WorldFish

November, 2021

Fisheries Sector Support Program – Phase 2

Year 1 - Progress report (Nov 2020 – Oct 2021)

FSSP2
Fisheries Sector Support Program, Timor-Leste – Phase 2

Funded by

Norwegian Embassy

In partnership with

MERCY CORPS

Gabinete do Director Geral das Pescas

Citation
This publication should be cited as: Tilley A., Byrd K, Dos Reis Lopes J., Duarte A, Klumpyan, K, Pereira, M. 2021. Annual Progress Report. Fisheries Sector Support Program, Phase 2, Timor-Leste. WorldFish. Penang, Malaysia: WorldFish.

About WorldFish
WorldFish is an international, not-for-profit research organization that works to reduce hunger and poverty by improving fisheries and aquaculture. It collaborates with numerous international, regional and national partners to deliver transformational impacts to millions of people who depend on fish for food, nutrition and income in the developing world. Headquartered in Penang, Malaysia and with regional offices across Africa, Asia and the Pacific, WorldFish is a member of CGIAR**,** the world's largest global partnership on agriculture research and innovation for a food secure future.

Contact
WorldFish Communications and Marketing Department, Jalan Batu Maung, Batu Maung, 11960 Bayan Lepas, Penang, Malaysia. Email: worldfishcenter@cgiar.org

Photo credits

Front cover, © WorldFish/Mario Pereira

All other photos: © WorldFish/Joctan Dos Reis Lopes

Table of contents

List of acronyms

DGP	National Directorate of Fisheries
FSSP	Fisheries Sector Support Program (2015-2019)
FSSP2	Fisheries Sector Support Program, Phase 2
FAD	Fish Aggregating Device
MAF	Ministry of Agriculture and Fisheries, Timor-Leste
MC	Mercy Corps
RCT	Randomised Controlled Trial
SBC	Social and Behaviour Change
SSF	Small-Scale Fisheries

1. Executive summary

This report summarises activities, results and outputs from the second year of the Fisheries Sector Support Programme – Phase 2 from November 2020 to October 2021. The main objectives of this project are:

To enhance sustainable management of inshore fisheries resources

To increase local fish production and income for men and women

To increase fish consumption in upland communities

The COVID19 Pandemic has continued to cause disruption in the project's second year, with all field activities halted due to movement restrictions in the country between March and August 2021. This further disrupted the baseline nutrition survey, which had knock on effects on sequential activities such as the deployment of fish aggregating devices and the rolling out of social and behavior change activities by project partner Mercy Corps. External project scientists and consultants have still been unable to enter Timor-Leste since the start of the pandemic, but we are optimistic that this may change in early 2022. This continues to have the largest effect on progress towards Outcome 1, due to the significant proportion of work to be carried out with co-management consultant Hugh Govan, a global expert in co-management processes. However, through consultation with Hugh Govan, we have formulated an adjusted plan of action for 2022, which is elaborated in section 4 and will build on the recently published *Framework for Action on Scaling up Community-based Fisheries Management: 2021-2025* (Pacific Community 2021).

This year has seen the emergence of major publications and funding that support and build on our work in Timor-Leste on the huge importance of small-scale fisheries for food and nutrition security and livelihoods. The publications include the Illuminating Hidden Harvests Report by WorldFish with FAO and Duke University, and the Global Fishing Index by the Flourishing Oceans Initiative of the Minderoo Foundation, which used PeskAAS as a case study for fisheries monitoring best practice. The PeskAAS system has also generated new interest and partnerships from Conservation International, PEMSEA and their ATSEA2 program, interested in using the data for other initiatives such as formulating a management plan for red snapper in the Arafura and Timor Sea Region.

Leveraging this Norway investment among others, and an established body of knowledge and work in fisheries support, we obtained emergency funding from the Minderoo Foundation to support the PeskAAS monitoring system through last year. The PeskAAS monitoring system, and the positive media that has surrounded it, have been instrumental in generating new investment in the fisheries sector. The DGP have also now officially adopted and financially supported the PeskAAS monitoring plaform with annual budget of USD 150,000 to pay for continued technical support from WorldFish and vessel tracking data fees from Pelagic Data Systems. The Directorate of Fisheries Management are aware that the data and results from PesKAAS provide crucial information to start managing fisheries resources, so have recruited an additional five data enumerators to cover coastal areas that were not previously covered. These new data collectors have been trained by WorldFish.

New projects emerging for WorldFish in Timor-Leste include two new projects funded by the Australian Centre for International Agriculture Research (ACIAR) and one by GEF/FAO, which will be led by WorldFish. These projects focus predominantly on livelihoods, climate resilience and nutrition.

The existing partnership with MAF continues to strengthen and grow. The Directorate of Fisheries Inspection has initiated vessel registration in five municipalities (Bobonaro, Liquica, Manatuto, Baucau and Lautem) and registered 2020 vessels so far. WorldFish has been providing technical support of this activity in terms of designing the data capture and storage via new online database software “Airtable”.

The baseline survey of household fish consumption in six municipalities was completed in September. The preliminary results and findings of this survey are reported below in section 3.1. This study (which incudes deployment and monitoring of FADs) satisfies many of the planned outputs under outcomes 2 and 3. A repeat (end line) survey will be repeated with the same households at the end of the coming year, and the results will be compared to test the effects of FADs and SBC on fish consumption at household level.

