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CULTIVATING VEGETABLE PLANTING BENEFICIAL FOR THE HEALTH OF SDN STUDENTS WEST CILANDAK 07 SOUTH JAKARTA BY VERTICULTURE WAY

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Abstract

The purpose of this service is to cultivate students and teachers in schools planting organic vegetables with maximum yields on narrow school land which is beneficial for the health of students. The method used is Active and Participatory Learning with material discussions, practices and demonstrations. The results of this service provide an increase in students' and teachers' understanding of the importance of cultivating organic vegetable farming. On the other hand, being able to educate students from an early age in maintaining health by consuming organic vegetables can be done from the simplest thing, namely by cultivating organic vegetables vertically. Understanding in using this technique of providing verticulture is strengthened because only with a narrow 3 x 4 m land can cultivate vegetables with maximum yields of organic vegetable harvests. Besides being able to cultivate organic vegetable farming, the verticulture technique itself can also provide a beautiful atmosphere. So that it can spoil school students and provide a calm and comfortable atmosphere for students in the school environment.

Keywords: Cultivation, Student Health, Vegetable Growing Techniques, Verticulture.

INTRODUCTION

Elementary school students (SD) are the nation's assets in the future. Therefore it is necessary to prepare various supporting needs such as the fulfillment of balanced nutrition, knowledge, skills, and creativity. Elementary-aged children are vulnerable to nutritional deficiencies, especially vegetables. The low level of consumption of vegetables in elementary school-aged children is due to several factors, such as families not introducing vegetable food early on, the surrounding environment being full of unhealthy snacks, the school environment not introducing information about the benefits of vegetables for health, and so on. If students' interest in vegetable-based foods is not increased, it will have an impact on the emergence of various risks, such as obesity. Data from the results of the 2010 Riskesdas showed that the prevalence of overweight and obesity in elementary school children (age 6-12 years) was 9.2%. In the Central Java region, the prevalence rate is higher than the national level, namely 10.9% (Ministry of Health RI, 2012). Another risk that can infect is the less than optimal development of the child's intelligence level. Whereas elementary school age is known as the golden age, which is when the human brain experiences its best development. The problem of low levels of vegetable consumption and the lack of knowledge of elementary school students regarding

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gardening activities and the types of vegetables and their benefits have also been studied and experienced at Public Elementary School (SDN) 3 Bancarkembar, North Purwokerto District, Banyumas Regency, Central Java Province. Therefore it is necessary to carry out activities that can increase students' love for gardening activities and knowledge of various types of vegetables and the benefits contained therein (Hadi, 2017).

In general, in urban areas to grow the plants we want, we are sometimes constrained by the size of the land. To overcome the narrow land we can grow plants vertically. The verticulture system is an agricultural cultivation system that is carried out vertically or in stages. This system is suitable for use on narrow plots of land or in densely populated settlements (Nursyamsu, 2018; Roidah, 2013). Verticulture is an agricultural cultivation system that is carried out vertically or in stages both indoors and outdoors (Nasruloh et al. 2021; Tini et al. 2016). Vertical or terraced agricultural cultivation systems are very suitable for urban areas and limited land. Vertical requirements are strong and easy to move around (Lukman, 2017; Djuwendah et al. 2021). Plants to be planted should be adapted to the needs and have high economic value, short-lived and short-rooted. There are many types of plants that can be grown vertically, usually vegetables, ornamental plants or medicinal plants known as horticultural plants. Vegetable plants that are often cultivated vertically include mustard greens, chives, lettuce, kangkung, spinach, pakcoy, caisim, katuk, basil, celery, tomatoes, bitter melon, long beans, cucumbers, leeks, and other leaf vegetable plants. (Mariyam, 2013; Lukman, 2017; Nasruloh et al. 2021).

Production of plants cultivated vertically is influenced by the growing media used, and the materials used as vertical containers. One type of plant that can be cultivated vertically is the mustard greens (Izhar et al. 2016). How to grow crops vertically is in principle the same as farming in gardens or in rice fields. The difference lies only in the land or media used for planting (Danfar, 2009; Hidayati et al. 2018). For example, 1 meter of land may only be able to grow 5 plant stems, whereas with a vertical system it can be obtained 20 plant stems. Verticulture can multiply agricultural output up to ten times or more (Rasapto, 2006; Lukman, 2017). If most of the big cities in Indonesia implement a system of cultivating vegetables, medicines and fruit through verticulture, then the reforestation program with productive plants can be reaped, enjoyed for its beauty and can also improve public health gradually (Rasapto, 2006; Trianto et al. 2021; Munawir et al. 2019).

