out to meet support and encourage entrepreneurship that makes personal independence. The Community Service Program was carried out the hydroponic plant cultivation to support the independence Aisiyah Cadres Muhammadiyah Branch Jetis Yogyakarta This program was intended so that students can learn directly the Hydroponic cultivation system as a provision for self-development for students who have graduated. The dedication program consists of 2 sessions, the first is exposure and discussion with hydroponic materials, the second session consists of installing hydroponic installation, nursery training, planting seeds in the hydroponic system, wick system and nutrient film system.The Output of this program are the increased knowledge, understanding, and skills of Aisyiyah cadres related to the implementation of hydroponic technology packages and the emergence of interest and motivation to do the cultivation and production of vegetable crops hydroponically are growing. Cadres utilize limited land for farming by applying hydroponic technology according to standard operating procedures.

KEYWORDS
Hydroponic Installation;
Hydroponic System;
Entrepreneur;

1. Introduction

One of the causes of the emergence of problems related to human health is the very diverse pattern of human life. This pattern of human life can be seen in the fulfillment of food needs, daily activities, and lifestyle. Many of the people around us still do not understand healthy lifestyles from the perspective of fulfilling food needs. In general, many people still prioritize the taste of food over the health quality of the food. One of the triggers for this is that food contains harmful chemicals. These chemicals mess up the genetic code in cells, triggering uncontrolled cell mass multiplication. This is a concern for some people who are starting to care more about their health. When some people began to understand the dangers of these diseases, they began to pay attention to healthier food alternatives. Some people are starting to switch to the concept of organic food or even food based on nature.

Increasing public consumption is not in line with optimal waste management capacity, either from the government or the community itself. Less than optimal waste management will result in environmental pollution and public health problems. The community stated that they did not understand that inorganic waste would have a negative impact on their agriculture. Public awareness of the hazard of waste must be increased because it has a direct impact not only on the environment but also on health. Therefore, it is necessary to try to increase public knowledge of the dangers of waste and utilize this waste to create something that has value. This eff[1], [2]ort can be done by conducting counseling and training on the use of inorganic waste as a medium for cultivating vegetables using techniques hydroponic [3]–[7].

One of the new breakthroughs for fulfilling a healthy lifestyle by satisfying the need for healthy food is the optimization of organic vegetables by utilizing hydroponic technology. Vegetables produced using hydroponic technology are considered healthier and more environmentally friendly because they utilize a variety of organic fertilizers. Many types of organic fertilizers can be made by utilizing natural ingredients that do not contain chemicals, such as organic waste such as vegetables, fruit, fish, shrimp, and so on [8]–[12].

Hydroponics is an alternative to growing vegetables on narrow land and weather hot one [13], [14]. This is because with hydroponic techniques it can be adjusted for temperature, pH, and availability of nutrients and economical use of land because it does not require soil as a planting medium [15], [16]. Examples of vegetables that are usually grown by using hydroponics are mustard greens, spinach, lettuce, kale, tomatoes and others [17], [18]. Hydroponics is a method of growing plants without using soil media, but by using a nutrient mineral solution or other materials containing nutrients such as coconut coir, mineral fiber, sand, broken bricks, sawdust, and others as a substitute for soil media [19], [20]. Hydroponics can hone people's creativity to process and create new media farming by utilizing existing goods or used goods[21], [22]. There are various hydroponic methods that can be applied including the wick system, irrigation systems, tidal hydroponics, NFT systems, floating rafts (water culture), systems aeroponics [23]–[26].

Aisyiyah cadres are mostly housewives who, of course, have begun to have an awareness of quality and safe vegetables for the family. Quality and safe vegetables are those that can provide health benefits, have an attractive appearance, do not contain pesticide residues, and are priced at a fixed price. affordable. Therefore, efforts are needed to produce quality vegetables that are safe, available throughout the year, and available in sufficient quantities.

For some Aisyiyah Cadres, farming is difficult because of the limited land. This is when agriculture is getting narrower due to critical soil conditions and limited water. Therefore, a solution is necessary so that city residents can grow crops. Based on this, the hydroponic cropping pattern is a good alternative for city residents to continue growing crops in their surroundings. One of the technologies that deserve to be disseminated is hydroponic technology. This is due to the increasing scarcity of agricultural land as a result of the many industrial and service sectors, on meeting the nutritional needs of plants or in the everyday sense of farming without soil. Agricultural cultivation technology with a hydroponic system is used as an alternative for people with limited land or yards so that it can be used as an adequate source of income.

