

Marine Change

Investing in the Transition to Sustainable Production of Tuna in Indonesia, Papua New Guinea, the Philippines, Thailand, and Vietnam



Final Report

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Acronyms and Abbreviations

ACE	Automated Commercial Environment
ANZ	Australia and New Zealand Banking Group
AP2HI	Asosiasi Perikanan Pole & Line dan Handline Indonesia
ASEAN	Association of South East Asian Nations
Big 3	FCF, Tri Marine, Itochu
BSP	Bank of the South Pacific
CAFE	Coffee and Farmer Equity
CDT	Catch Documentation and Traceability (system)
CoC	Chain of Custody
DHS	Department of Homeland Security, Customs and Border Protection
EEZ	Exclusive Economic Zone
EPA	Economic Partnership Agreement
ESAP	Environmental and Social Action Plan
EU	European Union
FAD	Fish Aggregation Device
FAO	Food and Agriculture Organization of the United Nations
FDA	Food and Drug Administration
FDI	Foreign Direct Investment
FGD	Focus Group Discussion
FIP	Fishery Improvement Program
GPS	Global Positioning System
GSP+	EU Generalized Scheme of Preferences (enhanced)
GT	Gross Tons
GTFP	Global Trade Finance Program
HACCP	Hazard Analysis and Critical Control Points
HG&G	Headed, Gilled and Gutted
HTS	Harmonized Tariff Schedule (code)
IFC	International Finance Corporation
IRR	Internal Rate of Return
ISSF	International Seafood Sustainability Foundation
ITC	International Trade Centre
ITDS	International Trade Data System
IUU	Illegal, Unregulated, and Unreported
JV	Joint Venture
KADIN	The Indonesian Chamber of Commerce and Industry
MMAF	Ministry of Marine Affairs and Fisheries (Indonesia)
MDPI	Masyarakat dan Perikanan Indonesia
MFI	Microfinance Institution
NGO	Non-Governmental Organization
NMFS	National Marine Fisheries Service (US)
NOAA	National Oceanic and Atmospheric Administration (US)
NPL	Non-Performing Loan
NSPF	Non-Specifically Provided For (usually species not named)

MSC	Marine Stewardship Council
MSY	Maximum Sustainable Yield
OSMI	Oceans and Seafood Markets Initiative
PNA	Parties to the Nauru Agreement
PNG	Papua New Guinea
PRI	Program-related Investments
PS	IFC Performance Standards
RFMO	Regional Fisheries Management Organization
RRF	Rabobank Rural Fund
SAFIRA	Strengthening Agricultural Finance in Rural Areas
SIMP	Seafood Import Monitoring Program (US)
SFP	Sustainable Fisheries Partnership
SPV	Special Purpose Vehicle
SSLC	Sustainable Shipment Letter of Credit
US	United States
USAID	United States Agency for International Development
UVI	Unique Vessel Identification Number
VASEP	Vietnam Association of Seafood Exporters and Producers
VCF	Value Chain Financing
VDS	Vessel Day Scheme
VMS	Vessel Monitoring System
WCPO	Western and Central Pacific Ocean
WCPFC	Western and Central Pacific Fisheries Commission
WFE	Whole Fish Equivalent
WWF	Worldwide Fund for Nature

Executive Summary

The present study has been undertaken for WWF to inform efforts to improve the traceability and sustainability of seafood products entering the US market and accelerate progress on the responsible management of fisheries in the Asia-Pacific region by 1) understanding the supply and value chains of the countries in question and 2) identifying potential financing nodes and frameworks for improved fisheries management. Its particular focus is one aspect of the large and valuable trade in tuna products into the US from South East Asia and the Western and Central Pacific Ocean (WCPO) – skipjack and yellowfin tuna trade and supply chains into the US market. The scope of this study includes four Southeast Asian countries – Indonesia, Vietnam, Philippines and Thailand – and one Pacific Island nation, Papua New Guinea.

The study drew on existing national and international trade (import/export) databases. Following compilation of the available trade data for 2014 through 2016 (the latest period for which data are available), supply chain flows were established and depicted diagrammatically, with the main industry actors identified in each country. Key informant interviews were then conducted in person and over the phone with various industry actors, government officials, and financial institutions in Indonesia, Papua New Guinea, Philippines, Thailand, and Vietnam. The information collected in these interviews related to supply chains, market conditions, availability of financing, potential challenges and opportunities for the implementation of traceability and sustainability schemes, and readiness to provide the catch and traceability data required under the new US Seafood Import Monitoring Program (SIMP).

