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and Nutrition Security



# Training on Integrated Rice–Freshwater Prawn and Polyculture in Homestead Ponds

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We also recognize the continued support and collaboration of national and regional partners, whose engagement ensures that the solutions developed are responsive to local needs, strengthen innovation systems, and contribute to building more resilient agrifood systems.

To learn more about CGIAR Scaling for Impact (S4I) program, please contact:

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## About CGIAR Scaling for Impact (S4I) program

Scaling for Impact (S4I) is a CGIAR program (2025–2030) that tests, refines, and scales innovations in food, land, and water systems. It works to align those innovations with stakeholder needs to achieve transformative impact.

Website: <https://www.cgiar.org/cgiar-research-portfolio-2025-2030/scaling-for-impact/>

## About CGIAR

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## Acronyms

AC - Agriculture Cooperative

AoW 2 - Area of Work 2

ASEAN - Association of Southeast Asian Nations

CGIAR - Consultative Group on International Agricultural Research

FiA - Fishery Administration

FiAC Fishery Administration Cantonment

M<sup>2</sup> - Square meter

MFL - Multifunctional Landscape

S4I - Scaling for Impact

## 1. Introduction

This training program is designed to strengthen the knowledge and skills of farmers and key stakeholders on rice–prawn and homestead pond aquaculture. It is organized under the *Scaling for Impact (S4I)* and Multifunctional Landscape (MFL) Programs, in coordination with other One CGIAR Initiatives.

Farmers and value-chain actors engaged in intensive monoculture rice production are increasingly seeking diversified options to enhance resilience and productivity. Integrating non-rice crops and aquaculture into existing rice-based systems offers promising opportunities to address the challenges posed by climate change. Through this training, participants will examine successful practices, identify constraints, and reflect on what has or has not worked in their own production systems.

Farmers participating in demonstrations of these technologies will receive support to strengthen their linkages with fisheries and aquaculture-related stakeholders across the value chain. This will help improve both production and market connectivity.

These training activities contribute to **Area of Work 2** of the S4I program, and **the Area of Work 1** of MFL is supported by the CGIAR Science Program as part of broader efforts to scale climate-resilient, sustainable farming innovations.

## 2. Objectives

The main purpose of the training was (1) To enhance participants' knowledge of family-based rice-prawn and homestead pond aquaculture. (2) Aimed to create an opportunity for **experience sharing** and **learning** between farmers and technical officers and experimental person, and (3) Promoting the adoption of improved post-harvest fish handling techniques. (4) Encouraged participants to begin formulating **integrated farming plan** that incorporates new skills and practices, with the broader goal of increasing aquaculture productivity, improving household nutrition, and boosting income.

## 3. The Training Event

Three training events on aquaculture techniques were organized at different venues in Prey Veng and Kampong Thom province where the target of WorldFish implementing program of ASEAN initiative, scaling for impact (S4I) and Multifunctional Landscape (MFL) to reach a broader participant and address various aspects of the sector. Each event focused on enhancing knowledge and skills related to sustainable aquaculture practices, fish farming techniques, and aquaculture post-harvest technologies.

## 4. Participants, Venue and Outcome

### 4.1 Event 1 – Venue: Kor Koh commune, Santuk district, Kampong Thom province

- **Key Topics Covered:** Rice seed selection with best practice and aquaculture farming practice.
- **Participants:** The total participants 30 with 12 female including local farmers, authorities, fisheries officers, and aquaculture enthusiasts.
- **Outcome:** Participants gained practical knowledge on improving aquaculture production based on rice-prawn and homestead pond system and maintaining healthy aquatic environments.

### 4.2 Event 2 – Venue: Theya commune, Ba Phnum district, Prey Veng province

- **Key Topics Covered:** Disease management, selective fingerling, integrated aquaculture systems, and aquaculture post-harvest.
- **Participants:** The total participants 19 (All participants are female) including experienced fish farmers, aquaculture entrepreneurs, and members of Agriculture Cooperative (AC).
- **Outcome:** Enhanced participants' capacity to implement sustainable and profitable aquaculture practices.