Hydroponics is one of the modern technologies that can be applied to produce quality, safe, year-round vegetables in sufficient quantities. The advantages of hydroponic technology are that treatment is more practical, pest disturbance is more controlled, fertilizer use is more efficient, it does not require brute force, and plants can grow more rapidly in conditions that are not dirty and damaged.

Aisyiyah cadres carry out activities that are concentrated at the Annur mosque, which is located on Jalan Pakuningratan No. 75 Cokrodiningaratan Jetis and has limited land. From the results of interviews with the chairman of the Council for Economics and Entrepreneurship, it is known that the cadres have a desire to use the yard as a place to grow vegetables hydroponically. However, the limited knowledge and skills of residents in hydroponic vegetable cultivation.

In economic development and entrepreneurship, MEK Muhammadiyah runs programs to develop capacity and revive Muhammadiyah's economic ethos to increase economic empowerment and people's welfare. One of the empowerment programs is training that motivates Aisyiyah cadres to start entrepreneurship to improve the family economy.

This Community Service Program focuses on the potential for limited land use but has the opportunity to become a business start-up. This program is in line with the efforts of PCM Jetis'

Economic and Entrepreneurship Council. The target of this service activity is PCM Jetis cadres, Yogyakarta City. Some of the activities that have been carried out are a) Training on making hydroponic plants, b) Counseling on motivation for entrepreneurship of ornamental plants, and c) Assistance in the maintenance and harvesting of hydroponic vegetables.

The output of PKM motivates cadres to become entrepreneurs and start businesses, which can increase family finances. Counseling on entrepreneurial motivation initiated by hydroponic vegetable cultivation can strengthen the role of partners as a means of entrepreneurship-based education. Educational facilities to provide awareness of the importance of waste management for the environment in line with the entrepreneurial spirit of individuals who are creative and able to create business opportunities by managing inorganic waste. Residents also determine the sustainability of community-based programs.

2. Method

The method used in this service activity is participatory rural appraisal (PRA). PRA is an in-process approach to empowering and increasing community participation; the emphasis is on community involvement in all activities (Pratiwi, 2007).The target group in this service activity is Aisyiyah PCM Jetis Cadre. Implementation of this Service through several stages, including:

2.1. Preparation

This activity began with the socialization of the work plan of the service team with the PCM and MEK JETIS leaders. The service team observed and discussed with Mr. Ari Sasmoko, Head of MEK PCM Jetis, and Mr. Imam Bayu Nugroho, the Secretary of PCM Jetis. This stage includes coordinating the PkM team to discuss Terms of Reference (TOR), preparation of tools and materials for activities, manufacture of counseling materials, determination of place of activity, implementation time, and participants, and management of permits for the implementation of PkM activities.

2.2. Implementation

According to the plan, 3 types of activities were carried out: counseling on the importance of healthy pesticide-free vegetables, counseling on ornamental plant cultivation, counseling on basic hydroponic techniques, how to care for and harvest, and training on hydroponic installation.

2.3. Evaluation

After the activity is carried out, the PkM team evaluates the activity so that it can know the deficiencies at what stage and follow up with program improvements on what to do next.The evaluation stage is carried out to measure the level of understanding and success of an activity that has been carried out by distributing pre-test and post-test.

