

## HYDROPONIC CULTIVATION TOWARDS ORGANIC PRODUCT ENTREPRENEURSHIP IN SOUTH MERUYA

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### ABSTRACT

The population of South Meruya are urban settlements characterised by restricted space, low levels of financial literacy, and a lack of business understanding. The PKK's housewives who are actively involved, their business consciousness, and the increasing demand for hydroponic products present potential opportunities. Therefore, this plan enables the residents of South Meruya to acquire knowledge about hydroponics, provide sustenance for their families, and generate income by selling their produce. The purpose of community empowerment through hydroponic vegetable farming is to enable skilled growers to achieve greater self-sufficiency and address challenges related to food, nutrition, and welfare. This activity aimed at empowering partner communities in South Meruya. Lecturers and students work together to enable these communities to cultivate hydroponic vegetables for their own consumption and to establish hydroponic businesses, promoting economic self-sufficiency. This collaborative initiative demonstrates that the training programme effectively addresses community issues, enhances community well-being, and enhances the productivity of hydroponic horticulture, so contributing to increased community revenue. The majority of participants found the materials and practises utilised during the implementation process to be beneficial in enhancing scientific knowledge and teaching the community about hydroponic agriculture. This positive experience has motivated them to consider engaging in similar activities in the future, with the ultimate goal of attaining food security and economic self-sufficiency for South Meruya.

**Keywords:** hydroponics, product selling price, food security, economic independence

### 1. INTRODUCTION

According to the Law Number 26 of 2007 about Spatial Planning, a minimum of 30% of the urban area must be designated as green open space, with 20% allocated for public recreational, tourism, and health (RTH) purposes, and 10% reserved for private RTH. The city's ecosystems will remain in equilibrium as long as a minimum of 30% of the area is allocated for recreational purposes. This encompasses the equilibrium of hydrological systems, microclimate systems, and other ecological systems. This initiative aims to enhance air quality and improve the aesthetic appeal of the city, thereby benefiting the community.

Previous research has examined the correlation between unplanned development and the proliferation of urban villages due to the insufficient availability of green areas within cities. The absence of sufficient public space and the narrowness of the road necessitate community action to expand the road that runs alongside the river. The strategic location significantly influences the utilisation of open spaces or corridors (Darmawan & Budi Utami, 2018).

In addition to the problem of limited open land, urban areas also face environmental problems in the form of air pollution, and low food security. Despite regulations on environmental openness, agriculture and consumption are still problems. Another environmental problem is waste pollution and pollution that hampers the agricultural sector in urban areas (Suhardjanto, Ashardianti & Setiany, 2018).

An earlier study in Lyon, France underlined that the food supply of European cities depends on the global food supply system. However, the economic crisis, and the effects of climate change are risks to the stability of the food chain. Urban agriculture increases urban self-sufficiency and resilience and is able to provide positive environmental and social benefits. However, its success depends on several variables, including the type of urban farm and the geographical layout of the city. The results show that hydroponic farming performs better than cultivation in greenhouse heat conditions, and is similar to conventional open field farming (Romeo, Blikra Veja & Thomsen, 2018).

Other research discusses the advancement of innovative agricultural science and technology. The continued intensification of urban agriculture could lead to the Second Green Revolution, which aims to meet current and future food needs. Various scales of urban agriculture have the potential to contribute to global food security by supporting local food supplies, strengthening food value chains, and implementing more sustainable practices than conventional agriculture. Further comprehensive urban agricultural life cycle assessments are needed, especially in developing countries, to prevent increased environmental burdens and to balance people, planet, and profit interests (Armanda, Guinée & Tukker, 2019).

As an urban area, the RTH area of West Jakarta is 0.02241 km<sup>2</sup> or only about 0.02% of the area of West Jakarta ([www.menlhk.go.id](http://www.menlhk.go.id)). This number is still far from ideal so it is hoped that the community can play an active role in helping the government in realizing this condition by adding greening land independently.

South Meruya is a kelurahan that has the second smallest area compared to other kelurahan in Kembangan District, West Jakarta (2.80 km<sup>2</sup>) with a population of 34,361 people and is dominated by residential zones and several mixed zones and public and social service zones. The development of public areas in this kelurahan is very low compared to other kelurahan.

The South Meruya area is a densely populated area with conditions in each house where green open space is very rare. This is because the area is included in a commercial area located in the administrative city center of West Jakarta so that greening for the community is not a priority. With the condition of the city of Jakarta which is densely populated and the air has been polluted by pollution, greening is needed. Greening has a very important function in an effort to reduce the increase in greenhouse gases that are the main cause of global warming and climate change.

Crisis conditions due to the COVID-19 pandemic are experienced by all households, including households in urban buffer areas such as in South Meruya, Kembangan District, West Jakarta. The decline in household income needs to be substituted through efforts to create other sources of income. This effort is important so that people affected by the COVID-19 pandemic crisis can find new sources of income that can support the family economy.

Based on this background, the Community Service Team of Universitas Mercu Buana carried out Community Service grant activities funded by the Ministry of Education and Culture and Technology through the Community-Based Empowerment Program. The activity was carried out after seeing the problems that existed in the activity partner area.

