

BUDIDALON (Fish Cultivation in Gallons)

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Abstract: *The Impactful Real Lecture Program (KUKERTA) of the University of Riau Building Villages in 2026 implemented a community empowerment activity in Olak Village through the introduction and demonstration of BUDIDALON (Fish Cultivation in Gallons). The activity aimed to introduce a simple, cost-effective, and environmentally friendly cultivation system that combines catfish cultivation with hydroponic water spinach using used gallon containers. The activity was conducted on July 11, 2026, at Pondokan RT 1 RK 3, Olak Village, through theoretical socialization, technical demonstrations, maintenance training, and interactive discussions. Participants demonstrated engagement and understanding during the discussion and were able to follow the demonstration of gallon preparation, media installation, fish stocking, plant planting, and maintenance. However, no quantitative pre-test or post-test assessment was conducted to measure changes in knowledge or skills. The activity introduced BUDIDALON as a potentially useful household-scale cultivation model for utilizing limited space and reusing used plastic containers. Further implementation with regular mentoring and measurable evaluation of fish growth, plant yields, water use, production costs, and household economic outcomes is needed to assess its sustainability and potential contribution to household food security.*

Introduction

Household food security is a crucial aspect in supporting community well-being, especially as productive land availability becomes increasingly limited and food demand continues to rise. This condition encourages the development of simple cultivation systems that can produce food while optimizing available household space. Aquaponics is one approach that integrates fish and plant cultivation into a single system, enabling the simultaneous production of animal and plant foods. This system has the potential to be implemented at the household level because it uses relatively simple technology and limited space. One related approach is Budikdamber, which utilizes containers for fish cultivation and can be combined with hydroponic plants to optimize the use of available resources (Abadi et al., 2022; Ash'ari et al., 2023).

Simple hydroponic technology is also relevant for households with limited productive land. Hydroponics enables vegetable cultivation without requiring extensive conventional agricultural land and can therefore be adapted to residential environments with limited space. Low-cost hydroponic systems have shown potential for small-scale vegetable production and food security, particularly in areas with

limited productive land (Mugisa et al., 2022; Wulandari et al., 2022). In Indonesia, the application of simple hydroponics through community empowerment can provide both cultivation knowledge and practical experience for household food production. For example, the application of simple hydroponics in Permata Baru Village was directed toward utilizing limited land and supporting the community's ability to meet family food needs (Susilawati et al., 2022).

However, the implementation of household-scale fish and plant cultivation still requires a system that is simple, affordable, easy to replicate, and compatible with available household resources. Community members need practical demonstrations of media preparation, fish stocking, plant planting, feeding, water management, and plant maintenance rather than theoretical explanations alone. Previous empowerment activities through Budikdamber have shown that the combination of materials and practical training can support community understanding and skills in fish cultivation on limited land (Abadi et al., 2022; Ulfah et al., 2022). In the context of the present activity, these considerations provide the basis for introducing BUDIDALON to the Olak Village community as a practical adaptation of small-scale integrated cultivation.

Another relevant issue is the utilization of used plastic containers as productive household resources. Plastic waste that is not properly managed can contribute to environmental problems because plastic is difficult to decompose and may pollute the environment. In Indonesia, plastic waste management remains an environmental challenge that requires community involvement through reduction, reuse, and sustainable management approaches (Kamaruddin et al., 2022; Sari et al., 2022). Therefore, the use of used gallon containers in BUDIDALON provides an alternative form of reuse by converting an available household container into a cultivation medium. Compared with conventional Budikdamber that generally uses buckets or similar containers, BUDIDALON adapts the cultivation concept to used gallon containers and combines fish cultivation with hydroponic water spinach in the same system. This modification emphasizes the use of readily available materials, simple construction, and suitability for household-scale cultivation in limited spaces.

Existing Budikdamber and aquaponic systems demonstrate the feasibility of combining fish and plant production within relatively simple cultivation systems. Community empowerment activities have reported the application of Budikdamber and aquaponics to support knowledge, understanding, and skills in utilizing limited land for food production (Ash'ari et al., 2023; Fransira et al., 2023). Nevertheless, there remains a need for contextual adaptations that use materials that are readily available to the community and can be demonstrated directly. BUDIDALON addresses this gap by adapting the basic principles of Budikdamber and aquaponics to used gallon containers. The use of gallon containers also provides a practical reuse option for household materials while maintaining the concept of integrated fish and plant cultivation in a compact system. Thus, the activity combines the aspects of limited-space cultivation, material reuse, and community empowerment without claiming that these outcomes have been quantitatively demonstrated through the activity.

Based on these considerations, this activity aims to introduce and demonstrate the construction and maintenance of BUDIDALON, integrating catfish cultivation with hydroponic water spinach using used gallon containers, to the Olak Village community. The activity focuses on providing a simple and practical household-scale cultivation model that can be adapted to limited spaces and readily available materials. The novelty lies in the contextual adaptation of Budikdamber and aquaponics through the use of used gallon containers and direct community training. Previous findings regarding cultivation training and demonstrations provide support for the use of practice-based empowerment approaches in introducing simple food production systems (Nugraheni et al., 2023; Fauzana et al., 2026).

Implementation Method

This socialization activity aims to provide understanding to the people of Olak Village regarding catfish cultivation in gallons (BUDIDALON) combined with hydroponic cultivation of water spinach as a practical, cost-effective and environmentally friendly cultivation alternative.

A. Time and Place of Implementation

- Day/Date : Saturday, July 11, 2026
- Time : 17:00-18:00 WIB
- Place : Pondokan RT 1 RK 3 Desa Olak
- Target : Olak Village Community

B. Steps for Making BUDIDALON

1. **Preparation and Drilling of Gallons:** Prepare a used gallon jug, make a hole in the top of the gallon using a soldering iron as an air circulation path and a place to place the plant container.
2. **Wick & Planting Media Installation:** Attach flannel cloth to the rice basket as a wick to distribute water and nutrients, then place rockwool in the basket.
3. **Arrangement and Distribution:** Put enough water into the gallon, sprinkle catfish seeds into the gallon, and plant kale seeds in the rockwool in the basket.
4. **Care Education:** Provides technical explanations regarding feeding, water quality monitoring, periodic water changes, and care of kale plants.

Results and Discussion

The socialization and practical program for cultivating catfish in gallons (BUDIDALON) was successfully implemented once during the KUKERTA period, on July 11, 2026, at the Olak Village Community Service Post. Participants from the Olak Village community showed high enthusiasm in participating in all activities.

The material presented included an in-depth introduction to the BUDIDALON concept, its benefits, the tools and materials used, and the manufacturing steps. In a hands-on demonstration session, participants were able to witness the entire assembly process, including seed sowing, firsthand. The session continued with an interactive discussion and Q&A session regarding manufacturing techniques, daily maintenance, and the potential for economic development in their homes.

Conclusion

BUDIDALON was successfully introduced and demonstrated as a potentially useful household-scale cultivation model that integrates catfish cultivation with hydroponic water spinach using used gallon containers in Olak Village. The activity provided participants with direct experience in preparing the cultivation media, stocking fish, planting water spinach, and maintaining the system. However, the activity was conducted only once for approximately one hour and did not include quantitative pre-test and post-test assessments or measurements of fish growth, plant productivity, sustainability, or long-term economic outcomes. Therefore, its effects on knowledge, practical skills, household food security, and plastic waste reduction cannot be established from this activity. Further activities should include regular mentoring and measurable evaluation of fish growth, harvest yields, water-use efficiency, production costs, and potential household economic benefits to assess the sustainability and broader application of BUDIDALON.

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