



Small-Scale Fisheries in Thailand

a brief analysis of cost and profits





Photo Credit
© Grading of fish catch at the landing area of Phetchaburi, Thailand

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Photo Cover

© Grading of fish catch at the landing area of Phetchaburi, Thailand

© Seafood restaurant in Cha-um, Phetchaburi province of Thailand

© Seafood (crabs and squids) kept in cold storage facility by the small enterprises in Chonburi, Thailand

Key Messages



Variable costs (e.g., gasoline, labor costs) are the major determinants of success for SSF. Financial institutions should work together with their clients on measures to reduce such costs.



Seafood restaurants and other VC actors - such as fish processing businesses - generate high margins but also require larger amounts of capital to start with.



The sales price determines business success. Financial institutions should help to better bring buyers and sellers together.



Evidence generated during the study showed the processing technologies for small-scale processors could only be scaled up taking a value chain approach from financing to product marketing.

Introduction

To make small-scale fisheries (SSF) in Thailand more sustainable, the fishing value chain (VC) needs to invest in responsible technologies, reduce overfishing, contribute to fisheries management, and implement climate change adaptation measures. To do so, small-scale fishers and other businesses in the VC need access to financial services.

In April and May 2022, the Asia-Pacific Rural and Agricultural Credit Association (APRACA) in collaboration with the Food and Agriculture Organization of the United Nations (FAO) and the Bank for Agriculture and Agricultural Cooperatives (BAAC), undertook field work in three provinces of eastern Thailand to investigate access to finance by the small-scale fishing value chain.

The results deepen the understanding of the financing mechanisms used by the VC actors. We offer insights into the profitability of the different businesses. The brochure also illustrates the most important drivers of costs for the different value chain actors. The information can help financial institutions to analyze the different VC actors and their potential as new clients.



Photo Credit
© Seafood restaurant in Cha-um, Phetchaburi province of Thailand

Innovations for investment: financing small-scale fisheries in Thailand

The results presented in this brochure are a follow-up activity to a more extensive project that the Food and Agriculture Organization of the United Nations (FAO) and the Asia-Pacific Rural and Agricultural Credit Association (APRACA), in collaboration with the Bank for Agriculture and Agricultural Cooperatives (BAAC), implemented in 2021–2022 to analyze and improve the access of small-scale fishers to financial services in Thailand.

The results of this project have been published in a circular which can be found under the following link: www.fao.org/voluntary-guidelines-small-scale-fisheries/resources/detail/en/c/1638842/ Among other things, the circular contains training material about the specifics of the small-scale fishing value chain which financial institutions might use to train their staff.

Study methodologies, respondents, and geography

The survey was conducted in April and May 2022 by means of key informant interviews and focus group discussions. The survey team covered the three coastal provinces of Prachuap Khiri Khan, Petchaburi and Chonburi in the east of Thailand which are locations of main fishing ports.

In total, 88 VC actors were interviewed, among which were small-scale fishers (SSF), fish aggregators, processors, retailers, transporters, and owners of cold storage units. The value chain actors were identified with the help of BAAC and fishers' cooperatives. The project team also interviewed 15 providers of ancillary services like ice factories, fishers' cooperatives, and financial institutions to deepen the understanding of financing mechanisms in the value chain.

To deduce profitability, the survey inquired about yearly income and costs. This analysis was complemented by asking participants about how they finance their business and about their relationship with financial institutions.



