



Participatory planning and implementation of fish-based livelihood innovations in Timor-Leste

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Executive summary

Fish and other aquatic foods are the backbone of island economies in Southeast Asia and the Pacific (Gillett 2016). Governments and nongovernmental organizations (NGOs) have made substantial efforts to reduce pressure on natural resources and improve incomes and food security by introducing alternative livelihood activities in rural coastal communities or enhancing existing ones (Pomeroy et al. 2017; Stacey et al. 2019). Initiatives based on outsiders' priorities and designs, which do not adequately consider the capacity, needs and aspirations of community members, are unlikely to succeed (O'Garra 2007; Gillett et al. 2008; Govan et al. 2019). Participatory approaches, which incorporate the ideas, needs and problems of community members, can result in more appropriate and longer-lasting development outcomes. Yet these approaches can have their own challenges. External agencies may need to be flexible, relinquish control over the process of identifying and prioritizing initiatives, and build capacity to facilitate discussions and enable critical reflection by participants. Similarly, community members may need to navigate differences in perspectives to identify common objectives and agree on a plan of action (Douthwaite et al. 2015).

This report documents the process, outcomes and lessons identified from a 4-year coastal livelihoods enhancement project in Timor-Leste using a participatory approach with two groups of people (40 participants in total) from two rural coastal communities. We find that there are opportunities to harness the economic and nutritional value of coastal aquatic foods in Timor-Leste. People in coastal communities are willing and interested to test out their ideas for enhancing their fish-based and coastal livelihoods. However, ideas can be limited to those in neighboring communities, and people may not be accustomed to working collectively. Facilitating access to training and building capacity to bridge the rural-urban divide are important components of making such initiatives a success.

Resource intensive projects like these can benefit their participants and generate important learning, but they are not feasible nor desirable to replicate in all Timorese coastal communities. Rather, alternative models of enabling community-led development are needed, with associated targeted support from fisheries agencies. More people in coastal communities in Timor-Leste could implement their ideas for improving their livelihoods at their own scale and pace, if the activities of government and its development partners shifted to more extension-based advisory and capacity building services. Such activities could focus on (a) facilitating better access to fish-associated information for people in rural coastal communities, (b) establishing links between similar small-scale efforts to facilitate peer-to-peer sharing and (c) providing training and microloans to interested communities and community groups. Municipality fishery officers could play a key role if provided with adequate fiscal resources and workplans that focus on extension-based advisory and capacity building services that enable community-led development.



Photo credit: Agustinha Duarte/WorlFish

Ililai and Binagua fishermen inspecting an Ililai fish aggregating device (FAD).

Introduction

Fish-based livelihoods play a critical role in the community economies of Timor-Leste (López-Angarita et al. 2019; Tilley et al. 2020a). The nation is also home to a rich blend of traditional and contemporary practices for preservation, value-addition and nutritious meals from aquatic foods (Duarte et al. 2020). The local economic and nutritional benefits of strengthening Timorese fisheries are recognized in key government planning documents, including Timor-Leste's Strategic Development Plan 2011–2030 (GOTL 2011). Many government and development partner initiatives to date have focused on the agricultural sector—in particular, on improving agricultural productivity and community capacity for engaging in value chains and commercial markets (Molyneux et al. 2012; Cardno 2021; TOMAK 2021). Efforts to enhance capture fisheries productivity and build domestic aquaculture are growing (López-Angarita et al. 2019; Tilley et al. 2019b). However, less is known about how to best enable innovation in these production systems to improve inclusive economic growth and deliver on policy goals.

Improved livelihoods of people who catch, process or trade fish and other aquatic foods is a critical pathway to poverty reduction. Across island nations in the Southeast Asia and Pacific region, government- and aid-funded development programs have tended to focus on top-down blueprints, such as construction of infrastructure, fleet mechanization programs, alternative mariculture activities or deep-sea fishing methods. However, these initiatives are typically based on “outside” or “expert” priorities (Benediktsson 2002; Gillett et al. 2008; Marocchino 2009). They have not been systematically evaluated (Gillett 2010) and do not sufficiently consider gender (Lawless et al. 2017; Stacey et al. 2019). In general, the gendered dimension of fish distribution networks and the social and cultural dynamics of fish-based livelihoods have received inadequate attention. Despite widespread investments and planning, rural women still feel that their fish-based livelihood practices are ignored in planning of infrastructure investments (Ride et al. 2020). Gender inclusion approaches are often designed only to “reach” women, such as increasing women's attendance at planning meetings (Mangubhai and Lawless 2021). As a result, much of the development programming around fisheries fails to properly engage or benefit women or to consider gender relations or the gendered impacts of interventions (Lawless et al. 2017; Labuinao 2020).

A livelihoods framing helps to think and plan around contemporary development narratives while governing marine resources in Pacific Islands (Allison and Horemans 2006). However, it does not solve the main challenge of defining a process for achieving development outcomes (Eriksson et al. 2020). Since the 1990s, the sustainable livelihoods approach (SLA) has become the dominant structure for analyzing rural livelihoods (Chambers and Conway 1992; Morse and McNamara 2013). The principles within the SLA are clearly relevant for scientific inquiry, but translating those principles into practice has been challenging. In the words of Scoones (2009, 185):

Although livelihoods analysis frameworks and methods definitely offer a way of uncovering complexity and diversity in ways that has often not been revealed before, the important question is: What happens next? Which option is best, and for whom?

The seminal research on rural livelihoods during the 1980s and 1990s was meant to replace our thinking around top-down development (Chambers 1997). Instead, it brought forward a theory-heavy view of rural livelihoods focused on “diversification.” Many of the projects that it inspired, which were meant to replace old modernization projects, were also unsuccessful. For example, community-led mariculture enterprises disintegrate when projects finish, and coconut crushing mills become dilapidated when maintenance costs escalate (O'Garra 2007; Hambrey Consulting and Nautilus Consultants 2011). So, what are rural fishers actually meant to diversify into, and how? A key message from this era was to “identify what the poor have, rather than what they do not have ... and build on their strengths” (Moser 1998). Listening to the ideas of the people who catch, process and trade fish provides a strong foundation for an alternative model of enhancing fish-based livelihoods through research.

Community-led or grassroots development initiatives are not new ways of thinking about alternative development (Schumacher 1973; Max-Neef 1991). For example, the World Bank has framed a portfolio of externally supported types of interventions around community-driven development as an alternative to a neo-liberal economic reform agenda (Wong and Guggenheim 2018; Woolcock 2019). Grassroots self-initiated and locally led development initiatives exist, but they tend to be rather invisible in the bigger conversations around development (Cox 2017; Roche et al. 2020; Suti et al. 2020). The challenge is to make these small, scattered initiatives have a bigger impact on development trajectories to structurally improve livelihoods of rural and coastal communities and find a balance between locally led and externally supported development (Eriksson et al. 2020; Roche et al. 2020). As an analogous example, community-based resource management has gone from small, scattered initiatives to now occupying a central space for sustainable management of fisheries in the Pacific (SPC 2015).

Sharing practical experiences from programs that deliberately take a community-led or participatory approach to supporting fish-based livelihoods can help to highlight the benefits and considerations of this mode of planning development in coastal communities. This is particularly important in contexts such as Timor-Leste, where there is growing interest in enhancing fisheries production and the contribution of this sector to food and nutrition security. So what happens when people share their ideas for development with external partners? This is the key question that this report seeks to address based on case studies from two rural coastal communities in Timor-Leste.



Photo credit: Kim Junnany, Charles Darwin University

Initial idea assessment with the Beacou women's group.

1. Project overview and report objectives

This project was carried out in Timor-Leste from 2016 to 2020. It aimed to work with two established groups to design and implement a livelihood enhancement initiative in their respective rural coastal communities. This was to be a two-stage process: (1) facilitate a participatory assessment of a prioritized livelihood idea and co-development of an action plan and (2) work with each group to implement its action plan, with refinement through cycles of action and reflection.

Participatory approaches to rural appraisal or action research, as well as the disciplines and practitioner fields in which they are applied, are diverse but build on a long tradition of practice (Chambers 1997; Greenwood and Levin 1998; Moser 1998). Like many other projects and programs in agricultural and innovation systems (Apgar and Douthwaite 2013; Douthwaite et al. 2015; van der Ploeg et al. 2016), we were guided by Chambers' (1983) request to "reverse" thinking in development and research, and project implementation followed the principles of participatory action research. In doing so, we sought to operationalize three key principles: (1) local people know their own situation best, (2) communities are more likely to adopt and sustain initiatives if they have ownership from the beginning, and (3) the research process itself creates opportunities for change (Cameron and Gibson 2005; Cameron et al. 2014). Our activities also built on the learnings from implementing a multidisciplinary research *in* development approach under the CGIAR Research Program on Aquatic Agricultural Systems (Douthwaite et al. 2015), which was completed in 2016. This approach reflects an integrated process of knowledge co-production and emphasizes participation, partnerships and coalitions.

Participatory livelihood planning approaches enable community or group members to articulate their needs and aspirations and identify initiatives that build on their skills and interests. They can overcome some of the common limitations of externally driven development projects, such as the top-down introduction of activities, which are not locally desirable or appropriate (O'Garra 2007;

Hambrey Consulting and Nautilus Consultants 2011). Meaningful participation, building on what people have and establishing expectations of co-contribution in which community members and the external partner both contribute to the project, can also develop a sense of ownership and empowerment (Douthwaite et al. 2015). We began the project in 2016, seeking to apply and refine a participatory livelihood enhancement approach using a tool developed for this purpose in the Pacific by Govan (2011). This tool has now been updated with the title *A new idea for coastal fisheries* or "New Idea" tool (Govan et al. 2019), with learnings incorporated from trials with community partners. The New Idea tool guides participatory assessment of a new livelihood idea by asking questions covering five broad components of sustainable livelihoods: natural resources, equipment, people and skills, markets, and finances. This approach aims to place the capacity for generating and using knowledge into the hands of people who are trying to improve their livelihoods and to support their prioritized actions. While the focus of the project was on fisheries-associated livelihoods, there were no other preconceived ideas or specifications on the type of initiative that the community groups could prioritize.

All participatory approaches are guided by some use of an iterative action and reflection cycle (Figure 1). In the "planning" step, the group involved develops an intention to do something to improve a real-life concern. The next "acting" step is when the group carries out its plan. Then in the "observing" step, the group identifies the consequences of its action. This is then followed by the "reflecting" step, when the group members evaluate what has happened by thinking about how it fits with their lives (Apgar and Douthwaite 2013). In this project, follow-up reflections were guided by the same New Idea tool used in the initial participatory assessment and asked, "How did this play out in practice?"

Community engagement and implementation of the initiatives followed the practical guidelines of Lawless et al. (2017), which were developed

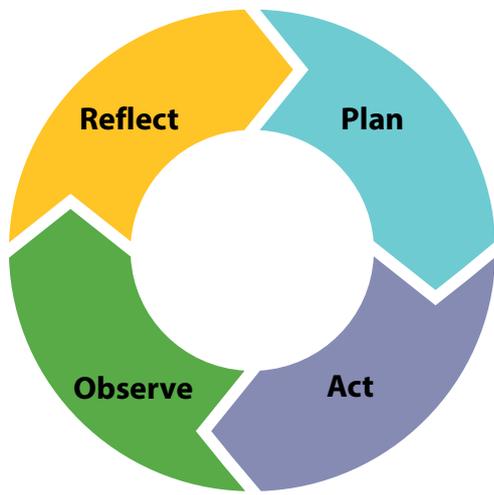


Figure 1. Generic action and reflection cycle.

based on lessons from the Solomon Islands in preparation for implementing this project. These guidelines came about from the recognition that gender norms and relations affect an individual's ability to participate and benefit from new or enhanced livelihood opportunities (Kabeer and Natali 2013; Kantor et al. 2015). Initiatives that account for differences in women's and men's participation in livelihoods are more likely to result in sustained and equitable outcomes. Knowing

this, we sought to be gender-accommodating at least by planning around four main areas defined by Lawless et al. (2017): opportunities to participate, division of labor, access and control over resources, and decision-making power.

The objective of this report is to document the process of implementing livelihood enhancement initiatives in rural coastal Timor-Leste through a participatory approach and to identify aspects that worked well and those that could be improved in similar future work. We consider how the New Idea tool can help facilitate livelihood innovations and improvement in the small-scale fisheries sector and identify some of the opportunities and barriers faced by coastal rural communities in Timor-Leste. To prepare the report, we used project trip reports from 2017 to 2019, documentation from initial participatory planning assessments and post-implementation reflection activities, financial records kept by each group on the implemented initiatives, and self-reflection by project team members. Findings are presented for each community location, or case study, followed by a reflection on what worked well and considerations for similar future work.



Initial ideas for the Ililai Fish House take shape.

2. Context

Timor-Leste is a small independent nation located in the southeast of the Indonesian archipelago. Over 70% of its 1.2 million people live in rural areas, where livelihood opportunities are largely limited to smallholder agriculture and some small-scale fisheries in coastal areas (Williams et al. 2017; López-Angarita et al. 2019).

The project focused on two rural coastal communities: Ililai and Beacou (Figure 2). They were identified in partnership with the Directorate General of Fisheries, Aquaculture and Marine Resources (DG-FAMR) in the Ministry of Agriculture and Fisheries (MAF):

- **Ililai** *suco* (village) is located approximately 160 km east of the capital, Dili, in Lautém municipality. Project activities were largely carried out in the coastal *aldeia* (hamlet) of Samalari, which has about 74 households with a population of 606 (GOTL 2016). Dominant livelihood activities are gardening (maize, cassava and pumpkin) and livestock farming, as well as some fishing. Most fish are caught from small paddle canoes with hook/line and nets in shallow nearshore waters and also seasonally around the mouth of the nearby Laivai River. There are an estimated 30 regular fishers (WorldFish Timor-Leste, unpublished). According to census data, 12 households in Ililai *suco* own at least one boat (GOTL 2016).

