

SOCIALIZATION OF VILLAGE GREENING THROUGH HYDROPONIC PLANTS TO UTILIZE LITTLE LAND IN SUKAMULYA, ANGGADITA VILLAGE, KLARI, KARAWANG

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ABSTRACT

The development of the industrial area in Karawang precisely in Klari Anggadita village made green land very limited. In addition, the level of air pollution has also increased both from road dust, large vehicles, and factories. Limited greening areas, the Community Service Team of Mercu Buana University provides training in planting practices using Hydroponic media. Hydroponics is a farming technique without using soil media. On the other hand, hydroponics is cultivation by utilizing water without emphasizing meeting the nutritional needs of plants. Water requirements in hydroponics are less than water requirements in aquaculture with soils. Hydroponics uses water more efficiently, so it is suitable to be applied in arid regions such as Anggadita village. This training was held for one day and its growth was monitored for 2 months. During the course of time, the Community Service Team at Mercu Buana University also provided plant maintenance techniques using Hydroponic media.

Keywords: *Hydroponic*

1. INTRODUCTION

1.1. Background

The development of the industrial area in Karawang precisely in Klari Anggadita village made green land very limited. In addition, the level of air pollution has also increased both from road dust, large vehicles, and factories. The limited area of greening, the Community Service Team of Mercu Buana University gave training in planting practices using media Population growth and industrial development resulted in increasingly narrow agricultural land and reforestation land, including in Karawang especially in Anggadita village. Anggadita Village has an area of 2.94 km², with a population density of 2.836 / km². In addition, land use in Anggadita Village 1.37 km² and 1.70 km² is industrial, while reforestation land such as plantations, forests and ponds is not available in Anggadita village. This is one of the causes of the aridity of the village of Anggadita and the high prices of vegetables and fruits in the village of Anggadita.

The lack of greening land in Anggadita village caused the writer to propose the concept of urban farming. Urban farming is the concept of moving conventional farming methods to urban farming methods. With urban farming the community can plant without needing large tracts of land, it can be done in the yard of the house, garden, and others. Planting and growing plants such as vegetables and fruits in a narrow area of land such as Anggadita village can be intended as personal consumption or distributed to others. One urban farming technique that can be practiced in Anggadita village is hydroponic technique.

Hydroponics is a farming technique without using soil media. On the other hand, hydroponics is cultivation by utilizing water without emphasizing meeting the nutritional needs of plants. Water requirements in hydroponics are less than water requirements in aquaculture with soils. Hydroponics uses water more efficiently, so it is suitable to be applied in arid regions such as Anggadita village. The word hydroponics itself comes from the words hydro (water) and ponics which means power. So hydroponics can be interpreted as a way to grow plants with water media. Hydroponic plants are very suitable for greening the environment, by providing training to residents to manage, so at least the surrounding environment will look green and attractive. How to plant with hydroponic techniques is one strategy to get around the availability of land that is increasingly minimal now. Hydroponic

planting is one type of crop cultivation that can be carried out by residents in the village of Anggadita.

Growing media can be made from several kinds of used items, such as used drink bottles. The bottle is cut into two parts, one part to hold water that has been mixed with hydroponic nutrition and another part to plant seedlings can use a coconut and cotton belt. So this system is very environmentally friendly because it can use waste as a new innovation in the field of agricultural technology. Hydroponic planting does not need to require a lot of land, it is easy and inexpensive.

In developed countries themselves, this way of farming has become the people's choice. This is because their land has become increasingly narrow and in Indonesia too. Because day by day the land continues to decrease for the benefit of housing and industry as in the Anggadita village.

This hydroponic farming technique has several advantages over conventional techniques, such as:

1. Plants grow half times faster because the roots of plants do not need to look for nutrients to the soil, aka just absorb it. Therefore, the nutrients needed by plants have been prepared with a special solution.
2. Hydroponic techniques do not require a wide planting media like the conventional way.
3. Safer against pests and germs.
4. The use of pesticides is much less so that the chemical content can also be minimized so that plants become healthier.

Gardening is a very exciting and healthy activity. Especially if you remember how the benefits. By gardening through hydroponic farming, the community can indirectly pick their crops for their own consumption. Thus, hydroponic plants such as vegetables will indirectly reduce household expenditure. Vegetables that can be planted through hydroponic media can be kale, spinach, mustard greens.

This is in accordance with the needs of the village areas of Anggadita, Klari, Karawang. The village of Anggadita which is quite dense by pemukiman and industry, makes the village of Anggadita look arid, coupled with the absence of plantation areas that produce vegetables and fruits which are the main needs of humans.