2. Progress against outcomes and outputs

#	Outcome/Output description	Indicators	Baseline	Year 1 target	Year 1 result	Year 2	Year 2 result	Data source of verification	Progress to date
1	Inshore fish resources managed sustainably	Number of fish stocks or municipalities with legitimate co-management agreements and/or fisheries plans	Some community management but no integrated co-management	0	0	4	0	Project records and reports	PeskAAS digital monitoring system has been adopted and paid for by GOTL and is now integrated in national decision-making. COVID has disrupted processes of forming specific plans or agreements with communities.
2	Increased local fish production and income for men and women	Increased fish production and fisheries income in target communities	0	0	0	20%	0	PeskAAS fisheries data system	Baseline data has been collected at 16 sites around the country, but at this point, the interventions have not had time to test appropriately.
3	Increased fish consumption in target communities	Increased fish consumption among children, women and men	0	0	0	20%	0	Baseline - end line surveys	The baseline survey is complete and mostly analysed, so we have initial household fish consumption data with which to compare after interventions.
1. Inshore fish resources managed sustainably									
1.1	A contextualized concept/model of co-management to make effective and sustainable management of marine resources.	# approaches scoped and developed with stakeholders	0	3	0	3	0	Project records	While further stakeholder consultation has not been possible, a framework for co-management implementation has been further developed based on extensive data from consultations under FSSP1, and used in planning and resourcing for scaling co-management and associated training
1.2	New institutions and practices for fisheries management in place and actively managing fish resources	# co-management plans approved by communities and government	0	2	0	2	0	Project M&E	No progress to report.
		# interactions between ground and high level institutions	0	increased	unchanged	increased	unchanged	Baseline-end line surveys	
		% Women represented in management	No co-mgt	NA	NA	NA	0	Project records MSC interviews with women	
1.3	Improved knowledge of co-management approaches and practice among managers, stakeholders and fishers	# of trainers trained in co-management	0	20	0	1	-	Project M&E	No progress to report.
		# fishers trained in co-management	0	50	0	150	-	Project M&E	
		# managers trained in co-management	0	20	0	20	-	Project M&E	
		% women in fisher training	0	50%	NA	50%	-	Project M&E	
		Increased knowledge, attitude and skills among trainees	End line survey	-	-	-	-	Project M&E	

1.4	Increased research capacity of the Ministry of Agriculture & Fisheries and fisheries students of local universities to support fisheries management	# traineeships offered	0	4	7	4	5	Project M&E	9 fisheries enumerators have been trained and deployed in coastal communities to gather catch data (MAF 5, WF 4), and 4 enumerators trained to conduct household surveys**.** The existing 11 MAF enumerators hired under FSSP2 are now funded for 1 year extension from the Minderoo Foundation
		% women in traineeships	0	50%	29%	50%		Project M&E	No progress to report
2. Increased local fish production and income for men and women									
2.1	Six Fish Aggregating Devices (FADs) will be deployed and managed equitably to increase fish catch and to allow fishers to access a more sustainable source of fish	# FADs deployed in focus communities	0	5	0	5	**8**	Project M&E	2 FADs have been deployed in each of the 4 treatment sites of the RCT.
		# FAD trips monitored	0	500	88	1000	**616**	PeskAAS data system	Enumerators are in place and collecting catch data in *PeskAAS* from fishers at each of the sites chosen for FADs, plus 2 control sites. New FADs deployed are now being monitored, but since the beginning of FSSP2 **616 trips** have targeted FADs.
		Increased catch rates due to FADs	0	50%	NA	50%	**0**	PeskAAS data system	No progress. This will be analysed in the final year of the project.
		Increased household income due to FAD fishing	0	0	NA	20%	**0**	Baseline-end line survey comparison	No progress to report
2.2	New fish stocks sustainably accessed through adopting new, diverse fishing methods	# new approaches and methods trialed with communities	0	5	0	0	**0**	Project M&E	No progress to report.
		# new techniques appropriate for women's fishing	0	2	0	0	**0**	Project M&E	No progress to report.
		# days of gear trials	0	14	0	14	**0**	Project M&E	No progress to report.
		# training events held for men and women fishers	0	4	0	4	**0**	Project M&E	No progress to report.
2.3	Women and men trained in fish handling and business skills in focus communities	# training courses	0	5	0	5	**11**	Training Report	Handbooks on fish handling, purchasing and processing translated into Tetum. Trainings completed at 5 sites.
		% women trained	0	50%	NA	50%	**100%**	Project M&E	Trainings focused on women
3. Increased fish consumption in target communities									
3.1	Improved knowledge by women and men of nutritional benefits from fish consumption	# Households (women and men) recieving education relating to nutrition benefits from fish consumption	0	150	0	150	**475**	Project M&E	SBC activities and materials have been designed and are currently being implemented by Mercy Corps
		Changes in knowledge, attitude and practice relating to fish and nutrition				NA	**-**	Baseline-end line surveys	No progress to report

3.2	Improved capacity of women and men to use cash to make healthy food purchasing, cooking and consumption decisions	Changes in knowledge, attitude and practice relating to purchasing, cooking and consuming healthy food	Baseline survey			NA	-	Baseline-end line surveys	No progress to report
3.3	Increased fish consumption by vulnerable members of the population	Increase in consumption by household members, with emphasis on women and children	Baseline survey			20%	-	Baseline-end line surveys	No progress to report
		Changes in consumption by households with varying poverty status					-	Baseline-end line surveys	No progress to report

3. Outputs and results

3.1 Household Nutrition baseline survey

The baseline survey was carried out from February 3 – September 25, 2021, in all six municipalities included in the RCT (figure 1). 768 households were surveyed, with the primary respondent being the head woman of the household. We also collected dietary data for 200 children aged 6-23 months.