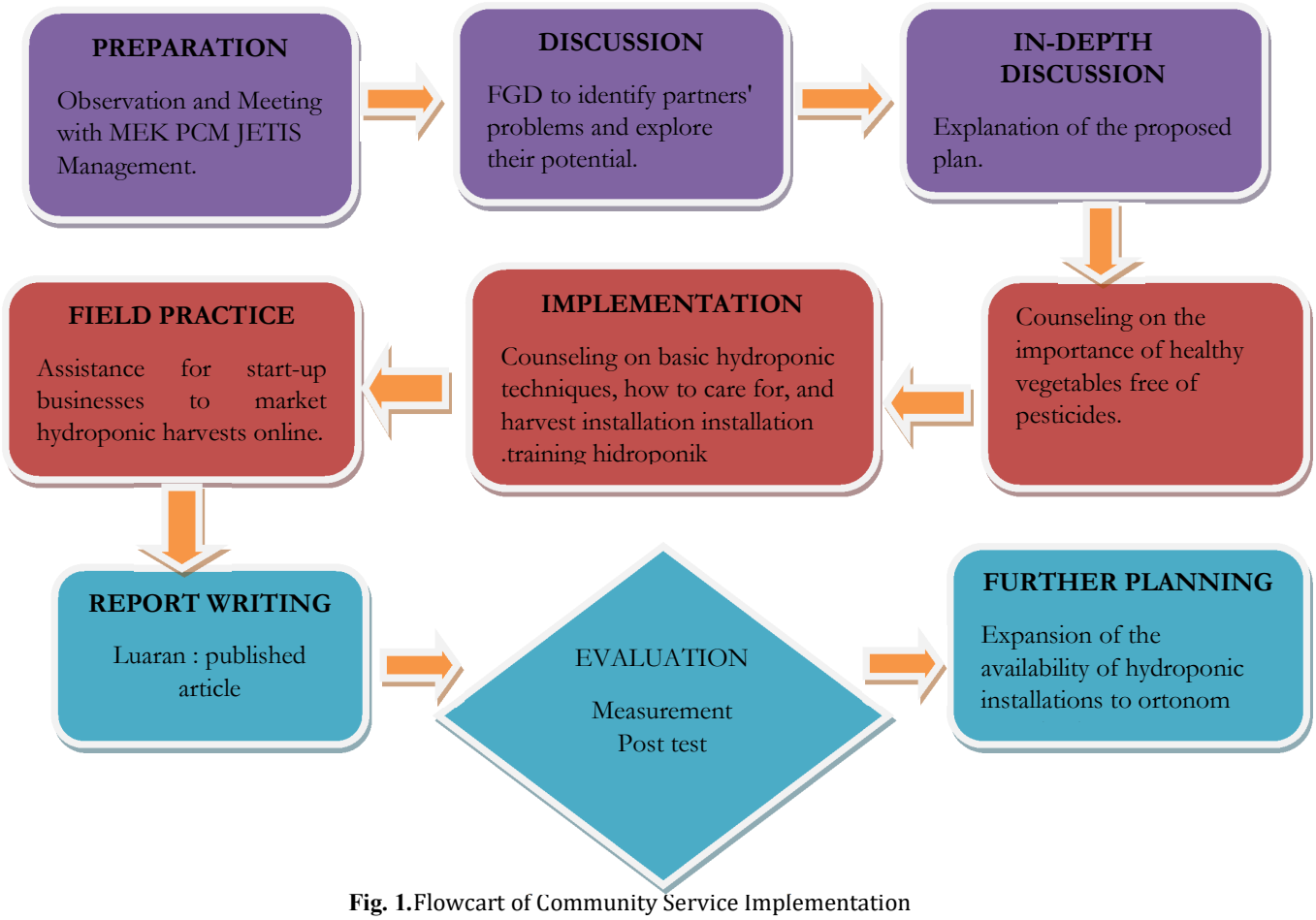

Fig. 1. Flowcart of Community Service Implementation

3. Results and Discussion

One of the causes of the emergence of problems related to human health is the diverse pattern of human life. This pattern of human life can be seen in the fulfillment of food needs, daily activities, and lifestyle. Many people still do not understand healthy lifestyles seen from the standard of fulfilling food needs. In general, many people still prioritize the taste of food compared to the health quality of the food. One of the triggers for this is that food contains harmful chemicals [27]–[30].

When some people began to understand the dangers of these diseases, people began to pay attention to healthier food alternatives. Some people are switching to organic food or widely known back to nature.

One of the new breakthroughs for fulfilling a healthy lifestyle from fulfilling the need for healthy food is the optimization of organic vegetables by utilizing hydroponic technology. Vegetables produced from hydroponic technology are considered healthier and more environmentally friendly because they utilize a variety of organic fertilizers. Many types of organic fertilizers can be made using natural ingredients that do not contain chemicals such as organic waste such as vegetables, fruit, and so on.

3.1. Ornamental plant cultivation training and entrepreneurial motivation

Ornamental plant cultivation training activities and entrepreneurial motivation were held on Sunday, February 26, 2023, at the AnNuur Pakuningratan Mosque. The participants who attended were Aisyiyah PCM Jetis cadres, Yogyakarta City, totaling 25 participants

Imam Bayu Nugroho as the speaker as well as PCM Secretary Jetis, explained how to grow crops using planting media and how to cultivate or maintain plants to be disease free. Cultivation of ornamental plants Angleonema because the price of these plants is stable. This activity is expected to motivate Aisyiyah's cadre mothers to become entrepreneurs. He added that PCM Jetis is ready to

distribute or sell ornamental plants from Aisyiyah cadres. This counseling method is a question-and-answer system, and participants are very enthusiastic about asking questions like how to get rid of plant diseases. The speaker explained that it is better to use organic fertilizers, one of which is to use vegetable pesticides. It is made from crushed papaya leaves, added with water and deposited for 1 day. Then it can be sprayed on the plants regularly to eliminate the disease.