Photo Credit
© Seafood restaurant in Cha-um, Petchaburi province of Thailand

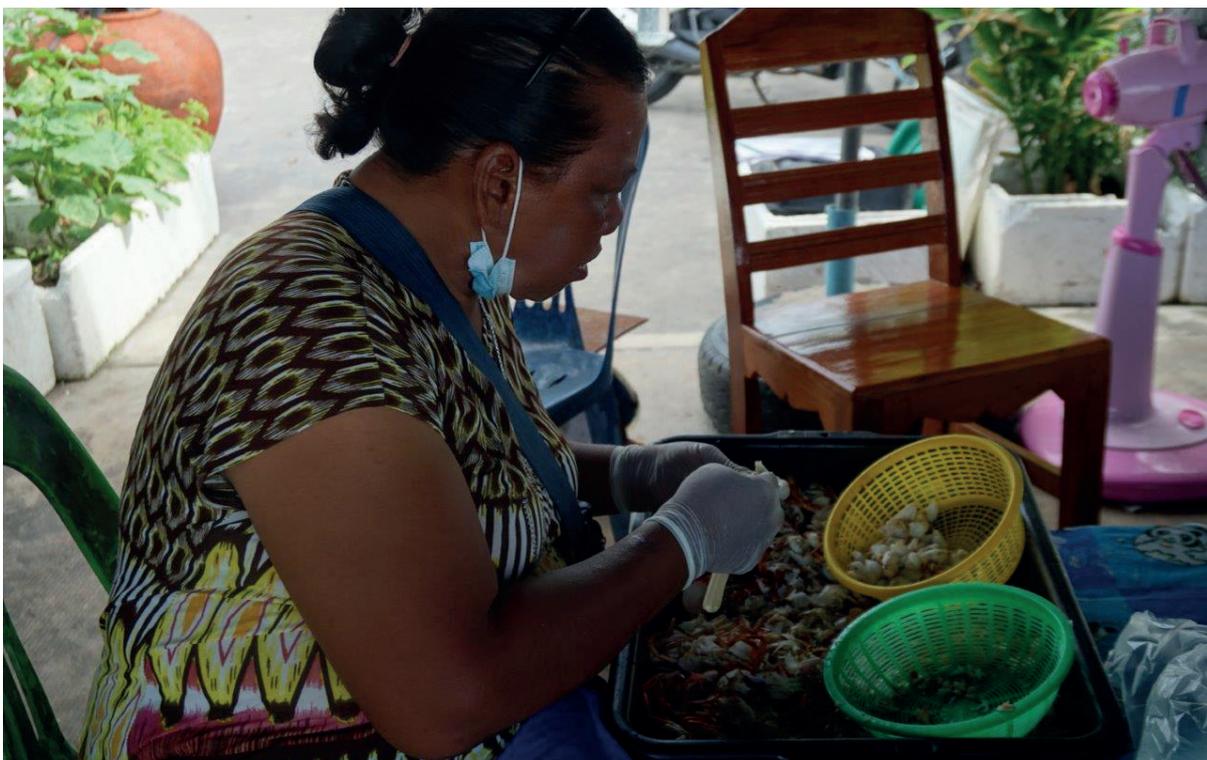
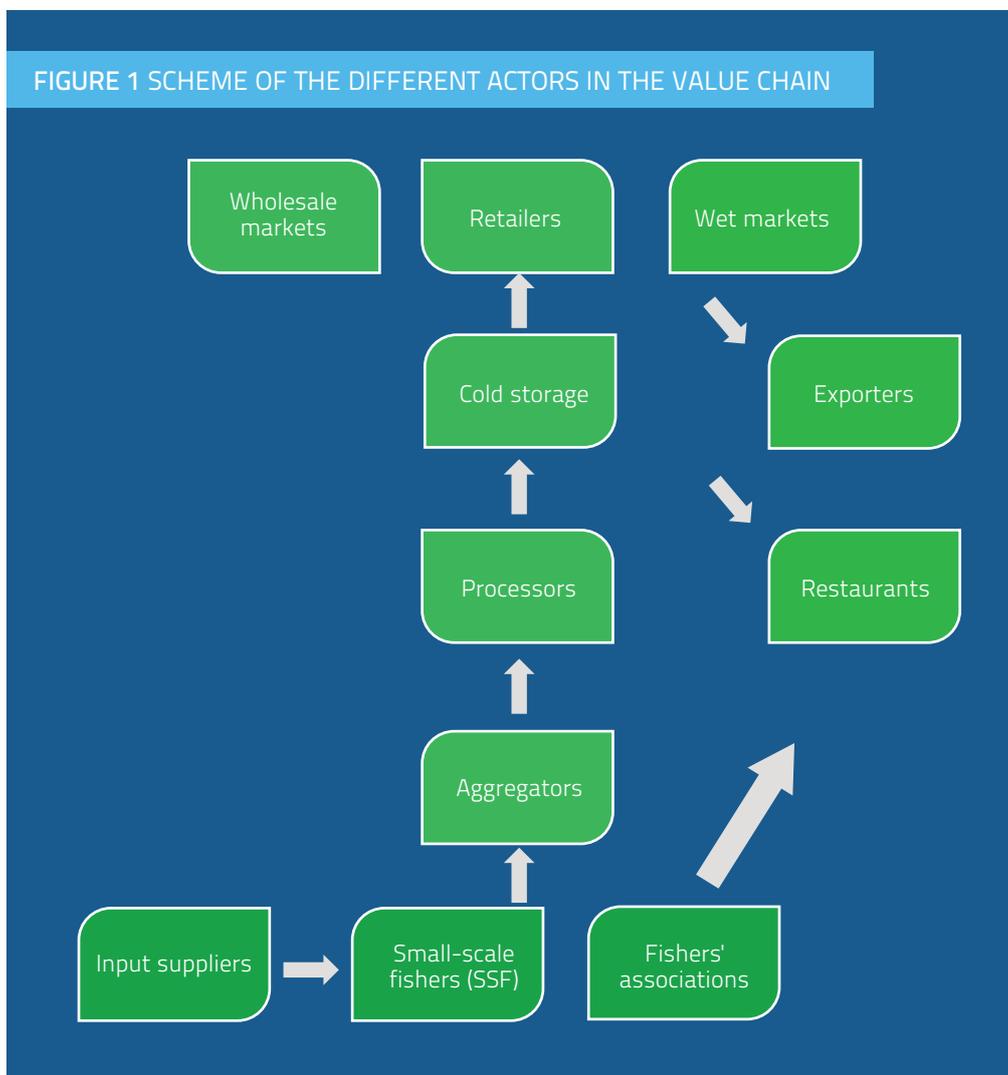