1.2. Service focus

The arid region due to lack of greening land, dense population and industrial settlements in the village of Anggadita, Karawang. The absence of plantation land makes the community provide vegetables and fruits from outside the city, thus making the price of vegetables more expensive than if vegetables and fruit can be available in their village. Planting vegetables and fruits using hydroponic growing media is very easy and inexpensive by utilizing used items such as used bottles for example to grow vegetables. Even narrow land is not a reason for planting because hydroponics can be done by sticking to walls, fences, roofs or even in narrow spaces. Residents in the village of Anggadita do not know the advantages of growing in a hydroponic way.

Here are some of the advantages of hydroponic farming.

1. More efficient use of fertilizer. because if we plant in the garden / rice field
2. Conventionally, or using land, we don't fertilize almost all of our land. This is wasteful.
3. Use water more efficiently
4. There is less labor needed, because we don't cultivate land.
5. Cleaner working environment.
6. Can plant crops in locations that are not possible / difficult to plant, such as environmentally poor soil nutrient, wilderness, rocky, etc. Even can plant in a garage, basement, even under the city though (with the addition of special lights / growing light).
7. Production of more extensive unity plants, because it can be done vertically.
8. Become a solution for those who want to grow crops but have minimal land.
9. No need to hoe.
10. Can relieve stress, as a healthy and enjoyable activity for the whole family.
11. Has its own value because it is free of pesticides, and has artistic value, and can innovate and create itself.

Solution to the problem of Anggadita Village Karawang, it is necessary to hold socialization

and training or practice on how to plant using used materials such as used bottles or used cans as planting media. Training and practice of utilizing used goods to grow hydroponics is carried out directly by giving participants the planting media and those who try to plant them guided by the instructor or Community Service team. Furthermore, participants will be monitored by the results of their plants by monitoring directly to the homes of residents to find out the development of plants. Furthermore, Anggadita villagers always report the development of hydroponic plant growth until the yield of vegetables or fruit can be picked / harvested. With the interest and diligence in taking care of the plants, the residents can utilize the results of the plants for their own consumption so as to save household expenses.

Training on how to grow vegetables with hydroponic media will be carried out in the multipurpose hall at Anggadita village office with the community service team giving information to the community in the form of delivering material and tips as well as practices on how to grow hydroponics and its maintenance. Through training and practice on how to grow hydroponics, it is hoped that local residents will become more interested in promoting greening in their environment. Output targets in the community service program to be implemented in Anggadita village, Klari Karawang are:

1. Residents can carry out greening programs around the environment by utilizing used goods as a medium for growing hydroponics, so the environment will look green and attractive.
2. Residents can produce healthy vegetables or fruits from farming and the results can be consumed by themselves.

1.3. Justification and Targets

Through surveys and interviews conducted in the Anggadita Klari Karawang village area, the community service team then made an agreement with the residents through the agreement of the kelurahan, continued to make invitations and distributed to all Anggadita villagers. Participants who will take part in this training are participants who are representatives determined by the village leader. Community service activities in the form of training and practice on how to grow hydroponics are carried out in the multipurpose hall of the Anggadita village office. Training and counseling activities for residents include the following activities:

1. The implementation begins with a presentation that contains material on how to plant using hydroponic media consisting of:

a) Seeding Seeds

The main stage in hydroponic farming is to start by sowing vegetable or fruit seeds in a seedling tray or container. Use seeds that can be bought at the plant store. A good and commonly used seed media is rockwool. Rockwool is very practical because it has high water absorption and is sterile. If the seeds are old enough and the leaves begin to grow two to no leaves then do the transfer from rockwool to planting media.

b) Preparation of planting media

The transplanting process is quite simple, just need to prepare a used bottle that has been made before. At the bottom of the bottle, pour enough nutrient solution. Then take the neck of the bottle, remove the rockwool growing media that has been overgrown with sprouts and roots carefully into it. Don't forget the nutritional path with wick or flannel. Then, join the two parts as shown. The next step is to carry out intensive care of plants that are already in used bottles. Make sure the plants continue to grow by providing nutrition regularly. Do not let the plant not absorb nutrients for a long time because it will pose a risk of crop failure due to dead plants. What you also need to know is the bigger the plant, the nutritional needs will increase. Therefore, at least once a week the nutrient solution must be added. The portion of making liquid hydroponic nutrition itself must also be added up until the plants are ready to harvest.

How to grow hydroponics from used bottles of mineral water with a wick system or axis system. For those of you who don't know, actually the wick system is only one of many other hydroponic systems, such as fertigation, floating raft, NFT, dutch bucket, and a few others. The axis system itself is a hydroponic system that is quite easily implemented by everyone, even beginners.