## **2. METHOD**

The Community Empowerment Program activity by the Community Service Team of Mercu Buana University is carried out in 4 stages, including:

1. Initial stages; This stage begins with the formation of a team, the implementation of site surveys and information about community problems submitted by South Meruya partners, PKK and RPTRA administrators which is then continued with socialization to the people of South Meruya as prospective training participants.
2. Implementation stage; At this stage, two training sessions were carried out, in the first training participants received material on techniques for designing and making hydroponic media and techniques for growing hydroponic vegetables simply. For the technique of designing and making hydroponic media, it is directly practiced by providing materials to make the following planting media with hydroponic vegetable seeds to be assembled and planted by representatives of South Meruya. In the second session of training, participants received material on packaging techniques and marketing for hydroponic products. In this session, participants also received material on cost calculation and determination of selling prices for hydroponic products.
3. Harvest and Post-Harvest Stages; Vegetable plants that are ready to harvest are harvested and packaged with plastic packaging with brand designs for a more representative appearance. After harvesting, the calculation of the cost and selling price of hydroponic products is carried out.
4. Evaluation stage; This evaluation stage is carried out after all the entire series of stages are undertaken, this evaluation needs to be done so that the next activity becomes better. This activity is expected to be carried out continuously with non-governmental funds. One of the evaluations was carried out by giving questionnaire forms to the participants.

## **3. RESULTS AND DISCUSSION**

Community service activities for this Community-Based Empowerment program are carried out offline, namely: (1) Material Delivery; (2) The practice of the hiroponics method starting from the design and assembly of hydroponic tools, seeding seedlings to harvesting hydroponic vegetables and calculating the cost and selling price of products.

Training activities and direct practice of hydroponics are divided into 2 sessions and carried out offline.

Training Session 1 will be held at the RPTRA Hall Room of South Meruya Tower on Friday, July 28, 2023 from 09.00-11.30. The event was attended by South Meruya Head Mr. M. Ghufri Fatchani and his staff, S.M. as South Meruya Head and Mr. Dafit Feriyanto, M. Eng., Ph.D. as Head of LPPM Mercu Buana University, Mrs. Dr. Erna Setiany, SE., M.Si. as the head of the Community Service Activity Team along with all team members, and students. The implementation began with the opening and provision of material by resource persons from the UMB Community Service Team, hydroponic activity actors in South Meruya and hydroponic business actors, then continued with direct

practice of hydroponic methods with tools and materials that have been provided by the community service activity team. The number of participants in this activity was 30 PKK women from South Meruya.

Located at RPTRA Menara, South Meruya on Friday, August 25, 2023 from 09.00-11.00. The event was attended by South Meruya Subdistrict, Mr. M. Ghufri Fatchani, SM. and Mr. Dafit Feriyanto, M. Eng., Ph.D. as Head of LPPM Universitas Mercu Buana, Mrs. Dr. Erna Setiany, SE., M.Si. as the leader of the Community Service Activity Team along with all team members, and students. The implementation began with the opening and provision of material on Packaging and Marketing as well as the Calculation of Costs and Selling Prices of Hydroponic Products. The number of participants in this activity was 30 residents of PKK South Meruya.



Figure 1. Training Flyer Session 1



Figure 2. Training Flyer Session 2



Figure 3 & 4. Resource Persons and Training Participants Sessions 1 and 2





Figure 5. Harvesting Hydroponic Pakcoy in Green Alley and Packaging Practices



Figure 6. Pakcoy Hydroponic Product Packaging

### Results of Activity Evaluation

The results of the activity evaluation can be described as follows:

Table 1. Participant Satisfaction Survey

No.	Description	Totally agree	agree	Disagree	Strongly disagree
1.	The expertise of the UMB PKM Team can solve several community problems	0,467	0,533	0	0
2.	The UMB PKM team utilizes a faster and easier way	0,4	0,6	0	0
3.	Training is very useful in developing community science	0,633	0,367	0	0
4.	The material provided is very useful as learning material for the community	0,7	0,3	0	0
5.	The training provided can have the opportunity to increase community income	0,467	0,533	0	0
6.	The training provided can increase public knowledge	0,633	0,367	0	0
7.	The training provided can improve the results of community products	0,4	0,6	0	0
8.	The training provided gave encouragement to do it in the future for the community	0,533	0,467	0	0
9.	The training provided can improve the quality of society	0,467	0,533	0	0

10.	The collaboration carried out with the UMB PKM Team is beneficial for the community	0,633	0,367	0	0
11.	The collaboration carried out with the UMB PKM Team met the cooperation target	0,333	0,667	0	0

Based on the table above, it can be illustrated that:

1. The training provided is useful in solving several problems in the community and improving the quality of society.
2. Most participants felt that the material and practices carried out during the implementation were very useful in improving and developing science and as learning materials for the community in doing hydroponic cultivation, so that it would increase the enthusiasm of participants to practice it again in the future in order to realize food security and economic independence of the people of South Meruya.

While evaluating the harvest, the team gave awards for the efforts of the South Meruya PKK Team according to the village secretary along with the PKK team. South Meruya, who was also present at the harvest time, expressed his pleasure with the yield of the harvest which can be seen from the quality of fertile and good vegetables. This shows the quality of hydroponic management that is well maintained and quality above average<sup>2</sup> in general.

#### 4. CONCLUSION

The people of South Meruya currently have characteristics as urban communities who face limited space problems, are not familiar with business concepts and opportunities in the field of hydroponics and the fulfillment of food needs for families, as well as limited financial literacy.

The results of this community partnership empowerment activity show that the training provided is useful in solving several problems in the community, improving the quality of the community so that it can increase the yield of hydroponic cultivation products that have the opportunity to increase community income. Most participants felt that the material and practices carried out during the implementation were very useful in improving and developing science and as learning materials for the community in doing hydroponic cultivation, so that it would increase the enthusiasm of participants to practice it again in the future in order to realize food security and economic independence of the people of South Meruya.

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