

Supporting Small-scale Fisheries Value Chain: capacity-building on fish processing and trade in Nam Oon Dam, Sakon Nakhon Province, Thailand

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Under the project “Small-scale Fisheries Management for Better Livelihood and Fisheries Resources,” the Training Department of SEAFDEC (SEAFDEC/TD) conducted a series of capacity-building activities to support the Ban Dong Kham Pho Fish Processing Group in Nam Oon Dam, Sakon Nakhon Province, Thailand. The three main processed fishery products of the Group are fermented fish, fermented fish meat wrapped with banana leaves, and dried fish using the raw materials from inland capture fisheries. The members of the Ban Dong Kham Pho Fish Processing Group acquired equipment and skills in processing and packaging technology and improved their knowledge of marketing strategy. The Group now is being supported by the government under the One Tambon, One Product (OTOP) program for formal branding to promote their processed fishery products.

Small-scale fisheries play an important role in food security and nutrition. The small-scale fishing communities are commonly located in remote areas, earning low incomes, and tend to have limited access to markets. Along the value chain, the majority task of men is catching or harvesting fish while women are mostly engaged in post-harvest activities such as processing and marketing. Value chains of small-scale fisheries include all the activities from pre-harvesting to harvesting to consumption. This includes gear making; capture or harvesting; sorting, cleaning, and processing; transport, marketing, and selling; and finally, the consumption of fish and seafood. The activities are often manual, using low-cost technologies which are accessible to millions of people with limited assets but can use their skills to benefit from the livelihood opportunities available. However, small-scale fishers and fish workers need skills and tools to avoid food losses and waste along the value chain (FAO, 2022).

The FAO Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines) recognize the importance of value chains, post-harvest, and trade to improve the livelihood of the small-scale fishers by building the capacity of individuals, strengthening organizations, and empowering women; reducing post-harvest losses and adding value to small-scale fisheries production; and facilitating sustainable trade and equitable market access (FAO, 2015; Zelasney *et al.*, 2020). Moreover, the ASEAN-SEAFDEC Resolution on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2030 also considers the significance of developing fish and fishery products to support the fishing

community livelihood, as indicated in Resolution No. 22 “*Improve and exchange technologies, and enhance facilities to ensure that fish quality assurance and safety management systems are in place and operational, taking into account the importance of traditional fishery products and food security requirements, and promote the development of fishery products as supplementary livelihoods for fisheries communities*” (SEAFDEC, 2020).

In this connection, SEAFDEC Training Department (SEAFDEC/TD) is currently implementing the project “Small-scale Fisheries Management for Better Livelihood and Fisheries Resources” with support from the Japanese Trust Fund. The goal of the Project is to achieve sustainable management of small-scale fisheries for improving the livelihood and well-being of fishers in Southeast Asia. The pilot site of the Project was at Nam Oon Dam, Sakon Nakhon Province in the northeast part of Thailand (Figure 1). SEAFDEC/TD conducted a series of activities in November–December 2021 to support the small-scale fisheries value chain through the promotion of fish and fishery products from inland fisheries of the Ban Dong Kham Pho Fish Processing Group.



Figure 1. Location of Nam Oon Dam, Sakon Nakhon Province, Thailand (Source: Google maps)

Ban Dong Kham Pho Fish Processing Group

The Ban Dong Kham Pho community is situated close to the Nam Oon Dam. Most community members are engaged in agriculture and inland fisheries for livelihood and household consumption. Moreover, they also carry out household fish processing to preserve fish during the peak fishing season. In 2014, the Ban Dong Kham Pho Fish Processing Group was established under the poverty alleviation program of the Government of Thailand. In addition to fish processing, the Group also engages in other livelihood activities including microfinance and ecotourism. As of 2021, the Group is composed of 29 members.