Photo Credit
© Washing crabs and squids before packing and storing in cold storages in Chonburi province of Thailand



Overview of the value chain (VC) actors

The VC for fish and seafood connects a wide array of different actors. Figure 1 provides an overview. Ultimately, the way that actors come together differs distinctly and impacts their finances, as we will see below.



Key results by value chain actor

4.1 Small-scale fishers (SFF)

The survey captured SSF of different sizes (and success). Most of the 38 SSF in the survey had begun fishing on their own and only few inherited the business from their parents. This is in some contrast to other regions of the world, where the fishing business is often passed down generations. The interviewed SSF sail out an average of 176 days a year. All vessels are smaller than 10-gross tons. The boats carry nets such as gill nets, cover nets, surrounding nets and/or persistent nets depending on the fish and seafood to be captured. SSF market their catch to wholesalers at the pier, at wholesale market, processors or directly to retailers and restaurants. The demand in the region seems to be strong. The SSF reported that they always manage to sell all their catch.

4.1.1 Finance

Many of the SSF borrow from government agencies, and only one from a commercial bank (in the sample that is due to the selection process, but it also represents a wider truth that government agencies play an important role in financing the sector). Moreover, some fishers also got loans from other sources: two from a non-bank financial institution, 13 SSF borrowed from a Thai village fund, four from informal money lenders and three from friends. Internal financing on a quid-pro-quo basis is an important financing mechanism as well. Under these arrangements, eight respondents borrowed from SSF-cooperatives, seven from aggregators, and one from a processor.

The SSF interviewed do not take up insurance for their fishing activity. However, a total of 35 (92 percent) fishers took a loan insurance which often is a prerequisite for borrowing.