The output of this activity is that PCM Jetis Asyiyah Cadres have an understanding and skill of cultivating ornamental plants using planting media in the form of husks + soil + organic fertilizer and how to separate plants into other media.

Fig. 2. Counseling for motivation ornamental plant cultivation

3.2. Counseling on seeding procedures

This activity was carried out on the same day as the ornamental plant cultivation training. The seeds were sown before the plant seeds were transferred to the hydroponic installation.

The speaker for this activity is Mr Sakir

The provided equipment is seeds, water, trays, rock wool, and toothpicks.

Seeding procedures:

- Rock wool is cut into cubes.
- Rock wool in holes with a toothpick 3-5 holes.
- With the help of a toothpick, insert the seed into the hole.
- Put the seeds in the rock wool in the tray, then cover them with plastic and place them in a place that is not exposed to direct sunlight.
- After about 2 days, it will grow white sprouts.
- Wait until the main leaves or true leaves appear and can be moved to the hydroponic installation. Pay attention to the roots.

Nutrition in the form of NPK can be obtained by buying AB Mix. One installation package of approximately 50 holes or 50 plant seeds can use 1 pack of AB Mix packages until harvest.



Fig. 3. Application of nursery, installation of wick system at ANNUR Mosque

3.3. The Implementation science and technology Hydroponic

The science and technology that will be implemented in the community include, first, building awareness of the importance of healthy, pesticide-free food for household members. Second, the application of technology to utilize limited land with a hydroponic system; third, training and hands-on practice of making hydroponic installations; plant maintenance to harvest;

Hydroponic literally means "hydro" (water) and phonic (work). So, in general, it means an agricultural cultivation system without soil but using water containing nutrient solutions. Application of hydroponic technology The system for this hydroponic plant is as follows: Provides food ingredients in a mineral or nutrient solution needed by plants by flushing or dripping. Through this technique, more plants can be grown in a narrower space. In fact, without soil media, a number of more productive plants can be maintained. The system of this hydroponic plant must be free of pesticides so that there are no pests or diseases. The application of hydroponic technology in this activity is the hydroponic system wick, or axis.

One of the breakthroughs for fulfilling a healthy lifestyle from fulfilling the need for healthy food is optimizing vegetables by utilizing hydroponic technology. Hydroponics is one of the modern technologies that can be applied to produce quality, safe, year-round vegetables in sufficient quantities. The advantages of hydroponic technology are that treatment is more practical, pest disturbance is more controlled, fertilizer use is more efficient, does not require brute force, and plants can grow more rapidly and in conditions that are not dirty nor damaged.

An extension activity related to the hydronic system was conveyed by Mr. Satiri. Hydroponic literally means Hydro = water and phonic = work. Generally, it means an agricultural cultivation system without using soil but water-containing nutrient solutions. Roots absorb nutrients. There is an ionization process in the soil so that nutrients can go up to the leaves and then the process of

photosynthesis. However, this hydroponic method does not recognize the ionization process, so the roots directly absorb nutrients and vitamins, which can cut about 50% of the planting time.

3.4. Application of Hydroponic Technology

The system of this hydroponic plant is as follows: Provides food ingredients in mineral or nutrient solutions needed by plants by flushing or dripping. This technique allows more plants to be grown in a narrower space unit. In fact, without soil media, many more productive plants can be maintained. The system of this hydroponic plant must be free of pesticides so that there are no pests and diseases. The application of hydroponic technology in this activity is the wick or axis hydroponic system.

Required equipment

- Rock wool has a high absorption power because it contains volcanic ash.
- Net Pot for plant seeds.
- Flannel.
- Hydroponic installation complete with a water pump to drain the water up about 2.5 - 3 meters.
- TDS meter tool to measure nutrients absorbed by water.
- Ph Meter to measure the PH of the water.
- Placing the hydroponic installation not in a place exposed to direct sunlight.

The way to overcome diseases or pests such as aphids, caterpillars, and grasshoppers or rats is by using vegetable fertilizers from garlic. The method is crushed garlic, soaked in water for about 1 day, and then sprayed on the plants regularly.