### 4.3 Event 3 – Venue: Prasat commune, Santuk district, Kampong Thom province

- **Key Topics Covered:** Homestead pond system preparation, seed and site selection, feed and feeding systems, water quality monitoring technologies, and aquaculture business development and market linkage.
- **Participants:** The total participants 14 with 10 female including fish farmers, aquaculture entrepreneurs, and members of Agriculture Cooperative (AC).
- **Outcome:** Participants learned how to integrate technology into aquaculture operations to increase productivity and efficiency.

## 5. Training Process and Result

### 5.1 Welcome remark by WorldFish's Project Manager

**Ms. OU Phichong**, Program Manager of WorldFish Cambodia and Lead for S4I-AoW-2, said that WorldFish has been working on several projects in Cambodia since 2005 to improve fish production, conservation efforts, and nutrition sensitivity. WorldFish has supported the Fisheries Administration in Cambodia for twenty years by implementing projects around the Tonle Sap, the upper Mekong, and the lower Mekong regions to enhance aquaculture and maintain capture fisheries.

This project works closely with communities and stakeholders in the agriculture sector, as well as local fish collectors, and supports the school meal program. In Kampong Thom province, S4I is in its transition phase, having piloted the school meal program in Santuk district across 26 primary schools, and is working to improve aquaculture production in the future.

### 5.2 Interesting remark by FiAC's representative

**Mr. Ngin Sok**, Deputy chief of the Fishery Administration Cantonment (FiAC) of Prey Veng, warmly welcomed participants and supporters. He reiterated the government's commitment to making aquaculture knowledge accessible at the community level. He encouraged farmers to think beyond subsistence fish raising and shift toward commercial production to meet market demands. He also noted the importance of engaging more men in fish production activities, highlighting that the current training was attended entirely by women.

### 5.3 Opening remark by FiA's representative

**Mr. Pel Samnang, Deputy Office, Department of Aquaculture Development.** It is my great pleasure to speak with you today about the promising opportunities for aquaculture development in Kampong Thom province. Our assessments and field observations show that Kampong Thom has strong potential for expanding aquaculture activities, particularly in rice–fish and rice–prawn farming, as well as in polyculture homestead pond systems. These models are well-suited to the local environment and can significantly enhance food production for household consumption. More importantly, they offer meaningful opportunities for families to increase their income and improve their livelihoods.

On behalf of the Department of Aquaculture Development, I would like to express my sincere gratitude to WorldFish Cambodia for its continued technical support and partnership. We also acknowledge the generous funding from the WorldFish and **Scaling for Impact (S4I)** initiative, which has enabled the implementation of these important activities in Kampong Thom province. Your commitment has brought valuable knowledge, innovation, and practical solutions to the communities we serve.

Looking ahead, we hope that WorldFish will consider expanding and scaling this program nationwide. The success we are beginning to see in Kampong Thom can serve as a model for other provinces across Cambodia, helping us strengthen food security, enhance rural livelihoods, and advance sustainable aquaculture throughout the country.

Once again, thank you to WorldFish Cambodia, S4I, our provincial teams, and all partners who have worked tirelessly to make this initiative possible. We look forward to continuing our collaboration for the benefit of our farmers and our nation.

## 6. Training Activities and Topics

### 6.1 The presentation on rice crop production

Mr. Chan Hok, Deputy Chief of the Agriculture Office for Natural Resources and Environment, delivered a presentation on key theories of rice crop production. His presentation focused on the essential technical applications required for successful rice cultivation, including paddy seed selection, land preparation, fertilizer application, direct seeding, weed and disease management, and effective water management.

## 6.2 The presentation on aquaculture production (Rice-prawn culture system)

Mr. Ouk Hak, Deputy Chief of the Fisheries Administration Cantonment, was assigned as the technical trainer. He delivered a briefing on the technical aspects of rice–prawn production. The key subjects introduced to participants included:

- Introduction to integrated farming systems: rice–prawn culture in rice fields and mixed-fish culture in homestead ponds.
- Site selection and preparation of aquaculture systems
- Species selection and appropriate stocking densities
- Feed types and feeding regimes
- Water quality monitoring and management
- Production planning for rice–prawn and fish culture
- Harvesting techniques and market linkages for fish and prawns
- Experience sharing from rice–prawn farmers

## 6.3 Share experience by rice-prawn farmer

Ms. Ngork Senghong demonstrated the key techniques used in her rice–prawn production system. These included selecting an appropriate site and preparing the system by digging a canal for water storage, establishing water inflow and outflow within the rice field, installing a fencing net, and setting up seed trays inside the canal. She also explained the proper use of agricultural lime, the process of composting using cow manure and liquid compost, and the importance of regular water monitoring. Additional practices covered stocking density management, appropriate feed and feeding methods, procedures for releasing post-larvae, and continuous water-quality monitoring.