Figure 1. SDN Cilandak Barat 07 South Jakarta

Based on the above problems the Community Service Team at the Department of Biology, as well as the Department of Regional and City Planning, Faculty of Science and Technology, Open University (FST-UT) Center wants to participate and play a direct role in assisting the Head of West Cilandak 07 Public Elementary School (SDN) in empowering students for vegetable cultivation activities with verticulture. As a consideration, the school was chosen as the target of Community Service because based on the results of the team's observations it showed that SDN Cilandak Barat 07 was included in the Slum and Poor (Kumis) school group. According to information from the school, it is called Kumis because the students who attend this elementary school are children from poor families, such as housemaids, laborers, drivers, itinerant traders and other informal workers who still have low incomes. Poor families are often still perceived by some people as identified with low knowledge, especially those related to family nutritional health.

It is one of the obligations of the Open University as a Higher Education institution to participate in building society by applying the knowledge it has. According to Law No. 12 of 2012, article 1 paragraph 9, Higher Education has an obligation to organize the Tri Dharma of Higher Education with elements of Education, Research and Community Service. The element of Community Service is an activity of the academic community that utilizes science and technology to promote community welfare and educate the nation's life. The Community Service Team at the Department of Biology, as well as the Department of Regional and City Planning of the Central FST-UT coordinates with the Principal and Teachers of the West Cilandak 07 Public Elementary School so that they can carry out vegetable cultivation activities with verticulture which will be integrated into Class 4 or 5 students West Cilandak 07 State Elementary School has a total of 107 people and 8 teachers. The hope is that the school community, especially teachers and students, can carry out vegetable cultivation activities with verticulture, so that they can do it independently and experience first-hand the benefits of cultivating vegetables with verticulture.

IMPLEMENTATION METHOD

The service method is Active and Participatory Learning (Nursyamsu, 2018). This method includes discussion activities with teachers and students (i) regarding the importance of cultivation techniques in organic vegetable cultivation with verticulture. The object of the service activity is Cilandak Barat 07 Public Elementary School, Cilandak District, South Jakarta City. The target target is at least 100 people.

The stages of this community service activity consist of 4 stages, including: first, distributing invitations to all teachers and students (i) Cilandak Barat 07 State Elementary School which contains information regarding the theme, time and place of the community service activities. Second, the delivery of activity material about organic vegetable cultivation techniques with verticulture techniques, the importance of the benefits of verticulture techniques around schools, the benefits of making verticulture planting media as a source and student learning process. Third, carry out practices related to how to cultivate teachers and students to consume organic vegetables. The fourth is the delivery of material on the importance of realizing a healthy generation of children from an early age in elementary schools.

Materials, Tools, and How to Practice the Organic Plant Verticulture System

Material :

- Organic vegetable plant seeds, manure, NPK fertilizer, Plastic Ice (Transparent Plastic), Plastic Tape, Paralone Pipe, Gutters and Tidy Rope/Wire Rope

Tool :

- Scissors, Knives, and Cutter

How to Do Verticulture Organic Plant Cultivation Techniques:

1. Prepare a place or land for making verticulture houses with an area of 3 x 4 m2
2. Make verticulture houses for ± 5 days until they are ready to be used by the service team and all students (i) Cilandak Barat 07 State Elementary School.
3. Make vertical planting media with gutters, right and left each as much as 4 gutters vertically with a length of @ 4 meters for the size to be made according to the height of the students (i) Cilandak Barat State Elementary School 07
4. Choose the right seeds to be used as planting material for verticulture plants.
5. Prepare manure that has been mixed with soil into the planting material container that has been prepared
6. Do watering with the water that has been provided
7. Planting with vegetable seeds that have been prepared at the beginning.
8. Maintenance, namely by watering every day 2 times in the morning and evening
9. After one week of age, the plants are given NPK fertilizer and then dissolved in water
10. Then sprinkled on the soil around the plants, applying fertilizer is recommended in the afternoon to reduce evaporation
11. Provision of fertilizer is sufficient once a week.

