

# Herbal Plant Education and Hydroponic Training of Vertical and Wick System in Limited Space

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## Abstract

The program "Empowering the Community of Simo Angin-Angin Village, Sidoarjo through the Use of Natural Materials to Achieve Health Independence" was implemented at the Simo Angin-Angin Village Hall, Krian District, Sidoarjo Regency in May-June 2023. This Community Empowerment Program (Community Service) carries a preventive and consists of a series of activities, including counseling about the use of natural materials based on the recommendations of the Koran, considering that the majority of Simo Angin-Angin village residents are Muslim. This activity also includes training in farming using the hydroponic method. The aim of this program is to strengthen health independence in Simo Angin-Angin Village in order to improve collective welfare. The Community Service program in Simo Angin-Angin Village was attended by 22 participants, consisting of health cadres and the general public. The implementation is divided into 2 stages, namely counseling regarding the Black Cumin herbal plant and training regarding vertical hydroponic procedures, as well as the use of plastic bottles with the Wick system. The evaluation results showed that participants' understanding was very good, with 95% of them achieving a score of 100, while 5% obtained a score of 80. The evaluation results of participant satisfaction with the implementation of the extension showed very good scores for the topic material and delivery of the material by resource persons on herbal plant education and hydroponic training. This Community Service activity provides skills for the community to grow crops on narrow land using a hydroponic system.

**Keywords:** hydroponics, black cumin, herbal plants

## Abstract

Program "Pemberdayaan Masyarakat Desa Simo Angin-Angin, Sidoarjo melalui Pemanfaatan Bahan Alam guna Mencapai Kemandirian Kesehatan" dilaksanakan di Balai Desa Simo Angin-Angin, Kecamatan Krian, Kabupaten Sidoarjo pada bulan Mei-Juni 2023. Program Pemberdayaan Masyarakat (PkM) ini mengusung pendekatan preventif dan terdiri dari serangkaian kegiatan, termasuk penyuluhan tentang pemanfaatan bahan alam berdasarkan rekomendasi Al-Quran, mengingat mayoritas penduduk desa Simo Angin-Angin beragama Islam. Kegiatan ini juga meliputi pelatihan bercocok tanam dengan metode hidroponik. Tujuan dari program ini adalah untuk memperkuat kemandirian kesehatan di Desa Simo Angin-Angin demi meningkatkan kesejahteraan bersama. Program PkM di Desa Simo Angin-Angin diikuti oleh 22 peserta, terdiri dari kader kesehatan dan masyarakat umum. Pelaksanaannya terbagi menjadi 2 tahap, yakni penyuluhan mengenai tanaman herbal Jinten Hitam dan pelatihan mengenai tata cara hidroponik secara vertikal, serta pemanfaatan botol plastik dengan sistem Wick. Hasil evaluasi menunjukkan

pemahaman peserta sangat baik, dengan 95% dari mereka mencapai skor 100, sementara 5% memperoleh skor 80. Hasil evaluasi kepuasan peserta terhadap pelaksanaan penyuluhan menunjukkan nilai sangat baik untuk topik materi dan penyampaian materi oleh narasumber edukasi tanaman herbal dan pelatihan hidroponik. Kegiatan PkM ini memberikan ketrampilan bagi masyarakat untuk bercocok tanama di lahan sempit dengan menggunakan system hidroponik.

**Kata kunci:** hidroponik, jinten hitem, tanaman herbal

## INTRODUCTION

Simo Angin-Angin Village, located in Wonoayu District, Sidoarjo Regency, East Java Province, has an area of 147.39 hectares. This village consists of 4 hamlets, 4 RWs, and 13 RTs, with a population of 3,117 people, consisting of 1,444 men and 1,673 women (Source: Sidoarjo Regency Central Statistics Agency, 2018). The majority of Simo Angin-Angin village residents seek their main livelihood as private workers (40%), while farmers and farm laborers account for 31% of the population (Badan Pusat Statistik Kabupaten Sidoarjo, 2018; Erayanti et al, 2022).

Angin village still tends to pay less attention to health prevention. This village only has one community health centre as the main health facility, indicating that the availability of health facilities is still limited. Therefore, a health empowerment program is needed through health promotion and prevention activities. This Community Empowerment Program aims to take a preventive approach. In this program, a series of activities will be carried out, from counselling about the use of natural materials based on the Koran's recommendations, considering that most Simo Angin-Angin village residents are Muslim, to training on hydroponic farming. The aim is to strengthen the health independence of the Simo Angin-Angin village community, hoping to improve collective welfare. The problem partners face is the lack of public knowledge about disease prevention, exacerbated by the limited availability of health facilities outside the community health centre. Apart from that, residents are also less familiar with the concept of hydroponic farming. Therefore, this program will focus on education about herbal plants recommended in the Koran and training in simple hydroponic farming, with the hope that people can become more productive and achieve the desired independence.

