



**Regional Fisheries Livelihoods Programme  
for South and Southeast Asia (RFLP)**

## Case study

# Piloting more hygienic post-harvest practices in Cambodia

### Overview



The Regional Fisheries Livelihoods Programme for South and Southeast Asia (RFLP) worked with coastal communities and the government to improve handling, hygiene and food safety and address the loss of income from fish and fishery products caused by spoilage. Twelve fishing boats and four landing sites were selected for a pilot trial application of improved hygiene practices. In addition, improved fish sauce and fermented fish

production pilots were supported in two villages. This case study describes the results of trials and pilots undertaken by RFLP. It also provides key lessons learned and recommendations to improve hygiene practices.

#### Key lessons learned

- It is very difficult to implement good hygienic practices for aquatic products in locations without access to portable water, electricity and basic sanitation.
- Market access remains a great challenge for fishers and processors.
- The key challenge to improving hygiene and sanitation practices lies mainly in changing people's attitudes and behaviour, raising public awareness of the importance of hygiene practices and stimulating a demand and willingness to pay extra for hygienic and food safe aquatic products.
- Using ice to chill fisheries products is one of the easiest ways to reduce post-harvest loss and to increase income for fishers.

## Context

Post-harvest sub-sector assessments conducted by RFLP Cambodia staff highlighted that fishers were unaware of measures to reduce post-harvest losses and to improve the quality of their products by following hygienic and food safe practices. Often, their catches were either of poor quality or were spoiled after fishing at sea for more than 12 to 24 hours and not using ice to preserve their catch. In addition, hygiene standards at fish landing sites and markets were often poor. A lack of potable water, food safe clean ice, wash rooms and basic equipment such as ice boxes can lead to contamination and rapid spoilage of aquatic products under the tropical conditions in Cambodia. Meanwhile, toxic substances including banned substances were sometimes used for processing and preservation of some fishery products to increase the product shelf life.

## The initiative

RFLP sought to improve aquatic product food safety and address the loss of income from fish and fishery products caused by poor handling. It also targeted improper preservation and processing practices, and inequitable returns to fishers because of closed and non-transparent marketing systems. Activities included public

awareness raising campaigns on food safety issues; the training of fishers, processors and traders in improved basic hygiene and food safety practices for aquatic product handling, processing and business management; improved management of landing centres; pilot operations for adding value to products and marketing; and improved access to market information.

In Cambodia, RFLP worked closely with the Department of Fisheries Post-harvest, Technology and Quality Control (DFPTQ) of the Fisheries Administration (FiA) to enhance the capacity of government staff and community fisheries (CFi) members. Activities conducted by RFLP included:

### ***Reducing post-harvest losses, improved hygiene and enhanced market chains***

- Developed a best practice manual on Good Hygienic Practice (GHP) for fishing boats and landing sites. 1,000 copies were published and distributed to community fisheries.
- Conducted trials on improved hygiene and sanitation practices on fishing boats and at landing sites, which resulted in a significant increase in the use of ice boxes and ice by fishers.
- Conducted an improved fish sauce production pilot.



*Fish washing practice in GHP manual*

- Conducted an improved fermented fish production pilot.

#### **Capacity building for FiA**

- Training of trainers training (TOT) was provided to key FiA DFPTQ staff on hygiene and sanitation measures/ fisheries processing technology.
- Training on sampling methodologies, basic biological, chemical and physical hazards and inspection techniques for aquatic products.
- TOT training was provided to key FiA DFPTQ staff on the use of the manual on Good hygienic practices (GHP) in

Community Based Fishery Products. FiA officers are now better able to train and mentor CFi members on improved hygiene and food safe practices along the aquatic product value chain

#### **Capacity building for communities**

- Training on improved hygiene and sanitation measures/fisheries processing technology.
- Training provided on business management for fish sauce production and fermented fish groups.