Fish catch is prioritized for sale and sold to fish traders or directly to consumers on the roadside, but there is limited information on the volume caught and/or traded. Ililai was selected by the DG-FAMR as a priority project site and was a new engagement location for WorldFish. The project worked with a group of 15 women and 15 men.

- **Beacou** *aldeia* is located approximately 90 km from Dili in Aidabaleten *suco*, Bobonaro municipality, and consists of about 100 households with a population of 579 (GOTL 2016). Fishing is a primary livelihood activity for many. A high proportion of households own at least one boat—approximately 22% at the *suco* level according to census data (GOTL 2016), but certainly higher in Beacou *aldeia*, which is reported to have an average of one boat per household (Steenbergen et al. 2019). Agriculture, salt production and trade are also important livelihood activities. Fishers here use both motorized (typically 15 hp) and paddle canoes, with larger boats operated by two or three crew members. Beacou is the main source of fish for the inland municipality capital, Maliana, and an important supplier for Dili (Steenbergen et al. 2019). It has been the focus of previous fisheries-related research and development assistance, and WorldFish had an existing relationship with the community. This project worked with a group of 10 women.



Figure 2. Map of project sites in Timor-Leste. Inset shows the location of Timor-Leste in Southeast Asia and relative to Australia.

3. Ililai Fish House

3.1. Community engagement and “idea” identification

Community engagement in Ililai *suco* began in April 2017. An initial meeting was held with village leaders and community members (29 women and 22 men) to introduce the project, learn about their fisheries activities and start a conversation

about a potential livelihood enhancement initiative to work on together. At the inception event, we facilitated activities inspired by the pebble distribution method for ranking important marine life. The activity itself is a creative research method done on the ground, where participants allocate scores to marine species most important for food, income and culture, and it clearly

Timeline of key events

2017

April	Initial community meeting
May	Exchange trip to fishery center
June	Participatory assessment of initiative
September	Fish House planning meeting
November	Start of Fish House construction
December	Group formation and numeracy-literacy training

2018

January	Basic business skills training
April	Fish aggregating devices (FADS) constructed and deployed
June	Cooking school in Dili
July	Fish House restaurant opens and FAD fishing exchange in Viqueque
August	Fish House official opening and fishing training in Dili
October	Showcase at the Women's Fisheries Forum and the National Fisheries Forum
November	Evaluation meeting

2019

February	Fish production showcase in Ililai
April	Fishing trial and FAD agreement with Ililai and Binagua fishers
August	Fish House restaurant closes
September	Group division and restructure
October	Fish House restaurant reopens
November	Final participatory evaluation

defined the identity of our partnership as one focused on coastal resources and livelihoods. Community members demonstrated their interest and engagement through the lively discussions the activity generated, particularly around the names given to some species. It was noted that there were currently 12 family groups who fished, but that they faced several challenges. These included lack of boats, motors and nets and a lack of knowledge about fishing technology, as well as difficulty dealing with seasonally strong winds and waves. The village leader suggested one or several “fish centers” (also known by the Indonesian name, *tempat pelelangan ikan*, or TPI) could be built near the village to support the operations of several fisher groups.

There is evidence that similar fish center facilities in Timor-Leste and other countries are often not well used. With this in mind, WorldFish arranged



Men's and women's groups discussing the local names of marine species and ranking their importance in Ililai.

for Ililai representatives to visit an established but underused fish center in Baucau municipality to observe and discuss its use and management, or lack thereof, with fishers and leaders from that community. One representative was sent from each fisher group for a total of 10 men and two women. During the visit, it came to light that the facility was not well used because it did not play a role in the fish marketing system and was far from fishers' homes and lacked water and clear organization. After the visit, the representatives from Ililai remained committed to the idea of building their own fish center. They explained that they were united and trusted each other and their village leaders, and they were committed to using the facility once built. They also noted that, if necessary, local regulations could be developed to ensure its use in fish trade. They thought the fish center could be built using mainly local materials. In addition, they asked WorldFish to help with training in group management, financial management, restaurant hospitality, fishing technology and motorboat use, as well as assistance to obtain a freezer, motorboat and nets.

3.2. Participatory assessment of livelihood initiative

At a WorldFish-facilitated workshop in June 2017, 30 community members (18 men and 12 women) assessed the feasibility of building and operating a fish center, or “Fish House” as it became known. The participants came from both coastal and inland parts of the *suco*. The original livelihood assessment tool (Govan 2011) was used to guide critical thinking and identify what would be required, where materials could be found and who would provide them. A summary of this assessment is provided in Table 1.

From responses made during the assessment, it was clear that the workshop participants envisioned the Fish House would serve several functions. Men would use it as a landing center, while women would use it to sell products, such as grilled fish and *katupa* (rice parcels wrapped in palm leaves), or as a small restaurant. Strong points were identified from most assessment components: (1) suitable land was available from *suco* authorities, (2) the basic tools and skills required for construction could be found within the community, (3) people had experience cooking food for sale, and (4) the proximity of

Natural resources	Equipment	People and skills	Markets	Finances
<ul style="list-style-type: none"> ✓ Suitable land is available at no cost, provided by <i>suco</i> authorities. ✓ The land is near the main road as well as the beach. ✓ A water source is available. ✓ Sand and gravel are available. 	<ul style="list-style-type: none"> ✓ Members currently own or can borrow the basic tools required for construction. 	<ul style="list-style-type: none"> ✓ Community members have existing skills in building houses. ✓ Fishers have fishing skills. ✓ Women have experience cooking food for sale, such as baked fish and <i>katupa</i>. ✓ The activity will be carried out in groups rather than individuals or families—one fish house for each of the three groups at the meeting. 	<ul style="list-style-type: none"> ✓ There is potential to attract customers traveling on the main road, including on public buses, who can buy dried fish and <i>katupa</i>. ✓ Other potential customers are Ililai community members and students. ✓ Fish traders can be contacted by phone, meet in the new Fish House and transport fish to markets in Lautém and Baucau. 	<ul style="list-style-type: none"> ✓ Cash and in-kind contributions to purchase construction materials can be collected from group members and fishers. For example, USD 5–10 per person, rice, animals and coconuts.
<ul style="list-style-type: none"> ? Timber for construction may be difficult to obtain, so the members would need to get a license from the Forestry Department. ? Palm leaf and stem (building materials) are difficult to obtain, so the members may need to purchase them elsewhere. → Seek contributions from group members and WorldFish. 	<ul style="list-style-type: none"> ? They need to purchase some materials, such as cement and nails. → Seek contributions from group members and WorldFish. 	<ul style="list-style-type: none"> ? The community lacks experience and knowledge in group management and business (financial) management. ? Members would like training in hospitality. ? They would also like training to improve fishing techniques, such as using new technology. → Seek WorldFish support with training. 	<ul style="list-style-type: none"> ? The proposed location is far from people's houses, but delivery of orders can be arranged. ? Fishers cannot access the beach at the proposed location at low tide, but this is seen as a manageable problem. 	<ul style="list-style-type: none"> ? Initial capital is a problem, so the group would need to sell some animals and/or vegetables to raise cash.

Table 1. Summary of the participatory assessment of the Fish House initiative by Ililai community members.

the proposed location to the main road was highly favorable for attracting passing customers. However, initial capital to purchase non-local building materials would be difficult to raise, and the group identified a need for training in group and business management as well as in hospitality and improved fishing techniques.

Interest in the meeting was high, as many of the attendees had participated in the fish center visit the previous week. Discussions were generally lively and continued for almost five hours. However, tensions arose around the provision of materials, equipment and financial capital. From the outset, both WorldFish staff and the village leader had emphasized the expectation of community members co-contributing to the project to build a sense of local ownership. This was reiterated throughout the assessment process by direct questions on “who will provide” each item required. This was a difficult concept for participating community members, because it challenged their expectation that all materials and equipment would be provided.¹

Despite these tensions, the project team agreed that the workshop had gone well overall. In the post-workshop reflection, the majority of participants indicated (using a five-point picture-based Likert scale) that they had found the planning questions very useful (57%) or useful (20%), and they commented that the New Idea tool questions had helped clarify what would be required to build a fish center. A few participants (10%) indicated the questions had not been useful. Participants were also asked whether they thought the planned activity would improve their lives: most chose positive (50%) or very positive (27%), though they acknowledged the outcome was not certain. Some participants (10%) chose negative or very negative and commented that they lived in the inland part of the *suco* and the fish center initiative would only benefit those living near the coast. The workshop had also been well supported by local authorities, such as the village leader, who had voiced his support for the co-contribution approach and also explained it in the local language (Makasae) to clarify any misunderstandings. However, some discussions were dominated by a few men and the village

leader. Discussions within the broader group were often in the local language, which the project team could not understand. While people in rural communities are often more comfortable conversing in their local language, which allows their discussions to be “private” from external parties, this also meant the project team was only presented with selected opinions and was not privy to the concerns of all participants.

Following the assessment workshop, the village leader reported that two groups of fishers and their families would no longer participate. The agreed livelihood enhancement initiative was revised to one Fish House, which would be built and managed by the remaining group of men and women as an initial pilot project.

3.3. Action plan development

A planning meeting was held in September 2017 to discuss the details of how the Fish House would be used, what it would look like and the materials and work required for its construction. The meeting was attended by 13 women and 14 men, who discussed their ideas separately and then reported back to the whole group. The women’s presentation portrayed the Fish House as a center for economic activity, including a restaurant and small shop. They also expressed aspirations of building several guest rooms for tourists. The men’s presentation focused on technical details of construction and requested WorldFish provide motorized canoes and fishing equipment to improve their fishing activities. The project team reiterated that they could not provide fishing equipment but could provide some technical fishing training.

Discussions were lengthy and at times contradictory to the previous participatory assessment meeting and the agreed expectation of co-contribution to implement the initiative. The project team also raised concerns about the distance of the proposed Fish House location from the main village. The group maintained that it was preferred over sites closer to the main village due to the availability of space and cleared land. The village leader also noted that he hoped some community members would relocate to this area once the Fish House was established. Ideas for income generation were limited to what community members had seen

in neighboring villages, such as selling grilled fish and *katupa*. Other livelihood ideas were imagined but not well conceived, suggesting that participants had little experience of running a business. The lack of functioning organized groups related to fishery-based livelihoods or markets, and the long and circuitous discussions at the meeting, also suggested participants were not used to working collectively.

On this basis, it was agreed that WorldFish would arrange training on working in groups and managing a small business. WorldFish would also start acquiring construction materials and make some simple drawings for a house design, while the MAF would supply a mini icemaker and cool boxes. After the meeting, the project team reflected that community members may have reiterated requests for material assistance due to the presence of an expanded facilitation team, including non-Timorese and representatives from the MAF. Comparing meeting attendance lists also indicated that only nine of the 27 attendees (seven men and two women) had actually participated in the previous assessment meeting, which also likely accounted for some of the difficult and contradictory discussions.

3.4. Idea implementation: Construction and training

Throughout the implementation period, WorldFish maintained regular communication by phone with the village leader, the members of the newly formed group implementing the initiative and the WorldFish field facilitator.

The first building materials were delivered to Ililai in November 2017, and the Fish House gradually took shape over the following 7 months. Some delays were experienced. For instance, it took time for the group to obtain timber as this required renting a chainsaw and contributing money to buy fuel. The group provided all the timber and labor, as well as food to feed the work team, while the project purchased other construction materials at a total cost of USD 4610, plus an additional USD 1558 for restaurant equipment. Group members, both women and men, worked together to mix cement, lay concrete blocks, prepare timber and build the roof. Final construction varied slightly from the initial design, as the group decided to use

roofing tin instead of palm leaf because it is more durable and reportedly similarly priced.

The local non-profit organization Empreza Diak conducted training workshops on group formation and numeracy/literacy, as well as basic business skills. These were held in late 2017 and early 2018, with each workshop running over 2 days. The first workshop, attended by 15 men and 14 women, focused on writing and understanding complex numbers, using a calculator, the benefits of working in a group, group structure and leadership roles, and the importance of goal setting and building trust. The second workshop, attended by 12 women and 12 men, sought to strengthen the group's ability to manage money from their trading activities and increase their understanding of the market. In particular, participants learned how to calculate the cost of their product, record income and expenses, calculate profit and plan for future business growth. Marketing and promotion was also a key component of the activities.

To support boat-based fishing activities, which only men in the community carried out, the project worked with the group to build and deploy two FADs in April 2018 to attract small pelagic fish closer to shore and increase fishers' catches. Other

fishing-training opportunities for some Ililai fishers took place in Viqueque and Dili in July and August 2018, though poor weather prevented on-water practice. The FADs were deployed successfully, but concerns were raised about who could use and benefit from them, as well as the risk of sabotage from neighboring communities. The Ililai village leader notified neighboring *suco* leaders about the FADs, but no formal agreement was made on their use or management. A few months after deployment, one of the FADs was cut from its mooring by fishers in a neighboring community.

To support the aspiration of women in the group to establish a small restaurant at the Fish House, a 2-day cooking school was arranged with the Timorese owner and cook of a beachside restaurant in Dili in June 2018. The training, attended by six women and the male group leader, aimed to increase their capacity and knowledge to prepare a selection of simple seafood dishes and to serve customers. The group opened their restaurant the following month, and the Fish House was officially launched in August 2018 at an opening ceremony attended by representatives from the MAF, WorldFish, Lautém Municipality Authority and others.



