

How to cite: Regita Cahyani, M., Zulpahmi, Ulza, E., Setiawan, E. & Pudji Rahayu, D. (2024). Community Economic Improvement with Assistance in Organic Plant Cultivation through Aquaponic System Around Banhuysiet School Krabi Thailand. *World conference on future innovations and sustainable solutions*. Futurity Research Publishing. <https://doi.org/10.5281/zenodo.14074798>

Community Economic Improvement with Assistance in Organic Plant Cultivation through Aquaponic System Around Banhuysiet School Krabi Thailand

Meti Regita Cahyani ¹, Zulpahmi ^{2*}, Emaridial Ulza ³, Edi Setiawan ⁴, Dewi Pudji Rahayu ⁵

¹ Department of Accounting, Universitas Muhammadiyah Prof. DR. HAMKA, Jakarta, Indonesia
regitameti@gmail.com, <https://orcid.org/0009-0006-9351-4765>

² Department of Islamic economics, Universitas Muhammadiyah Prof. DR. HAMKA, Jakarta, Indonesia
zulpahmi@uhamka.ac.id, <https://orcid.org/0000-0003-0620-746X>

³ Department of Management, Universitas Muhammadiyah Prof. DR. HAMKA, Jakarta, Indonesia
emaridialulza@uhamka.ac.id, <https://orcid.org/0000-0003-3293-3617>

⁴ Department of Management, Universitas Muhammadiyah Prof. DR. HAMKA, Jakarta, Indonesia
edisetiawan@uhamka.ac.id, <https://orcid.org/0009-0000-9091-6837>

⁵ Department of Taxation, Universitas Muhammadiyah Prof. DR. HAMKA, Jakarta, Indonesia
dewirahayu@uhamka.ac.id, <https://orcid.org/0000-0002-4270-1900>

Accepted: October 19, 2024 | **Published:** November 1, 2024 | **Language:** English

Abstract: This research aims to improve the economy of the community around Banhuaysiet School, Krabi, Thailand, through mentoring organic plant cultivation using an aquaponic system. The aquaponics method was chosen because it is a sustainable system that combines fish and plant farming in one ecosystem, making efficient use of land and water resources. The mentoring program was carried out by training and direct application of the aquaponic system to the local community. The results of this program show that the aquaponic method can increase the yield of organic crops and provide an additional source of income for the community. Thus, organic crop cultivation through



aquaponics has the potential to be an alternative solution in improving the economic welfare of the community in the area.

Keywords: economic, aquaponic system, training.

Introduction

In recent years, awareness of the importance of organic farming has increased along with the growing demand for healthy and environmentally friendly food products. One method that is considered effective in organic farming is the aquaponic system (Diatin et al., 2021), which combines plant cultivation and fish rearing techniques in one integrated ecosystem (Asciuto et al., 2019). This system not only produces organic crops, but can also be a solution for communities to develop local economies through reduced production costs and increased yields of healthier, high-value crops (Estim et al., 2019).

Krabi, Thailand, is one of the areas with great potential for aquaponic farming, especially around Banhuaysiet School. Many communities around this area still rely on conventional farming methods (Cammies et al., 2021), which are often environmentally unfriendly and require high production costs (Francisco et al., 2024). Traditional farming systems are also vulnerable to climate change and environmental degradation, which can threaten food security and the economic well-being of the community (König et al., 2018). Therefore, the application of aquaponic farming could be a promising alternative in facing these challenges (Fang et al., 2017).

The mentoring of organic crop cultivation through the aquaponic system aims to improve the skills and knowledge of the community in managing sustainable agriculture (Paksi et al., 2022). With the assistance, the community around Banhuaysiet School is expected to not only be able to understand aquaponic techniques (Farida et al., 2024), but also apply them effectively in their daily lives (Nugraha et al., 2024). In addition, this mentoring provides support so that they can maximize their production and make it a source of additional income.

Improving the community's economy through aquaponic systems is not only about increasing crop yields, but also expanding business opportunities in other sectors, such as marketing organic products and developing local tourism based on ecotourism (Naflah Azmi Nur Aisyah et al., 2023). The organic products produced can be a special attraction for tourists who are interested in healthy and environmentally friendly products, thus opening up new economic opportunities in the tourism sector.