#### **Impacts/Results**

RFLP successfully assisted the FiA to develop the GHP manual, provided TOT training to key FiA DFPTQ staff on use of the manual and disseminated the manual to CFi members. The use of ice boxes and ice for preserving the catch resulted in a significant reduction in post-harvest aquatic catch loss and gave improved fisheries product quality. Although most fishers initially believed that ice boxes were too expensive, they later realized that by using them they could increase their income by up to as much as three fold. However efforts to provide access to clean water and power and sanitation remain a great challenge, which was beyond the scope of RFLP to address. In addition the launch of the RFLP supported

improved fish sauce and fermented production systems have provided positive changes including reduced post-harvest losses and increased income through value added products for the pilot group members. Details of impacts/results are described below:

### **The development of Good Hygienic Practice (GHP) manual**

RFLP provided both international and national post-harvest and marketing consultants that worked with the Fisheries Administration to develop a manual on Good Hygienic Practices (GHP) on fishing boats and landing sites. This national manual which was approved by FiA now serves as an important legal document that can be used as an aid by fishers and landing site owners to ensure they practice appropriate hygiene procedures. The manual was developed using a participatory approach; the first draft of the manual was presented at a workshop for key stakeholders conducted on 1-2 September 2011, which was attended by 59 people (7 women). Comments were incorporated into the manual and with the input from an international consultant, the GHP manual was approved at a national workshop on 19 January, 2012 which 51 people attended (10 women). 940 GHP manuals were thereafter distributed to CFis and the FiA Cantonment during an awareness raising campaign.

An awareness raising campaign on fisheries product safety at landing and processing sites and for consumers was also conducted. GHP manuals were distributed to the 520 participants (204 women) who took part in the event, which was conducted in September 2012 in all target CFis. Focus group discussions held in villages demonstrated that respondents had increased awareness on hygiene and food safety issues of aquatic products. This was also confirmed through household interviews.



*Equipment and materials delivery to landing site owner in CFi Chumpou Khmao, Preah Sihanouk*

### **Trial application on fishing boats and at landing sites**

RFLP supported the pilot use of basic equipment such as gutting knives, cleaning tables, gum boots, gloves, ice boxes and fish baskets at six CFis namely CFi Chumpou Khmao, CFi Tumnup Rolok, CFi Trapaing Ropov, CFi

Chang Hoan, CFI Chroy Svay and CFI Koh Kchang. In all, twelve fishing boats and four landing sites were selected for the pilot. Each of the 12 selected pilot fishing boats received 1 ice box, 4 plastic baskets, 4 plastic rain coats, 4 pairs of long neck boots, 4 pairs of gloves, 1 tarpaulin sheet, 2 cartons of boat paint, and 1 carton of oil. In addition, pilots on hygiene and sanitation were also conducted at 4 CFI landing sites namely: CFI Champou Khmao in Sihanouk Province, CFI Chroy Svay in Koh Kong Province, and CFI Trapaing Ropov and CFI Chong Hoan in Kampot Province.



*Mr. Rem Mi, fisher from CFI Trapaing Ropov*

Beneficiaries of the trials found the equipment and materials very effective and easy to use, which resulted in improved catch quality while maintaining hygiene and sanitation.

After being trained by RFLP, Rem Mi was provided with an ice chest, rubber gloves, baskets and boots. Thereafter he began spending around 2,000-3,000 Riels (50-75 US cents) each day to buy 7-10 kg of ice from a

local ice plant to be used with the ice box. According to Rem Mi the first day fishing with the ice box made him realize what a difference it could make to fish quality.

“Before I had the ice box, most of my catch was spoiled and I could only sell short-bodied mackerel for about 500-800 Riels per kg. Now I can sell them for up to 2,000-3,000 Riels per kg. I now feel so happy when I open the ice box and see the bright colour of the fish after it has been chilled,” he says.

Rem Mi, added that, “When I first used my gloves to remove fish from the nets, other fishers made jokes at me for being different from everyone else in the village. But after seeing that I could remove the fish faster and without cutting my hands, they started to copy me and are now using both ice boxes and gloves.”

Mr. Doung Proeung was another recipient of hygiene training from RFLP. A fisher from CFI Trapaing Ropov, he has started to use ice boxes, gloves and ice every time he goes fishing.

He told RFLP that, “I started using ice, ice boxes and gloves because I learned from the project that if I use all these materials my catch will stay fresh for longer. I attended most of the project’s awareness raising activities and even though I was not selected for the trial application, I bought ice boxes myself and use

ice to chill the fish to keep them in good condition.”