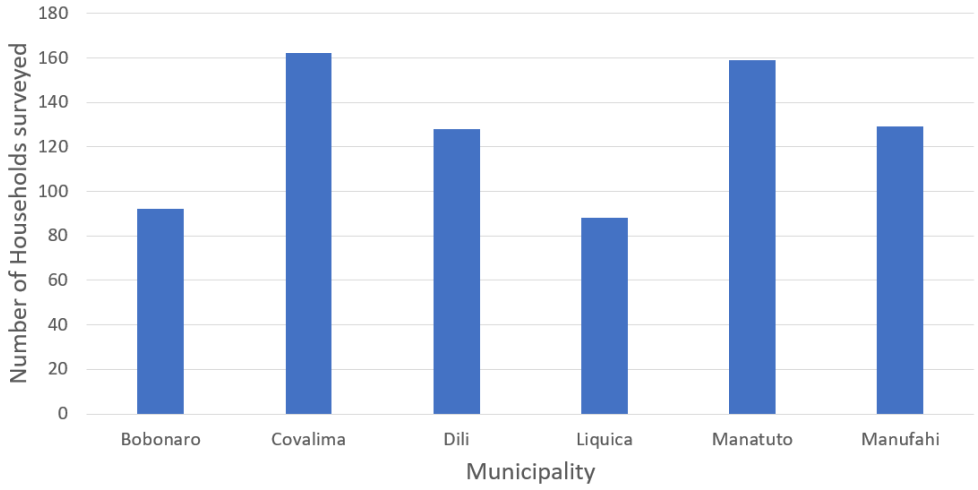

Figure 1. The total number of households surveyed in Timor-Leste, by municipality.

The average household size was 4.8 people, and around half of the households (n = 361) have children under five. Most of the households work in agriculture, followed by paid labor (Table 1).

Main source of income in HH	N (%)
Fishing	12 (2%)
Agriculture	308 (41%)
Livestock	64 (9%)
Paid Labor	144 (19%)
Salaried	116 (15%)
None	6 (1%)
Remittance	5 (1%)
Other, e.g., small shop owner (*Fa'an Kios*), rice paddy farmer (*Halai Natar)*, Lorry Driver (*Lori Ojek*)	101 (13%)

Table 1. The main source of income as reported by the household head

Household Hunger

We did not find a high prevalence of household hunger in the sample, with only 22 (2.5%) of households suffering from severe hunger (Figure 2).

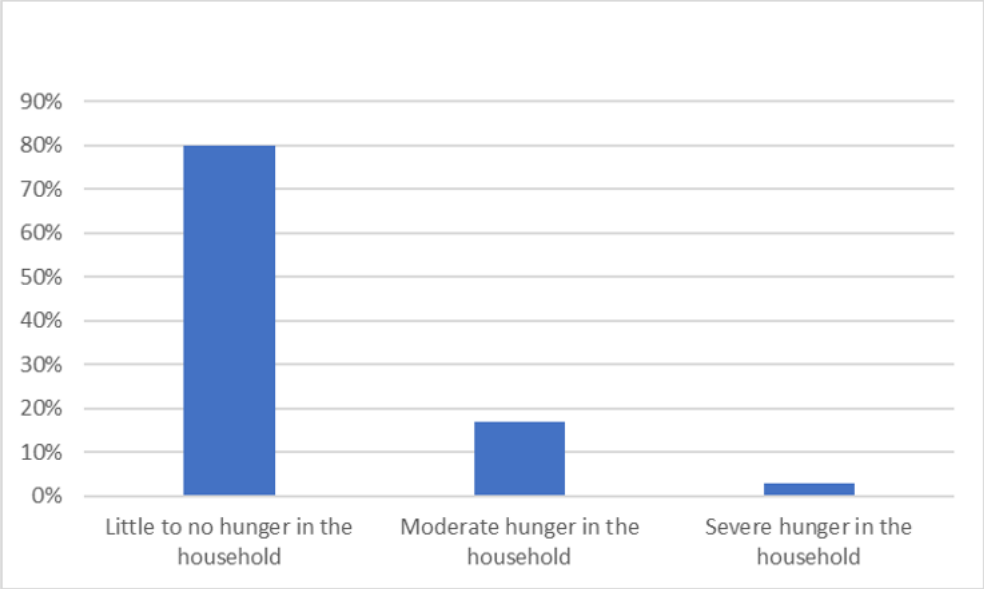

Figure 2. The prevalence of household hunger, based on the household hunger scale (HHS) (Ballard, 2011)

While there was little hunger based on the HHS, we did find that many of the households did not have enough money to purchase the foods they preferred. Some of the foods mentioned by the respondents were rice, fish, chicken, and leafy green vegetables.