Use easy growing media for growing plants such as cocopit (coired coconut husk), can also be a mixture of roasted husk and gravel sand, or a mixture of rockwool and gravel sand. Place the planting media in the desired container such as a used pot, bottle or can.

c) Nutrition

Use the right hydroponic nutrition, nutrition in how to grow hydroponics is very important for plant growth. Nutrition is widely sold in plant stores with the name Nutrition A B Mix or Hydro Mix widely marketed. Hydroponic AB-Mix nutrients that can be found in this agricultural shop are in the form of powder and some are already in liquid solution. If you want to mix it yourself, then buy the powder form and follow the guidelines on how to dissolve it which is generally attached to a piece of paper. For AB-Mix itself there are several types, you can ask directly with the seller. For vegetables, you can buy AB-Mix leaves (leaf vegetables). As for fruit plants, you can choose AB-Mix specifically for fruit growth. AB-Mix consists of two types of separate liquid solutions which will be mixed with water so that it is ready for use.

Nutrition can be done by manual flush morning and evening, or if you want to be more practical you can try how to grow hydroponics with the axis system. The wick (can be from cotton, wick stoves or used cloth) will flow nutrients to all parts of the plant. This wick technique is one of the simplest hydroponic techniques.

d) Treatment

Treatments on the hydroponic system basically do not differ greatly from treatments on conventional systems such as pruning, cleaning weeds, and beware of pests, etc. Types of Pests That Can Attack Hydroponic Plants.

The types of pests in hydroponic plants are as follows:

1. Aphidoidea mites (white / clear)

- a. Symptoms: Plants will experience very slow growth. The new growth process will stop, the leaves will bend, the weak lungs bend and take care.
- b. Handling: Cut off the affected leaves and then the healthy parts immediately spray with biopesticides

2. Caterpillars, cockroaches and grasshoppers

- a. Symptoms: Leaves are torn and hollow
- b. Handling: All types of insects, caterpillars and cocoons are searched and then draped. Furthermore, the plants are seprot with biopesticides

3. Fruit fly larvae

- a. Symptoms: Plants wilt, growth degenerates, stunted plants, leaves torn, yellowing, loose and soft roots.
- b. Handling: Plant medium must be dismantled and cleaned

4. Small insects form lumps of white powder

- a. Symptoms: Plants filled with white powder, wilted leaves and fall
- b. Handling: Insects that form white clumps scraped then scraped leaves immediately sprayed with biopesticides

5. Lice Shield

- a. Symptoms: The goods and leaves are covered with a black coating, and lice are attached.
- b. Handling: Insects that form black clump scraped then scraped leaves immediately sprayed with biopesticides

2. THE METHOD USED

The method used in the community service program is tutorials and counseling accompanied by practice by involving participants to be active in the activities of how to plant hydroponics properly and how to care.

2.1. Place and time

This Community Service activity was held in the multipurpose hall of Anggadita Village, Klari, East Karawang which was held for 2 months.

2.2. Activity type

Community service activities related to planting socialization using hydroponic media and how to deal with pests as a way to save family expenses is done in the form of training.

2.3. Activity Procedure

Stage 1: Survey of activity locations and selection of participants.

Stage 2: Dissemination and Training with hands-on cultivation in hydroponics

Stage 3: Evaluate the results by visiting 4x the homes of residents by overcoming the attacking pest.

Stage 4: Assessment of the results of growing vegetables.

2.4. Realization of Activities

Community service activities in the form of training on how to grow vegetables using hydroponic media in Anggadita Village, carried out for 2 months in the form of training and counseling. The time and activities are as follows:

Time : 08.00 - 11.00 WIB, (Opening 13 October 2018 and Closing 16 December 2019) with mentoring activities once every two weeks for two months.

Place : The multipurpose room in Anggadita Village, Karawang. Opening and closing of the training event. To practice farming in one of the houses of the trainees.

Implementer : This activity was carried out by a team of permanent lecturers in the Accounting Study Program at the Faculty of Economics and Business at Mercu Buana University.

3. RESULTS AND DISCUSSION

3.1. Result

Following are the outputs of community service activities to be carried out:

Table 1. Achievements Outcomes of community service activities

No	Outcome Types	Achievement indicators
1	Scientific publications in journals / proceedings1)	
2	Publication in mass media (print / electronic) 2)	
3	Increased turnover for partners engaged in the economy 3)	
4	Increasing the quantity and quality of products 3)	
5	Increased community understanding and skills 3)	√
6	Improvement of public peace / health (general public partners) 3)	√
7	Services, models, social engineering, systems, products / goods 4)	√
8	Intellectual property rights (patents, simple patents, copyrights, trademarks,	
9	Textbook 6)	

Through surveys and interviews that have been carried out with residents in the village of Anggadita, the community service team then made an invitation and distributed it to all residents in the village of Anggadita with participants representing representatives sent by the village leader. Community service in the form of training in planting plants with hydroponic media was carried out in the multipurpose hall in Anggadita Village. Training and counseling activities for residents include the following activities:

1. The implementation begins with the opening of the training which was attended by the chairman of the Implementers of community service along with the lecturers, village leaders and their staff and staff. The opening was opened with remarks from related parties, which basically discussed the benefits of farming using hydroponic media.
2. The next activity was guided by the Community Service Team to provide community counseling and at the same time practice how to plant water spinach, mustard greens and red spinach with

hydroponic media. In the training the team gave direction on how to plant well, how to care for them and what if the plants were exposed to pests and diseases.