This report attempts to 1) highlight the importance of the US as an export market for the four priority Southeast Asian countries plus PNG for skipjack and yellowfin tuna products in comparison to other export markets 2) identify major supply chains from these countries to the US market 3) identify priority issues relating to traceability and sustainability in each country, and 4) present viable business cases that have been vetted with selected industry actors across the value chain and NGOs working on the ground.

Overall US tuna imports from countries in scope are dominated by HS 160414 canned/pouch tuna products worth between US\$560 and US\$710 million in recent years, with fresh/frozen yellowfin products worth around half that total value (US\$300 million in 2016), but with a higher unit value per kilogram. A variety of fresh/frozen yellowfin tuna products is involved, with the following main products and associated HTS/NMFS codes traded:

HS 030232 (fresh/chilled yellowfin, with some bigeye): imports from countries in scope comprise approximately 16 percent of US imports, worth US\$30-35 million, with the Philippines the main exporter in 2016; high unit value.

HS 030342 (frozen whole/HG&G yellowfin): small proportion of US imports, worth around US\$25 million in recent years, and includes some lower value species for canning. The countries in scope account for 96 percent of imports to the US in this category.

HS 030343 (frozen whole skipjack): smallest trade, worth just US\$0.25 million, two-thirds of US imports sourced from the countries in scope in 2016.

HS 030487 (frozen loins/fillets): the largest component of US fresh/frozen trade, with imports from the countries in scope valued at over US\$240 million in 2016 and comprising over 70 percent of the global imports in this category. The NMFS category is however NSPF¹ so it is not known how much of this is yellowfin but it can be assumed to be high. Imports were dominated by Indonesia until recently, followed by Vietnam, Philippines and Thailand. Much of the product is treated with carbon monoxide.

Sustainability and socio-economic considerations:

Given the fecundity of these species, catch levels of skipjack and yellowfin in the WCPO are currently classified as sustainable. However, there is excess harvesting and processing capacity across the region and generally open access to fisheries in territorial waters. In the high seas there is little check on overexploitation. One of the key benefits of certification schemes such as MSC is the imposition of harvest control strategies that limit catch effort.

Another challenge is the lack of minimum standards which companies are obligated to follow, particularly with respect to the high seas. The regional fisheries management organizations (RFMOs) reportedly have the tools for proper management but lack the political will by some member states for enforcement. Some large multinational actors follow standards promoted by the International Seafood Sustainability Foundation (ISSF), even though abiding by these rules is sometimes perceived as a competitive disadvantage.

For artisanal fishers in Southeast Asia with little if any access to banking services, middlemen often finance fishing trips at very high interest rates. These loan terms can make it difficult for fishers to ever get out of debt, which in turn can lead to increased catch effort. Any effort to promote sustainability among these small-scale fishers must first address their economic insecurity.

Supply chain of skipjack and yellowfin tuna exports at national level:

Detailed tuna supply chain summaries and diagrams were prepared for each country, with the main features briefly detailed as follows:

Indonesia

US tuna imports from Indonesia were valued at US\$140 million in 2016, dominated by frozen fillets/loins (half of exports by volume and 75 percent by value) processed by a range of plants throughout Indonesia, with processed skipjack exports also significant. The US is the largest market by value for Indonesian tuna exports, which draw almost entirely on the large domestic tuna production. Imports of tuna by Indonesia are small by comparison with local production, and mostly supplement local raw material supplies for canning.

¹ NSPF = Not specifically provided for i.e., no species nominated

Papua New Guinea

The world's largest producer of skipjack tuna and a major producer of yellowfin, PNG is one of the main sources of tuna exported to processors in Thailand, the Philippines, Vietnam, and Indonesia. The domestic processing industry is small and disadvantaged relative to other countries by a high-cost environment, poor infrastructure, and regulatory uncertainty. PNG's tuna exports enter the EU, the main export market, duty free. No skipjack or yellowfin is exported directly from PNG to the US.

The Philippines

With a major domestic fishery supplemented by large volumes of imports, the Philippines is a significant canned skipjack processor for export and domestic consumption. A domestic handline fishery supports significant fresh/frozen tuna production, much of which is exported to the US. US oceanic tuna imports from Philippines were valued at \$93 million in 2016, about two-thirds of which was yellowfin, dominated by frozen fillets/loins and fresh/chilled (70 percent, and 30 percent, respectively).