The three main fishery products of the Group are fermented fish, fermented fish meat wrapped with banana leaves, and dried fish using the fish species caught from the Nam Oon Dam (**Figure 2**). The fermented fish called “pla som” uses common silver barb fermented with salt, garlic, and cooked rice. 2) The fermented fish meat wrapped with banana leaves called “pla som hor” uses the meat of featherback mixed with salt, garlic, and cooked rice and wrapped with banana leaves. The dried fish called “pla haeng” uses Siamese mud carp soaked in salt water and sun-dried on a sieve.



Figure 2. Main fishery products of the Ban Dong Kham Pho Fish Processing Group: fermented fish (*above-left*), fermented fish meat wrapped with banana leaves (*above-right*), and dried fish (*below*)

The focus group discussion was conducted with the members of the Ban Dong Kham Pho Fish Processing Group to obtain a deeper understanding of their fish processing activities as well as address the constraints in the processing and marketing of their processed fishery products. It was found that the Group produces its processed fishery products based on the availability of raw materials and orders from customers. Their products are sold directly to customers including government officers, teachers, and factory workers in Sakon Nakhon Province as well as delivered to customers in other provinces such as Bangkok and Chonburi Province by courier. However, the Group lacks processing and packaging technology and has limited knowledge of marketing strategy.

The economic analysis was carried out to assess the cost structure and profitability of processed fish products. The fixed cost was the depreciation cost of the production equipment while the variable cost was the expense incurred in producing processed fishery products such as raw materials, ingredients, water supply, and electricity. The total cost was the sum of fixed cost and variable cost. The processed fishery products are packed using plastic bags. The packaging of fermented fish is 1 kg or 2–3 fish per bag and sold for THB 150.00 (USD 3.95) per bag. Six pieces of fermented fish meat wrapped with banana leaves packed in the bag are sold at THB 50.00 (USD 1.32) per bag. The dried fish is packed at 100 g with the price of THB 50.00 (USD 1.32) per bag. The profit was computed by deducting the total cost from the selling price. Results of the economic analysis revealed that among the three processed fishery products, the fermented fish meat wrapped with banana leaves had the highest profit despite its cheaper selling price than fermented fish. On the other hand, fermented fish had the lowest profit in spite of being sold three times higher than the other two products (**Table 1**).

The total cost of producing processed fishery products greatly affected the net income of the Group. Therefore, it is necessary to improve the business plan to reduce the total cost of production as well as develop a marketing strategy to increase income. For fermented fish, it is recommended to modify the packaging quantity by packing 1–2 fish per bag instead of 1 kg per bag and increasing the selling price that is commensurate with the production cost. Also, the package should be improved by using the technology in sealing the bags to prevent liquid spillage and extend shelf life. A high profit could be gained from fermented fish meat wrapped with banana leaves. However, they use their hands to mix fish meat and ingredients which takes about one hour. Thus, it would be better to use a machine for the mixing process to save time and improve hygiene. For the dried fish products, it is difficult to dry fish during the rainy season and might be good to improve the drying system by using solar drying houses which could reduce contamination by dust and prevent the infestation from insects and other animals. That could enhance the quality of the dried fish products to meet the standards.

Table 1. Economic analysis of processed fish products produced by Ban Dong Kham Pho Fish Processing Group in Nam Oon Dam, Sakon Nakhon Province, Thailand

	Fermented fish	Fermented fish meat wrapped with banana leaves	Dried fish
Fixed cost per bag (THB, USD)	4.41, 0.12	0.40, 0.01	0.28, 0.007
Variable cost per bag (THB, USD)	126.96, 3.34	18.72, 0.49	23.29, 0.61
Total cost per bag (THB, USD)	131.37, 3.46	19.12, 0.50	23.57, 0.62
Selling price per bag (THB, USD)	150.00, 3.95	50.00, 1.32	50.00, 1.32
Profit per bag (THB, USD)	18.63, 0.49	30.88, 0.81	26.43, 0.70

Furthermore, SEAFDEC/TD also performed the SWOT analysis to assess the status of fish processing activities of the Group including the internal and external factors and current and future potential to develop the strategic plan for fish processing products. As shown in **Box 1**, The strengths of the Group include unity among the members and transparency in management as the group members are designated with clear roles and responsibilities; thus, they could efficiently perform their work and manage the group. However, the group members lack the technology and knowledge of processing and packaging techniques which made it difficult for them to obtain standard certifications (*e.g.* Food and Drug Administration, Halal, among others) for processed fishery products.

