



Hydroponics for Dense Settlements in Gendingan Village, Jebres, Surakarta City

Kamari¹, Siti Nurkhotiah², Rizka Furqorina³

^{1,2,3}Universitas Terbuka

kamari@ecampus.ut.ac.id, snurkhotilah@ecampus.ut.ac.id, rizkafurqorina@ecampus.ut.ac.id

Abstract

Gendingan Village, Surakarta City is a dense settlement. Most of the land in this settlement has been covered by boarding houses because it is located close to the UNS Campus. This resulted in a lack of available land for farming. Green plants are difficult to find in Gendingan Village due to knowledge and training regarding preparing planting media, providing fertilizer and plant pots or containers from local materials. This hydroponic planting idea can be carried out by housewives who are members of the PKK group. Through the activities of the PKK group, it is hoped that hydroponic farming activities can be carried out in a more controlled and sustainable manner, meaning that it is not a short-term activity. Through the activities of the PKK women's group, hydroponic farming, which was originally only to meet family consumption needs, can later be enlarged into a valuable commodity crop. The community is very happy about the ABDIMAS Activity on Hydroponic training. Based on the results of the training conducted by the Open University, it is very beneficial for the community, especially for the supply of vegetables. The benefits of Hydroponic Vegetable Plants are felt by the community, this can be felt if you want to cook vegetables, just pick them and you will get fresh vegetables.

Keyword: Hydroponics, dense settlement, Gendingan Village

INTRODUCTION

Jebres District, Surakarta City has an area of 12.58 km² with a population density of 11,622.34 people/km². For the Surakarta area, Jebres District is one of the districts with the lowest population density. However, Jebres District has the highest population growth rate after Banjarsari District, which is 2.75%. The population of Jebres District is 25.61% of the total population of Surakarta City, Central Java in Indonesia. Thus it can be said that in the following years the population density of Jebres District will increase significantly. In addition to the high rate of population growth, Jebres District also has a high poverty rate, namely 14,691 people, below the poverty rate of Banjarsari District (the Department of Population and Civil Registration of the City of Surakarta, 2016).

Supplying food stuffs for growing population of the country and the need for achieving self-sufficiency in agriculture products and food protection demands the increasement of agriculture products in the country as much as possible (Sagar J. Dholwani, Sagar G. Marwadi, Vandan P. Patel, Vijeta P. Desai, 2018). The concept of urban farming in Indonesia basically adopts the local wisdom of the people who have always used the yard to be planted. Various types of crop commodities that are quickly harvested but do not require a large area are generally planted in the yard (B Frasetya, K Harisman and N A H Ramdaniah, 2020) including like Jebres sub-district consists of 11 sub-districts, including the Jebres sub-district. The population of the Jebres Subdistrict is 33,076 or 5.79% of the total population of

the Jebres Subdistrict. Judging from the total population, the Jebres Village is the second most populous area after the Mojosongo Village (Dinas Kependudukan dan Pencatatan Sipil Kota Surakarta, 2016). Apart from that, the Jebres Village also has a high slum area (slum area) which is prone to flooding from the Bengawan Solo River and Kali Anyar.

Since urbanization seems to be undeterred, it makes sense to include urban and periurban environments as part of the 2050 effort to feed the world with good quality, affordable, and sustainably produced food. In urban settlements, where space is limited and vegetative land uses are difficult to maintain, urban agriculture (UA), as is known, integrates into the urban economic and ecological system, the production of crop and livestock goods to provide products to the local population, including peri-urban agricultural areas around cities and towns, (Roberto S. Velazquez-Gonzalez, Adrian L. Garcia-Garcia, Elsa Ventura-Zapata, Jose Dolores Oscar Barceinas-Sanchez 1 and Julio C. Sosa-Savedra, 2022) that is also included Gendingan Village area of Jebres Village, Jebres District, Surakarta City is an urban area with a high population density. Residential settlements in this area are filled with buildings which on average have yards that are not wide enough. Most of these yards have not been managed and have not been utilized properly. If the yard is managed properly, namely by planting various plants, this settlement will not only be more beautiful and cooler, but also be able to dampen the hot air due to overcrowding and residential buildings.