## GENERAL DESCRIPTION OF THE COMMUNITY, PROBLEMS AND TARGET SOLUTIONS

### General description

The application of science and technology to the community in this PkM activity takes the form of counselling on herbal plants recommended by Islam and is followed by training in simple hydroponic farming along with the vertical hydroponic installation process. This activity was motivated by low awareness regarding disease prevention, followed by low knowledge regarding the use of natural ingredients for prevention as well as public ignorance regarding hydroponic farming.

Table 1. Target description

Name of target	Characteristics of target	Amount	General problems or targets
Non-Economic target	Health Cadre	12	Health Sector,
	Public	10	Public

### Problem

The problem faced by partners is the lack of public knowledge in preventing disease, which is supported by the lack of health facilities other than community health centers. Apart from that, people still don't know how to cultivate hydroponics, so it is hoped that educational activities

related to herbal plants recommended in the Al-Quran and training on simple planting using hydroponics can be carried out so that people can be more productive. and achieve health independence.

Tabel 2 Problem and solution

No	Problem	solution	Indicators of goal
1	Health: Preventing Disease	Knowledge transfer Mentoring empowerment	Increase skor knowledge

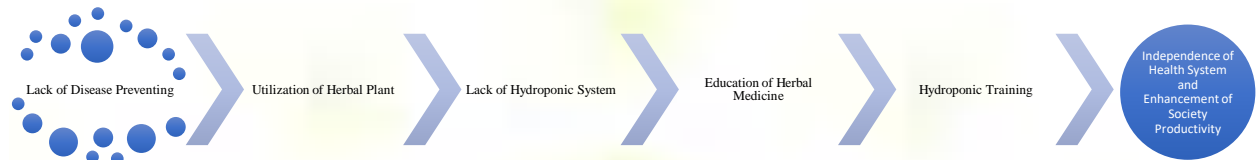


Figure 3: Flow of of innovation

### Target solution

Based on the problems, the target solution is to develop vertical and wick hydroponic in limited area through an empowerment approach

### METHOD

The method that will be applied in this community service activity is explained as follows: The Community Service activity with the title "Empowering the community of Simo Angin-Angin Village, Sidoarjo through a program for utilizing natural materials to achieve health independence" was carried out at the Simo Angin-Angin Village Hall, Krian District, Sidoarjo Regency trough an empowerment approach by *Forum Group Discussion* and training to develop vertical and wick hydroponic in limited area.

### RESULTS AND DISCUSSION

The application of science and technology for the community in this Community Service activity takes the form of counselling on herbal plants recommended by Islam and is followed by training in simple hydroponic farming along with the vertical hydroponic installation process. This activity is based on awareness regarding low disease prevention, followed by knowledge regarding the use of natural ingredients such as black cumin which has various benefits for health which is still quite low and public ignorance regarding hydroponic farming. This activity was attended by 22 Health cadres and the general public. The implementation was carried out in 2 stages, namely education regarding the Black Cumin herbal plant by distributing pamphlets. The use of therapy using natural products has experienced a significant increase in the last few decades as an alternative to treat various pathological conditions. This is preferable to using synthetic drugs due to safety concerns, efficiency of use, and difficulty of use. *Nigella sativa*, better known as black cumin, is a plant that originates from the Mediterranean region and has been exported to various parts of the world. Many biological benefits have been discovered from plant extracts *N. sativa*, including anti-inflammatory properties, antioxidants, and significant neuroprotective effects (Widjaja, 2020). Additionally, black cumin, also known as black seed has been mentioned in the Koran. In a hadith narrated by Bukhari and Muslim, it is stated that "In black cumin there is a cure for various types of diseases, except death." Apart from that, the Koran also states that black cumin has benefits for body health. Some of the benefits of black cumin described in the Koran and Hadith include its ability to treat rheumatism, regulate blood sugar levels, act as an anti-inflammatory agent, have antibacterial properties, and support the

improvement of sperm quality (Marlinda, 2015). In this activity, the participants were enthusiastic, because information regarding the use of black cumin was still unknown to the public, so this activity was able to inform the people of Simo Angin-Angin village about the role of the black cumin herbal plant for health. In the next stage, training was carried out on vertical hydroponic procedures and the use of plastic bottles with the Wick system. The results of the participants' comprehension scores were 95% reaching 100, while 5% reached 80 which can be observed in Figure 4.