Question	Percent of respondents reporting yes
In the past four weeks, were you or any household member not able to eat the kind of food you preferred because of a lack of resources?	63%
In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food?	37%
In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food?	20%
In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food?	9%

Table 2. Percentage of respondents reporting yes to a series of questions about household hunger (n = 768).

Household Dietary Practices

We surveyed all the households on their purchases and practices about animal-source foods (ASF) and going into more detail on fish and aquatic foods. In the previous seven days, the most reported ASF was fish (Figure 3). Of the 768 households surveyed, 344 had consumed fish or aquatic foods in the previous week. However, the average number of days households consumed fish was relatively low, with households reporting consuming fresh fish on 1.3 days out of the previous seven. Similar patterns were observed for other ASF, and the other types of fish.

For most of the forms of fish (smoked, dried, tinned) and other ASF (milk, eggs), households reported spending around 1 USD per week. However, among the households that reported fresh fish, the average spending reported was 2 USD per week. For meat, households that purchased it reported spending 5 USD per week.

Most households reported that eggs, milk, and tinned fish were purchased from the local village canteen, while the majority of meat was procured through “own production or gathering.” Of the households that purchased fresh fish, 70% reported that the fish was purchased outside the village (i.e., in Dili).

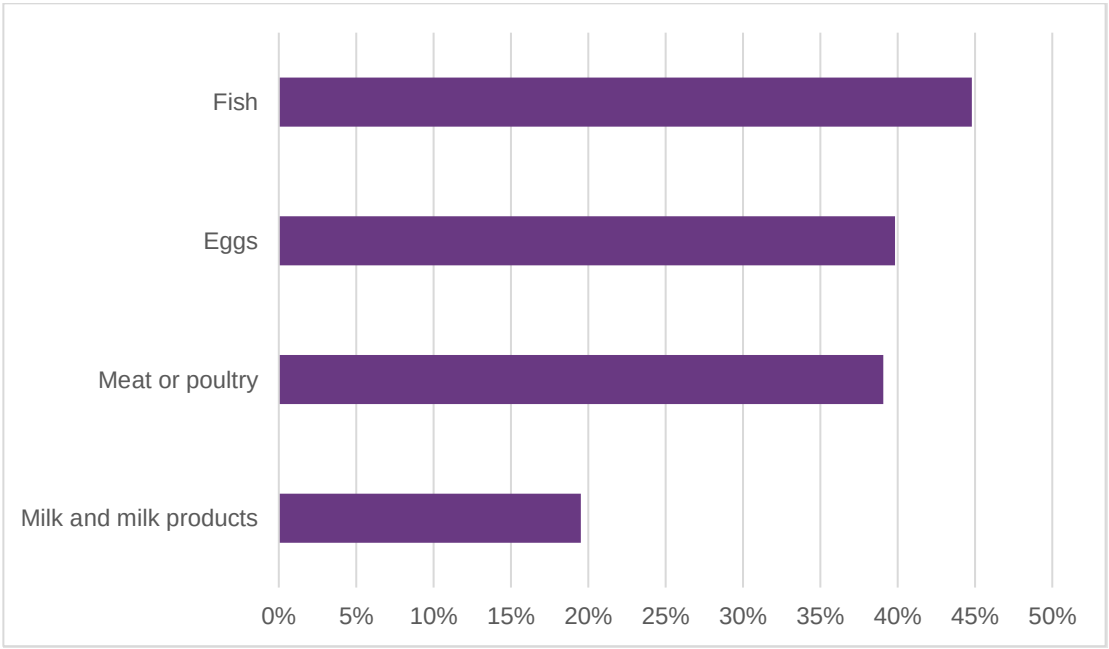

Figure 3. Proportion of households reporting consuming animal-source foods in the previous seven days.

To gain more insight into the types of fish and aquatic foods households are purchasing and consuming, we divided the fish category into types of fish (Figure 4). Fresh fish was the most consumed of all the fish types (40%, with tinned fish a close second (38%). Dried fish, smoked fish, seafood, and prawns were all infrequently consumed.

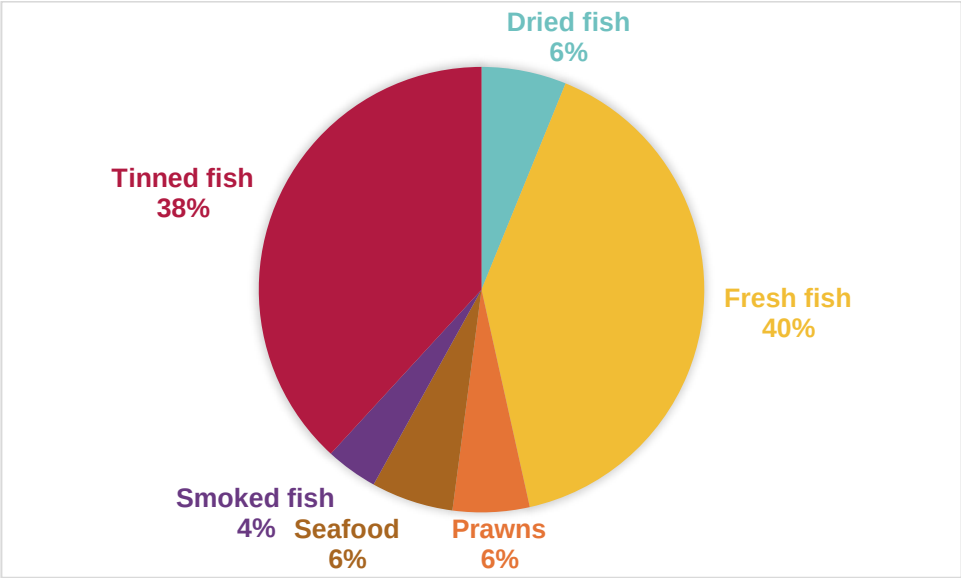

Figure 4. The breakdown of the forms of fish and other aquatic foods reported by the 344 households that reported consuming and purchasing aquatic foods in the previous seven days. Seafood includes seaweed, octopus, crab, sea urchin, and giant clam.