Thailand

With insignificant domestic oceanic tuna production, Thailand as the world's largest canned tuna processor imports almost all its raw material for processing and re-export. This has been up to 800,000 tons in some years of mostly purse seine-caught fish from the WCPO. Longline landings by foreign fleets in Phuket are processed in part for the small amount of fresh/frozen exports, possibly supplemented by some high-graded purse seine yellowfin. Total skipjack and yellowfin exports to the US were valued at \$320 million in 2016, 90 percent of which was canned/pouch skipjack and 10 percent frozen fillets/loins.

Vietnam

With a relatively small domestic catch of tuna suitable for processing and export, Vietnam imports large amounts of tuna (US\$220 million in 2015) for both canning and fresh/frozen processing. Vietnam skipjack and yellowfin exports to the US were valued at US\$125 million in 2016, two-thirds of which was yellowfin. This is approximately one-third of the total value of Vietnamese skipjack and yellowfin exports.

Financing nodes across the tuna supply chain:

Commercial finance is generally only available to industry actors who have demonstrably stable cash flows and fixed assets that can be collateralized. Most banks are unwilling to accept vessels as collateral due to flight risk. As a result, finance is typically only available to processors, vertically integrated fishing companies, and diversified firms with assets and cash flows associated with other business lines.

Frameworks for aligning capital flows and sustainability:

Having received feedback from the focus group convened at the end of the first phase of this project, we present in-depth analysis of the following business cases:

The business case for long-term contracting in artisanal fisheries: facilitating value chain financing

Fisheries at the small-scale often lack access to both international markets and to formal providers of credit, foregoing investments in basic equipment that could improve fish quality and thereby increase their incomes. This perpetuates a cycle of financial insecurity for artisanal fishers, leading to increased pressure on fish stocks. Meanwhile, buyers of fish risk security of supply and increased quality assurance costs without lasting agreements with their suppliers.

Value chain financing (VCF) entails a long-term contract between supplier (fisher) and off-taker (trader/retailer) in which the security of the off-taker agreement allows suppliers to borrow for assets related to production. The structure goes as follows: Participating banks lend directly to affiliated supply companies, who then sell production inputs to suppliers at a discount. At harvest, suppliers sell to the off-taker at a discount, effectively repaying the loan with interest. The loan is then repaid by the off-taker. This framework requires testing and refinement in the fisheries sector, but has proven effective in expanding access to credit in the agricultural sector.

VCF could be an excellent complement to Fair Trade certification, where artisanal fishers receive a premium for high quality fish and are incentivized to reinvest into improving fish quality and sustainability, perpetuating a cycle of higher incomes and environmental stewardship.

The business case for strategic, long-term investment in FIPs and MSC certification

Numerous retailers and traders have invested in FIPs in an attempt to secure and increase the supply of sustainable seafood. However, these investments are often made without a review of the commercial viability of certification, leading to a significant proportion (approximately 20 percent) of fisheries dropping out after certification is achieved and donor funds are no longer available. In a resource-constrained environment, rather than continue grant funding indefinitely after certification, debt financing for commercially viable fisheries entering MSC assessment can improve long-term outcomes and maximize the impact of industry's sustainability budgets.

Ultimately the only way to mobilize debt financing for sustainable fisheries is through rigorous financial analysis of the returns to MSC certification. To highlight the importance of financial analysis for FIP planning and MSC certification, we performed preliminary financial analysis for FIPs currently underway in Indonesia, the Philippines, and Vietnam, and assessed the potential funding needs and return on investment for certification in each fishery.

A compelling mechanism for long-term fisheries financing is a revolving certification fund for retailers and traders to invest their sustainability budgets into. This fund could be cost-neutral for industry relative to current expenditures and could attract matching investments from NGOs and philanthropies. Professionally managed, the vehicle would consider fisheries investments in a long-term, systematic way, providing grants for FIPs and debt financing for MSC certification.

General conclusions regarding current traceability:

In terms of fresh/frozen exports to the US from these countries, it is likely that the large operators, who account for just over half of the treated product which is the main component of the trade, will have little difficulty in complying with the SIMP requirements for the most part, on the basis of their previous Hazard Analysis and Critical Control Points (HACCP) and EU experience, as well as having well developed accounting procedures, and electronic traceability in some cases. Even for these companies, dealing with re-exports and high seas longline-caught yellowfin will present considerable challenges. For can/pouch exports to the US, as much larger proportion of exports comes from large operators, there will likely be little difficulty in complying with the SIMP requirements, even for re-exports.

The smaller operators, with more informal supply chains and accounting for a significant 48 percent of the fresh/frozen trade, face a wider range of bottlenecks summarized in detail in the traceability annex to this report. It is clear that a large component of the fresh/frozen yellowfin suppliers from ASEAN to the US, at least in terms of numbers, will struggle with meeting the SIMP standard.