Photo credit: Jordan Bos, Peta Lopes/WorldFish

Ililai women mixing concrete to build the floor of the Fish House.

3.5. Idea implementation: Monitoring operations

Over the course of project activities, the group participated in and showcased some menu items from the restaurant at various WorldFish-associated events. These included the Women Fisheries Forum and National Fisheries Forum held in Dili (October 2018) and a fish-based production experience-sharing workshop in Ililai (February 2019).

After about 4 months of operation (November 2018), the project team facilitated an evaluation meeting with all group members, consisting of 26 people, plus village leaders and the police commander. The purpose was to reflect on progress since the Fish House's official opening and to discuss improvements that could be made in group and financial management. Several positive aspects were identified: the restaurant was receiving daily business and had started to provide catering for events in the community, recordkeeping was up to date thanks to assistance by the WorldFish field facilitator, and the restaurant was operating in weekly shifts to allow for differences in group members' availability.

However, a number of problems were raised, mostly associated with internal group dynamics. There was little trust, cooperation or respect between some members, and there was a lack of confidence in group structure and roles. There was also little transparency regarding income reporting and a lack of commitment from some members. The restaurant was not currently profitable, and customers had sometimes received poor service, which risked damaging the restaurant's reputation. The men had not been fishing regularly due to lack of equipment, and not all had been successful in catching fish around the FADs. There were also issues over variable pricing of fresh fish and the distribution of profit among fishers (the men in the group) and the restaurant (operated by the women). Despite these issues, the group members wanted to continue working together, and they made some commitments to work toward better collaboration and communication.

The Fish House restaurant continued operation for another 8 months and was profitable over this period. In November 2018, the group had used some of its earnings toward paying for half of the

cost of a freezer, with the other half paid by the project. An agreement was made with fishers in the neighboring community of Binagua, who fish more actively than Ililai fishers, to allow them access to the Ililai FAD in return for boosting the supply of fish for the Fish House. This included Binagua and Ililai fishers carrying out a fishing trial together around the FAD. Unfortunately, group disagreements and internal conflict continued to affect the operation of the restaurant, culminating in its closure in August 2019. There were other difficulties too. A lack of clean water necessitated transporting water by rented car from the main village. Adjacent road upgrades had caused heavy dust and pollution. At times, the restaurant suffered from low patronage, which was attributed to variable customer service.

Rather than give up on the restaurant entirely, the group held a series of meetings in September 2019 seeking to resolve their internal disputes, which centered around the mismanagement of money and group leadership issues. Separate meetings were facilitated by the group, the project team (at the group's request) and the village leader. Some members were unhappy with the proposed resolution and decided to leave the group to open their own separate restaurant business, taking with them about USD 200 of earnings. The remaining members were committed to restarting the business at the Fish House and were willing to contribute cash for the initial capital required. Subsequent meetings helped the group to reorganize its leadership structure, develop simple group regulations



Ililai group member with fish cooked at the Fish House restaurant.

and bylaws to prevent the reoccurrence of money mismanagement and prepare to reopen the restaurant in late September 2019.

3.6. Final participatory evaluation

The final participatory evaluation was held in November 2019, approximately 2.5 years after the initial community engagement and 15 months after the official Fish House opening. Separate discussions were held with the seven women and five men left in the group. Questions were organized around the same five components of sustainable livelihoods used in the initial participatory planning assessment from the New Idea tool: natural resources, equipment, people and skills, markets, and finances. A summary of discussions is provided in Table 2. Overall, responses from the women's and men's discussions were similar. The exception was questions on "equipment," where their discussions were focused on their respective restaurant operation and fishing activities. Positive and negative aspects were noted for all five components:

- The Fish House restaurant, predominantly run by the women in the group, had established trade in grilled fish and *katupa* and also provided catering services for community events. The women in the group earned income from working in the restaurant, while the men could earn income from selling fresh fish to the restaurant and working in the restaurant if required.
- Raw ingredients, such as fish, vegetables and coconuts, were supplied to the restaurant from both Ililai and the neighboring communities. Project activities were not thought to have changed the ways in which men and women used natural resources. However, in the women's discussion it was noted that women's ability to earn an income from natural resources had improved. They could now earn the same income as men if, for instance, the women grew and sold vegetables to the restaurant. The Fish House was thought to have led to some negative changes in natural resources. In particular, it had reduced the availability of young coconut leaves, which were used daily to make *katupa*, a popular

dish among customers. It also increased plastic garbage because of more people visiting the area and the lack of disposal facilities.

- Restaurant equipment provided by the project was still functional and used, and the women's discussion highlighted ambitions to purchase new equipment to improve food quality and hygiene and reduce their workload. The men's discussions, however, focused on their lack of boats, outboard motors and fishing nets, which prevented them from fishing in deeper waters and increasing their catches. Their attempts to save money by selling fish had been unsuccessful, and they reiterated earlier requests for assistance from WorldFish and the government.
- Working collectively was valued in both women's and men's discussions as a way of sharing work. It was noted that the group had worked well together for some activities, particularly in building the Fish House. Both women's and men's discussions reported that the training provided on group formation had been beneficial, but that they had not managed to fully apply the lessons. For instance, they mistrusted each other to do the tasks associated with their agreed upon group roles. Financial mismanagement (group money taken by individuals and not returned) and group leadership had caused internal divisions, which had resulted in 18 out of 30 members, or 60% throughout the project period, leaving the initial group.



The completed Ililai Fish House.

Natural resources	Equipment	People and skills	Markets	Finances
<ul style="list-style-type: none"> ✓ Fish are supplied to the restaurant from Ililai as well as neighboring communities (Binagua, Equisi and Watabou). [w & m] ✓ Vegetables, coconuts and other raw ingredients are purchased from group members and the broader Ililai community. [w] ✓ Both men and women can now earn the same income from their natural resources if they work diligently. [w] - No change to how women and men use natural resources. [w & m] 	<ul style="list-style-type: none"> ✓ Restaurant equipment provided by the project is still functioning and used. [w] ✓ Broken equipment can be replaced using group cash set aside from earnings. [w] ? The group proposed to buy new items to improve food quality, hygiene and reduce workload (glass display cabinet, rice cooker and electric stove), possibly by borrowing money and repaying it using group earnings. [w] 	<ul style="list-style-type: none"> ✓ Group work has lightened workloads and members can support each other. [w & m] ✓ The group worked together to build the Fish House. [w & m] ✓ Division of tasks: women cook, manage income and negotiate fish prices with neighboring fishers; men fish, sell fish to the restaurant and maintain the Fish House, but also assist with cooking when catering large events. [w & m] ✓ The restaurant is operated based on a daily work schedule agreed upon by the women in the group, but members inform each other if they cannot work. [w] ✓ Cooking skills and menu diversity have improved. [w & m] ✓ Capacity and confidence to participate in national events have increased. [w] ✓ Good relations have been established with fishers in neighboring communities, who supply fish and sometimes buy ice from the Fish House. [w & m] ✓ The community supports the restaurant by selling produce and promoting the restaurant among family and friends [w] and by not disturbing restaurant customers. [m] ✓ Support from <i>suco</i> authority: local authorities ensure the security of the Fish House [w] and are now building water infrastructure. [m] ✓ Differences of opinion are managed through discussions [w & m] and involvement of the village leader if necessary. [m] ✓ Other people (including former group members) have now also established four restaurants in Ililai. [w & m] 	<ul style="list-style-type: none"> ✓ Women earn income from selling grilled fish, <i>katupa</i>, soft drinks and other products at the restaurant (monthly share based on time worked), as well as from providing event catering for NGOs, police, army, government officials and <i>suco</i> authorities. [w] ✓ Men earn income from selling fresh fish to the restaurant, and they also earn a monthly share from restaurant activities (based on time worked). [m] ✓ All food is prepared at the Fish House. [w] ✓ Products sold are based on consumer demand. [w & m] ✓ Women and men make marketing decisions together, such as how to promote to bus passengers and others. [w & m] ✓ Men and women both benefit from marketing, as men can sell more fish to the restaurant, which means the restaurant earns more income. [w & m] ✓ Fish pricing: fresh fish prices vary seasonally and are lower when fish catches are larger. [m] A fish bought for USD 1 can be sold cooked for USD 2, or 10 small fish bought for USD 1 can be sold for USD 1 each. [w] ✓ Product quality is ensured by using good (fresh) raw ingredients [w & m] and maintaining electricity supply for the freezer [m]. ✓ Women's and men's time efforts and constraints are managed through a daily work roster. [w] ✓ Ililai has become known thanks to the Fish House and restaurant. [w] ✓ Currently, the group has <i>suco</i> level permission for running the restaurant [w], and municipality approval from the Fish House launch [m]. 	<ul style="list-style-type: none"> ✓ The restaurant opened in July 2018 with USD 100. ✓ After putting aside USD 10 each month for group cash, the group uses 50% of remaining earnings to purchase raw ingredients and cover other operational costs, and distributes the remaining 50% among group members based on time worked. [w & m] ✗ Individual income from the restaurant is low, but members can at least contribute one sack of rice per month to their households. [w] ✓ Group members' families continue to be supportive of the business. [w] - Group members continue other livelihood activities, like gardening and raising animals, to support their families. [m]
<ul style="list-style-type: none"> ✗ Availability of young coconut leaves (used for <i>katupa</i>) has decreased due to daily use in the restaurant. [w] ✗ Plastic garbage around the Fish House and beach has increased. [m] ✗ People from another community poisoned fish on nearby intertidal flats using a plant root poison (thought to be motivated by jealousy). [w & m] 	<ul style="list-style-type: none"> ✗ Lack of boats, outboard motors and fishing nets prevent fishing in deeper water and increasing fish catches. [m] ✗ Savings from fishing using paddle canoes are too low to enable purchase of fishing equipment. Assistance was requested. [m] 	<ul style="list-style-type: none"> ✗ There was initially poor group leadership and management, which led to internal conflict. [w & m] ✗ Some group members left due to poor leadership, money mismanagement and internal conflict. The group started with 15 women and 15 men, but now there are just seven women and five men. [w & m] ✗ Good lessons were learned from training on finances and group formation, but the group failed to apply them, such as carrying out duties according to the agreed upon group structure. [w & m] 	<ul style="list-style-type: none"> ✗ Group earnings initially saved were taken by individual members and not returned. [w & m] 	

Table 2. Summary of the final participatory evaluation of the Ililai Fish House initiative and associated project activities by the women's [w] and men's [m] discussion groups.

- Restaurant earnings covered expenses, but the profit share that each group member received was still low, though it was “sufficient to contribute a sack of rice to the family.” In the women’s discussion, it was thought this was due to not adequately applying lessons from group formation and business training.² Group members intended to continue the restaurant and seek ways to improve the business, and they had the support of their families to do so. They also maintained their other livelihood activities, such as gardening and raising animals. Some former group members had decided to open their own restaurants using skills learned through the project, and there were now four small restaurants operating in Ililai.

Both the women’s and men’s discussions identified ways in which *suco* authorities and the broader Ililai community had supported their activities. Examples given of *suco* authority support were maintaining security and plans to provide water infrastructure, while the broader community sold its produce to the restaurant and encouraged friends and family to visit. Good relations with fishers in neighboring communities were also reported, as indicated by their willingness to supply fish to the restaurant and also purchase ice. Comments from the village leader and nine community members not involved in project activities supported this perspective of an overall positive impact from Fish House activities, particularly as a regular buyer of community members’ fish, coconut leaves, vegetables and spices. However, some community members felt the restaurant group prioritized buying from family and recommended the group give all community members the same opportunity to sell to the restaurant. Some of these non-group members had known about the project from the start but had other commitments, which prevented their involvement. Others had not been involved due to the distance of the activities from the main village area, or had not heard about the project until the Fish House had opened.

The main benefits of the project identified in the women’s discussion were their improved cooking skills, the experience gained from participating in national-level events in Dili, and that Ililai was now well-known thanks to the Fish House and restaurants. The men’s discussion identified the establishment of the Fish House itself, as well as good relations with neighboring fishers. In

both discussions, the group believed they had sufficient equipment and skills to continue the new livelihood activity with minimum input from the project team. The women’s discussion noted that WorldFish, together with the village leader and training partner Empreza Diak, had adequately supported them and responded to their needs. When asked if the project could have done anything differently, the men’s discussion suggested that materials, specifically boats, motors and nets, be provided alongside training. The women’s discussion also identified further material assistance with a signboard, recreational area, homestay construction and group uniforms.

3.7. Monitoring initiative progress

Quantitative data collected over the project implementation period included fish catch surveys to record the amount and type of fish caught in the Ililai fishery as well as bookkeeping records from the restaurant. The fisheries data recorded as part of the PeskAAS national catch monitoring system (Tilley et al. 2020b) indicated that most fish is sourced nearshore at relatively low fishing effort, using mostly handlines from canoes. There is some use of gillnets, and gleaning has also been recorded. Snapper, trevally and barracuda were the most frequently recorded species, but further analysis was not possible due to sporadic data collection by the onsite enumerator. Tracking of six fishing canoes fitted with solar-powered GPS units (Figure 3) suggests fairly limited fishing activity in Ililai. Each canoe took between zero and 35 trips per year in 2018 and 2019, for an average of 13 trips annually. Fishers traveled an average distance of 4 km per trip, and the average maximum range from the landing beach was 1.4 km.