Households that reported fresh fish consumed a variety of species, with sardines being the most reported at 33% of all fresh fish reported (Figure 5). The two types of tinned fish sold in Timor-Leste are tuna and sardines.

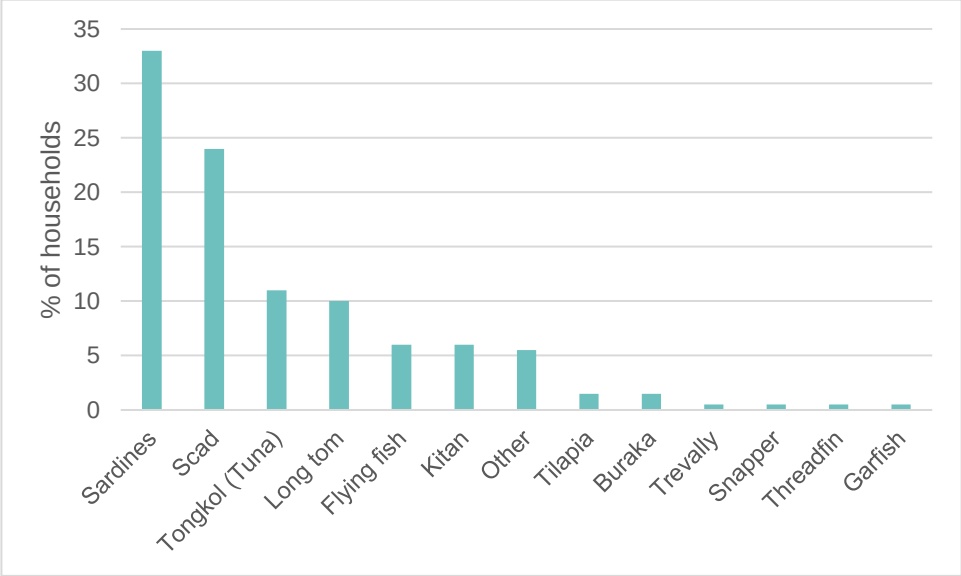

Figure 5. The breakdown of types of fresh fish species reported by the 344 households that reported consuming and purchasing fresh fish in the previous seven days.

Child Dietary Practices

Among the 200 children for which dietary data were collected, 26% achieved the minimum dietary diversity (MDD), which is based on consuming at least five of the eight foods groups in the previous 24 hours (figure 6). Most of the children had consumed grains in the day prior (e.g., rice), with vitamin A-rich fruits and vegetables a close second (this category includes leafy greens).