Box 1. SWOT analysis of Ban Dong Kham Pho Fish Processing Group in Nam Oon Dam, Sakon Nakhon Province, Thailand

Strengths

- United group members
- Transparent management
- Unique taste of products

Weaknesses

- Lacking technology and knowledge of processing and packaging techniques
- Lacking standard certifications

Opportunities

- High demand and marketing channels
- Abundant raw materials
- Strong support from government and other organizations

Threats

- Less fish during the closed season
- No sunlight for dried fish in the rainy season
- Lacking processing and packaging technology

Because of the unique taste of the products, there is a high demand from regular customers and the Group had the opportunity to venture into more market channels. The Group is supported by the government and other organizations such as the Department of Fisheries of Thailand, Community Development Department, and Sakon Nakhon University which educate the group members on improving fish processing techniques, packaging, and quality. Nevertheless, there is a low supply of raw materials during the annual closed season of Nam Oon Dam from 16 May to 15 August which made the Group buy raw materials from other areas adding to production costs. Also, it is difficult to process dried fish in the rainy season.

Capacity-building activities

Since the plastic bag packaging of fermented fish is sealed only by a rubber band, the liquid could easily leak and the fish could not be kept for a long time making it difficult to sell and deliver the product to farther areas. Therefore, SEAFDEC/TD through the Project provided the Group with a vacuum sealer machine to improve the packaging. Moreover, the meat mixer machine was also provided to the Group for processing the fermented fish meat wrapped with banana leaves to save time and improve product hygiene. Then, the members of the Group were trained on the proper and safe use and maintenance of the vacuum sealer and meat mixer machines (**Figure 3**). The machines provided to the Group could help them improve the quality of their products to obtain certification standards and enhance access to markets.



Figure 3. Practical training for the members of the Ban Dong Kham Pho Fish Processing Group on the proper and safe use of vacuum sealer and meat mixer machines



Figure 4. Training on enhancing marketing access for small-scale fisheries participated by the members of the Ban Dong Kham Pho Fish Processing Group

Furthermore, SEAFDEC/TD organized the training on market access for small-scale fishery products to enhance the marketing strategy of Ban Dong Kham Pho Fish Processing Group (Figure 4). The marketing strategy model of the small-scale fishery products was presented to the Group members including packaging and value chain from producers to customers. During the Training, the Groups were taught to consider the 3Rs for developing a marketing strategy, namely: right target, right channels, and right message. The Group should know their customers and how to distribute their products to their customers with the right communication message. Moreover, the Group would still need support from the government and other organizations to progress in their fish processing activities.

Way Forward

The Ban Dong Kham Pho Fish Processing Group is planning to apply for standard certification for their processed fishery products. They are seeking new marketing channels by introducing their products to academic institutions in Sakon Nakhon Province and selling in festivals and tourist areas. Also, the Community Development Department, Thailand would assist the Group in the promotion of their products as a One Tambon, One Product (OTOP) brand. Tambon means Sub-District, and OTOP is a local entrepreneurship stimulus program of Thailand that supports unique locally made and marketed products of each Tambon all over the country.

Acknowledgments

The authors are grateful to the provincial offices of the Department of Fisheries Thailand, namely: Sakon Nakhon Provincial Fisheries Office, Pang Khon District Fisheries Office, and Nam Oon Dam Inland Fisheries Patrol Unit for the support in the conduct of the activities on promoting community fish products in Nam Oon Dam. We appreciate the Ban Dong Kham Pho Fish Processing Group for their active participation in the activities. We thank the Japanese Trust Fund for funding support to the activities as well the lead technical officer of the project “Small-scale Fisheries Management for Better Livelihood and Fisheries Resources,” Ms. Panitnard Weerawat, for her kind advice.

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