# Application of Hydroponic Systems and Women's Empowerment in Food Security Efforts

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Abstract:- Jongbiru Village is one of the villages supported by the State University of Malang which has potential natural resources and human resources that need to be developed optimally to increase village food security. Food security is an effort to eliminate hunger (zero hunger) which is one of the Sustainable Development Goals (SDGs). Currently, hydroponic vegetable plantations have been initiated under the technical guidance of BUMDES Jongbiru Village and Mitra Rotasi Institute. However, BUMDES still faces many obstacles in implementing hydroponics. Therefore, the service team from FEB UM will hold hydroponic vegetable training based on a circular economy that minimizes waste by involving students. It is hoped that after participating in the training and FGD, the participation of residents (especially women) and **BUMDES** as well as Rotation Institute partners supported by the FEB UM service team will be maximized so that hydroponic vegetable plantations can strengthen the food security of Jongbiru village and its surroundings. This community partnership service focuses on a number of trainings with potential relevance, including the introduction of a circular economy, as well as optimizing BUMDES and the role of women.

*Keywords:* - Food Security, Hydroponics, Circular Economy, Women and BUMDES.

#### I. INTRODUCTION

Food security is one of the important factors that supports the No Hunger indicator in the Sustainable Development Goals (SDGs) (Valazquez et al. 2023). In connection with the Sustainable Development Goals, food security will support the community to take responsibility for improving the quality of life of the community in meeting nutritional needs. Food security through agriculture that is adaptive to the geographical conditions of an area will encourage a multiplier effect in various aspects of life. This is because independent and sustainable food security will be able to solve the problems of nutrition and hunger, poverty and unemployment, environmental pollution and degradation, and various other social problems. Therefore, the service team focuses on optimizing hydroponic plantations that apply circular economy methods in Jongbiru village to strengthen community food security.

Jongbiru Village has the potential for abundant natural resources and human resources but is less empowered because many young people have migrated to other areas that are more promising for a decent life. Hydroponic plantation trials have never been carried out in Jongbiru Village. So the FEB UM service team aims to implement a hydroponic vegetable plantation system based on a circular economy. A circular economy is a model that seeks to extend the life cycle of existing products, raw materials and resources so that they can be used as long as possible. The principles of a circular economy include reducing waste and pollution, preserving used products and materials for as long as possible, and regenerating natural systems (Ellen Macarthur Foundation). Through a circular economy, we can achieve more by using less (lcdi-indonesia.id).

The topic of circular economy is currently a topic of global interest, both in the concept of sustainability in general and economics and the environment in particular (Murray et al., 2017). An economic system that aims to optimize economic output without negating environmental sustainability is the concept of a circular economic system (EC, 2014). The circular economy has shown significant results in various economic sectors (Stahel, 2016) and society.

The purpose of preparing this program is explained in the following points, including:

- Education on the management of hydroponic vegetable plantations based on a circular economy that empowers the role of women and BUMDES.
- Implementation of hydroponic vegetable plantation management based on a circular economy that empowers the role of women and BUMDES.
- Maintenance of hydroponic vegetable plantations based on a circular economy

The benefits of implementing the program for companies include the following:

- Collaborate on programs to empower the younger generation who have the potential to become part of the company in the future
- Meanwhile, for villages, implementing this program will be beneficial for
- Provide opportunities for the younger generation to develop skills in the field of sustainable agriculture
- Support the acceleration of implementation of sustainable village development through optimizing technology in the agricultural sector

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The targets of the activities in this program are the community and youth in Jongbiru Village. In the initial stages of community activities, they will receive knowledge transfer, introduction and guidance regarding hydroponic technology in supporting food security in Jongbiru Village, Kediri Regency.

#### II. RESEARCH METHODE

Basically, this research program is carried out by first observing the partners, the extent of the activities they have carried out in developing their business. This initial observation is carried out to find problems that occur with business partners, so that the training and mentoring model implemented is also appropriate to the problems and able to provide solutions to existing problems. 1) Initial observations were carried out using qualitative methods, namely by conducting in-depth interviews and direct documentation with several relevant informants, namely the owner, workers and local government. Initial observations were carried out by holding an FGD or Forum Group Discussion. 2) The next stage is to conduct training for women of Jongbiru village residents. 3) Discussion and questions and answers about the obstacles faced by residents in implementing hydroponic vegetable planting. The implementation of this activity is carried out through several stages which are presented in the following table.

In the first stage, observations will be carried out in Jongbiru Village, Kediri to identify the problems faced by women of Jongbiru village residents regarding the follow-up to last year's research activities, namely socialization about food security. This observation also aims to coordinate training regarding the implementation of vegetable planting using a hydroponic system. Observations were carried out using the Forum Group Discussion (FDG) technique with the managers of BUMDES Jongbiru so that this hydroponic system could also be implemented in BUMDES Jongbiru.

After recording and identifying problems, the research team entered the second stage, namely designing the assistance and training needed by village women and BUMDES managers. Mentoring will be carried out by the research team and training on the application of the hydroponic system will be preceded by an introduction to the concept of hydroponics to village women and BUMDES managers so that they gain a strong understanding before going into the field.

In the third stage, the research team will carry out observations and analysis of the understanding of village women and BUMDES managers. In this third stage, the research team will ensure the understanding and readiness of village women and BUMDES managers by holding discussions and questions and answers. The results of the discussion and questions and answers will be used as a basis for the final stage, namely the implementation of vegetable planting with a hydroponic system. So it is hoped that at the time of implementation, the women of Jongbiru village and BUMDES really understand and are ready to go into the field.