Through this research, it is expected to identify the impact of aquaponic cultivation assistance on the economic improvement of the community around Banhuaysiet School, Krabi. The results of this study are also expected to be a reference for the government (Ghofur et al., 2021), educational institutions and the wider community in implementing aquaponic systems as a solution for food security and economic improvement based on sustainable agriculture (Zulfanita et al., 2021).

Research Methods

This research method uses a qualitative approach with a participatory method. This approach involves collecting data directly in the field through observation, in-depth interviews, and documentation during the mentoring process of organic crop cultivation through the aquaponic system[14]. The research subjects are 20 communities around Banhuaysiet School, Krabi, Thailand, who will participate in this mentoring activity. The researcher acts as a facilitator, assisting the community in applying aquaponic cultivation techniques and monitoring their economic development after the assistance is carried out. Data analysis was conducted by reducing data, grouping information based on main themes, and drawing conclusions related to the impact of the aquaponic system on improving the economy of the local community[15]. This participatory approach is expected to provide a deeper understanding of the benefits of mentoring and the potential sustainability of aquaponic systems for community economic development.

Research Results

Educational Assistance for Organic Plant Cultivation through Sociopreneur in the community around Banhuaysiet school received a positive response from the surrounding community. This activity can run well because of the support and cooperation between the implementing team who coordinate with each other to prepare everything needed.

Figure 1

Introduction



The activity began on December 19, 2022, which began with a welcome speech then continued to introduce themselves in order to adapt to the community at Banhuaysiet School. After that, it was continued by starting this organic plant cultivation education by explaining the types of organic plants, the benefits of organic vegetables and planting techniques with aquaponic media and the correct technique for harvesting organic plants, along with socialization about healthy and good food for children's growth and how to technically grow organic plants using an aquaponic system.

Figure 2

Organic crop planting



Not only that, the international work study team participated in camping activities which are held every year towards the end of the year. In this activity I participated in carrying out the camp at Banhuaysiet school for 3 days and 2 nights, in order to train students to have a spirit of leadership and independence and learn with a natural atmosphere.

Figure 3

Organic crop planting site



After one month of activities, the community around Banhuaysiet School has the ability to practice hydroponic mushroom cultivation and understand the importance of organic vegetables. This activity also has a positive impact on school students and the surrounding community.



Despite the various obstacles experienced during the implementation of the assistance, this activity was finally able to fulfill the initial goal of providing education on organic plant cultivation and English as an effort to provide knowledge and train the sociopreneur spirit in students at Banhuaysiet school.

Conclusions

The mentoring program for organic crop cultivation using the aquaponic system around Banhuaysiet School, Krabi, Thailand, has shown positive results in improving the economy of the local community. With this assistance, the community can apply aquaponic techniques independently, increase organic crop yields, and earn additional income. In addition, this activity also encourages the creation of new business opportunities and the potential for ecotourism development based on organic products. It can be concluded that aquaponic systems not only provide solutions for environmentally friendly food security but also strengthen the economic welfare of the community in a sustainable manner.