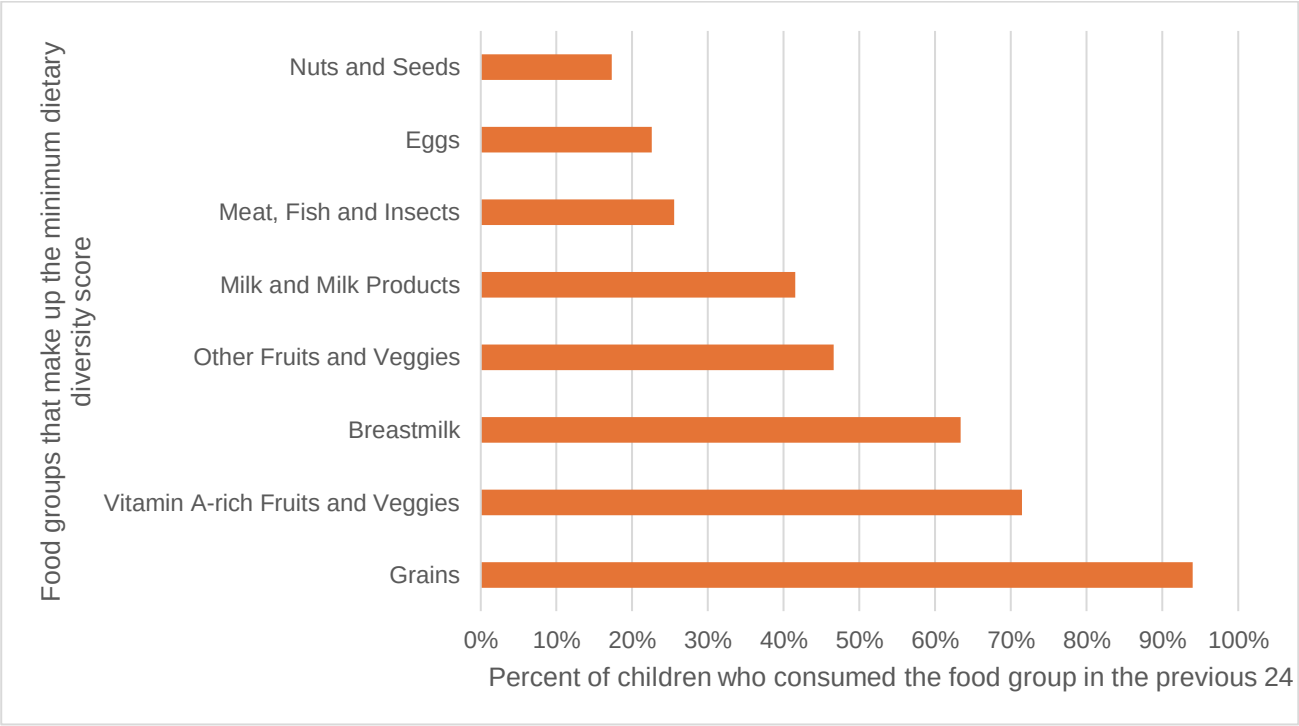

Figure 6. Food groups that children aged 6-24 months had consumed in the previous 24 hours, as reported by caregivers.

3.2 Social and Behaviour change activities – Fish Improving Nutrition (FIN) – Implemented by Mercy Corps

The FIN Program, implemented by project partner Mercy Corps, works with 27 Village Savings and Loans Association (VSLAs) consisting of 541 members (335 female: 206 male) from 425 households in 12 communities. The VSLA members have been trained on the VSLA methodology, save together weekly and meet for nutrition trainings and activities.

Summary of SBC Activities:

FIN Flipbook: The FIN Flipbook includes four interactive lessons promoting fish consumption in target Communities. The lessons focus on the importance of consuming nutritious foods particularly protein foods. Gender is integrated not all lessons with a specific lesson on the importance of shared decision making regarding resource allocation for protein foods. Participants also practice budgeting for meals that include a protein sources such as fish and in the final lesson they have the opportunity to practice proper handling and deboning of fish for young children through a practical cooking session. The first three sessions have been facilitated to the 27 VSLA groups and the fourth lesson will launch in December.

Flipbook Lesson Titles

1. Nutrition
2. The Importance of Protein and the Benefit of Consuming Fish
3. Gender Awareness and Resource Allocation
4. Fish Handling, Hygiene and Cooking Demonstration

Community Level Events Promoting Fish Consumption: The program has implemented seven (7) community events. Events were hosted at primary schools and included interactive learning activities for both adults and children. The community events through mass attendance reach 2,318 people (female 1277 : male 1041)

The community events included a **cooking competition** where contests make the Abon Ikan (dried fish) recipe. The contestants were judged on gender balance of the cooking group, safe food handling and preparation practices, inclusion of the Timor-Leste three food groups and taste acceptance by the judging panel.

The events also included nutrition and hygiene **games for the children** with objective that children learn about the three food groups, the importance of each food group especially the protein foods, key promoted hygiene behaviors such as hand-washing and fun fact about fish. Games included pin the tail on the fish, snakes and ladders, coloring competition and a fish puzzle which also enhances problem solving skills for children.

FIN Program Video: A reality style video with a choose your own ending was developed and field tested. The video uses and animated fish as the narrator to promote fish consumption and other protein foods. The video also serves as a communication tool to promote dietary diversity especially for pregnant and lactating women and for children starting at six months. The video also promotes shared decision making in the house around nutritious foods. The facilitator stops the video at key times to ask the audience questions and gain audience participation. The video will be launched in December with the 27 VSLA groups.

FIN Program Radio Drama: Based on the FIN video script a radio drama was developed and field tested. The radio drama is based on the video and reinforces the same key promoted behaviors. The radio drama is planned to be broadcasted with discussion groups at the market events planned in December and January.

Students playing the snakes and ladders game with nutrition an hygiene messages at a Community Event in Covalima Municipality

Cooking competition contestants at a community event. Preparing the dried fish recipe for the contest.

Facilitation of Lesson 1: Nutrition to VSLA Group in Bobenaro Municipality

Facilitation of Lesson 1 : Nutrition to VSLA group in Bobenaro Municipality

3.3 Business and fish handling training

Fish handling and business skills have been completed in six communities in five municipalities. The full report on all training sessions is in appendix 1.

Community Site	Type of training delivered	Date of meeting/training	Total Participants
Hera, Dili	Preliminary assessment meeting	28th June 2021	14
	Group Formation & Business Training	6th - 13th July 2021	14
	Fish Handling Training	13th October 2021	7
Dato, Liquica	Preliminary assessment meeting	19th of August 2021	12
	Fish Handling Training	4th of October 2021	7
Atabae, Liquica	Preliminary assessment meeting	11th of August 2021	11
	Fish Handling Training	5th of October 2021	11
	Group Formation & Business Training	11th – 12th October 2021	11
Aiteas, Manatuto	Preliminary assessment meeting	17th August 2021	7
	Fish Handling Training	8th October 2021	6
Suai, Covalima	Preliminary assessment meeting	13th August 2021	12
Betano, Manufahi	Preliminary assessment meeting	14th August 2021	18
	Group Formation & Business Training	19th-20th October 2021	12

3.4 Research capacity training

PeskAAS has been adopted and paid for by the GOTL through an agreement signed with WorldFish. As part of this agreement, WorldFish continues to provide training and technical supervision of enumerators along with data validation, fisher consultations, and other PeskAAS related programs at municipal and national level.

