

## Case study:

### Viet Nam scad drying pilot fails to take off



#### Overview

The Regional Fisheries Livelihoods Programme for South and Southeast Asia (RFLP) has worked with Viet Nam's Department of Agriculture and Rural Development (DARD) to pilot an innovative scad-drying model in Phong Hai commune of Thua Thien Hue province. In early March 2012 a scad drier was installed in the commune however the results of early trial runs were unsuccessful. This case study highlights the need for thorough and participatory planning to take place before any initiative is launched, as well as the potential damage failed pilots can cause to community relations.

#### Key lessons learned

- A thorough and participatory needs assessment and context survey should be conducted before any pilot activity goes ahead.
- Involve stakeholders from the beginning and inform them of the risks involved, especially if they are required to make investments (either in time or money).
- When expert advice is needed make sure to find the right expert.
- Do not leave pilots in a 'failed state', so as to avoid damaging the reputation of those involved, as well as relationships with communities.

## Context

Phong Hai commune in Phong Dien district, of Thua Thien Hue Province, Viet Nam has 6 km of coastline, a total area of 561 ha and 1,115 households with a total population of 5,110 people. Local people live mainly on marine capture fishing and aquaculture, with 60 percent of the households working in marine fishing, particularly inshore fisheries, mostly catching scad (*cá núc*) and anchovies (*cá com*). The total marine fishery production of Phong Hai commune is now about 900 tons per year, with scad accounting for nearly 50 percent of the total catch.

Due to the lack of cold storage facilities for fish preservation in Phong Hai commune, most scad are sold fresh for daily consumption or processed into fish sauce production. The traditionally and meticulously produced Phong Hai fish sauce has received certification for export. However, the remaining scad not sold fresh or for fish sauce production are usually processed by either boiling or sun-drying and are used for domestic consumption or sold at local markets.

Similar to other fishing communities in Thua Thien Hue province, fish drying in Phong Hai commune is mostly carried out in the form of traditional sun-drying, both for human consumption and animal feed. The traditional method of processing herring and scad is by de-heading, gutting and salting in a weak salt solution for 5-10 minutes, before being boiled for five minutes in a pot and then laid out on racks to dry in the sun. Scad drying by this method is highly weather dependent, which results in low and variable quality and questionable food safety levels. Fish take longer to dry on cloudy monsoon days and the likelihood of contamination with blow-flies laying eggs on the drying fish increases. The peak herring catch is from December to

March, which is closely aligned to the monsoon season. The peak scad catch season occurs outside the monsoon season.

## The initiative

In 2011 the Department of Agriculture and Rural Development (DARD) of Thua Thien Hue province requested the support of RFLP to pilot an innovative scad-drying model in Phong Hai commune of Thua Thien Hue province, with a drying capacity of 300-500 kg per batch. It was expected that this innovative drying process would ensure compliance with food safety and food hygiene requirements at the household-scale production level. If feasible, the improved drying production model could be replicated to generate both income and jobs, especially for women in coastal fishing communities who have few local employment opportunities.

For piloting the model, the Commune People's Committee selected the household of Mrs. Nguyen Thi Long, who practiced traditional solar drying methods to dry any surplus catch from her husband, Mr. Hoang Hong, an inshore fisher. The beneficiary household met key selection criteria, i.e. they were a poor inshore fishing household and they practiced traditional solar fish drying.



The RFLP Project Management Unit (the board set up by the Thua Thien Hue Provincial People's Committee to take responsibility for managing RFLP activities in the province), selected the Faculty of Mechanics and Technology of Hue University College of Agriculture, Forestry and Fisheries (HUAF) as the service provider to implement this activity.