On the other hand, the PKK group in this residential area actively has various activities. PKK groups that are well managed can of course be a force for efforts

to improve settlements, especially yards. It is undeniable that life in the city requires a relatively large cost of living. Likewise with the cost of living for residents in the Gendingan Village, Jebres District, Surakarta City. Members of the PKK group, who are basically household managers, are of course very aware of the benefits that can be obtained if they can manage all the components they own, including managing their yard.

A map of the condition of the residents of the Gendingan Village, Jebres District, Surakarta City as mentioned, namely the high level of residential density, settlements that still have yards, and the activities of PKK women who are well managed, managing the yard can as one of the activities of the PKK. In addition, to help with living expenses, yard management should be aimed at yards with plants of economic value.

One of the management of the yard that is not too big, has economic value, and is easy for housewives to do is planting by hydroponics. With a hydroponic planting system, residents can grow vegetables to help meet their daily vegetable needs. The target of this community service activity is the use of narrow yards through a hydroponic system by PKK Group in Gendingan Village, Surakarta City.

The development of hydroponic techniques has not experienced rapid development (Hereyah, 2018). Some are worried about the quantity of the harvest. Yields from hydroponic techniques produce crops that have good quality and quantity. However, hydroponic growing techniques cannot be applied to all types of plants. Even so, hydroponic planting techniques can be a solution to get around limited land in urban areas.

The problem faced by Gendingan Village, Jebres Sub-District, Surakarta City is dense settlements so there is minimal availability of land for planting. Most of the land in this settlement has been covered by buildings and cast cement so that the availability of soil as a conventional planting medium or in pots is very difficult. In addition, there is a lack of knowledge and training regarding preparing planting media, providing fertilizer and plant pots or containers from local materials.

The hydroponic planting system can make it easier for residents to grow vegetables and fruit to help meet their needs as well as the existence of plants for reforestation in this settlement. Thus the target of this community service activity is the utilization of narrow yards through a hydroponic system by PKK Group in Gendingan Village.

Hydroponics is the cultivation of plants that utilize water and without using soil as a planting medium. develop agricultural products, namely by way of hydroponic farming. Hydroponics is agricultural cultivation land without using soil media, so hydroponics is an agricultural activity that is carried out by using water as a medium to replace soil. So that the hydroponic farming system can utilize narrow land (Roidah, 2014).

The characteristics of hydroponic land use are part-time or to fill spare time and are intended for beauty as well as by-products such as vegetables, fruits and so on. However, in the context of strengthening national food security based on household security, it can play an important role. In order to optimize the role of land, especially as a provider of food and nutrition for households and a source of household income as well as in maintaining business continuity in yards, it is necessary

to design a more comprehensive use of yards (Ashari et al, 2012).

The hydroponic technique has several advantages. These advantages are safer growth and production, hydroponic techniques do not require difficult maintenance, and more controlled pests, efficient use of fertilizers, plants can grow faster and in conditions that are not polluted and damaged, sales of hydroponic products are higher than non-hydroponic products, and does not require large areas of land (Ermayanti, 2022).

Hydroponics is the cultivation of plants by utilizing water without using soil with an emphasis on meeting the nutritional needs of plants. The need for water in hydroponics is less than the need for water in cultivation with soil media. Hydroponics is suitable for urban areas that have a limited water supply (Indriasari et al, 2018).

The use of water in hydroponics is more efficient. Water does not need to be splashed on the plants but water circulation is carried out in a container. Planting with this hydroponic method does not require a large area of land, because the plant media can be stacked/vertical. Plant growth is faster and the quality of crop yields can be maintained (Jariyah, Wae, Gajo, & Abdullah, 2022).

The purpose of this community service program is to increase knowledge and skills, awareness and motivate the community, especially the PKK group of women in dealing with limited land for planting, applying several hydroponic verticulture techniques and maintenance that can be implemented easily by the community.

IMPLEMENTATION METHOD

Settlement of the problem of limited yards of residential areas in the Gendingan

Village, Jebres District, Surakarta City will be approached through the activities of the PKK group. The PKK group activities will include hydroponic farming activities. Through the media of the PKK group, it is hoped that the use of residential yards with hydroponic plants by PKK members can run in a more controlled and sustainable manner.