The Fish House restaurant’s bookkeeping records provide some insight into income that the new livelihood initiative generated. All “cash in” and “cash out” transactions were recorded, except for those related to catering for community events and distribution of group members’ monthly share of sales profits.³ Income and expenditure are summarized in Table 3 and Figure 4. Over all 17 months of operation, total income from restaurant sales was USD 7086 (average USD 417 per month). The total cost of goods sold over this period was USD 4844 (average USD 285 per month). This equated to an average gross profit margin of 32%. Total operating expenses were USD 530 (average USD 29 per month).⁴ Total net profit was USD 1712, for a net profit margin of 24%.

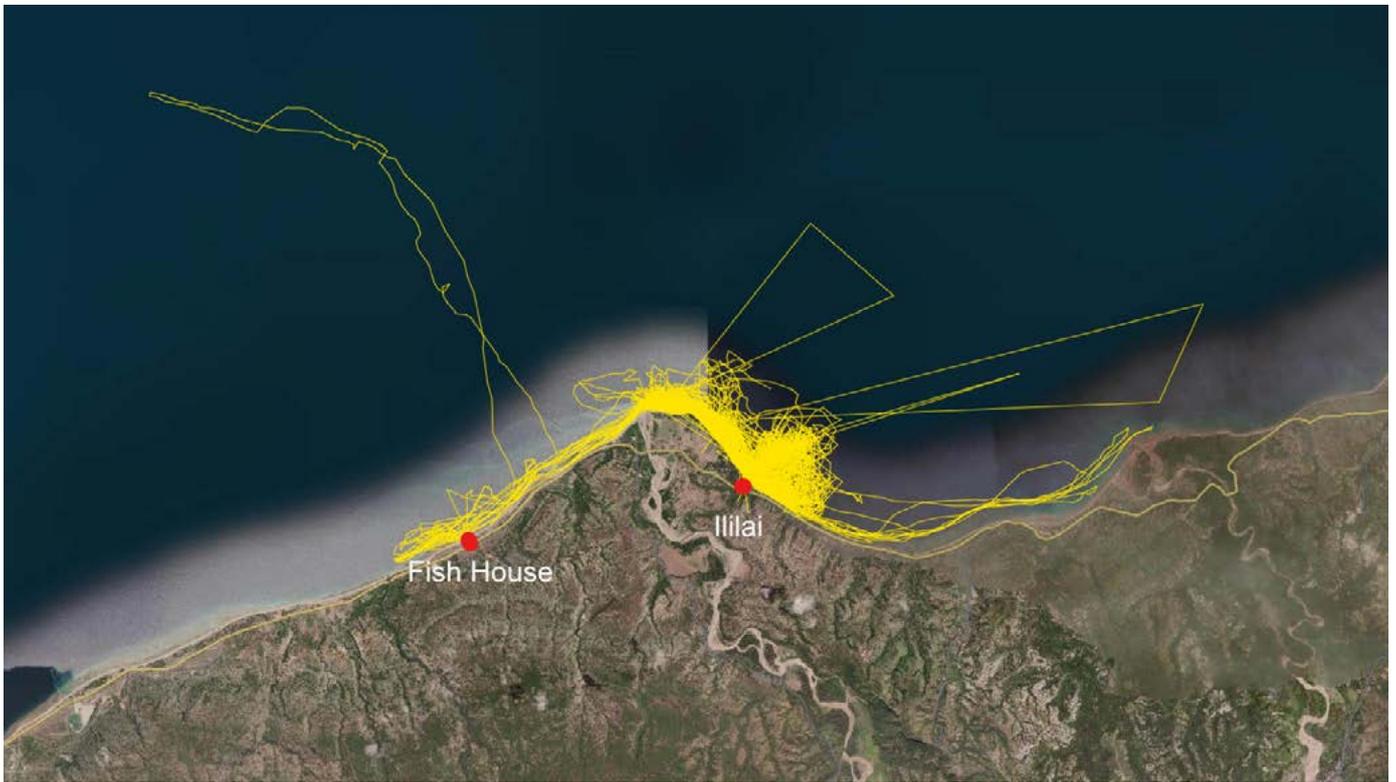
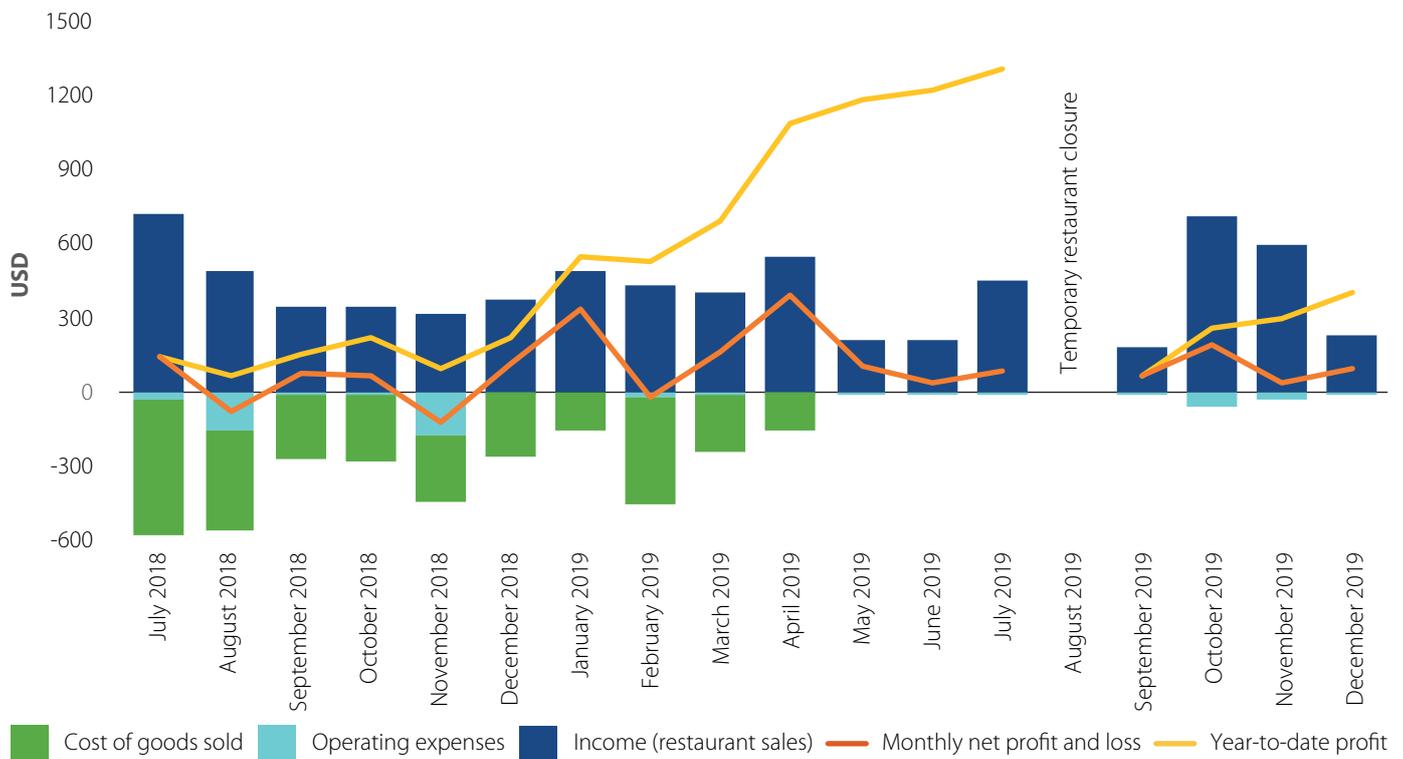


Figure 3. Tracks of six Ililai fishing canoes from 2018 to 2021.

	1st opening		2nd opening		All months	
Period	July 2018–July 2019		September–December 2019		July 2018–December 2019	
	Total	Monthly average	Total	Monthly average	Total	Monthly average
Income						
Restaurant sales	5360	412	1726	431	7086	417
Expenses						
Cost of goods sold	3602	277	1241	310	4844	285
Operating expenses	447	34	83	21	530	29
Net profit from sales	1311	101	402	100	1712	101
Distribution of sales profit						
Future business fund	~1191*	101	~40	10		
Kept for restaurant operation (working capital)			~181	45		
Share distributed to members	~120		~181	45		
Balance	0	0	0	0	0	0

* Lost due to mismanagement.

Table 3. Fish House restaurant income, expenses and distribution of profit (USD).



Note: Excludes events, catering transactions and distribution of wages (data not recorded).

Figure 4. Fish House restaurant sales turnover, cost of goods sold, operational expenses and profit (July 2018 to December 2019).

During the first restaurant opening period, active group members received about USD 12 (or a sack of rice) from restaurant sales, as well a share of income from catering events (not recorded). The remaining income from sales was allocated to the group business fund. Due to mismanagement and internal disputes, however, these funds were taken by individuals and not returned to the business. During the second opening, group members received a share of net profit from sales each month according to the number of days they had worked. While this data was not recorded, the total amount distributed to members was probably about USD 45 per month based on bookkeeping records and the group’s distribution method (Table 3). This equated to about USD 6.40 per individual per month, based on seven active members.

The Fish House restaurant has become established as part of local fish market chains. Over half the income received from restaurant sales came from selling grilled fish (average USD 207 per month). Similarly, fish accounted for just under half (47%) of the cost of goods sold (Figure 5). This equated to a total of USD 2274 worth of fish being purchased from fishers in Ililai and neighboring communities

from July 2018 to December 2019, or an average of USD 134 per month, though most fish was purchased from outside the community. Data on the number of individual fishers selling fish to the restaurant was not recorded.

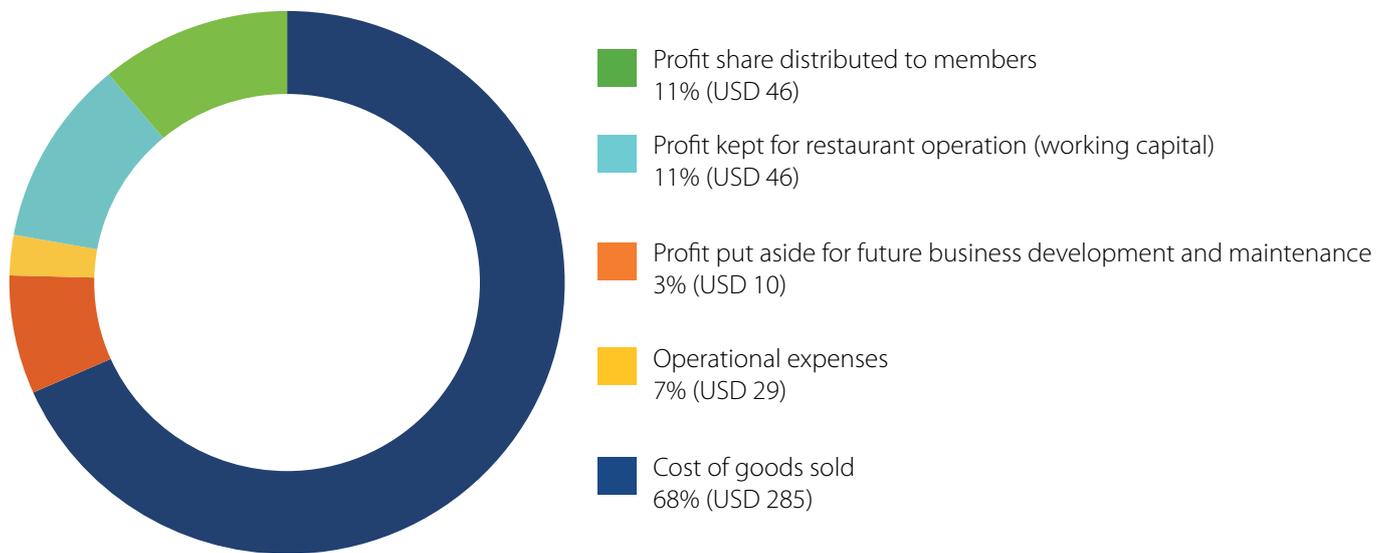
Restaurant operating expenses were fairly low, averaging USD 29 per month (Figure 6). They comprised mainly fuel and vehicle rental costs to transport water and produce, as well as items such as light bulbs and cleaning materials; there were no site rental or electricity expenses. A monthly profit was made in all but three of the months the restaurant was open (Figure 4). The loss in August 2018 (USD 74) was largely due to the purchase of a buffalo for the official opening ceremony of the Fish House, while the November 2018 loss (USD 122) was due to the purchase of a freezer.

3.8. Before and after comparison based on participatory assessments

An assessment was done on how well the initial participatory planning workshop prepared the group and project team for potential challenges. We compared what was discussed and predicted at the idea assessment (“pre-assessment”) to



Figure 5. Average monthly sales, purchase costs and profit by product type (July 2018 to December 2019) at the Fish House.



Note: Excludes catering transactions, with profit breakdown (green) estimated based on description provided by group members (second restaurant opening).

Figure 6. Average monthly breakdown of expenses and profit (July 2018 to December 2019).

“what actually happened,” based on the final participatory evaluation workshop (“post-assessment”) and project records (Table 4).

The initial assessment using the New Idea tool was conducted based on the idea of “constructing a fish house/facility.” However, the objectives of how it would function and how it would improve

people’s livelihoods were not clearly defined. In particular, the restaurant aspect of the initiative was not fully conceived at this stage in the project. As a result, the pre-assessment did not thoroughly assess the requirements, feasibility or potential impacts of restaurant activities, nor the use of the facility as a landing center or trading hub. Potential restaurant activities were only discussed in relation

to two of the five livelihood components: people and skills, and market.