*Mr Long getting fish ready for placing in the drier*

## The drier design

The design of the scad drier was based on similar drying units being operated in the neighbouring provinces of Quang Tri and Quang Ngai with some modifications that the consultant considered would improve the design, such as:

- The drying system was composed of a drying chamber (190 x 165 x 230 cm), made of hollow bricks to increase insulation.
- The heat distribution system and pressure stabilizer were made of reinforced concrete plates placed at the bottom and top of the drying chamber.
- There were ventilation holes (4 cm in diameter) at the top of the drying chamber. Meanwhile, 30 trays (70 x 70 cm) of fish could be dried in each of the two towers within the drying chamber.
- The system had two separate burners; one for fish steaming and

the other to heat the air blown into the drying chamber. The burners can use coal, charcoal or wood as fuel.

- A centrifugal 3 phase electric motorized fan (1 KW) circulated the hot air through the drying chamber, with valves and pipes used to direct the hot air to the both the lower and upper parts of the scad drying chamber, which meant there was no need to swap tray positions during drying.
- The service provider calculated a cost benefit ratio of 47.7 percent using the data (see table below) collected from Quang Tri and Quang Ngai provinces during a study visit. However the service provider failed to consider the investment cost for the scad drier which was significant (US\$ 2,815) and which would likely take in the region of two years to repay.

No	Item	Unit	Quantity	Unit cost	Amount (VND)
1	Fresh materials	Kg	1,000	11,000	<b>11,000,000</b>
2	Drying cost				<b>1,190,000</b>
2.1	Charcoal	Kg	30	25,000	<b>750,000</b>
2.2	Electricity	KW	70	2,000	<b>140,000</b>
2.3	Labour	Days	2	150,000	<b>300,000</b>
	<b>Total cost of one batch of dried fish</b>				12,190,000
3	Income from dried fish	Kg	400	45,000	<b>18,000,000</b>
4	Net profit from one batch of dried fish				5,810,000

## Results

In March 2012, the RFLP supported the first trial run of the drier with a batch of herring. The fish however were not dried to an acceptable standard. This was due to the oven only being set at 50-55°C because of concerns that the fish would burn at a higher temperature. The higher fat and oil content of herring compared to scad was also a factor.

A second trial took place in April 2012 with scad. For this batch 80 percent of the dried scad were more acceptable in terms of moisture content, however the product had a smoky flavour and the beneficiaries were unable to sell the dried scad in their local market.

The pilot household were concerned that the smoky flavour was a health risk, while the dried scad from the 'improved' drier also had higher moisture content, than traditionally solar dried scad. As the product could not be sold the household decided to stop operating the drier.

## Consequences

The drying component of the pilot scad drier has been left unused since the second pilot took place in early in 2012. The beneficiary household has complained that their own investment in terms of time, labour and money had been lost as a result.

News of the poor performance of the drier became known throughout the local community, which has understandably become more sceptical about a drying technology that was supposed to be more effective than the traditional solar drying system. In addition, the reputation and credibility of all involved parties has been tarnished.



*Measurements taken on the end products*

## Ways forward

RFLP is undertaking checks on the quality of scad dried using coal/charcoal powered driers from Quang Tri and Quang Ngai provinces against the traditionally dried scad from Phong Hai commune. By doing so it should be able to gain a clearer and more realistic understanding of the potential product quality from this type of powered drier. In addition RFLP will arrange for Mr. Hong and Mrs. Long to have operational hands-on training at a coal/charcoal powered scad drying unit in either Quang Tri or Quang Ngai province and thereafter RFLP will fund the costs of additional technical adjustments to the drier and more pilot runs to ensure that the beneficiary household is confident to operate the system.

## Unexpected benefits

Although Mr. Hong and Mrs. Long stopped using the drying section of the system, they still use the cooking component to steam fish for solar drying. Previously when they cooked fish, they boiled the fish over a wood fire. The current cooking component of the system is

far more efficient and uses significantly less wood than the old system.