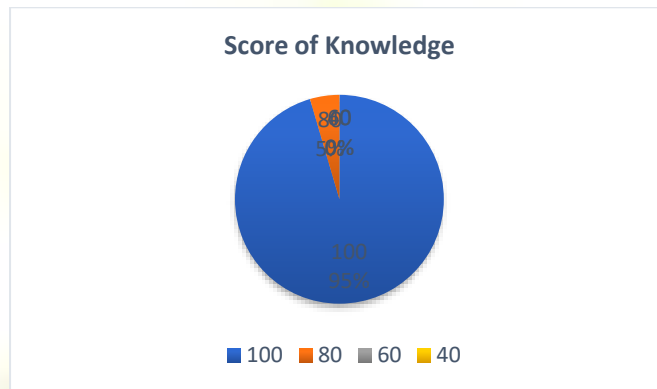


Figure 4. Results of evaluating material understanding

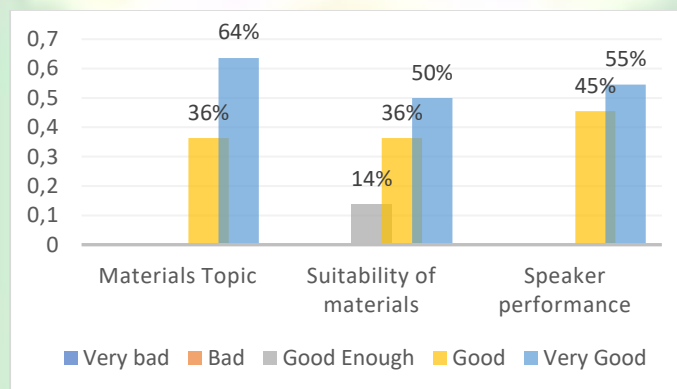


Figure 5 . Evaluation results of the implementation of educational activities on the herbal plant "Black Cumin" recommended by Islam

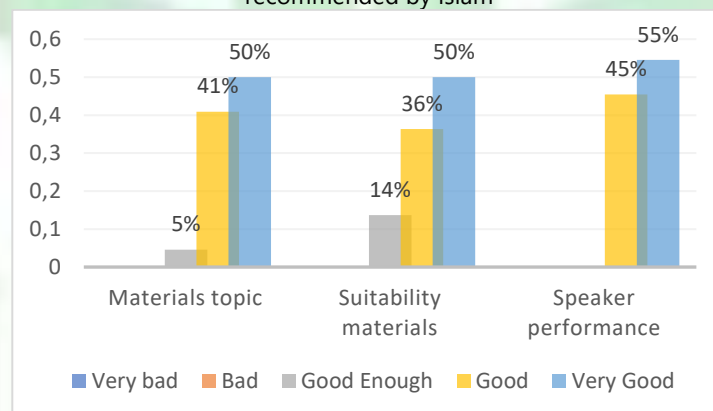


Figure 6 . Evaluation of the implementation of hydroponic farming training

Based on the evaluation results, participants satisfaction with the implementation of the counselling received very good marks for the material topic and delivery of the material. However, there were 14% adequate assessments regarding the suitability of the material. Meanwhile, for the evaluation of the training implementation, there was a very good score for the delivery of the material, both for the suitability of the material and the topic of the material. However, there were 14% adequate assessments regarding the suitability of the material and 5% adequate assessments

for the material topic. The emergence of hydroponic planting techniques began with increasing human awareness about the importance of providing proper nutrition to plants. Plant growth can be optimal if they receive the required nutrients in sufficient quantities. In hydroponics, the function of soil as a growth medium is replaced by artificial nutrients, and water acts as a nutrient solvent that plants can absorb directly. This concept is the basis for developing hydroponic growing techniques that provide plants with optimal nutrients (Waluyo et al., 2021). Hydroponics is an agricultural system that does not use soil as the main growing medium but relies on alternative media such as pumice, gravel, sand, coconut fibre, pieces of wood, or foam. This approach was taken because the role of soil in supporting plant roots and delivering nutrients can be replaced by providing nutrients, water and oxygen through this medium (Roidah, 2022). Based on the evaluation results show that residents are very enthusiastic about doing hydroponics, especially using vertical ones without requiring a large area of land. This sparked awareness among the community, especially Simo Angin-Angin village health cadres, to implement hydroponics, which was previously unavailable in the village.

## **CONCLUSIONS AND SUGGESTIONS**

The implementation of Community Service activities in Simo Angin-Angin village was attended by 22 Health cadres and the general public. The implementation was carried out in 2 stages, namely counselling regarding the Black Cumin herbal plant and training on vertical hydroponic procedures, as well as the use of plastic bottles with the Wick system. The results of the comprehension scores were considered very good with 95% reaching 100, while 5% reached 80. Based on the evaluation results, participants satisfaction with the implementation of the counselling received very good marks for the material topic and delivery of the material. Meanwhile, for the evaluation of the training implementation, there was a very good score for the delivery of the material, both for the suitability of the material and the topic of the material. It is expected that the activities are carried out continuously so that the results obtained can be maximized.

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