In terms of the construction aspect of the Fish House initiative, activities proceeded largely according to the pre-assessment discussions. The group contributed tools, some local building materials and labor as committed; however, there was a change in roofing design (tin instead of local materials), which had budget and time implications. The group’s collective efforts in construction did create a strong sense of pride and ownership. While the collection of cash to pay for non-local building materials did not proceed as initially discussed, the group did raise USD 100 as initial working capital for the restaurant.

Pre-assessment discussions on restaurant activities usefully led to identifying training needs associated with running a restaurant, such as business skills and cooking/hospitality training. In the post-assessment, women highlighted diversified cooking skills as one of the main benefits of the project. Selling grilled fish and *katupa* to travelers along the highway was the main target market identified in the pre-assessment, and this was successfully achieved. The Fish House established itself as a well-known restaurant, including among bus drivers and government officials. However, the other intended functions of the Fish House—as a landing facility and fresh fish sales hub—did not happen, largely due to the limited fishing activities carried out in Ililai. This had both positive and negative

Natural resources	Equipment	People and skills	Markets	Finances
<p>✓ Land used for the Fish House site has been suitable, as predicted in the pre-assessment, despite initial concerns from the project team. While evidently creating some extra labor, distance from the main village was still noted as a positive in the post-assessment. However, some non-group members reported the distance was a factor in their lack of involvement in the project.</p> <p>x✓ Construction materials: Timber was successfully sourced by the group; sand and gravel were purchased by the project. Design changes decided by the group led to the use of roofing tin (supplied by the project) instead of palm leaf. This had implications for the budget, timber used and resulted in some delays.</p> <p>x✓ Water availability was noted as a positive aspect of the proposed site in the pre-assessment, but once in operation the lack of clean water was a problem for the restaurant. The pre-assessment comment probably related to an alternative construction site near the main village. In the post-assessment, it was reported that <i>suco</i> authorities were addressing this issue by building water infrastructure to the Fish House, <i>suco</i> office and surrounding area.</p>	<p>✓ Building tools and materials: Tools available in the community were adequate to build the Fish House, and some materials (such as cement and nails) were purchased by the project. Both were consistent with discussions in the pre-assessment.</p>	<p>✓ Building skills within the group and community were adequate to build the Fish House, as identified in the pre-assessment.</p> <p>✓ Cooking skills: As identified in the pre-assessment, women both had existing cooking skills and also benefitted from additional training. In the post-assessment, this was noted by the women as one of the main benefits of the project.</p> <p>✓ Group work and business management: Training needs were identified in the pre-assessment and supported by early observations from the project team. The group made substantial progress in this area, despite inexperience and challenging situations. Evidence for this is provided by the group reopening the restaurant after internal conflict, loss of members and financial setback.</p> <p>? Fishing skills were identified as an area for improvement in the pre-assessment. While some training and FAD deployment were included in project activities, these were not mentioned by the group in the post-assessment. The village leader noted that the FADs were not being well used by the fishers.</p>	<p>✓ Cooked food (grilled fish and <i>katupa</i>) is being successfully traded from the Fish House, a potential activity identified in the pre-assessment; other seafood dishes are also made to order.</p> <p>✓ Customers: The restaurant has been successful in attracting customers, including public buses, as predicted in the pre-assessment. Potential food orders from the community were also identified; this opportunity has evolved into event catering for a range of NGOs and government officials.</p> <p>x✓ Fresh fish trade: The intended function of the Fish House as a hub for Ililai fishers to trade fresh fish did not happen. This was partly due to the success of the restaurant, which is able to buy and add value to the small fish quantities caught in Ililai, but also due to limited local fishing activities.</p> <p>x Landing facility: The intended function as a landing center did not happen, mainly due to limited local fishing activities and the distance of the Fish House from fishers’ homes, leading to concerns over boat security.</p>	<p>✓x Initial capital: The group members put together USD 100 as initial working capital for the restaurant; however, they did not finance construction materials, as proposed in the pre-assessment. These were purchased by the project.</p>

Table 4. Comparing “what actually happened” with the initial participatory assessment of the Fish House and restaurant.

consequences for restaurant operations. The group developed good relations with fishers in neighboring communities, which established the Fish House as part of broader fish market chains, but the men in the group were less actively occupied and involved themselves in restaurant affairs, which the women in the group disliked.

Comparing pre- and post-assessments also identified a number of challenges or issues that were not anticipated or adequately considered in initial planning (Table 5). First, there was no analysis of the potential financial viability of the restaurant, nor discussions on desirable individual incomes to be generated from restaurant activities. Financial data suggests that even the members of the smaller group running the restaurant in its second opening have only received low individual incomes. Second, there was little discussion in the pre-assessment about fish availability in Ililai. Fish were not even identified as a potential source of income to obtain startup capital, only the sale of other animals such as chickens and goats. Fortunately, the neighboring fishing community near Ililai was able to supply the restaurant with fish, otherwise this oversight may have had more serious consequences for

project activities. While neighboring fishers had started using the Ililai FAD, it remains unknown whether overall fish landings have increased to meet demand from the restaurant(s) or if supply has been diverted from other markets, such as difficult-to-reach inland communities.

Some of these omissions, as well as construction design changes, may have arisen due to different people involved in the assessment and implementation. The initial planning workshop was conducted with all interested community members, mostly from three loosely associated groups of fishers and some from inland parts of the *suco*. Only nine people in the implementing group (about 30%) had participated in the initial planning workshop. It may also have been beneficial to conduct separate assessments of the proposed uses of the Fish House, as a restaurant and fish trading hub, after the final group composition was established and the initial training workshops on group formation and business management were completed. This may have flagged key considerations, such as fish supply and restaurant financial feasibility, earlier in the implementation process.

Natural resources	Equipment	People and skills	Markets	Finances
<p>Fish availability and potential impact of the activity on fish resources were not considered in the pre-assessment. This was probably due to its focus on house construction rather than restaurant operation. It was clear from early in project engagement that Ililai fishers had only limited fishing capacity. In the post-assessment, it was noted that alternative fish supplies from neighboring communities had been secured to meet restaurant demand. While this has successfully established the Fish House as part of broader fish market chains, it is unknown whether the activity has increased fishing effort to meet extra demand or if fish supply has been diverted from elsewhere (e.g. from markets such as inland communities).</p> <p>Other restaurant ingredients were also not considered in the pre-assessment. The post-assessment noted that the now daily use of coconut leaves was unsustainable with current resources.</p>	<p>Restaurant equipment was not considered in the pre-assessment due to its focus on construction. This equipment was mainly purchased by the project; however, the group contributed to purchasing a freezer using restaurant earnings. A savings plan is in place to cover repairs, and the women expressed interest in purchasing new items, possibly through a loan. However, the amount currently put aside is fairly low and may not be sufficient.</p> <p>Lack of fishing equipment (boats, motors and nets) was identified as a constraint to fishing activities at the initial community engagement meeting, though not specifically noted in the pre-assessment (despite fishing listed as an income source to cover expenses). This constraint was highlighted again in the post-assessment, as well as fishers' inability to save enough to buy equipment themselves.</p>	<p>Time availability: The pre-assessment did not clearly consider how the proposed activity would fit alongside existing livelihood activities and commitments. In the initial months after restaurant opening, group members focused their efforts on restaurant work and did not carry out their other income-generating activities, such as collecting firewood and stones for sale. They later created a roster system to enable group members to continue other livelihood activities as well as working in the restaurant.</p>	<p>Fish pricing: The pre-assessment did not discuss local pricing of fish, seasonal variability or potential markup that could be obtained on cooked products, such as grilled fish. Pricing was raised as an issue during one of the group evaluation meetings. It had caused tension between the men and women in their respective roles as fishers (fish suppliers) and restaurant managers (fish buyers). At the post-assessment, men noted that the price they/fishers requested did vary based on seasonal availability. Reported markup was variable, possibly based on fish type and size.</p>	<p>Restaurant financial viability was not analyzed in the pre-assessment, despite the clear aspiration to use the Fish House for selling food products.</p> <p>The restaurant operating model was also not discussed in the pre-assessment, though it was noted that the overall initiative would be carried out in groups.</p> <p>Income (or other) aspirations: Individual incomes were implied to be lower than desired in the post-assessment. While income generation was an apparent goal in pre-assessment discussions and planning, clear objectives or discussions on aspirations were not recorded.</p>

Table 5. Unassessed factors or unanticipated challenges associated with the Fish House and restaurant initiative.

4. Beacou fish-based microenterprise

4.1. Community engagement and “idea” identification

WorldFish has carried out fisheries research and FAD deployment activities in Beacou *aldeia* since 2013. As such, the project team had an existing relationship with the community. In April 2017, the project team held an initial meeting with fishers and fish traders in Beacou. This led to the construction and deployment of two FADs in May 2017 to support access to pelagic resources and reduce fishing pressure on coral reefs. At a subsequent meeting, held to discuss needs to support existing livelihood activities, fishers and

fish traders identified an interest in receiving training in business management, fishing techniques and safety at sea, as well as material assistance with cool boxes and gillnets.

Based on these discussions, the project conducted a 3-day training workshop in March 2018 on basic business skills and group formation, which was attended by 18 women and 2 men. At the end of the workshop, some of the women in attendance proposed to form a new group business to make two fish-based products: bottled sardines and a “fish powder” seasoning product (also known as *gurih-gurih gizi*). They asked if the project could

Timeline of key events

2017

April	Initial visit
May	FAD construction and deployment
October	Discussion with fishers, fish traders and women on livelihood priorities

2018

March	Group formation and business training
April	Bottled sardine demonstration by women
May	Participatory assessment of initiative—bottled sardines
June	Participatory assessment of initiative—fish powder
July	Fish powder product development commenced
October	Showcased products at the Women’s Fisheries Forum & National Fisheries Forum
November	Fish powder and bottled sardine products piloted in Dili retail outlets

2019

February	Fish production showcase in Ililai and marketing of products in Dili
May	Fish powder stocked in Delima Fish Market, Timor Organic and Pateo
June	Fish powder stocked in Loja Agrikultura
July	Group members meet with Loja Agrikultura in Dili
November	Final participatory evaluation

provide support. Some of the women had learned to make these products previously, from the Japanese aid agency Pacific Asia Resource Center Interpeoples' Cooperation (PARCIC). However, due to an internal dispute, their former group had disbanded and ceased production. The following month, the women demonstrated their skills in bottled sardine production and convinced the project team to provide support to restart the group and help facilitate product development.

4.2. Participatory assessment of livelihood initiative and action plan development

To evaluate the feasibility of the idea to produce bottled sardines and fish powder products for sale, WorldFish facilitated two workshops in May and June 2018 to conduct a participatory assessment guided by the draft New Idea tool. These assessments were

carried out by a group of 10 women who were interested in forming the group business. Summaries are provided in Tables 6 and 7.

For both products, the group had good access to most of the natural resources required. However, production would be limited by the availability of fresh sardines (only February and March) and shrimp, and some ingredients (olive oil) and packaging items (glass jars, plastic packets and labels) could only be sourced in Dili. Firewood was also a potential problem. The preferred alternative, a kerosene stove, could potentially be purchased in the future, not immediately. The group had access to most equipment needed to make the bottled sardines, but its potential market was uncertain and likely limited to consumers in Dili due to price. For the fish powder, they identified the local hospital as a potential local buyer, but key pieces of equipment were needed and the group doubted

Natural resources	Equipment	People and skills	Markets	Finances
<ul style="list-style-type: none"> ✓ Sardines are caught every year, in February and March. ✓ The group lives close to the beach, where fishing boats come to shore. ✓ Freshwater is available. 	<ul style="list-style-type: none"> ✓ The group already has most (75%) of the equipment needed for production. → For other items, they can borrow them from other group members, submit a proposal to an NGO, or members can contribute money to buy. ✓ They can maintain equipment by cleaning and keeping it together, and keep some future earnings for repairs. 	<ul style="list-style-type: none"> ✓ Five of the 10 group members have the skills needed to make the product. ✓ Skilled members will teach the others, including any new members in the future. ✓ Members can work twice a week in the sardine season to produce 40–50 jars per session. ✓ Members will inform the <i>Chefe Aldeia</i> (hamlet chief) about activity to ensure they have permission. ✓ They can establish a verbal agreement with fishers (men) to sell fish to the group (women). 	<ul style="list-style-type: none"> ✓ Members want to sell products. ✓ They can use public bus to transport products to Dili or ask the supermarket to collect when buying vegetables nearby. ✓ Members can produce large batches to reduce transportation costs. 	<ul style="list-style-type: none"> ✓ To save money for startup capital, each member can contribute USD 2 per month by selling bread, pumpkin or salt. ✓ Production plan for 150 jars (6 fish/jar): <ul style="list-style-type: none"> • Total expenses: USD 155 <ul style="list-style-type: none"> - Sardines USD 75 - Olive oil 1.5L USD 15 - Jars USD 60 - Dry wood USD 5 • Sales price: USD 4.50 each - Income: USD 675 - Expected profit: USD 520 ✓ Put aside half of earnings for the group to ensure continuity.
<ul style="list-style-type: none"> ? There is no olive oil in Beacou, but it can be bought in the supermarket in Dili. ? Dry wood is needed for cooking, but it is difficult to get in the wet season and is damaging to the trees/forest → Use a kerosene stove instead. x There are no sardines when bad weather stops fishing. → Increase production during sardine season. 	<ul style="list-style-type: none"> ? They do not know where to buy jars, so they need to ask the NGO who provided training. ? It is not easy to buy some equipment, such as a kerosene stove, which can only be found in Dili. ? Group is unsure if it can borrow a stove. → They can use existing equipment and firewood initially, but want to buy a stove in the future. 	<ul style="list-style-type: none"> ? Training is needed on how to connect with and negotiate trade with Dili stores. 	<ul style="list-style-type: none"> ? The target market is Dili supermarkets (other Dili stores, local market?) but members do not know if people will buy. → Ask stores where products were sold before. ? There is no current trading agreement between the group and stores. → The group leader will arrange a new agreement with Kmanek. ? Help is needed to design and make product labels. 	