Introduction

The Oceans and Seafood Markets Initiative (OSMI), funded by the Gordon and Betty Moore Foundation and implemented by the World Wide Fund for Nature (WWF), among others, is a program that aims to “protect marine and coastal ecosystems by improving aquaculture practices and the health and abundance of wild-capture fish stocks”.² A small component of the overall OSMI program, this scope of this study is limited to canned/pouch skipjack tuna and canned and fresh/frozen yellowfin tuna entering the United States market from Indonesia, Papua New Guinea, The Philippines, Thailand, and Vietnam.

The goals of this study are to:

1. Map the supply chains for the species and countries in the project scope, including harvesting, trading/importing, processing, and (re-)exporting;
2. Map the flows of finance and role of the financial sector within the supply chain, including key actors, and sources, quantities, and types of financing;
3. Highlight areas of the supply chain prone to unsustainable, illegal, and unfair production and examine what instruments could be adopted to reduce these risks; and,
4. Identify and present specific actions and frameworks for aligning capital flows with sustainable and profitable seafood production.

Harmonized Tariff Schedule (HTS) categories defined

For the purposes of this study, we focused on specific product categories of skipjack and yellowfin entering the US market. These are not exhaustive or exclusive, but based on our experience and judgment they are the most accurate reflection of the true figures based on the available data. The US HTS codes included in this study are as follows, with comments on the likely origin, value and usage of the commodities:

HS 160414 Prepared skipjack tuna

The overall trade in tuna products between the countries in scope (as a bloc) and the US is dominated in volume and value by trade in processed tuna products, mostly canned but also pouch and cooked loins. Prepared products mentioned in this report include only skipjack tuna (and exclude albacore and bonito).

HS 030343 Frozen whole skipjack tuna

Much smaller trade, probably mostly used for canning.

HS 030232 Fresh/chilled yellowfin

This is mostly large individual fish, usually greater than 20 kilograms and of sufficiently high quality to warrant costly airfreight from main ASEAN airports such as Manila, Bangkok, Ho Chi Minh City, and Denpasar that have good connections to the US either through intermediate ports such as Honolulu or Los Angeles, or direct. The unit value reached at

² Gordon and Betty Moore Foundation website.

auction or at contract price, subject to grading, is high (approximately US\$15 per kilogram for whole fish). Catch documentation and traceability should be straightforward for this category as product sold as individual high-value lots, and often segregated by individual fishing vessels or even individual fishers onboard collector vessels.

HS 030487 Tuna fillets/loins frozen – NSPF³

Given that species is not explicitly stated, it not known how much of this is yellowfin – it can be assumed to be high but this cannot be stated with absolute certainty. With a relatively high unit average value of approximately US\$11 per kilogram, this however seems likely.

It is assumed that much of the product is carbon monoxide-treated, with whole or headed, gilled, and gutted (HG&G) fish being processed domestically prior to export in value-added form. It is assumed that the product is fillets or loin, i.e. halved or quartered fish, and does not include steaks, saku and other tuna pieces.

The fish is assumed to come mostly from handline/longline fisheries as these fishing techniques produce higher quality and value fish suitable for export, with many of the handline being small scale and the catch volumes smaller than longline. Traceability for this largest HS03 component will be the biggest challenge as it indicates that the fish is not properly categorized or labeled by species at point of export.

HS 030342 Frozen whole yellowfin

Usually adult yellowfin (greater than 20 kilograms) imported whole round or HG&G/eviscerated; usually imported for further processing and may not be highest grade. The unit value is intermediate since recovery rates and quality are probably lower. About two-thirds of the trade involves whole fish. The countries included in this report dominate US imports (90+ percent in volume and value).⁴

³ NSPF = Not specifically provided for i.e., no species nominated

⁴ ITC Trade Map: Trade Statistics for International Business Development.

Key Challenges

Sustainability considerations

Skipjack and yellowfin tunas are highly migratory and opportunistic species, making them highly productive and resilient to exploitation.⁵ Skipjack in the WCPO are classified as not fully exploited, though catch is approaching maximum sustainable yield (MSY).⁶ Yellowfin tuna do not mature as quickly as skipjack and are therefore not as resilient; in the past they were overexploited in the region and they are currently considered fully exploited.⁷

The key challenge to sustainability cited in nearly all of our interviews was the problem of overcapacity, both in harvesting and processing. With the notable exception of Papua New Guinea, the countries in this study do little to control access in their territorial waters, leading to a tragedy of the commons. For the national governments in this study, there is limited capacity for enforcement and limited political will to remedy the current situation. Papua New Guinea hosts a lucrative but imperfect vessel day scheme. One of the key benefits of certification schemes such as MSC is the imposition of harvest control strategies that limit catch effort.

