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Financially Independent Based on Vegetable Self-Sufficiency Technology

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ABSTRACT

Vegetable consumption in Indonesia is still low, reaching only 173 grams per day, far from the WHO recommendation of 400 grams. To address this problem, a community service program in RW 18 Karadenan, Bogor, applies hydroponic technology for housewives and single parent mothers. This program includes socialization and training on hydroponic techniques, including the Nutrient Film Technique (NFT) and Deep Flow Technique (DFT) systems, as well as the use of used containers. The training also includes organic vegetable marketing strategies and financial management using the full costing method to determine the cost of goods sold. Continuous mentoring and periodic evaluations are carried out to ensure the effectiveness of the technology and maximize harvest yields. This program aims to improve participants' farming skills, support family food security, and encourage economic independence. By implementing hydroponics, this program is expected to meet vegetable needs, increase family income and provide efficient farming solutions, and has the potential to be expanded to other areas.

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INTRODUCTION

Vegetables are one of the human foods consumed daily, like fruits, vegetables also supply fiber for the body to facilitate digestion. In general, the benefits of vegetables are the main source of fiber, vitamins, minerals, and nutrients for the body.

Indonesian people's fruit and vegetable consumption according to BPS 2022 data reached 173 grams per day, lower than the World Health Organization's (WHO) nutritional adequacy figure of 400 grams per day. The government is quite active in encouraging people to consume fruits and vegetables regularly through Presidential Regulation No. 42 of 2013 concerning the National Nutrition Improvement Movement, it is clear that the health priority is to overcome community nutritional problems, especially toddlers, through awareness of consuming fruits and vegetables. [1]

Based on data obtained by the Central Statistics Agency in 2022, fruit and vegetable consumption has only reached 180 grams per capita per day, whereas the WHO standard is 400 grams per capita per day. In fact, from 2020-2022, the average vegetable consumption of Indonesian people per capita was 37.20 kilocalories. Meanwhile, the average availability of vegetables from 2020 and 2023 was 33.50 kilocalories per capita. From these data, it can be seen that there is a shortage of vegetable availability of 3.70 kilocalories per capita.

This condition causes the need to look for a strategy to meet the vegetable shortage. Urban farming (city farming) is one solution to fulfill vegetable needs, especially for those who don't have land to farm and for residents who have limited means to shop.

The concept of agriculture utilizes limited land by using very narrow yard areas and makeshift planting media (e.g. used cans, polybags, pots, and others). The very narrow land owned by urban families is utilized to grow vegetables that have a short growing period. The results of the farming can be consumed by the family as food and the excess can be sold as additional income. [2]

The scale of production resulting from urban farming is very small, so a way is needed so that the agricultural products have added value and economic value for the family. Hydroponic techniques or organic farming can be used to increase added value.

In addition to changing agricultural techniques, changes in marketing methods are also needed. Marketing carried out by individuals results in not having a strong selling position in the vegetable market. To obtain a strong selling position, togetherness is needed between urban farmers, cooperatives are one solution to overcome all of this. Cooperatives act as a center for selling urban farmers' products, as providers of urban farmers' needs, as supervisors of urban farmers' product standards, and as providers of capital for urban farming. To start urban farming, a pilot project is needed so that residents can see the benefits of fulfilling family vegetable needs and increasing family income.

This financially independent activity based on vegetable self-sufficiency technology for the single-parent mothers group in Karadenan Bogor will be held in RW 18, Karadenan Village, Bogor Regency. A total of 70 participants consisted of housewives. The reason for choosing single-parent mothers is because mothers will determine the type of food that is good for the family. In addition, currently, there are no productive programs such as motivation that generate direct or indirect finances. Most people still think that skill improvement programs are unproductive because they prefer to spend time and energy on unproductive things.

Land limitations by using very narrow yard areas and makeshift planting media. RW 18 in Karadenan is a housing complex where the yard area in each area is very limited so people's interest in utilizing the land is small. In addition, the fundamental problem is that land that should be able to be used for planting is widely used by the community to build permanent facilities. The selection of the location in RW 18, Karadenan Village is also based on the economic conditions there, which are still included in the lower economy.

In addition, in RW 18 Karadenan, an Environmentally Friendly Village (KRL) has been formed which has been decreed by the Head of Karadenan with Decree no. Number: 660/196/Kpts/XI/2023 concerning the Environmentally Friendly Village (KRL) with Morals (Educated, Creative, and Independent) RW 18, Karadenan Village, Cibinong District, Bogor Regency. This self-sufficiency vegetable community service activity is not only to meet the family's vegetable needs but also to increase the family's income.