3. Activities after the first day of training are carried out monitoring of the growth of kale, mustard and spinach plants, monitoring of plant growth is carried out by field visits by the Community Service team. The review is carried out as follows:
 - a. Peninjauan 3 hari setelah pelatihan, masing-masing peserta mengamati pertumbuhan tanamannya pada hari ke tiga yaitu mulai tumbuh benih tanaman. Selain itu tim menyarankan warga untuk menggunakan botol plastik bekas sebagai media hidroponik untuk menyemai benih.
 - b. Peninjauan setelah 10 hari tanaman mulai tumbuh dan sudah banyak daunnya, namun ada masalah yang dihadapi yaitu tanaman yang tidak subur tumbuhnya dan tanaman yang tumbuhnya terlalu padat.
 - c. Peninjauan tanaman di lokasi oleh tim PPM dilakukan untuk memberikan masukan bagaimana cara pemeliharaan tanaman dan membasmi hama tanaman. Kegiatan ini terus dilakukan sampai dengan umur tanaman mencapai 60 hari lebih.
4. The last activity after 2 months of planting hydroponic plants, the community service team to determine the training participants who managed to plant well and declared as champions. In addition, the community service team also harvested kale with the residents.

3.2. Discussion of Results

The results of the community service that has been carried out by Anggadita villagers in the form of vegetable plants consisting of water spinach, spinach, and caisim using hydroponic media received great attention. Very large interest to plant because of the easy and practical way of planting is also quickly followed by other residents. Residents pay great attention to their plants, this is proven by making new media from used bottles.

Participants are diligent in communicating with the implementation team through the means of mobile phones. Participants are diligent to provide information about plant development starting from 3 days from planting until the plant looks tall. Participants did not hesitate to send photos and tell if there were problems with plants. These problems include plants that grow less fertile and pest and animal disorders such as mice that eat plant products. From the results of the visit of the implementation team to the location (people's houses) the problem of the infertility of plants caused by too many spreading seeds in one pot so that the plants do not grow well. The solution to the problem is the community service team suggests moving some seeds to another pot. Another problem is due to pest and animal attacks (rats, etc.), so the community service team suggests taking proper care to avoid star attacks. After making four field visits, the crops are ready to be harvested. From the results of monitoring in the field the participants seemed very happy to see the results of their plants and stated that the results of the plants could be used for family consumption so they could save money on buying vegetables. However, before harvesting, an assessment and judging are conducted to determine which participant plants will have better results and be declared champions.

Based on the results of the evaluation of Anggadita Village residents on the training that has been carried out, several findings were obtained, including:

1. The number of seeds is spread too much to the pot so that the growth is hampered. The community service team provides a solution to transfer part of it to plastic bottles ...
2. Its location is not exposed to sunlight so that the plants are less fertile, the leaves are less numerous and yellow.
3. Lack of maintenance of plants from pests and animals, causing plants to die or be eaten.

The success of hydroponic planting training for Anggadita villagers fostered the interest of residents to continue hydroponic cultivation with used goods media, participants reduced the ability to plant hydroponics to other residents who had not yet participated in the training, the results of the training became a solution for efficient household expenditure. Thus the objectives of the training have been met although the findings during the results of the implementation of community service are still lacking. But on the other hand, there were failures in introducing hydroponic plants, some residents considered planting them by spreading seeds to the ground more quickly and without fuss. This may be related to the mindset of residents who are still not open with the renewal of how to plant using hydroponic media.

4. CONCLUSION

The conclusions that can be drawn from the results of community service activities by taking the theme of hydroponic planting are:

1. Participants of the community service activities do not yet fully understand and know how to plant using hydroponic media.
2. Participants after participating in the training activities were happy and enthusiastic about participating in the training activities, this can be seen from the number of participants who attended the activities carried out in the multipurpose room in Anggadita Village
3. After participating in community service activities, monitoring is carried out in the homes of residents to see firsthand how the participant plant growth.
4. Participants become good at planting by hydroponics, but there are also participants who fail to plant because of pests and lack of sunlight, but do not make participants stop to plant.
5. Hydroponic farming provides provisions for participants to carry out greenery around the house and produce vegetables that are healthy and safe for consumption.

SUGGESTION

Suggestions proposed for further community service activities are that community service activities can be carried out for a wider target area with a greater number of participants so that the target of greening in the village of Anggadita village, Karawang can be realized.

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