*Mr. Doung Proeung, Landing site owner in CFi Trapeang Ropov*

Mr. Proeung added that ‘Before, if I caught 300 kg of fish I would lose at least 75 kg as the fish went bad because of insufficient ice, non-insulated ice boxes and not knowing how to chill the catch properly. Now if I catch 300 kg, I will lose no more than 10 kg.’

### **Pilots on fish sauce and fermented fish**

RFLP worked closely with two selected CFis namely CFi Koh Kchang to pilot improved fish sauce production and CFi Banteay Prey on improved fermented fish production. Training was given to the group members to improve their traditional fish processing practices, business management, book keeping and recording as well as financial management. The CFis were also hired to carry out construction work for the fish sauce and fish fermentation units. This helped generate jobs and income for the communities rather than engaging external

contractors. The group also received hygiene materials and equipment from RFLP to process their products.

During monitoring visits to the two CFi production sites, it was found that the groups were using the hygiene materials provided and were abiding by the rules for product standards. They believed that by doing so it would help them produce products that would be more easily marketed than other competitors and for a higher sale price.

### **Women’s fish sauce group operation**

12 women were selected to join the fish sauce production group in Koh Kchang CFi. They were very happy to learn new techniques from the consultant. The fish sauce unit was constructed and fish sauce tanks as well as other equipment and materials were provided with RFLP support.



*Applying salt to fish*

Improved hygiene and sanitation methods were introduced for raw material washing, soaking,

and boiling. Previously, these women ran the production cycle for a maximum of 4-5 months. As a result the taste of the sauce was not particularly good and the sauce could only be used for family consumption.

With the improved production techniques, the cycle was extended to between 9-12 months based on the fish size. The filtering technique also played an important role in improving the quality of the sauce. The only constraint now facing the group is a lack of skills to develop a market for the fish sauce when it is ready to sell. The commune chief has also requested FAO intervention to have the product certified by the Department of Industries.

The first batch of fish sauce production has matured and been extracted and the quality has met consumer's satisfaction.

### **Women's fermented fish group operation**

This one year pilot in Banteay Prey CFI was late in starting as the peak season for raw materials was over by the time the group was ready to begin production, so the price of fish was twice the usual price. In addition to training, technical and equipment support the groups also received help to develop improved labelling and packaging as part of the pilot. The professional looking packaging increases customer confidence in the product and has helped the group to increase their sales volume. In 2013,

the group was able to sell its product at a higher price than usually paid for traditionally produced fermented fish products, while consumers have started phoning in more fermented fish orders.



*Fermented fish production unit*

In all some 2,500 kg of fermented fish were sold in May 2013. This was packaged in plastic containers bearing CFI labelling. Individual consumers in the village were reported to have purchased only about 80 kg, however a wholesaler in Sre Ambel district ordered about 1,000 kg of product after learning about this improved quality. The price of the fermented fish sold has also increased from 5,500-6,000 Riels per kg to 6,500-7,000 Riels per kg after using the improved packaging. The group decided not to increase the price further as they felt that customers were not fully aware of the benefits of this more hygienic product and would not be willing to pay any more. The business group believed that in the near future as people become more aware about their

product that they will be able to increase their sale price.

In addition to these pilots, RFLP also produced awareness raising material on food safety issues so that it could deliver other clear messages to fishers, processors and end consumers about the need for and benefits of better personal and aquatic product hygiene. Materials produced included posters on safety of fisheries products, a manual on community based fisheries products and good hygienic practices (GHP) on fishing boats and at landing sites.

### **An improvement in the capacity of government officers to provide Post-harvest support**

Government officials who were trained by RFLP in post-harvest techniques were hired as trainers to train CFi members. Results from monitoring visits and focus group discussions with the CFis showed that trainees at the CFi level were generally satisfied with the training provided by the FiA officers. The perception of CFi members was that the FiA officers had improved both their facilitation skills to deliver the courses, as well as their technical knowledge.

Mrs. Tim Chinda, from CFi O’Krasa, Kep province said that “Before we never saw FiA officers at Cantonment level, NGO staff or other FiA officers from the central level come to train

us in the village. We are happy to learn from them as before they only come to have meetings with us about patrolling or other community work.”