Table 6. Summary of the participatory assessment of bottled sardine production by the Beacou women's group.

Natural resources	Equipment	People and skills	Markets	Finances
<ul style="list-style-type: none"> ✓ Members can get fish from the sea, moringa leaves from gardens and clean water. 	<ul style="list-style-type: none"> ✓ The group has some equipment already; some is the same as for making bottled sardines. 	<ul style="list-style-type: none"> ✓ Group activity. ✓ Four members have skills and experience in making this product. ✓ Skilled members will teach the other members. ✓ Members can work together once a week to make products and then assess demand. ✓ They can establish a verbal agreement with fishers (men) to sell fish to the group (women). 	<ul style="list-style-type: none"> ✓ Target market is the hospital and school children. Atabae Hospital (nearby) is interested in buying the product. ✓ Members can transport the products to the hospital and school by public transportation. ✓ People are interested in buying the product at a price of USD 0.25 per portion. 	<ul style="list-style-type: none"> ✓ Production plan for approximately 300 packets (40 g each): <ul style="list-style-type: none"> - Total expenses: USD 33+ - Fish (12 kg) USD 15 - Shrimp USD 10 - Seasoning USD 5 - Moringa leaves USD 2 - Oil USD 1 - Packaging? • Sales price: USD 0.25 each - Income: USD 75 - Expected profit: ~USD 42 ✓ Put aside half of earnings for the group to ensure continuity.
<ul style="list-style-type: none"> ? It is difficult to dry moringa leaves in the wet season. ✗ If there is no shrimp, products cannot be made. → Try to find shrimp at Loes. ? Difficult to get dry wood in the wet season → Use a stove instead. 	<ul style="list-style-type: none"> ? A blender, scales and press machine for sealing packets are needed. → Ask the project for assistance to buy them. ? Plastic packaging is needed to maintain freshness. → Request assistance from the project to buy. ? It is not easy to find some equipment, such as scales, packaging and press machine, which are only available in Dili. 	<ul style="list-style-type: none"> ? Training is needed on how to connect and negotiate trade with stores in Dili. 	<ul style="list-style-type: none"> ? Target market is limited. Members could approach the school feeding program to maybe integrate into the school menu and sell in other shops. ? Need assistance to link with Dili stores. ? Need help to design and make a product label. 	<ul style="list-style-type: none"> ✗ Group members have insufficient capital to buy the remaining equipment needed. → Ask the project to buy them.

Table 7. Summary of the participatory assessment of fish powder production by the Beacou women’s group.

its ability to save sufficient funds to purchase them. The women with existing production skills were willing to train other group members, but all lacked experience in negotiating trade agreements with supermarkets in urban Dili. Based on estimated costs of ingredients and proposed selling prices, both products appeared to be profitable.



Beacou women cleaning fish to make fish powder.

4.3. Idea implementation: Product development and establishing market connections

Following the assessment, the project provided the group with the equipment needed to make both products, including a blender, scales, wok and stove, for a total cost of approximately USD 500. Production was set up and initial packaging and labeling developed. The group leader followed up on pre-project discussions with the local hospital, which had been interested in incorporating the fish powder product into its nutrition programs. However, the 2018 national elections led to a change in government officials and a political impasse that halted all government spending for several months, thereby stalling any progress on these arrangements.

The project team and the group decided to investigate the potential market for both products in Dili. In November 2018, several Dili supermarkets were approached with fish powder and bottled sardine samples to determine their willingness to

stock the products. The supermarket where the women had previously sold products had since changed its regulations and now required local food production groups to be registered as an official business. This was deemed too onerous given the group was still in the early stages of establishment and product development. However, another store was willing to trial sales, on the condition that the group purchased and used its plastic packaging and jars. After some experimentation by the project team and the group, it was decided that a type of ziplock packet (sold by the store) was reliable, suitably priced and attractive for fish powder sales. A source of printed stickers for labels was also identified. Initial sales in Dili were lower than anticipated and were impacted by factors such as visibility in the store. In February 2019, the project team sought to informally market the products to friends, family and colleagues in Dili to build consumer interest and awareness. Feedback from the store manager and sales records suggested the fish powder was suitably priced, but the bottled sardines were too expensive to attract interest from consumers.

Given that the market for fish powder seemed most promising, the group decided to focus its efforts on this product. Initial batches had problems with inconsistent flavor caused by variations in ingredient proportions. To solve this, the project team worked with the group in 2019 to develop standard operating procedures for production. This included detailing the quantities of ingredients and their processing. By May 2019, the fish powder was being sold in three Dili stores—Timor Organic, Delima Fish Market and (briefly) Pateo Supermarket—and in Loja Agrikultura 1 month later. The first three stores are private operators that regularly sell local produce consolidated and distributed by farmer cooperatives and project-based distribution initiatives. Loja Agrikultura is a store established solely to facilitate and promote the sale of local produce, run by the Japan International Cooperation Agency (JICA) in partnership with the MAF. The fish powder was sold in 30 g packets. While store retail prices ranged from USD 1.25 to USD 2 per packet, payment to the group was the same across all stores, at USD 1 per packet. Trading arrangements varied from upfront payment to monthly payment based on product sold. Loja Agrikultura had a bonus system whereby the group was paid the retail price (USD 1.25 per packet) if all product was sold by the expiry date.

Workshops were arranged to plan for the group to take on greater responsibility for sourcing materials, structuring production and communicating directly with the Dili stores. In July 2019, the project arranged a face-to-face meeting between group representatives and store managers. In November 2019, some group members traveled to Dili to learn where to buy supplies of plastic packaging and how to arrange printing of the sticker labels. The project also helped the group set up a bank account, through which the retail outlets managed transactions and the group could oversee its finances.

Over the course of the project, the group also participated in and showcased its products at various WorldFish-associated events. They included the Women Fisheries Forum and National Fisheries Forum held in Dili (October 2018), a fish-based production experience-sharing workshop in Ililai (February 2019) and the International Day for Rural Women in Dili (October 2020).

4.4. Final participatory evaluation

A participatory evaluation was held in November 2019 to assess progress and discuss the difficulties and the challenges in making their business a viable enterprise. The meeting was attended by the eight active members, all women. A summary of this assessment is provided in Table 8.

The group had made considerable progress over the 18 months since the initial planning workshops were held. The fish powder product was being successfully sold in Dili, particularly in two stores



Beacou women working together to package the fish powder.

Natural resources	Equipment	People and skills	Markets	Finances
<ul style="list-style-type: none"> ✓ Sourcing fish for making fish powder depends on fishers' catches. Flying fish are best, as these are often caught at the FAD, though they are also seasonal. ✓ Shrimp for fish powder can be obtained by gleaning at low tide or purchasing from sellers at Loes River. 	<ul style="list-style-type: none"> ✓ Suitable and reasonably priced plastic packaging (USD 0.08 each) and labeling stickers (USD 0.11 each) were identified and are being used by the group. ✓ The group has agreed to start buying packaging and labels themselves when they bring their product to Dili. Some members were shown how to buy supplies shortly after this meeting. 		<ul style="list-style-type: none"> ✓ Fish powder is successfully being sold in two shops in Dili (Delima Fish Mart and Loja Agrikultura). Initially, it was stocked in four supermarkets, but it was slow to sell at the other two. ✓ Loja Agrikultura is also willing to receive other local products from Beacou, such as salt and vegetables. ? There is a need to restart discussions to investigate the school or nutrition feeding programs as potential markets. 	<ul style="list-style-type: none"> ✓X While the group is breaking even, most monthly sales earnings are kept as working capital; income is insufficient to make regular payments to group members. ✓ The group now has a bank account for receiving payments as well as a business license, both of which are requirements to sell products at Loja Agrikultura.

- X Fresh fish can be difficult to obtain when bad weather prevents fishing activities.
- X Despite having two potential shrimp sources, it can still be difficult to get regular amounts of shrimp at a consistent price. Loes River shrimp are often not available when river water is clear, during the dry season.

- X Some group members were unable to actively participate due to pregnancy or lack of family support (e.g. husband not allowing them to travel to Dili).
- X Some members also make salt individually, so it can be difficult for them to organize time to make the fish powder.
- X The group lacks people with confident and dynamic personalities to communicate with Dili retail outlets. Sometimes the store calls but receives no answer, so it contacts WorldFish to pass messages to the group.

Table 8. Summary of the final participatory evaluation of the Beacou women's group fish-based production initiative.

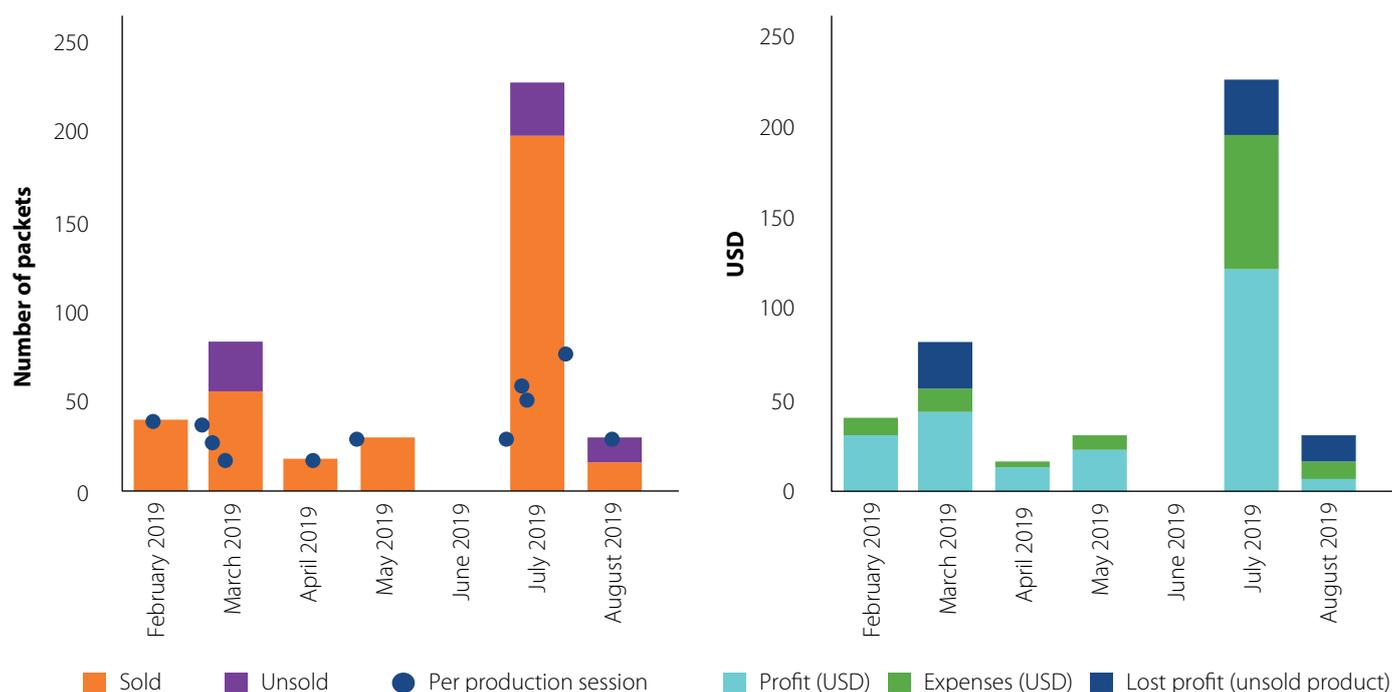


Figure 7. Monthly fish powder production (left) and earnings (right), February–August 2019.

Period	February–August 2019	
	Total USD	No. sold (No. made)
Income		
Fish powder (sold by packet)	355	355 (425)
Bottled sardines (sold by jar)	24	4 (28)
Total sales	379	
Expenses		
Fish powder production	119	
Bottled sardine production	28	
Total expenses	147	
Net profit from sales	232	
Distribution of sales profit		
Equipment replacement	20	
Group funds (working capital)	132	
Share distributed to members	~80	
Balance	0	

Table 9. Fish-based product income, expenses and distribution of profit (USD).

(Delima Fish Mart and Loja Agrikultura), which had each been restocked four times. The group had set up its own bank account and members were receiving some individual income from dividing the sales profits among them. The group had also started to take greater responsibility for maintaining the production process. Shortly after the evaluation meeting, members started to buy their own packaging and labeling supplies in Dili. However, the group still lacked confidence to communicate directly with the Dili retail outlets, which meant some continued reliance on WorldFish staff. Self-organization by the group to make the product when stocks were requested also remained a challenge. The seasonal availability of fish, sardines and shrimp interrupted the production process, as did the seasonal salt production activities carried out individually by some of the women. In addition, one or two of the group members had not been able to actively participate due to family issues, including a lack of support from their husband or family.

4.5. Monitoring initiative progress

Quantitative data collected over the project implementation period included bookkeeping records kept by the women’s group. From February to August 2019 (7 months), total income from selling 355 packets of fish powder was USD 355 (Figure 7 and Table 9). Production cost was USD 119 to make 425 packets, of which 70 did not sell before the expiry date. This resulted in a profit of USD 236 (a profit margin of 66%). Total income from bottled sardine sales was USD 24 (Table 9). Production cost was USD 28 to make 28 jars, but most did not sell, resulting in a loss of USD 4. Total sales profit earned by the group was USD 232. Most earnings each month were kept as working capital, while USD 20 was spent to replace a broken blender. A one-off share of earnings—USD 10 for each active member—was distributed in mid-2019.