Community service activities that will be carried out are in the form of coaching which includes:

1. Counseling on the use of yard land
2. Hydroponic farming training
3. Counseling about the further development of hydroponic farming (entrepreneurship)

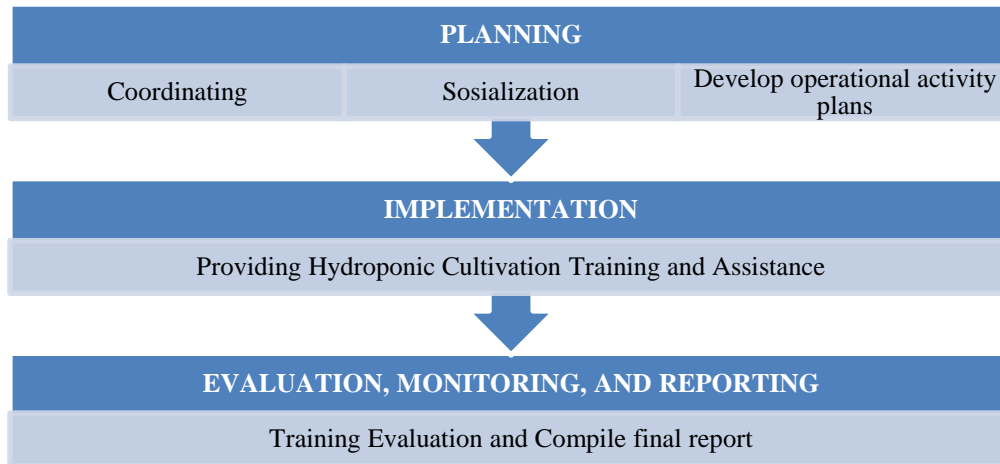


Figure 1 The process of implementing community service activity

In order for this community service program to run smoothly, the team must coordinate with the Head of the PKK Group for the Gendingan Village. The aims and objectives of community service to be carried out at that location, namely about innovation in growing hydroponic vegetables in the yards of PKK members' houses.

In carrying out the activities, the community service team apart from providing knowledge about the environment, the team will also provide information and skills about growing vegetables in the hydroponic system, planting practices and plant maintenance and carrying out periodic harvests for vegetables during the community service program. The practical implementation of the hydroponic system of vegetable farming will always be monitored by the team on a regular basis. With this system,

the team will know the progress of the implementation of the hydroponic planting system that they are doing. Based on the results of monitoring or observations from the team, we can provide suggestions, improvements or input for the next steps.

Monitoring of abdimas activities is carried out to see hydroponic planting practices and ascertain whether there are obstacles and discuss solutions. Monitoring was carried out 3 times, starting from after initial planting, mid-age plants, and plants ready for harvest. Evaluation is always carried out in conjunction with monitoring. The final evaluation was carried out to find out and determine the further development of this hydroponic farming. Monitoring is also carried out through the distribution of instruments and discussions to find out the extent of understanding of members about growing vegetables using the hydroponic method.

PROCESS AND RESULTS OF HYDROPONIC TRAINING

The training implementation process runs for four months, from August to November. The method used is the lecture method, demonstrations and direct practice.



Figure 2 Community Service Activities

The results of the training are in the form of skills to apply the planting system by means of hydroponics. In addition, the results of training can also be enjoyed together, namely vegetables from hydroponic crops.



Figure 3 Hydroponic Cultivation Results and Yields Processed into Mustard Leaf Chips

CONCLUSIONS

The community is very enthusiastic about Community Service activities regarding Hydroponic training. Target partners gain knowledge about hydroponic techniques by utilizing limited land. The PKK group, assisted by gentlemen from the local residents, are very excited to do their first harvest. The community also works together to sow seeds to continue the hydroponic culture in Jebres District.

Based on the results of the training from the Community Service program conducted by the Open University, it is very beneficial for the community, especially for the supply of vegetables. Another benefit is that the surrounding environment becomes greener with a variety of plants grown using hydroponic techniques.

The community is very enthusiastic about this kind of activity. This indicates the benefits felt by the target partners from community service activities. The lack of land for farming in urban areas in densely populated areas can be circumvented by using this hydroponic technique. Hydroponic techniques are an alternative for producing useful plants on narrow and limited land.

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