RESULTS AND DISCUSSION

A. Demonstration of Vertical Organic Vegetable Cultivation Methods

In the practice of cultivating verticulture vegetables, there are 3 stages, namely (1) the stage of making seeds, (2) planting seeds and (3) caring for plants from seed to harvest.

Making Vegetable Seeds

How to grow vegetables, especially Kangkung is actually much easier than planting other types of vegetables. If you are a fan of "cah kangkung" or "sautéed kangkung" it will suit you if you know how to cultivate it. Before we review how to cultivate Kangkung, we should first get to know the types of kangkung plants that can be cultivated. There are 2 types of kangkung plants that can be cultivated, namely (1) ground kangkung and (2) water kangkung.

Table 1. Differences between land and water spinach

ground kangkung	water kangkung
1. Grow it in a dry place 2. Smaller stems with a greenish white color 3. The leaves are thinner and softer 4. The color of the flower is generally white	1. Growing in wet places, for example in rice fields or puddles 2. Larger stems and deep green color 3. Leaves are wider and tougher 4. The color of the flowers is reddish white

Sumber: https://www.infoagribisnis.com/2015/01/cara-menanam-kangkung/

Vegetable seeds, both kangkung, spinach and mustard greens come from seeds. Vegetable seeds can be obtained by cultivating them yourself from vegetable seeds found in plants/vegetables whose seeds have dried. However, to make this Abdimas activity easier, vegetable seeds are obtained from buying the seeds at a shop that sells these vegetable seeds. Once the vegetable seeds are available, the next step is to make a nursery. Prepare the planting medium that will be used in the nursery. The trick is to mix soil, sand, and manure with a ratio of 2:1:1. After being thoroughly mixed, the media is then put into a wooden box/or plastic box with a thickness of about 5-10 cm. Make planting holes that are 5 x 5 cm to 8 x 8 cm apart.

Figure 2. Production of Vegetable Seeds

Plant the kangkung seeds that were prepared earlier into the planting hole. Each planting hole is sufficient to fill with 1 seed. Repeat until all the holes are filled with kangkung, mustard or spinach seeds. Place the wooden box/plastic box where the kangkung was planted in a shady location. Flush the media every morning and evening. Approximately within 5-7 days, these kangkung seeds will grow into seeds that are ready to be transplanted into the field. Up to this stage students are guided to do seed nurseries by being given examples by the Abdimas team.

Vegetable Seed Planting and Care

Paralon pipes or gutters are actually materials specifically for building materials, not for farming. However, along with the growing activity of urban farming, people are using PVC pipes and gutters for gardening. Both were chosen because they are easy to obtain, durable and can be obtained at an affordable price. Vegetable gardening using PVC pipes will also produce neat, clean and beautiful gardens. Even this method can be done on limited land, but it is

effective because it can be done vertically (multilevel).

Figure 3. Grade 4 and 5 students at SDN Cilandak Barat 07 Practicing Planting Vegetable Seeds

Verticulture or vertical garden is gardening vertically by placing plants or arranging terraced plants. To plant vegetables such as mustard greens, spinach, kangkung or others, provide a pipe that has a diameter of at least 3 inches. Cut the paralon pipe to the size you want, it can be 1 meter, 1.5 meters or more. Make planting holes on the sides of the pipe regularly. The spacing between the holes is adjusted to the type of vegetables to be cultivated. Fill the inside of the paralon pipe with planting medium that is loose and contains lots of nutrients. The planting medium is a mixture of soil, husk charcoal and manure or compost. When finished, the media is ready for planting vegetable seeds.

At Cilandak 07 Elementary School, South Jakarta, this vertical garden gardening activity was carried out jointly by students, teachers and accompanied by the Community Service team from the Open University. In the next stage, students, especially grades 4, 5 and 6, are expected to be able to take care of these plants by watering regularly every morning on an ongoing basis until the vegetable plants can be harvested. Of course this activity must always get assistance from the respective class teachers.

Figure 4. Example of a student practicing cooking vegetables

After harvesting the vegetable crops, the Abdimas team has collected the harvest and then tested it to be cooked by the teachers, the results are in the form of vegetable soup, stir fry, or other types, so that cooking vegetables is included in the form of practical demonstrations of student learning.