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#### III. RESULT AND DISCUSSION

There are several main stages in this research activity in Jongbiru Village, namely as follows:

- Preparation. At this preparatory stage, it is carried out to map the potential of Jongbiru Village so that the design of the activities to be carried out can provide solutions to the problems of the partner villages. Apart from that, in this initial stage there will also be wider socialization of the program.
- Implementation of activities. Implementation of activities includes training activities related to circular economy, BUMDES. This series of activities aims to strengthen village institutions and develop human resources in Jongbiru Village.
- Evaluation and monitoring of activities. Evaluation and monitoring of activities is carried out periodically by involving implementing and empowering members. Evaluation will be carried out as a whole to determine the degree of success of the activity based on the targets that have been set. Apart from that, it is hoped that the evaluation results will be used as a basis for recommendations for future activities.

The research team has carried out the first stage as an initial study in the form of a visit to Jongbiru Village and mapped several problems faced by women living in Jongbiru Village based on situation analysis and observations.

- It is necessary to strengthen the concept of a simple hydroponic system
- It is necessary to improve the ability to manage hydroponic vegetable plantations
- It is necessary to increase the knowledge and insight of youth youth organizations, PKK members and BUMDES and tourist village managers regarding the concept of a circular economy
- The role of women in managing hydroponic vegetable plantations is less than optimal
- Poor management of BUMDES as an economic institution that supports sustainable food security programs

The principle of a circular economy is to minimize waste. So in implementing a circular economy on hydroponic vegetable plantations in Jongbiru Village, training will be provided on arranging recycled water circulation and making organic compost (both from food waste, livestock and rotten harvest waste).

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Jongbiru Village, Kediri District Sumber: google.com

Initial observations were carried out in March 2023 at BUMDES Jongbiru, Kediri Regency. At that time the research team met with BUMDES managers to discuss issues of food security for village residents. Including studies identifying conditions of food independence, what programs have been implemented by village officials in order to strengthen the food security of village residents, the level of education of women in Jongbiru village.

In this FGD activity, the research team gathered information about the obstacles faced by business partners and discussed alternative solutions. Apart from that, the research team delved deeper into the desires of village officials and village residents to create businesses so that residents have nutritional independence and food independence. The research team offers the desired training and mentoring model that is most suitable to business partners and determines the date for implementing training activities. From this FGD activity, it was agreed that training on the introduction of hydroponic concepts would be held on August 18 2023. Then discussion and question and answer activities regarding hydroponics, especially vegetable growing, would be held on August 19 2023.

Apart from providing training on hydroonic concepts, the service team also provides training on good financial management for this business. Provides knowledge on how to separate business assets from personal assets, so that business capital, profits and personal money are not mixed. By mastering good financial management techniques, it is hoped that partners will be able to know the extent of profits or losses so that corrections can be made to the business's financial position. Apart from the 2 things above, the research team also provided suggestions for selecting production partners, starting from selecting seeds, to packaging vegetables. Suggestions for managing business management so that the community wear business is more resilient in the business world and prepares when a competitor enters a similar business.

This research program has continual program community research activity which has objectives that must be achieved, one of which is to help community businesses to provide more benefits to the surrounding environment, not only thinking about getting profits but also benefits to the community and the surrounding environment because the production process can run sustainably if supported by strong human and natural resources.

This research program also helps promote local culture which is packaged nicely through contemporary products that target the millennial generation to love and preserve local culture more. The need for support from the government and society can encourage the creation of a workforce, reduce unemployment and improve welfare if done seriously. ISSN No:-2456-2165

After carrying out training and mentoring, the next plan is:

#### Monitoring Businesses in Developing their Products

A series of training using information and computer technology (ICT) that can support business development is

- Financial training using applications from the Financial Services Authority website
- Online marketing training by utilizing existing marketplaces
- Managerial/leadership training to improve managing/management.

After training in financial management, online marketing and business management, it is hoped that this knowledge can be applied in the business so that the business can survive for a long time and can compete with similar products. It is also hoped that with this training this business can expand better and gain more profits. Kediri Regency's anniversary, hydroponic plantation businesses will more often participate in similar events to market and introduce their products.

## Continuous Online Marketing via the Website that has been Created.

This business has created a website with the hope that this website will make it easier to market to remote areas of the archipelago even though this business does not yet have an offline shop. Evaluate the effectiveness and efficiency of this website in order to help sell products online.

#### Help create a brand and register it with Intellectual Property Copyright (IPR).

At this stage, the hydroponic vegetables will be branded and the brand will be registered with the Ministry of Law and Human Rights. While waiting for the progress of the brand proposal application, the next stage is to accompany this business to create a good and attractive business proposal so that it can attract investors to invest their funds.

#### IV. CONCLUSION AND RECOMMENDATION

The conclusions obtained from this research activity are:

- The partners' enthusiasm for this activity can be seen from their efforts to spend time in the midst of production activities and their participation in the cultural week. Partners get facilities for consultation on the difficulties they face and solutions to these problems.
- The results of training regarding financial management and website-based online marketing are really needed by business partners in developing their businesses. They know how to manage finances properly and correctly so that business capital is not mixed with personal funds. With website-based online marketing training, partners will know about the advantages and disadvantages of marketing products via websites.

• The results of assistance in cultural week activities have become a driving force for partners to increase production in order to introduce their products to the general public, because it is not only the people of Kediri who visit these activities but also people from outside the city.

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Based on the conclusions outlined above, several suggestions can be made as follows:

- Partners must organize their business management to be more orderly and organized in managing their business.
- There is a need for continuous education so that knowledge about hydroponics can be applied to all residents by planting various types of vegetables so that there is no room for competition with fellow residents. The spirit of sharing success stories must be emphasized so that we can achieve success together.

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