Once the prawns reach marketable sizes, farmers can conduct partial harvests, collecting the larger prawns for sale or household consumption while allowing the remaining stock to continue growing.

Another aquaculture topic which focuses on polyculture systems for homestead ponds. was presented and led by FIAC's officer of Prey Veng. There are two species of walking catfish and pangasius which focus on essential techniques for **pond construction**, **pond management**, **fish selection**, **stocking density**, **feed and feeding** and **fish harvesting**. with the goal of enabling participants to independently implement and scale aquaculture activities in their communities.

### Key topics included:

- **Training rules and expectations:** Participants were encouraged to engage actively, ask relevant questions, and apply lessons in practice.
- **Site selection for ponds:** Trainers emphasized the importance of locating ponds near reliable water sources and away from potential chemical contamination. Integration with rice fields was encouraged for improved sustainability.
- **Pond design and construction:** Guidance was provided on standard pond sizes (Approximately 100 m<sup>2</sup>), ideal depth (1.5–2.5 meters), fencing, and use of excavated soil for embankments. Community-led construction with technical guidance was encouraged.
- **Pond preparation:** Both old and new pond management techniques were presented, including liming, fertilizing for plankton development, and water conditioning before stocking.
- **Fish species and stocking:** A wide range of local and introduced species were introduced, including Tilapia, Common Carp, Pangasius, and Walking Catfish. Stocking density and fry acclimatization procedures were demonstrated. Special care was given to species identification to avoid confusion during stocking.
- **Small-scale intensive systems:** Raising fish in **plastic tents or cement pools** was discussed, with a focus on water quality control, feed optimization, and stocking strategies for both monoculture and polyculture systems.
- **Feed and Feeding:** The different kinds of commercial feed and supplementary feed (homemade feed) depending on its cost and availability. The feed selected for aquaculture farming practice must be high in nutrients and protein for fish growth around 35% - 45% with protein contained.
- **Management practices:** Trainers shared key success factors such as water quality monitoring, preventing predator entry, proper feeding, and financial records.
- **Fish harvesting:** After raising the fish to meet market demand, the farmers can harvest partially the big fish for selling or for household consumption.

Throughout the training, participants shared positive reflections, highlighted their improved understanding of pond construction, water management, fingerling selection and shift in perspective from household-level to **market-oriented aquaculture**.

## 6.4 On-farm training activities

To properly prepare a rice–prawn system and maintain good water quality for prawns, the trainer demonstrated each step to the participants. This included building the necessary infrastructure, such as digging canals and installing protective fencing nets around the system to prevent predator entry. The trainer also provided hands-on instruction on preparing liquid compost, applying lime, and monitoring water quality using Aqua Test kits.

## 7. Conclusion and Recommendation

- **Opening Remarks:** Representatives from the government institute and the WorldFish Program Manager emphasized the importance of aquaculture development and highlighted the project's goals in enhancing aquaculture production and strengthening market linkages.
- **FiA National Representative:** The Fisheries Administration (FiA) representative underscored the strong potential for aquaculture expansion in Kampong Thom province and encouraged farmers to adopt improved practices to boost productivity and income.
- **Farmer Presentations:** Participating farmers shared the techniques they applied in the rice–prawn culture system, including system management, stocking methods, harvesting processes, and income outcomes.
- **Key Learnings Identified by Farmers:** Farmers highlighted several practical lessons gained from the training and field practice, including:
  - System preparation (canal digging, drying)
  - Application of agricultural lime
  - Seed selection
  - Predator protection
  - Appropriate stocking density
  - Regular water monitoring
- **Interest in Adopting Practices:** Two farmers expressed interest in applying rice–prawn culture practices, five farmers showed interest in polyculture systems, and eleven farmers indicated interest in adopting general aquaculture techniques.



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