In Karadenan Village, there are 19 RW and 122 RT. In RW 18, the location of this service, there are 581 Heads of Families (KK). Data collected in 2023, from 581 KK, the number of single-parent mothers was 70 people. To increase the productivity of these mothers, an Environmentally Friendly Village (KRL) was formed. [4]

This program is expected to foster an entrepreneurial spirit in the community. The most important key concept of entrepreneurial success lies within oneself because in essence the entrepreneurial spirit is embedded in every person, which means having creativity having certain goals, and trying to achieve success in life. [3]

The general objective of community service activities is expected to foster an entrepreneurial spirit in the community. The specific objectives of this activity are 1) to identify situations and problems of vegetable consumption, 2) to build community awareness and involvement, 3) to offer solutions through urban farming, 4) to empower single-parent mothers and 5) to increase added value and marketing of agricultural products.

METHOD

Planting with hydroponic techniques means farming by paying attention to fulfilling the nutritional needs of the plants concerned, or in other words farming without soil but using water containing the nutrients needed by the plants. The community has realized the importance of fertilizer needs for plants. Wherever a plant grows, it will still be able to grow well if the nutrients (nutrients) needed are always sufficient. In this context, the role of the soil is to support the plants and the water is a nutrient solvent, which can then be absorbed by the plants. Based on the problems faced by partners, the needs of partners, and the conditions and characteristics of partners, the steps in community service are as follows:

1) Socialization

The team carried out socialization activities for the single-parent mothers' group RW 18 Karadenan Bogor where community service would be carried out.

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2) Training
   a. Increasing creativity and hydroponic knowledge, in the form of training on basic hydroponic techniques, including how to design a hydroponic system, suitable types of plants, and how to care for plants. This training will also include the use of used containers as pots, to promote recycling and cost savings.
   b. Training on making hydroponics and planting vegetables, in the form of training for various types of hydroponic systems (such as NFT, DFT, and Wick System) and types of fast-harvesting vegetable plants. Training materials will include setup techniques, maintenance, and pest control.
   c. Marketing and product management training, in the form of training on how to market organic vegetable products, starting from planning marketing strategies, and creating product branding, to sales techniques in local and online markets. In addition, calculating the cost of goods sold using the full costing method.
3) Application of technology

Using the Hydroponic Method as a planting medium by utilizing minimal land and not using soil media. This method regulates the heat, sunlight, and hydration needed by plants. This method also makes nutrients more easily available and absorbed by plants so that the growth process is faster. In addition, in its bookkeeping, the Community is equipped with a method to create a system for calculating the cost of production and selling prices using the full costing method with self-sufficiency in vegetables. Determination of the cost price is based on recording, classifying, controlling, and summarizing all cost variables related to the production process based on previous data. [4]

4) Mentoring and evaluation

Mentoring in processing vegetables that will be packaged and then sold to the market and monitoring the use of vegetable self-sufficiency technology by making improvements to maximize harvest results.

5) Sustainability of the program

Monitoring the realization of the use of vegetable self-sufficiency technology in calculating costs carried out by the single-parent mother's group RW 18 Karadenan Bogor. This vegetable self-sufficiency technology will also develop its concept in other areas.

RESULTS

The socialization of hydroponic activities to the single parent mothers group in RW 18 Karadenan, Bogor is part of a community service program that aims to improve knowledge and skills in farming effectively using hydroponic technology. This program is motivated by the need to provide efficient and sustainable farming solutions, especially for single mothers who often face challenges in meeting the food and economic needs of their families. Hydroponics, as a method of farming without using soil, offers various advantages such as more efficient water use, more space-saving, and faster harvests.

In this socialization, the materials presented included the basics of hydroponics, various types of hydroponic systems, and the maintenance techniques needed to maintain plants with this system. Participants were introduced to various hydroponic methods, such as nutrient circulation systems and floating raft systems, accompanied by detailed explanations of the advantages and applications of each method. A live demonstration of making a simple hydroponic system was also carried out to provide participants with a practical overview of how to start and maintain a hydroponic system in their homes.

The socialization method used involved an interactive approach through visual presentations, discussions, and practical sessions. Visual presentations were used to explain the theory and basic principles of hydroponics, while question and answer sessions provided an opportunity for participants to clarify information and overcome confusion. The live demonstration aimed to show the practical steps in making a hydroponic system, allowing participants to practice their new skills with direct guidance from the community service team.

Training on basic hydroponic techniques is held to enhance participants' creativity and knowledge in cultivating plants using this soil-less method. This program is designed to provide an in-depth understanding of how to design a hydroponic system, from selecting suitable plant species to the routine maintenance required. In this training, participants are also introduced to the concept of using used containers as pots, which not only promotes the principle of recycling but also helps save costs. By utilizing available materials, participants are expected to be able to reduce expenses and environmental impacts from their farming activities.