## Lessons learned

- The premise for the pilot scad drier activity was flawed. In Quang Nam and Quang Ngai provinces the improved solar drier was used for species like anchovies and squid, which are abundant during the monsoon season. In Phong Hai however, the majority of scad are caught from June to September when the average temperature is high and there is very low humidity. At this time of year it is more cost effective to solar dry scad by the traditional method.
- The total cost of building the scad drying unit was approximately US\$ 2,815. This was an inappropriate amount for an average poor inshore fishing household to invest in, even assuming the pilot had been successful. Such a technology package would only be appropriate for wealthy coastal households that had considerable savings or had collateral and access to credit. As a result, widespread replication would be unlikely.
- In hindsight where livelihoods technologies required larger investment, RFLP should have supported activity piloting with a Fishery Association group, rather than an individual beneficiary household.
- A thorough and participatory needs assessment and context survey should have been conducted before any decision was made as to go ahead with the pilot. The findings of the assessment should have been presented and verified in a consultation process with the participation of all relevant stakeholders.
- Although HUAF had previously designed rice and cassava driers this was the first time that they had attempted to design and operate a fish drier. It was assumed, wrongly as it turned out, that the same principles for drying other products could be applied to scad drying, albeit with some modifications.



*Fresh fish landed at Thuan An fishing port in Thua Thien Hue province*



*Trays of fish are being taken out of the boiler (before being moved to the drier)*

- Although the consultants were able to bring the drier into operation, it yielded products of unsatisfactory quality. The lack of understanding of the nature of fisheries products, and particularly of the oil and fat content, by the service providers was a significant contributing factor to the disappointing early results of this pilot. When a service provider/expert is recruited to pilot a new technology, it should be ensured that the right person is selected for the position. Sound technical support provided by experts is vital when introducing a new technology in a convincing manner to community members.
- Participants can quickly become disillusioned with a pilot if the results are poor. However the introduction of any new technique is almost certain to require trial and error and on-going mentoring and support. It should be noted that Mr. Hong stated that his family agreed to implement this initiative because they believed the potential benefits as outlined to them by the Commune People's Committee. In a show of confidence, the Hong's also invested nearly US\$ 1,000 of their own money to construct the building to house the drier, demonstrating their full commitment. The reluctance of the pilot

household to carry on with the initiative is understandable however as continued support from both the government authorities and RFLP is needed in terms of technical modifications to the equipment, on-going training and support for the cost of fuel and fish for the early trial runs. It is also important that pilots are not left in a 'failed state', so as to avoid damaging the reputation of those involved, as well as relationships with communities.

- No participatory community consultation process took place to select the beneficiary household which was hand-picked by the Commune People's Committee. Although the beneficiary selection process was less than ideal, it is largely in line with the local context and practice whereby considerable emphasis is placed on the development of model farmers as an example for others. As inshore fishers and fish driers with a good standing in the community and a strong work ethic it can be argued that the beneficiaries were well qualified to participate in the pilot. While a more open and transparent process may have resulted in the same household being selected to pilot the activity, this would at least have been conducted with the approval of other Fisheries Association members.



- The implementing modalities of development projects need to be established in such a way that effective evaluation of activity proposals can take place. While operating within the context of local systems the development project must be in a position to accurately assess activities and have full and active involvement in all stages of planning and implementation.

## Recommendations

- Additional modifications need to be made to the scad drier and the operators provided with further training (as well as support for fish/fuel costs).
- The results of the modifications and further trials should be closely monitored. Should the drier continue to prove unsuccessful, value should be derived from the lessons learned gathered during this process.



**This case study was written by Don Griffiths, RFLP Chief Technical Adviser and Steve Needham, RFLP Information Officer with editorial and layout support from Angela Lentisco, RFLP Case Study Developer**

## 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. By doing so the RFLP seeks to improve the livelihoods of fisher folk and their families while fostering more sustainable fisheries resources management practices. The four-year (2009 – 2013) RFLP is 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. For more information about the Regional Fisheries Livelihoods Programme for South and Southeast Asia (RFLP) see [www.rflp.org](http://www.rflp.org) or contact the Regional Information Officer [Steve.needham@fao.org](mailto:Steve.needham@fao.org)