4.1.2 Profit Analysis

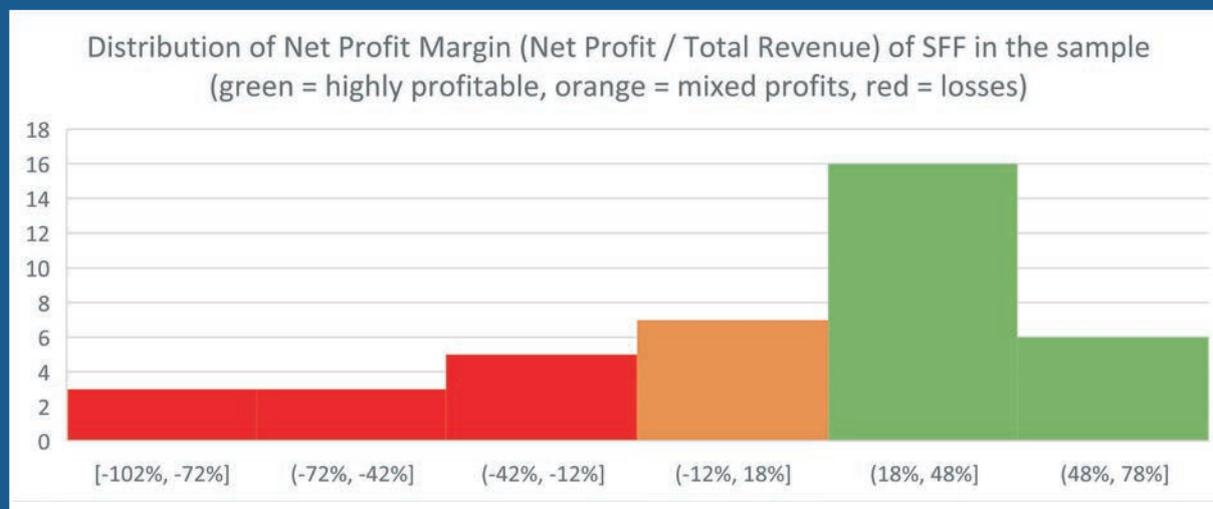
The small-scale fishing business was profitable on average and the average operating net profit margin stands at around 23 percent. However, only 23 fishers (61 percent) report a positive net profit from fishing while 15 fishers (39 percent) report overall negative profits. Figure 2 shows the distribution of the net profit margin for the sample of SSF in the survey (red color indicating losses and green color indicating positive net profit margins, orange indicates SSF with mixed results). The good news here is that only very few SSF turn severe losses, and most manage to attain robust net profit margins. Some SSF are even highly profitable. However, the survey also shows that many fishers rely on alternative sources of income to sustain their lives. Only 34 percent of the SSF interviewed sustained their annual household income purely from fishing. These alternative sources of income need to be considered by financial institutions while analyzing potential clients.

Variable costs¹ are the main driver of costs for the SSF. The most important variable expenses for the fishing households are labor cost, gasoline expenses for the vessel and cars, foods for the laborers, followed by electricity and pipe water and cooking gas. As such, increases or savings of variable expenses can have a big impact on the profitability of SSF. The main annual fixed cost was the cost of repairing the vessels, with the least expense reported at USD 103 to the highest cost at USD 6 666.

¹ Throughout the analysis variable costs are costs that can easily be scaled up or down with the business, e.g.: fuel, electricity, labor, water, cooking gas. Fixed costs are costs that cannot be scaled down immediately, e.g.: repair costs, buying costs for major machinery or boats. For the intermediate steps in the VC, the cost for buying the main input (i.e. fish and seafood) is shown separately in the tables.



FIGURE 1 DISTRIBUTION OF NET PROFIT MARGIN FOR SSF



One-third of the SSF respondents did not hire any laborers due to the difficulty in finding them and the high costs associated with it. For the rest, the average labor rate for male is USD 13 and for female is USD 8.

The average amount of fish caught per day was 56 kg but varies widely with the lowest catch reported at 5 kg and the largest catch of 300 kg on one day. The average implied total amount of catch per year is 6 467 kg. The average selling price per kilo was USD 4 but is the result of vast differences in the price of different kind of commodities. The lowest price was USD 0.41 per kilo (examples of low-price catches are sea cucumbers or seaweeds) and the highest price was USD 9 per kilo (examples of high-price items are crabs or lobster). The price per kilo is another major determinant of the overall profitability of the fishing activity, besides the variable costs.