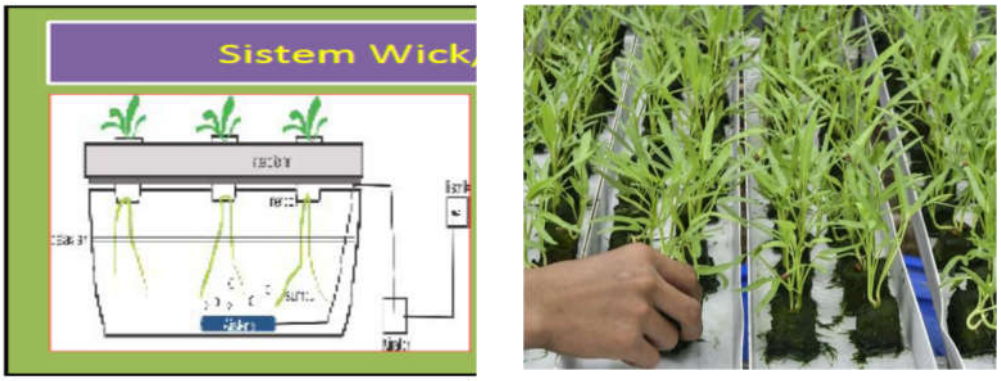

Fig. 4. Application of Hydroponic Technology

The output of this activity is that Aisyiyah PCM cadre members have an understanding of hydroponic techniques as a way of cultivating healthy vegetables for families.

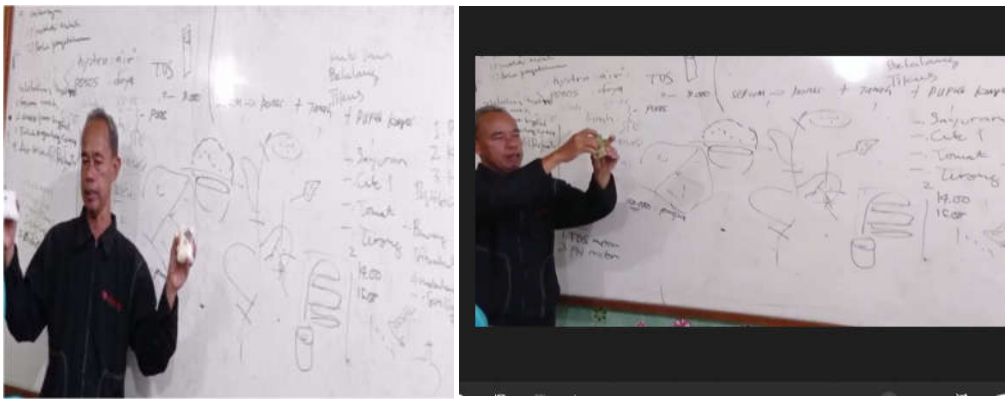

Fig. 5. Vegetable cultivation training with hydroponic techniques

Fig. 6. Monitoring and maintenance of hydroponic vegetables

Counseling and training activities on the application of hydroponic technology went well. Participants showed great interest and enthusiasm, and there were no significant obstacles to implementing hands-on training in the field. This service activity ends with the process of monitoring and maintaining vegetables and ensuring that the hydroponic installation runs smoothly.

The outputs achieved in this community service are: (a) for Aisyiyah's cadre partners, there is an understanding of the cultivation of vegetable crops with a hydroponic system in accordance with good cultivation standards, and the technology that is applied directly through "hands-on training" is felt to be very effective so that it can be carried out and developed further. This will support the community's entrepreneurial spirit, which is an attitude and ability to start and develop new businesses and ideas with a creative and innovative spirit that can increase family income. An active soul working creatively and innovatively to increase family revenue.

4. Conclusion

Community service activities were carried out at the Annur Pakuningkartan PCM Mosque. It can be concluded that the implementation of community service activities had been carried out entirely in accordance with what had been planned jointly between the team and partners. Aisyiyah cadres' knowledge related to the application of hydroponic technology and community interest in cultivating and producing hydroponic vegetable plants is increasing. The community understands hydroponic technology in accordance with the standard operating procedures provided.Another activity was counseling on the cultivation of ornamental plants. Partners were interested in cultivating healthy vegetables by utilizing hydroponic system technology in accordance with standard operating procedures and making it a business start-up.

Provide a statement that what is expected, as stated in the "Introduction" chapter can ultimately result in "Results and Discussion" chapter, so there is compatibility. Moreover, it can also be added the

prospect of the development of research results and application prospects of further studies into the next (based on result and discussion).

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Author Contribution

The activity plan in order to implement the solutions offered that there are five series of activities, namely coordination, logo design, socialization of covid, marketing, and marketing education.

Funding

The program participants appreciate LPM UMY, which has funded this program. We also thank the Board of Muhammadiyah Branch Jetis Yogyakarta , 35, Mr. Ari Sasmoko,the Head Board of Economic and Entrepreneur Jetis, all aisyiyah Cadres . Thamk you for highly value cooperation, togetherness, and support during Community Service activities.

Conflict of Interest

The authors declare no conflict of interest.

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