This approach aims to teach the principles of sustainability while facilitating innovation in the use of resources. In addition to learning basic techniques, the training also includes practical knowledge on the creation and use of various types of hydroponic systems, including the Nutrient Film Technique (NFT), Deep Flow Technique (DFT), and Wick System. Each system has its advantages and applications, and participants are allowed to understand the advantages and challenges of each method. This training provides practical

guidance on system setup, maintenance techniques, and effective pest control, which are essential to ensure optimal plant growth.

Picture 2. Socialization and training activities for hydroponic techniques for mothers in RW 18

The training is not only limited to the technical aspects of farming, but also includes aspects of marketing and product management. Participants are taught marketing strategies for organic vegetable products, including planning, branding, and sales techniques in local markets and online platforms. Effective marketing is key to achieving success in product sales, and this training prepares participants to face market challenges with a well-planned strategy and the right tools. By understanding how to build and promote their brand, participants can increase the appeal of their products to consumers and expand their market reach.

In terms of financial management, this training teaches the method of calculating the cost of goods sold using full costing. This method includes recording, classifying, controlling, and summarizing all cost variables related to the production process. By understanding how to calculate the cost of goods sold comprehensively, participants can set selling prices that accurately reflect production costs and optimize profitability. Effective cost management is essential for business sustainability, and the ability to calculate the cost of goods sold accurately allows participants to make better business decisions and maintain financial balance.

The application of hydroponic technology in this training shows great potential in utilizing minimal land without using soil media. This hydroponic method allows better regulation of important factors such as heat, sunlight, and hydration, all of which are needed for optimal plant growth. By facilitating the provision of nutrients and accelerating the plant growth process, this technology provides an efficient solution to the growing need for food. Providing participants with knowledge about calculating the cost of goods sold and managing production supports vegetable self-sufficiency, making them better prepared to face the challenges of production and marketing. With this comprehensive approach, the training is expected to have a significant positive impact on improving the skills and success of participants in their hydroponic businesses.

Mentoring and evaluation are critical components in ensuring the success and effectiveness of the hydroponic program implemented by the single-parent mothers group in RW 18 Karadenan, Bogor. This mentoring focuses on the processing and packaging of harvested vegetables for sale to the market. The mentoring team provides direct guidance in the processing process which includes cleaning, sorting, and packaging the product, ensuring that the final product meets good quality standards and is ready to be marketed. In addition, mentoring also includes ongoing monitoring of the use of hydroponic technology, by making necessary improvements to maximize yields and addressing technical issues that may arise. This aims to ensure that every step in the production process runs efficiently and effectively.

Periodic evaluations are conducted to assess the effectiveness of the implementation of hydroponic technology and its impact on harvest results and business management. This evaluation includes analysis of production data, comparison of harvest results with targets set, and assessment of the implementation of technology and methods used. By conducting systematic evaluations, the team can identify areas that need improvement and provide recommendations to improve performance. This evaluation process is important to ensure that the program remains relevant and adaptive to participant needs and changing market conditions.

The sustainability of the program is the main focus in the next phase, with an emphasis on monitoring the use of vegetable self-sufficiency technology in the long term. This monitoring involves continuous monitoring of the costs incurred by the single-parent mothers group in the hydroponic production process, as well as analysis of cost efficiency and business profitability. The data obtained from this monitoring is used to make adjustments and improvements in cost management so that the program remains sustainable and provides maximum benefits to participants.

In addition, there are plans to develop the concept of vegetable self-sufficiency technology in other areas, to expand the benefits of this program. This development involves adapting the program model based on the evaluation results and experience gained in RW 18 Karadenan.

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CONCLUSION

The community service program in RW 18 Karadenan-Bogor aims to improve the knowledge and skills of single-parent mothers in farming using hydroponic technology. Through socialization, participants are introduced to the basic principles of hydroponics, various types of systems such as the Nutrient Film Technique (NFT), Deep Flow Technique (DFT), and Wick System, as well as plant care techniques. Demonstrations of making hydroponic systems and using used containers as pots also provide practical insights, integrating the principles of recycling and cost savings.

This training not only covers technical aspects, but also marketing strategies and financial management. Participants are trained in marketing organic vegetable products, including branding and sales techniques in local and online markets. Cost management is described using the full costing method, allowing participants to calculate the cost of goods accurately and manage their businesses more effectively. This is important to ensure the profitability and sustainability of their hydroponic businesses.

Ongoing mentoring plays a vital role in ensuring effective technology implementation. The mentoring team provides guidance in vegetable processing and packaging as well as ongoing monitoring to improve and maximize yields. Periodic evaluations are conducted to assess the effectiveness of technology implementation and provide recommendations for improvement, maintaining the relevance and adaptability of the program. The sustainability of the program is maintained through long-term monitoring of technology use and cost management.

The data collected is used for adjustments and improvements, as well as to expand the hydroponic concept to other areas. With this holistic approach, the program is expected to not only improve the skills of participants but also expand the benefits of hydroponic technology, support food security, and encourage economic independence in the wider community.

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