*FiA Officers were trained on sampling methodology on basic biological, chemical and physical hazards and inspection techniques for aquatic products*

### **Government fisheries officers perceive an improvement in their working capacity on post-harvest fisheries**

FiA officers who received training from RFLP on post-harvest fisheries related topics were in general able to use the skills and knowledge obtained to teach and mentor CFi members.

RFLP provided capacity building for FiA at the central, Inspectorate and Cantonment level on Sampling Methodology, Basic Biological, Chemical and Physical Hazards and Inspection Techniques. Training was conducted on 25-29, September, 2012 in Phnom Penh. 14 trainees took part (all men). Field work was conducted in



the second week of October 2012. Upon receiving training, the officers reported that they were more confident in carrying out their jobs.



*Ice is used for chilling*

In addition, RFLP provided TOT training for 16 FiA Officers (2 women) in using the manual for good hygienic practices (GHP) in Community Based Fishery Products in October 2012. After training, the FiA officers expressed their confidence that they would be able to mentor the CFIs to improve hygienic practices along the aquatic product value chain.

## **Lessons learned**

- It is impossible to implement improved hygiene practices without access to potable water, electricity and sanitized latrines. This basic infrastructure needs to be in place before many post-harvest actions can be undertaken.
- The key challenge to improving hygiene and sanitation practices lies mainly in changing people's attitudes and behaviour and particularly in raising their awareness of the importance of better hygiene practices when handling and processing aquatic products, which will in turn create greater demand for and willingness to pay more for hygienically produced aquatic products.
- The use of ice to chill fisheries products is one of the easiest ways to reduce post-harvest loss and to increase income for fishers. Less spoilage means greater income from catch for fishers.
- Ice boxes play an important role in keeping fisheries products fresh for longer and in generating additional income.
- Ice plants in coastal areas do not follow GHP standards (i.e. ice was found to be contaminated). The government authorities should routinely check that water used in ice production facilities is clean and potable and usable for food safe ice production.
- Pilot implementation of improved fish sauce production and improved fermented fish production should be done during the peak season for raw material availability. The fermented fish pilot was conducted outside the peak

fishing season, and as a result the price of fish as raw materials was more than double the peak season price. Input costs were therefore very high and if the project had not paid for the fish, no profit would have resulted.

- It takes time for fishers to get used to hygienic equipment and materials; however efforts must be continued to increase awareness on using such tools.
- The DFPTQ and FiA need to develop regulations for fish landing site management, use of chemicals in fisheries products and extension materials to raise awareness on the dangers of using banned chemicals and insanitary conditions and water to food safety.
- The Fisheries Administration should conduct more awareness raising on the use of ice boxes throughout coastal Cambodia.
- The FiA Cantonment and NGO partners should seek to support to build community landing sites, so that they benefit fishers and reduces their dependence on privately owned landing sites.

## **Recommendations**

- The FiA and NGO partners should design activities to help fishers and family members to improve market access for fisheries products.
- The Ministry of Rural Development, concerned institutions and donor agencies should consider supporting access to clean water and sanitized latrines in CFIs. This will help to improve the application of hygiene and sanitation not only in households, but also in processing areas.
- The FiA Cantonment should inform the Ministry of Mines, Energy and Industry about private sector businesses (ice plants) that do not follow GHP standards through a national workshop.
- Industrial law enforcement should be strengthened.
- The FiA Cantonment should seek support to build community landing sites, to provide benefits for fishers and to reduce their dependency on privately owned landing sites.
- More capacity building on marketing should be given to government staff and CFI members.

**This case study was written by Wiryra Khim, RFLP Cambodia M&E Officer with input and editing from Steve Needham, RFLP Information Officer, and Don Griffiths, RFLP Chief Technical Adviser.**

#### **About RFLP**

The Regional Fisheries Livelihoods Programme for South and Southeast Asia (RFLP) sets out to strengthen capacity among participating small-scale fishing communities and their supporting institutions in Cambodia, Indonesia, the Philippines, Sri Lanka, Timor-Leste and Viet Nam. The four-year (2009 – 2013) RFLP was funded by the Kingdom of Spain and implemented by the Food and Agriculture Organization of the United Nations (FAO) working in close collaboration with the national authorities responsible for fisheries in participating countries.