References

- Asciuto, A., Schimmenti, E., Cottone, C., & Borsellino, V. (2019). A financial feasibility study of an aquaponic system in a Mediterranean urban context. *Urban Forestry and Urban Greening*, 38(January), 397–402. <https://doi.org/10.1016/j.ufug.2019.02.001>
- Cammies, C., Mytton, D., & Crichton, R. (2021). Exploring economic and legal barriers to commercial aquaponics in the EU through the lens of the UK and policy proposals to address them. *Aquaculture International*, 29(3), 1245–1263. <https://doi.org/10.1007/s10499-021-00690-w>
- Diatin, I., Shafruddin, D., Hude, N., Sholihah, M., & Mutsmir, I. (2021). Production performance and financial feasibility analysis of farming catfish (*Clarias gariepinus*) utilizing water exchange system, aquaponic, and biofloc technology. *Journal of the Saudi Society of Agricultural Sciences*, 20(5), 344–351. <https://doi.org/10.1016/j.jssas.2021.04.001>
- Estim, A., Saufie, S., & Mustafa, S. (2019). Water quality remediation using aquaponics sub-systems as biological and mechanical filters in aquaculture. *Journal of Water Process Engineering*, 30(October 2016). <https://doi.org/10.1016/j.jwpe.2018.02.001>
- Fang, Y., Hu, Z., Zou, Y., Fan, J., Wang, Q., & Zhu, Z. (2017). Increasing economic and environmental benefits of media-based aquaponics through optimizing aeration pattern. *Journal of Cleaner Production*, 162, 1111–1117. <https://doi.org/10.1016/j.jclepro.2017.06.158>
- Farida, I., Eduard, T., Sinar, A., Yani, D. E., Huda, N., Sigit, A., & Terbuka, U. (2024). MELALUI SISTEM AKUAPONIK PADA KELOMPOK KARANG TARUNA Idha Farida *, Tengku Eduard Azwar Sinar , Diarsi Eka Yani , Nurul Huda , Argadatta Sigit kegiatan pertanian terpadu antara bidang pertanian dan perikanan dengan menggunakan metode terbatas , selain itu. *Diseminasi: Jurnal Pengabdian Kepada Masyarakat*, 6(1), 15–24.
- Francisco, E. C., Freato, T. A., Piolli, A. L., & Poz, M. E. S. D. (2024). Analysis of the Aquaponic System Sustainability via System Dynamics Modelling - FEW Nexus Approach. *Circular Economy and Sustainability*, 0123456789. <https://doi.org/10.1007/s43615-024-00408-z>
- Ghofur, M., Rizki, N., & Sugihartono, M. (2021). INTEGRASI BUDIDAYA IKAN PATIN (*Pangasius hypophthalmus*) DAN TANAMAN AIR PADA PEMELIHARAAN SISTEM AKUAPONIK. *Jurnal Akuakultur*



Sungai Dan Danau, 6(1), 1. <https://doi.org/10.33087/akuakultur.v6i1.86>

Hariato, E., & Budiardi, T. (2021). Kinerja Produksi Ikan Lele (*Clarias gariepinus* sp) dengan Ukuran Tebar Berbeda Pada Sistem Akuaponik. *Jurnal Akuakultur Sungai Dan Danau*, 6(2), 50. <https://doi.org/10.33087/akuakultur.v6i2.117>

König, B., Janker, J., Reinhardt, T., Villarroel, M., & Junge, R. (2018). Analysis of aquaponics as an emerging technological innovation system. *Journal of Cleaner Production*, 180, 232-243. <https://doi.org/10.1016/j.jclepro.2018.01.037>

Naflah Azmi Nur Aisyah, Anjelina Sugianti, Habib Zainal Muhtarom, Daniel Putra Prastyawan, & Muhammad Thoriq Ardiazza. (2023). Implementasi INVOPER (Inovasi Pertanian) dengan Sistem Aquaponik sebagai Teknologi Tepat Guna dalam Budidaya Lele. *NUSANTARA Jurnal Pengabdian Kepada Masyarakat*, 3(3), 161-168. <https://doi.org/10.55606/nusantara.v3i3.1471>

Nugraha, A. P., Nuraeni, D., Alifan, M. F., Ramdan, N. A., Fitriyani, N., & Pramita, S. A. (2024). Pembibitan Ikan Nila Dan Tanaman Pakcoy Dengan Sistem Akuaponik Di Desa Leles Kecamatan Leles Kabupaten Garut. 1(12), 2199-2204.

Paksi, A. K., Setyorini, F. A., & Tiara, A. (2022). Pelatihan Budidaya Sayuran Organik Secara Aquaponik Pada Peternak Lele di Desa Muntuk, Kabupaten Bantul. *Jurnal Abdimas BSI: Jurnal Pengabdian Kepada Masyarakat*, 5(2), 231-244. <https://doi.org/10.31294/jabdimas.v5i2.12683>

Ulfah, I. K., Prasetyo, M. A., & Maulana, R. I. (2022). Pelatihan Teknologi Akuaponik Dengan Sistem Budikdamber Sebagai Upaya Menumbuhkan Minat Budi Daya Pada Remaja. *Jurnal Pengabdian Masyarakat*, 3(2), 291-302. <https://doi.org/10.32815/jpm.v3i2.1099>

Zulfanita, Z., E.M, R., Rinawidiastuti, R., Iskandar, F., & Setiawan, B. (2021). Gelar Teknologi Akuaponik Tanaman Sayuran Dan Budidaya Lele Dalam Ember Di Desa Butuh, Kecamatan Butuh, Purworejo. *SELAPARANG Jurnal Pengabdian Masyarakat Berkemajuan*, 4(2), 340. <https://doi.org/10.31764/jpmb.v4i2.4356>