B. Sustainability of Verticultural Organic Vegetable Cultivation

Sustainability of cultivating verticultural crops at Cilandak 07 Elementary School, South Jakarta as an effort to optimize food security and introduce organic plants to school children from an early age, namely as follows: (1) Caring for verticulture plants by consistently watering them and applying fertilizer when needed. Teachers and students (i) at Cilandak 07 Elementary School, South Jakarta have been well organized, so that the cultivation of verticulture plants in that place can be maintained. (2) Carry out sustainable development of verticultural organic vegetable cultivation so that one can understand how to assemble or manufacture verticulture.

Figure 5. Examples of Verticulture Mustard Vegetables, Spinach and Kangkung

In the implementation of mentoring for community service activities in 2021 which was carried out at Cilandak 07 Elementary School, South Jakarta, a questionnaire was made which was distributed after the implementation of verticulture acculturation assistance. The questionnaire contains questions related to teachers' and students' understanding of organic plant cultivation techniques towards the initiation of the use of verticulture planting techniques in the school environment.

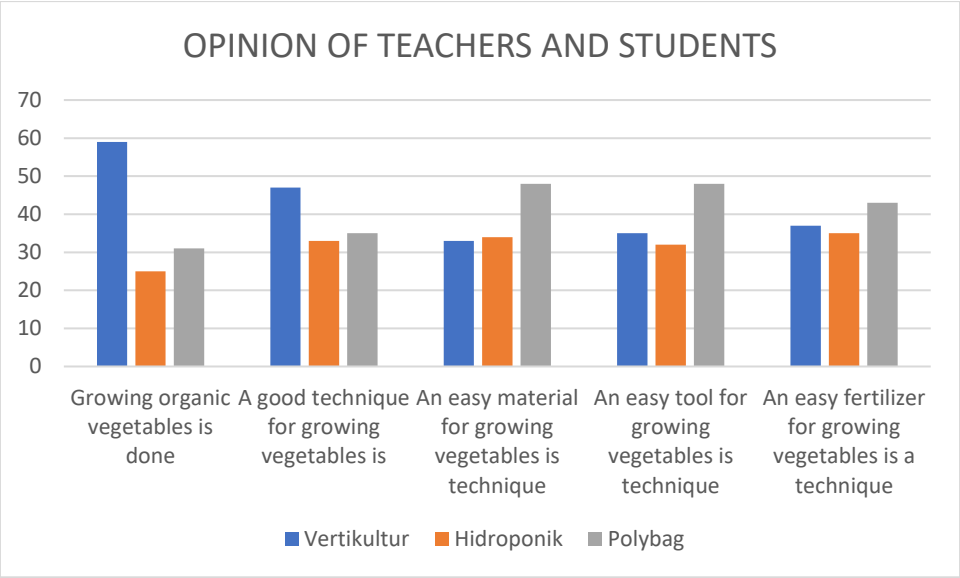

Figure 6. Opinions of Teachers and Students of Organic Vegetable Cultivation.

The results of the questionnaire on the bar chart above show that the teacher and student respondents have a fairly high understanding of the cultivation of verticulture plants and the cultivation of other organic plants, especially hydroponic techniques and polybags. The majority of teachers and students received initiation regarding the cultivation of verticulture crops as an effort to optimize vegetable farming in a sustainable school environment. In this regard, teachers and students are very interested in organic vegetable cultivation techniques, especially verticulture by gaining knowledge from socialization carried out by implementers in community service and will apply these techniques on an ongoing basis in schools and guide school children to know farming techniques and the importance of organic vegetables for health.

CONCLUSION

Increasing students' understanding of the importance of cultivating organic vegetable farming and educating students from an early age in maintaining health by consuming organic vegetables is done from the simplest things, namely by cultivating organic vegetable plants vertically. The initiative to use this verticulture planting technique was based on the fact that only a narrow 3 x 4 m land could cultivate vegetables with maximum yields of organic vegetable harvests. So that the service team took the initiative to increase the understanding of students and teachers in the process of making verticulture using very minimal capital where the school itself will get quality fresh crops with very economical capital. In addition to providing economic value, the verticulture technique itself can provide a beautiful atmosphere. So that it can spoil (i) school students and provide a calm and comfortable atmosphere in the school environment.

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