4.6. Before and after comparison based on participatory assessments

An assessment was done on how well the initial participatory planning workshop prepared the group and project team for potential challenges. We compared what was discussed and predicted at the idea assessment (“pre-assessment”) to “what actually happened,” based on the final participatory evaluation workshop (“post-assessment”) and project records (Tables 10 and 11).

The objective of the Beacou group’s initiative was to establish a small business producing and selling fish-based products: bottled sardines and/or fish

powder. The implicit intention was to generate income for group members. Specific income targets or aspirations were not recorded.

Establishing the micro-enterprise proceeded largely as anticipated in terms of equipment and production skills. The project provided the initial equipment, and the group was able to maintain and replace equipment as required. The potential market for bottled sardines in Dili was identified as an unknown element in the pre-assessment. Pilot sales provided early feedback that the product would be difficult to sell and led the group to focus efforts on the fish powder product. Challenges associated with packaging

Natural resources	Equipment	People and skills	Markets	Finances
<p>X Ingredients: Sardine availability is constrained to a short season; olive oil can only be bought in Dili (other/local oils not suitable). All of these aspects were identified in the pre-assessment or initial discussions.</p>	<p>✓ Jars: A source of suitable jars was identified in Dili.</p>	<p>X Production skills: Not all members know how to make the product since it was not the focus of production efforts.</p>	<p>X Market and price: Products took a long time to sell. They seemed too expensive for Dili consumers.</p>	

Table 10. Comparison of “what actually happened” with the initial participatory assessment for bottled sardine production.

Natural resources	Equipment	People and skills	Markets	Finances
<p>✓X Shrimp: Obtaining a regular supply of shrimp has been a problem at times, as flagged as a potential issue in the pre-assessment. The solution identified at the time, to source from Loes River, has been partially successful, but also has had seasonal limitations.</p> <p>X Fish powder production stopped in the wet season due to poor fishing conditions and difficulty drying moringa leaves. This was partly discussed in the pre-assessment.</p>	<p>✓ Equipment needed for fish powder production was provided by the project. When the blender broke, the group was able to replace it from its earnings.</p> <p>✓ Packaging: After some experimentation by the group, a type of ziplock packet was identified that suited production methods, maintained product quality and was attractive to consumers.</p> <p>✓ Labels: The project helped the group identify a suitable source of stickers for product labeling.</p> <p>✓ Purchasing supplies: The group has transitioned from relying on the project to source labels and packaging to buying their own supplies when they transport their products to Dili.</p>	<p>✓ Group activity: The women’s group has worked well together to make the product.</p> <p>✓ Production skills: All members now know how to make the product, as planned in the pre-assessment.</p> <p>✓X Confidence and skills in business negotiations: Group members have improved in confidence and have taken on responsibility for liaising with Dili stores. At the end of the project period, WorldFish was still involved at times as a facilitator and mentor to the group.</p>	<p>✓ Dili market: While not identified as a priority market in the pre-assessment, there has been good demand for the product at two stores in Dili.</p> <p>✓ Transportation: As predicted in the pre-assessment, public transportation has been adequate for taking the product to market.</p> <p>X Hospital market: The target market identified in the pre-assessment did not happen due to external political factors.</p> <p>? School and nutrition supplement markets have not yet happened and are currently in discussion.</p>	<p>✓ Group savings: The group has maintained sufficient working capital to continue production.</p> <p>X Income: The group is breaking even, but profits are insufficient to provide regular income to group members.</p> <p>X✓ Profit margin: Production costs have been higher than estimated in the pre-assessment (~USD 8.50/kg vs ~USD 2.75/kg). However, this has been offset by a higher than anticipated marketable sales price (USD 1 for 30 g vs. USD 0.25 for 40 g), resulting in a similar profit margin to what was initially estimated (~50%–60%).</p> <p>X Production quantity per production session has been lower than anticipated in the pre-assessment (39 packets on average vs. 300 planned).</p>

Table 11. Comparison of “what actually happened” with the initial participatory assessment for fish powder production.

identified in the pre-assessment were successfully overcome through the collaboration of the group and project team. The group initially relied on WorldFish to source materials from Dili. But by the end of the project, members were able to do this themselves. However, other aspects of the “people and skills” livelihood component did not proceed as anticipated. The ability of the group members to organize themselves and liaise with Dili retail outlets was impacted by the departure of their dynamic leader. One or two members also faced a lack of support from their husband or families, preventing them from participating in certain activities, such as traveling to Dili. Furthermore, the seasonal involvement of some group members in salt-making activities was not incorporated into initial planning. The seasonality of key product ingredients also proved problematic at times. While this had been anticipated, potential solutions identified in the pre-assessment, such as alternative sources of shrimp, were only partially successful.

Comparing pre- and post-assessments also identified a number of challenges or issues that were not anticipated (Table 12). Due to external political factors and changes in government department leadership, the identified local market for fish powder at the hospital did not happen within the project period, though an alternative market was found in Dili retail outlets. The reliance on the Dili market and trade arrangements with retail outlets meant it took a

long time for the group to receive payment for their products. This was different from the women’s experience selling salt, which they were able to sell and receive payment for locally. Fish powder production costs were higher than identified in the pre-assessment, but the group was able to sell the product for a higher price, resulting in a similar profit margin to that originally expected. However, the initial production plan was highly optimistic. The actual average number of packets produced per session was 10 times lower (over the period for which data is available) than initially estimated. As a result, by the end of the project period, earnings had been insufficient to provide regular income to group members.



Beacou women discussing the sale of their product with the Loja Agrikultura manager in Dili.

Natural resources	Equipment	People and skills	Markets	Finances
<p>✓ Fish availability has sometimes been a problem. This issue was not anticipated in the pre-assessment.</p>		<p>X Lack of support from family was an unanticipated issue that has affected some members’ participation, such as their ability to travel to Dili.</p> <p>X The group leader moved away from the <i>aldeia</i>, affecting group organization and communication.</p> <p>X Other livelihoods: Time conflicts with other livelihood activities were not anticipated in the pre-assessment.</p>		<p>✓ Bank account and business license requirements for trading in Dili stores were not anticipated; however, the group was able to obtain these with the assistance of the project.</p> <p>X It takes a long time to receive earnings, as the product is sold in Dili and most stores give payment after (and only if) the product sells. The exception is Delima Fish Market, which pays upfront. This is different to salt, which the members are able to sell locally.</p>

Table 12. Unassessed factors or unanticipated challenges associated with fish-based product development.

5. Reflection

The Ililai and Beacou cases provide useful insights into the opportunities and challenges associated with taking a participatory approach to assess and establish new fish-based livelihood activities in rural coastal Timor-Leste. While the groups in both communities were newly formed, they differed in several areas. In terms of size and composition, there were initially 15 women and 15 men in Ililai versus 10 women in Beacou. Ililai had little experience working with external agencies, while Beacou had some. When it came to project activities and group decision-making, local authorities had frequent involvement with the Ililai group but very little with the Beacou group. WorldFish had also worked with the Beacou community previously, though not with the group of women involved in the project, while Ililai was a new engagement location.

The general approach of the project was similar in the two communities. Community members proposed a new fish-based livelihood idea. The tasks involved and feasibility of the idea were then assessed in a participatory planning workshop. Finally, a plan of action was agreed upon and implemented. Overall, there were both successes and challenges in each case. Some of the challenges faced were shared, while others, due to the differences between groups, contexts and the activities themselves, were specific to each case.

5.1. What worked well and why?

In Ililai, the physical construction of the Fish House was a successful collective effort by the newly formed group. It created a strong sense of achievement and ownership and became motivation for them to continue activities despite internal group troubles. The women in the group also realized their aspiration to establish a restaurant at the Fish House. This generated some income for group members, particularly the women, from restaurant sales, as well as for men in the group, other fishers and broader community members who supplied the restaurant with fresh fish, vegetables, spices and coconuts. The informal experience-sharing and training activities facilitated by the project—the fish center exchange visit, cooking training and joint FAD fishing trials with

neighboring fishers—built skills and relations in a locally appropriate and non-confrontational format. This was evident in the variety of dishes cooked at the restaurant, demand for catering events, and the trading relations established with neighboring fishers, as well as from reflections by group members. The Fish House and restaurant, launched at an official opening event attended by national fisheries dignitaries, created a sense of “being seen” by government in an otherwise remote part of Timor-Leste. By the end of the project period, the restaurant was not only operating without WorldFish facilitation, but the livelihood activity had also spread, as four new restaurants had opened in Ililai by former group members and other community members.

In Beacou, the newly formed women’s micro-enterprise developed a tasty, affordable and attractively packaged fish-based product (fish powder) and started trading in retail outlets in Dili. The initial idea of establishing a small business to sell fish-based products was identified and proposed by the women themselves. As such, the women owned the idea from the start, worked together to share skills, equipment and ingredients, and were motivated to make their business a success. The presence of retail outlets in Dili that were willing to trial new local products, as well as facilitation by the project coordinator, helped overcome some of the challenges faced



Ililai fishers on an exchange visit to Vemasse to discuss FAD fishing techniques.

by rural producers trying to reach the urban Dili market. Over the 18-month period, suitable packaging and labeling materials had been sourced, trading relations with retail outlets established, and the group had opened a bank account and obtained a business license. By the end of the project period, group members were able to carry out most tasks independently.

In both cases, the initial participatory planning workshops, guided by the New Idea tool, were beneficial in bringing people together to discuss and assess the tasks and resources that would be required to carry out their proposed ideas. In Ililai, the process highlighted key training needs, such as group formation and business management, to support the successful realization of project activities. While this delayed the start of the livelihood initiative work, it provided a fundamental platform from which project activities could be built. In Beacou, the assessment identified key challenges that the group and project team would need to work through together, particularly in sourcing suitable packaging and establishing trade agreements with Dili retail outlets. It also flagged the need to investigate consumer interest in buying expensive bottled sardines. This led to piloting both products in Dili and ultimately the decision to focus on the more popular fish powder product.

The planning process in both cases challenged participants' notions of development as externally driven and their expectations that the project would be providing all material needs. For instance, people were surprised (and at times, deflated) when asked where and how each item required would be obtained and what they could contribute to achieving the proposed idea. However, it helped to develop a mutual understanding of expectations and clarity on roles and responsibilities, though this differed somewhat between the two cases. In Ililai, it was necessary to reestablish expectations of co-contribution and redefine the proposed idea at the subsequent planning meeting, probably due to both different participants and an expanded facilitation team in attendance. The inability of the project to provide certain material assistance, such as boats and motors, was also an aspect that had to be regularly emphasized. In contrast, the assessment in Beacou was carried out by the group of women proposing to implement the idea, and the idea itself was more clearly defined.

By this stage, the project team also had more experience facilitating the assessment workshop, and the planning process more readily led to an agreed action plan.

Assessment tools, such as the New Idea tool, are not intended to replace more complete participatory assessments or planning, nor to provide lists of possible livelihood activities. We found that the New Idea tool can work well where there is a group of people who have a clear and agreed upon proposed activity to evaluate, as was the case in Beacou. In contrast, additional participatory planning activities *prior* to idea assessment may be beneficial where there are no existing groups and/or where potential ideas are not yet well-formed, as was the case in Ililai. It is clear from our experiences that community or group members' ideas for development can be limited to what has been seen in neighboring villages and may have little grounding in participants' experience or broader demand, such as the Ililai group's repeated focus on tourist guesthouses. Ideas also tend to be focused on income generation, suggesting this is a priority need in rural communities and/or is what people conceive when asked about ways they could improve their lives. People can also identify ideas or needs that are outside the skills and expertise of the project team. In our two cases, we were able to partner with local organizations to address group formation and business training needs, facilitate learning from a similar local business to meet cooking and hospitality training needs, and informally consult with other experienced organizations and businesses to overcome challenges associated with the fish powder product development.

5.2. Key challenges and considerations for future work

The project had originally wanted to work with established group structures. Strengthening existing groups can leverage existing experience, capacity and leadership structures and achieve greater impact, as shown by other projects in Timor-Leste and the Pacific (Tilley et al. 2019b; SPC 2021). However, the groups we worked with on this project were not well established, organized or experienced in working together. While the project provided additional training to strengthen these groups, internal group dynamics were highly influential on the pace and scale of activities.



Final participatory evaluation with women group members in Ililai.

Group membership, structure, organization and decision-making likely relied on existing social structures, power relationships and hierarchies, largely invisible to the project team, as identified in research on other externally supported groups in Timor-Leste (Niner 2015).

Disagreements among group members occurred in both our cases, but they were particularly problematic in Ililai, where they culminated in the breakup of the original group. These problems largely arose from mistrust within the group to carry out allocated tasks, especially the group's finances. Group members at one meeting noted, "There are many treasurers, which complicates the management of money." This was compounded by a lack of accessible financial infrastructure, such as a banking service, and the original group disbanded when group cash taken for "safe keeping" was not returned. This was a severe setback for all group members. The remaining members had to recontribute cash to reopen the restaurant, while the former members received little return on months of time, effort and resources invested in the physical infrastructure of the Fish House. The temporary closure of the restaurant also halted the flow-on benefits of the restaurant as a buyer of community members' produce. The re-formed group sought to prevent a similar reoccurrence by distributing most sales profits to group members each month rather than saving money to reinvest in the business. Similar projects in future could promote earlier discussions on options for securing group savings and/or facilitate access to financial infrastructure.