TABLE 1 PROFIT ANALYSIS SSF

	MIN*	MAX*	AVERAGE
Days of catching seafood or fish (number)	45	300	176
Amount of seafood or fish caught per day (kg)	5	300	56
Total amount caught per year (kg)	600	39 000	6 467
Average selling price per kilo (USD)	0.41	9.00	4.00
Annual sales revenue (USD)	4 166	55 555	24 473
Annual variable expenses (USD)	2 466	67 800	16 405
Annual fixed cost (USD)	103	8 333	1 579
Annual interest on loans (USD)	166	5 000	982
Annual total costs	3 180	72 800	18 026
Annual net profit/loss (USD)		172 833	5 557
Operating (Net) Profit Margin			23%

*Min and Max are for each item separately

4.2 Aggregators

Aggregators buy fish from their favored or linked SSF, grade, sort and sell to local retailers and wholesale markets. In the sample, there are various kinds of fish and seafood like mackerel, tuna, sardines, stingray, barracuda, sillago, king mackerel, tilapia, snakehead fish and catfish as well as squid and crab. All aggregators conducted the business as proprietors or single owners. The location of their businesses was at their homes except one aggregator who has an office in a different area. These respondents had their own pick-up vans to transfer their products.

4.2.1 Finance

Four out of five aggregators provided funds to SFF to help fishers run their fishing businesses on the condition that the fishers sold their catch to the aggregators. At the same time, aggregators likewise borrow from banks. Again, lending from government banks is very frequent and comes at much cheaper rates (around 4 percent p.a.) than from a commercial bank (at around 17 percent p.a.). All the aggregators took insurance, combining life, loan and health insurances.

4.2.2 Profit Analysis

Only three out of five aggregators managed to run a profitable business. Even more so, three aggregators, considering their overall household finances, had no or little money left for savings and revealed that they face a large financial burden in general. The analysis shows that variable costs (in particular gasoline and labor) need to be kept in check in order to successfully scale up the business. Two of the five aggregators did not have other sources of income. However, another two aggregators got their own vessels and caught fish (in an attempt to vertically integrate the business).

TABLE 2 PROFIT ANALYSIS AGGREGATORS

	BANG SAPHAN	PETCHABURI 1 BANLEAM	PETCHABURI 2 CHA-UM	PETCHABURI 3 BANLEAM	PETCHABURI 4 MUANG
Days of aggregating	300	360	270	240	360
Amount of seafood or fish aggregated per day (kg)	7 000	300	1 000	3 000	1 000
Total amount per year (kg)	2 100 000	108 000	270 000	720 000	360 000
Average selling price per kilo (USD)	0.83	2.36	5	2.7	1.6
Annual sales revenue (USD)	1 743 000	254 880	1 350 000	1 944 000	576 000
Annual cost of buying fish or seafood (USD)	1 166 670	225 000	1 125 000	1 403 890	440 000
Annual variable expenses (USD)	498 340	28 840	90 670	18 670	20 400
Annual fixed cost (USD)	125 000	5 250	20	6 120	4 030
Annual interest on loans (USD)	33 340	3 780	44 450	10 000	1 340
Annual total cost (USD)	1 823 350	262 870	1 260 140	1 438 680	465 770
Annual Net profit/loss (USD)			89 860	505 320	110 230
Operating (Net) Profit Margin	-5%	-3%	7%	26%	19%

4.3 Sea food restaurant

Seafood restaurants play an important role in the value chain of small-scale fishers in Thailand. With the growth of the 'consuming class' and 'tourism', the number of these establishments have increased dramatically and are in a growth phase. At present most of these outlets buy directly from wet markets or supermarkets and few of them buy the sea animals/sea fish directly from the small-scale fisher. Though there may be niche opportunities to develop relationships with individual sea food restaurants, as well as chains, that want a consistent supply of high-quality sea fishes and sea creatures, which meets food safety requirements.



4.3.1 Finance

Seafood restaurant owners usually borrow to finance their businesses. Only one owner did not avail of any loan. The amount of loans was between USD 27 777 to a very large loan of USD 1 333 333 with an average of USD 180 000. The rate of interest for government banks was between 4 percent and 7 percent p.a., the commercial bank charged higher rates between 14–18 percent p.a.

4.3.2 Profit Analysis

The restaurant business (with the exception of the smallest restaurant in the sample) generates high profit margins of up to 67 percent. Compared with the other VC businesses, restaurants require the highest capital investments to start with. The average total annual turnover was USD 77 870.