Date	Activities	Participants	Comments and Progress
February 2021	Online refresher training	11 men	COVID has restricted peer-to-peer learning and direct contact. An online training was held during movement restrictions.
Sept-Oct 2021	On-site training	11 men	Once movement restrictions were lifted, and as part of completing the baseline survey in different locations, refersher trainings were undertaken in person.
June 14–18, 2021	Introductory training for 6 newly hired MAF enumerators	2 women, 4 men	This particular team is still adapting to the *peskAAS* data collection since they joined the DGP in May 2021. Due to Covid19 constraints, the training was very short and involved very little face-to-face learning. These enumerators are assigned to landing sites in Dili (2), Ainaro (1), Lautem (1), and RAEOA (1). These enumerators are learning and adapting quickly, but still require substantial supervision and feedback to ensure data quality
May 2021 - present	Ongoing virtual and face to face training and mentoring 2-4 hours per week	5 men, 3 women	Training and mentoring 8 new graduate DGP employees to use and integrate data from PeskAAS into fisheries decision-making. These staff will eventually be responsible to take over the technical supervision of enumerators, data management and data-related tasks. Since May 2021, this team has shown good motivation and peer-learning services from WorldFish on a weekly basis with 2 to 4 hours per week plus independent learning sessions. Training involves technical, digital and practical experiences in the field with fisheries data collection with the existing enumerators across the municipal landing sites This team has also supported the survey data collection for a *peskAAS* Impact Assessment survey in collecting data from *peskAAS* users with a total 40 interviews recorded. This team are also responsible for encoding the data from the new vessel registration underway by MAF, and will support WorldFish to develop a

			species guide and multiple trainings manuals of *peskAAS* in English and Tetun versions

3.5 Publications and Communications

3.1.1. Peer-reviewed publications:

Tilley A, Byrd KA, Pincus L, Klumpyan K, Dobson K, do Reis Lopes J, Shikuku KM (2021) A randomised controlled trial to test the effects of fish aggregating devices and SBC activities promoting fish consumption in Timor-Leste: A study protocol. medRxiv. https://www.medrxiv.org/content/10.1101/2021.08.10.21261568v2

Tilley A, Dos Reis Lopes J, Wilkinson SP (2020) PeskAAS: A near-real-time, open-source monitoring and analytics system for small-scale fisheries. PLoS One 15:e0234760.

3.1.2 Policy briefs and manuals:

Tilley A (2021) Nearshore fish aggregating devices (FADs): A technology to boost fisheries production and combat malnutrition in Timor-Leste. https://hdl.handle.net/20.500.12348/4495

A folder of SBC manuals and materials developed for FIN.

3.1.3. Popular science and other media:

The Timor-Leste news channel filmed an episode about the PeskAAS monitoring system and the work of WorldFish Research Analyst Joctan Dos Reis Lopes: http://www.tatoli.tl/2021/08/20/epizodiu-3-joctan-peskizador-ikan-iha-timor-leste-motivasaun/

PeskAAS was also used as a case study for best practise in the recently launched Global Fishing Index: Big data transforming small-scale fisheries: a new reporting system in Timor-Leste | Global Fishing Index | The Minderoo Foundation

4. Plan of activities for 2022

One of the primary activities for 2022 is the carrying out of the RCT, and the technical and messaging components of this. The RCT is designed in such a way that covers outcomes 2 & 3, and is not affected by the international travel ban due to COVID19, as all elements can be carried out by WorldFish and Mercy Corps in-country teams.

Outcome 1 is not related to the RCT, and relies much more heavily on the input and expertise of international consultants. The speed with which activities can resume that involve international experts travelling into Timor-Leste to conduct training and capacity building elements is still very much unknown. In planning activities for 2021 we are working under the current assumption that travel will be possible in the second half of the year. If there are further delays, adapted work plans will be discussed with the donor prior to any decision-making.

4.1 Key activities against outcomes and outputs

Outcome 1: Inshore fish resources managed sustainably

1.1 *A contextualized concept/model of co-management to make effective and sustainable management of marine resources*.

Given the substantial disruption that COVID19 continues to cause to international travel, consultants budgeted for under co-management activities have been unable to visit Timor.The plan for the final year is to develop the system for two-way communication between government and communities. This enables the government to notify communities of changing regulations or updates, and allows communities a mechanism to request assistance to implement co-management according to their needs and aspirations. The structure of this mechanism will follow the recently published *Framework for Action on Scaling up Community-based Fisheries Management: 2021-2025* (Pacific Community 2021).

1.2 *New institutions and practices for fisheries management in place and actively managing fish resources*

An impact assessment of the PeskAAS catch monitoring system will be finalized at the end of 2021, and the planned communications system will be assessed as part of project MEL and reporting in 2022.

1.3 *Improved knowledge of co-management approaches and practice among managers, stakeholders and fishers*

Local knowledge among stakeholders will be improved as part of introduction of the Pacific framework and the co-design of a system that allows coastal communities and relevant stakeholders to regularly receive information that supports resource management and through which they can provide feedback and raise concerns through appropriate and effective communication mechanisms.