Tensions were also created between women and men in the Ililai group by the gendered nature of activities, and norms around money and power. From idea conception, the women and men in the group proposed distinct but complementary uses of the Fish House. However, the men's limited fishing activity meant that their intended use of the Fish House as a landing facility and fresh fish trading hub was not realized. Besides being unable to provide a reliable supply of fish to the restaurant, this created tensions within the group as the women's activity of establishing the restaurant was far more successful. The women in the group complained that the men encroached on their restaurant activities by, for example, inquiring daily about sales and income. The gendered nature of project support may have exacerbated these tensions by facilitating the setup of the restaurant operated by the women, but not meeting the men's repeated requests for fishing equipment. WorldFish Timor-Leste has a clear policy of not providing material assistance in the form of boats, motors or nets that only benefit individuals rather than the broader fishing community. This was made clear from the start of community engagement. Instead, the project supported FAD deployment and training in FAD fishing methods.

Project activities in Ililai also caused some tensions with fishers in neighboring villages. One of the FADs deployed by the project was cut by fishers from a neighboring village, an action thought to be motivated by jealousy. While Ililai authorities were proactive in discussing the deployed FADs with neighboring village authorities, this was evidently insufficient to resolve tensions among fishers. A subsequent agreement to allow neighboring fishers to fish around the FAD in return for supplying fish to the restaurant was received positively. While this did not increase the fishing activities of Ililai fishers, establishment of good relations with neighboring fishers was noted as a main benefit of the project at the men's final evaluation workshop. This highlights the need to accompany the physical deployment of FADs with actions that address the social and governance aspects of improved access to fishery resources. Equitable access to FAD deployment opportunities could also reduce potential conflict among fishing communities.

In Beacou, the main challenges were associated with product development and building the confidence needed by the women to conduct

business in urban Dili. Neither the women's group nor the project team had previous experience in product development or marketing. Choosing suitable packaging materials, designing and printing labels, and identifying potential markets and retail outlets were particular tasks that relied on the project team to research options in Dili to then present and discuss with the group in Beacou. This involved investigating other locally produced products and consulting with retail outlet managers, other organizations, friends and colleagues. While this was largely successful, discussions between the group and the project coordinator were hindered at times by the local language barrier. Group members were more willing and able to express their opinions in their local language, Kemak, which was not shared by the project coordinator. Convincing urban Dili consumers that locally made products were good quality was also a challenge, as many people typically prefer to purchase imported products over similar local products (also reported in Da Silva 2016).

Acquiring the skills and confidence to have meetings with retailers in Dili was a major challenge for the Beacou group, and at times a barrier to progressing activities. The departure of the dynamic group leader partway through project implementation required a period of adjustment and restructuring, and it highlighted the need to develop skills, such as marketing and communication, in several group members. In addition, one or two group members were not permitted to travel to Dili by their husbands. The women gradually took on responsibility for transporting the product and purchasing packaging and labeling materials in Dili, demonstrating their increased confidence gained over the course of the project. Yet direct communications between retail outlets and the group were still inconsistent by the end of the project and often required involvement of the project coordinator. Demand for the fish powder product grew, but the group struggled to self-organize to carry out production. Future development of the business will likely require some members to take on specific roles, such as in marketing and selling, rather than all being focused on production. Seasonal availability of ingredients also constrained production and, at times, slowed momentum in product development and building trade relations with Dili retail outlets. This will continue to be an issue for the group, particularly as it tries to scale-up production to meet demand.

In both cases, the individual incomes generated by the new livelihood activities remained low by the end of the project period. This was reflected in comments made by participants in both Ililai and Beacou final evaluation workshops. Records were not kept on the actual income amounts distributed to members in either case. In future work, records on profit distribution should be strongly encouraged, not only to inform the progress of project activities, but also to develop transparent financial processes within the groups. Based on bookkeeping records and profit sharing methods, individual monthly incomes were estimated to be less than USD 7 in Ililai and USD 1.50 in Beacou. Furthermore, in Beacou, trading arrangements for post-sale payment meant it took a long time for the group to receive any earnings. In both cases, reasons for low incomes were probably a combination of trade volume relative to the number of members receiving a share of profits, as well as high costs of goods sold and low gross profit margins, particularly in Ililai. Certain products sold at the Fish House restaurant gave little return, such as cigarettes and alcohol. And while the markup on fish was described by members as being 100%, or even 900% for small fish, it appeared to be closer to 54% from bookkeeping calculations. The Beacou group also lost profits when their product did not sell by the expiry date. This usually only occurred when Dili stores nominated a higher selling price (over USD 1.50 per packet). Learning from this, the group later focused on selling through the retail outlets with more favorable trading arrangements.

Project activities in both cases resulted in the creation of group enterprises, which primarily benefitted their newly affiliated members through occasional distribution of profits. However, some of the challenges and situations that arose justify the discussion and consideration of alternative models of collective action. In Ililai, while the physical Fish House infrastructure was built on community land with group members investing their time, labor and resources in its construction, this did not result in continued access rights for the majority of people involved (60%) after they left the group. In addition, opportunities to indirectly benefit from the Fish House restaurant, through the supply and sale of raw produce, were described as inequitable by some unaffiliated community members. Alternative models of operation could facilitate more equitable distribution of benefits, but would

likely require substantial facilitation by external partners to help establish clear and transparent governance structures. For instance, the entire initiative could be established as a community-owned business, with all community members as shareholders, and so the success of the business would be shared. Alternatively, the physical building and restaurant operating costs could be treated separately, where the building is a physical asset under community co-ownership and the restaurant is a private enterprise renting the space. In Beacou, the difficulties associated with organizing group members to manufacture the product, coupled with growing demand for the fish powder product, warrant consideration of either a cooperative or middle actor model. Just as “collector” traders buy fresh fish from multiple fishers to transport and sell in Dili (Steenbergen et al. 2019), fish powder could be purchased from a number of small groups, who possibly use shared facilities. This could also reduce the lengthy delay between production and payment as experienced under current arrangements. There are numerous examples of external actors providing a market linking role in Timor-Leste, including Empreza Diak⁵ and Market Development Facility.⁶ There are also examples of cooperatives and social enterprise in the coffee industry, such as Cooperativa Café Timor⁷ and Café Brisa Serena.⁸

Finally, it is worth reflecting on the role and influence of local authorities on project activities. The involvement of local authorities was important for legitimizing project activities, including the approach of community co-contribution, for

encouraging community member involvement and for resolving internal group disputes, particularly in Ililai. However, by leveraging existing political structures for facilitation, this project may have reinforced existing power dynamics and potential local inequities and not provided individuals (whose livelihoods, time and effort was involved) to freely voice their opinions and concerns. The participatory, locally led approach taken meant the project team could prompt discussion on certain issues, but final processes and decisions were left to the community members involved. For instance, the location chosen for the Ililai Fish House by the group and village leader precluded participation by some community members living at too great a distance. Even small change can take a long time, and navigating the complexities of village politics and power dynamics is challenging and non-trivial. The aspiration to provide sufficient opportunity for marginalized and vulnerable groups to participate and benefit from externally supported development plans can be difficult to operationalize by external partners. Donor expectations for impact and results must be balanced with ideal scenarios for locally led development. The role of an external partner in this context is to support emerging processes that may only be part of a longer journey of local development and change (Sukulu et al. 2016). Rather than rushing through internal processes seen as necessary for project milestones, programs and planning must be adapted to local development processes that allow sufficient time and awareness raising before any community-level decisions are made.



Ililai women attending cooking training at a beachside restaurant in Dili.

6. Conclusions and recommendations

The case studies described here are small fish-based initiatives developed and implemented by two groups of people living in coastal rural Timor-Leste. They were given some financial support and substantial facilitation by an external organization and had mixed success in terms of measurable outcomes. In both cases, project activities enhanced the skills of participants and their access to equipment and created new markets for fish-based products. Individual incomes generated were modest, but group members expressed their interest to continue and improve their businesses. Establishing new livelihood activities in rural communities is inherently complex. Taking a participatory approach to planning, implementation and reflection was also a learning process for the small Timor-Leste project team, as well as for the two groups of participants. Many of the challenges the groups and the project team experienced were not new or unique, but common to many efforts to enhance rural livelihoods. A review of participatory development activities in Timor-Leste similarly identified a challenging operational environment, characterized by expensive inputs (often only found in Dili), tenuous links between small-scale efforts and limited local capacity (World Bank 2012). Our case studies demonstrate that there are opportunities to harness the economic and nutritional value of coastal aquatic foods in Timor-Leste. People in coastal communities are willing and interested to test out their ideas for enhancing their fish-based and coastal livelihoods. However, facilitating access to training and building capacity to bridge the rural-urban divide are important components of making such initiatives a success.

The need to shape fisheries development toward building local capacity is increasingly recognized in Timor-Leste. For instance, the Draft National Fisheries Strategy (2018) emphasizes that “All Timorese fisheries resources that can be sustainably caught by Timorese fishers should be caught by Timorese fishers.” However, putting policy into practice remains a recognized challenge for national programs. The project approach taken in these case studies is highly resource-intensive, in terms

of cost, staff engagement and time required. Such an approach can benefit its participants and generate important learning, but it is not feasible nor desirable to replicate in all Timorese coastal communities. Similarly, it is not the type of work that national and municipal fisheries departments should seek to carry out, given their limited financial and human resources available (Tilley et al. 2019a). One of the challenges of community approaches to development is that they often fail to achieve impact at scale, without compromising the participatory underpinning (Uvin and Miller 1996). Scaling of innovation is now increasingly understood as a system-level change where different actors have different roles to play (Wigboldus et al. 2016). So how can enhancement of fish-based livelihoods be achieved at scale in Timor-Leste? And what can be learned from these in-depth case studies?

Alternative models of enabling community-led development are needed, with associated targeted support from fisheries agencies. By promoting the flow of information to rural coastal communities, facilitating peer-to-peer sharing, providing training requested by community groups and making microloans available, more people in coastal communities could implement their ideas for improving their livelihoods at their own scale and pace. Municipality fishery officers could play a key role here if provided with adequate fiscal resources and workplans that focus on these ways of enabling community-led development. This would require a shift in the activities of government, and some of their partners, in the coastal fishery sector in Timor-Leste—from a provider of material assistance, prevalent during post-Independence reconstruction efforts, to more extension-based advisory and capacity building services. It would also require a shift in the expectations of people in coastal communities and establishing a new relationship between coastal peoples and national and municipal fisheries departments—one based on service, information and advice rather than expectations of material goods.

To expand the range of ideas visible to people in coastal communities, greater effort needs to be

made to document, share and create links between the many small-scale initiatives that have been carried out in coastal communities in Timor-Leste. In-depth case studies, like those described in this report, make up a rich base of experiences and learning that can help recommend considerations and requirements involved. There are many examples of community-led activities and work carried out by other external agencies, such as Blue Ventures, Empreza Diak and PARCIC, that include marine resource management initiatives, product development and homestay co-operatives. These could similarly be documented, demonstrating different ways that people can work together to enhance fish-based and coastal livelihoods. This portfolio of positive examples, as well as key training modules—on livelihood idea assessment (for instance, using the New Idea tool), group

formation, business management and others—could become part of a resource kit available for municipality fishery officers to facilitate discussions and provide guidance to people in coastal communities. There are also important lessons to be gained through cross-sector collaboration, particularly from the extensive research and development activities carried out in the agricultural sector. The private sector, such as urban retailers, should also be encouraged to further support rural fish-based microenterprises, possibly through incentives from government and/or partner agencies where necessary. Simultaneously, investment in basic infrastructure is also essential, such as better roads linking rural communities with potential markets. This would benefit multiple sectors and facilitate bottom-up diversification of the broader Timorese economy.



Photo credit: Chris Bailey/CADRI

Welcoming dance at the Ililai Fish House opening launch.

Notes

- ¹ This expectation is common throughout Timor-Leste and is based on experience or knowledge of emergency aid in the aftermath of widespread destruction and violence during the process of gaining independence from Indonesia (1999) and a subsequent period of civil unrest (2006), and the continued practice of many development projects and government agencies.
- ² While bookkeeping records kept by the women were regularly consulted to determine matters such as funds available for operation, analysis on product profit margins was not carried out at this stage, to the knowledge of the project team. See Ililai section on “Monitoring initiative progress” for analysis of financial records.
- ³ These were excluded from reporting based on the decision of the group members.
- ⁴ There were no labor expenses in the group’s operating model.
- ⁵ Empreza Di’ak: <https://empreza-diak.com/micro-businesses-enterprises/>
- ⁶ Market Development Facility: <https://marketdevelopmentfacility.org/timor-leste/>
- ⁷ Cooperativa Café Timor: <https://hamutuk.tl/en/profiles/organisation/CCT/>
- ⁸ Café Brisa Serena: <https://www.bmp-international.com/timor-leste>

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About WorldFish

WorldFish is a nonprofit research and innovation institution that creates, advances and translates scientific research on aquatic food systems into scalable solutions with transformational impact on human well-being and the environment. Our research data, evidence and insights shape better practices, policies and investment decisions for sustainable development in low- and middle-income countries.

We have a global presence across 20 countries in Asia, Africa and the Pacific with 460 staff of 30 nationalities deployed where the greatest sustainable development challenges can be addressed through holistic aquatic food systems solutions.

Our research and innovation work spans climate change, food security and nutrition, sustainable fisheries and aquaculture, the blue economy and ocean governance, One Health, genetics and AgriTech, and it integrates evidence and perspectives on gender, youth and social inclusion. Our approach empowers people for change over the long term: research excellence and engagement with national and international partners are at the heart of our efforts to set new agendas, build capacities and support better decision-making on the critical issues of our times.

WorldFish is part of One CGIAR, the world's largest agricultural innovation network.