It is very common for restaurant owners to engage in other businesses. Five owners of restaurants had other sources of income: (a) a coconut grove, (b) fish processing, (c) conducting resort and tourist diving, (d) land rental, and house rental, (e) fish aggregator and (f) fishery. The amount of annual income from other sources is, however, smaller than the profits from the restaurant business and ranges approximately from USD 5 556 to USD 28 944.

TABLE 3 PROFIT ANALYSIS RESTAURANTS

	BANGSAPHAN KRUJA BANGTAPHAN	BANGSAPHAN I-TALAY	BANGSAPHANNOI HAADSON SEAFOOD	PETCHABURI CHOMVIEW SEAFOOD	PETCHABURI NATATIEW SEAFOOD	PETCHABURI KHUN AEW SEAFOOD
Days of business in a year (number)	350	350	360	360	300	360
Average sales per day (USD)	420	700	280	2 780	840	1 120
% of selling fish in the restaurant	30	40	40	50	70	70
Annual sales revenue (USD)	155 400	245 000	103 600	1 000 800	252 000	403 200
Annual cost of buying fish and seafood (USD)	8 670	38 890	50 000	75 000	66 670	80 000
Annual variable expenses (USD)	95 750	113 000	34 600	175 420	43 600	41 080
Annual fixed cost (USD)	5 560	8 340	5 560	30 560	2 670	5 000
Annual interest on loans (USD)	0	16 670	11 120	333 340	5 560	6 670
Annual total cost (USD)	109 980	176 900	101 280	614 320	118 500	132 750
Annual Net profit/loss (USD)	45 420	68 100	2 320	386 480	133 500	270 450
Operating (Net) Profit Margin	28%	27%	0%	39%	53%	67%

4.4 Processors

Two of the processors surveyed bought all their fish from SSF, and the third processor bought 50 percent each from the SSF and from the market. As none of them had a factory, they dried the fish in the sun. The crab processor boiled and peeled the crabs. They conducted their businesses as proprietors. Their workplaces were at home and near the seaside. All processors had their own pick-up vans or motorcycles to transfer their products.

4.4.1 Finance

The cost of buying and transferring (through pick-up vans) the fish to the processing centres is being invested by the processors as evidenced from the survey. However, this depends on the volume of business and to secure higher business volume, they receive financing from the banks and also sometimes from the retailers who need the processed fish.

4.4.2 Profit Analysis

The processing business can be profitable, but our analysis seems to indicate that a certain level of scale is needed to generate profits as the smallest-scale producer in the analysis does not manage to turn profits.

TABLE 4 PROFIT ANALYSIS PROCESSORS

	PETCHABURI	CHONBURI 1	CHONBURI 2
Days of processing	144	200	360
Amount of sea creatures per day (Kg)	500	20	200
Total amount of sea creatures per year (Kg)	36 000	2 000	72 000
Average selling price per kilo	4.2	5.5	8.4
Annual sales revenues (USD)	151 200	11 000	604 800
Annual cost of buying sea creatures (USD)	1 670	10 000	277 780
Annual variable expenses (USD)	24 650	5 670	17 170
Annual fixed cost (USD)	0	0	0
Annual interest on loans (USD)	1 950	190	0
Annual total cost (USD)	28 270	15 860	294 950
Annual net profit/loss (USD)	122 930		309 860
Operating (Net) Profit Margin	81%	-44%	51%



Photo Credit

© Crab boiling process for making seafood sauce in Prachaup Khiri Khan, Thailand



Analysis of profits along the value chain

The following graphs provide an overview of sales prices and gross margins (defined as the difference between buying and selling price divided by the buying price) along the VC. The value chain takes different forms in different locations. Sometimes businesses are vertically integrated (an example are aggregators that also acquire boats to go out to fish), sometimes steps are skipped (for example when restaurants buy directly from SSF). The following analysis of the gross margins by the different value chain actors can thus only be exemplary.

From the analysis we can see that no value chain actor stands out in making extraordinarily larger profits than the others. Instead, the increase of price is passed on more or less uniformly as each actor upgrades the product. An exception are restaurants that manage to buy directly from SSF and sell at a much higher price to their customers. That business model of direct purchase is, however, constrained by lower volumes.