1.4 *Increased research capacity of the Ministry of Agriculture & Fisheries and fisheries students of local universities to support fisheries management*
Joctan training MAF graduates in digital fisheires monitoring

MAF has employed five new graduates and these have been trained by WorldFish in digital approaches and fisheries as part of an ongoing mentoring program. This will continue in the final year of the project. In addition, we will be conducting a mentored study of co-management in Timor-Leste, using MAF researchers to gather the survey information in the field. We will then assist them to analyse these data and formulate conclusions from this analysis into a report and potentially a published paper.

Outcome 2: Increased local fish production and income for men and women

Outputs under Outcomes 2 and 3 will be achieved as part of the RCT. See section 3.2 below for details on the trial design.

***2.1** Six FADs will be deployed and managed equitably to increase fish catch and to allow fishers to access a more sustainable source of fish*

Eight FADs have been built and deployed at four sites in four municipalities (Hera,Dili; Atabae, Bobonaro; Manatuto, Covalima). Landings records and the price of fish have been monitored in these locations for the past year, and these will be compared with data collecting following FAD deployments, with geospatial analysis of displacement of fishing effort from reefs to FADs.

***2.2** New fish stocks sustainably accessed through adopting new, diverse fishing methods*

Given the substantial disruption that COVID19 continues to cause to international consultants budgeted for under fishing trials and training activities, the training in FAD fishing and other non-reef based fishing methods is unlikely to be completed as part of this project. However, we will co-design and install signboards with community members to accompany FAD deployments and illustrate simple FAD fishing guidelines and maintenance tips.

***2.3** Women and men trained in fish handling and business skills in focus communities*

Training courses combining elements of fish handling and business skills have been completed in six target communities in 2021 by WorldFish and BD Smart consultants (Appendix 1). There is one remaining training to complete in Suai, Covalima in 2022, and the ongoing activities of trained groups in all communities will be monitored to evaluate outcomes.

Outcome 3: Increased fish consumption in target communities

***1.1** Improved knowledge by women and men of nutritional benefits from fish consumption*
***1.2** Improved capacity of women and men to use cash to make healthy food purchasing, cooking and consumption decisions*

These two outputs will be achieved through the ongoing SBC activities run by Mercy Corps in (see detailed study design). This campaign is providing nutrition knowledge/messages through Village Savings and Loans Associations (VSLA) and will complete by June 2022. Some of the materials used for SBC activities can be seen here.

***1.3** Increased fish consumption by vulnerable members of the population*

This encompasses the major research question of the RCT, so will be answered through analysis of the baseline and end line questionnaire data comparing treatment and control sites. This output is planned for the end of the project in 2022.

4.2 Budget according to planned activities (Nov 2021 - Oct 2022)

Implementation Plan Budget of November 2021 to October 2022

Budget Details	USD	USD
1. Personnel Cost		**130,821**
1.a WorldFish Staff	**130,821**	
2. Casual Help / Temp Staff		**9,135**
2a. Local Enumerators	9,135	
3. Consultants		**20,800**
3a. Co-management Consultancy	5,000	
3b. Nutrition consultancy	12,500	
3c. Data science consultancy	3,300	
4. Travel Costs		**15,500**
4a. Travel airfare	5,330	
4a. Travel accommodation	5,294	
4b. Travel per diem	3,576	
4c. Travel - Misc	1,300	
5. Publication Costs		**9,441**
5a. Open access publication fees	2,645	
5b. Design, proof reading and editing	6,796	
6. Training/Workshops		**13,207**
6a. Co-management training	4,982	
6b. Fisheries Research Capacity training	4,982	
6c. Women Fish Handling and Business skills training	3,243	
7. Partners/Collaborators		**38,000**
7a. Mercy Corps Nutrition education final payment	38,000	
8. Equipment		**2,000**
8a. Replacement laptop for field staff	2,000	
9. Field Costs		**32,219**
9a. Field operating cost	28,634	
9b. Office operation cost	3,585	
10. Allocated Facilities Cost	**1,999**	**1,999**
11. Allocated MIS Costs	3,357	**3,357**
Total Direct Costs		**276,479**
Indirect Costs (5%)		**13,824**
System Cost (2%)		**5,806**
Total Project Costs		**296,109**

References

Kinyoki DK, Osgood-Zimmerman AE, Pickering BV, Schaeffer LE, Marczak LB, Lazzar-Atwood A, et al. Mapping child growth failure across low- and middle-income countries. Nature. 2020;577: 231–234.

Tilley A, Wilkinson SP, Kolding J, López-Angarita J, Pereira M, Mills DJ. Nearshore Fish Aggregating Devices Show Positive Outcomes for Sustainable Fisheries Development in Timor-Leste. Frontiers in Marine Science. 2019;6: 487.

Pacific Community. 2021. Pacific Framework for Action on Scaling up Community-based Fisheries Management: 2021–2025. Noumea, New Caledonia: Pacific Community. 20 p.

Appendix 1. Report on business skills and fish handling training.

About WorldFish

WorldFish is an international, not-for-profit research organization that works to reduce hunger and poverty by improving fisheries and aquaculture. It collaborates with numerous international, regional and national partners to deliver transformational impacts to millions of people who depend on fish for food, nutrition and income in the developing world. Headquartered in Penang, Malaysia and with regional offices across Africa, Asia and the Pacific, WorldFish is a member of CGIAR, the world's largest global partnership on agriculture research and innovation for a food secure future.

For more information, please visit www.worldfishcenter.org