FIGURE 3 PRICES AND GROSS MARGINS* FOR AN EXAMPLE OF A HIGH-VALUE PROCESSED FISH LIKE SPOTTED MACKEREL



* $(\text{sales price} - \text{buying price}) / \text{buying price}$

Cost Analysis

For a financial institution, analyzing the profitability of the value chain actors crucially depends on understanding the drivers of costs. Naturally, these drivers vary among the different types of VC actors. Table 6 summarizes costs by value chain actor (red indicating very important drivers of costs, and green indicating items of no importance to overall costs).

For fishers, fuel and labor are the main costs. Strategies to keep these costs at moderate levels can be very helpful to boost their profitability.

For the intermediate value chain actors that process or aggregate fish and seafood, all depends on the cost of buying their input. They use surprisingly little funds to pay for workers. The focus of their profitability analysis should thus be on the margin between the costs of goods sold vs. the costs of buying these goods.

The aggregators' business model requires going around and finding and aggregating fish. This increases the importance of gasoline and labor costs. The successful aggregators in the sample manage to keep these variable costs in check.

For restaurants, the picture is yet more nuanced. Repairing the restaurant is a significant cost element as are wages for laborers. As the restaurant owners in this survey owned their premises, rent is not an issue. Buying ingredients (fish and non-fish items) are still the largest cost item, but the profitability analysis should encompass all cost categories to provide a wholesome picture of business success.

COST SHEET ITEMS	SMALL FISHER	AGGREGATORS	PROCESSORS	RESTAURANTS
Electricity/pipe water/cooking gas	5%	0%	2%	4%
Gasoline/fuel	28%	6%	1%	5%
Machinery & equipment, tools, baskets, nets	9%	1%	0%	2%
Cost of buying inputs fish/sea creatures	0%	83%	86%	41%
Non fish-food ingredients	0%	0%	0%	20%
Repairing cost	8%	2%	0%	9%
Rent	0%	0%	0%	0%
Labor cost	32%	7%	3%	12%
Other costs	19%	1%	8%	7%
TOTAL	100%	100%	100%	100%



Conclusion

There is a multitude of businesses in the small-scale fishing value chain in Thailand that manage to generate solid profits. The operating (net) profit margin for the SSF in the sample stands at 23 percent. The average profit margins for restaurants and processors are even higher, although their businesses generally require higher capital investments to begin with.

The principal drivers of costs vary widely between the different VC actors. Operating costs such as labor and fuel are extremely important for SSF. Swings in the prices of these items are difficult for the fishers to cope with. Financial institutions, when assessing SSF as potential clients should devise strategies on how to deal with these costs and, if needed, work on savings measures, together with their clients. Another major determinant for the success of the fishing businesses was the sales price. While the price is largely determined by market demand and supply, timely pricing information might help SSF to boost their income. Financial institutions could help developing tools to better connect buyers and sellers in the market”.

Both formal (borrowing from banks) and informal finance (such as quid pro quo buying between fishers and aggregators) arrangements exist. Often, the same VC actor might rely on both types of financial agreements. Borrowing from government institutions is an important feature of the VC and the funds from government banks come at considerably lower rates than from private banks. Financial institutions, while appraising clients, must gain a holistic view of a client’s finances. They might also ask why such a high number of informal finance arrangements still exist in the market.

In principle, there are ample opportunities for financial institutions to collaborate with VC actors and to try to develop the sector in a sustainable manner. The Covid-19 pandemic and large swings in input prices have challenged fishers, not only in Thailand. However, the value chain has proven to be robust and opportunities for investment exist.

Abbreviations

APRACA	Asia-Pacific Rural and Agricultural Credit Association
BAAC	Bank for Agriculture and Agricultural Cooperatives
FAO	Food and Agriculture Organization of the United Nations
SSF	Small-Scale Fishers
THB	Thai Baht
USD	United States Dollar
VC	Value Chain

Conversion rate: USD1 = THB32.5 (as on 31 March 2023).

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Photo Credit
© Grading of fish catch at the landing area of Phetchaburi, Thailand

APRACA 45

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**Asia-Pacific Rural and Agricultural Credit Association
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