Another challenge is the lack of minimum standards which companies are obligated to follow, particularly with respect to the high seas. The regional fisheries management organizations (RFMOs) reportedly have the tools for proper management but lack the political will by some member states for enforcement. Some large multinational actors follow standards promoted by the International Seafood Sustainability Foundation (ISSF), even though abiding by these rules is sometimes perceived as a competitive disadvantage.

Socio-economic considerations

For industry actors large and small, the primary consideration is economic. While there has been increasing awareness of sustainability issues in the US, especially by large corporations keen to safeguard their brand image, for artisanal fishers in Southeast Asia the paramount concern is feeding their families. The communities often have no access to banking services and no social safety net, and when credit is available, it is at very high rates via local middlemen who finance their fishing trips. These loan terms can make it difficult for fishers to ever get out of debt, which in turn can lead to increased catch effort. Any effort to promote sustainability among these small-scale fishers must first address their economic insecurity.

⁵ Food and Agriculture Organization of the United Nations, FAO's Input to the UN Secretary-General's Comprehensive Report for the 2016 Resumed Review Conference on the UN Fish Stocks Agreement.

⁶ Western and Central Pacific Fisheries Commission Scientific Committee Twelfth Regular Session (2016), Stock assessment of skipjack tuna in the Western and Central Pacific Ocean.

⁷ Food and Agriculture Organization of the United Nations, FAO's Input to the UN Secretary-General's Comprehensive Report for the 2016 Resumed Review Conference on the UN Fish Stocks Agreement.

U.S. Market Conditions

Market trends

Consumption of canned tuna peaked in the US market around 1990⁸ and US imports of prepared tunas peaked around 2010.⁹ The overall US market for processed skipjack contracted in both 2015 and 2016, and is down 20 percent since 2014. This drop in demand is reflected in prices, which have fallen in each of the last two years for which data is available.

By contrast, the demand for high-quality yellowfin, especially frozen varieties, has increased by over 50 percent since 2014 and the unit prices for these products continue to hold steady.

In total value terms, the US import market for skipjack and yellowfin has decreased by nearly 10 percent since 2014.

Figure 1: Total US imports of skipjack and yellowfin tuna, 2014-2016

	2014		2015		2016	
	Tons	US\$ thousands	Tons	US\$ thousands	Tons	US\$ thousands
Skipjack (can/pouch)	236,869	1,099,043	202,942	908,534	190,716	840,301
Skipjack (frozen whole)	395	657	230	379	251	403
Yellowfin (frozen fillet)	20,534	231,629	25,724	302,634	29,105	332,267
Yellowfin (fresh/chilled)	16,160	197,963	15,532	188,302	16,553	196,317
Yellowfin (frozen whole)	2,099	14,628	2,728	19,451	3,277	25,768

Source: ITC data

Figure 2: Growth and pricing of US imports of skipjack and yellowfin tuna, 2014-2016

	2014		2015		2016	
		US\$/kg	Growth	US\$/kg	Growth	US\$/kg
Skipjack (can/pouch)		4.64	-14.3%	4.48	-6.0%	4.41
Skipjack (frozen whole)		1.66	-41.8%	1.65	9.1%	1.61
Yellowfin (frozen fillet)		11.28	25.3%	11.76	13.1%	11.42
Yellowfin (fresh/chilled)		12.25	-3.9%	12.12	6.6%	11.86
Yellowfin (frozen whole)		6.97	30.0%	7.13	20.1%	7.86

⁸ United States Department of Agriculture.

⁹ ITC Trade Map: Trade Statistics for International Business Development.

Distribution to the U.S. Market

Canned and pouch tuna

The market for canned and pouch skipjack in US retail outlets is dominated by three brands: StarKist (headquartered in Pittsburgh, PA and owned by Dongwon Industries of South Korea), Chicken of the Sea (headquartered in San Diego, CA and owned by Thai Union), and Bumble Bee (headquartered in San Diego, CA and owned by a UK-based private equity firm).

They sell various types of canned and pouch tuna, skipjack and albacore being the most prominent, but also including yellowfin and bigeye tuna (typically juveniles caught as purse seine bycatch) mixed with skipjack as “chunk light tuna”. These three companies accounted for approximately 81 percent of canned and pouch tuna sales in the US in 2016, and though there is increasing competition from private labels, market shares have been stable over the last five years.¹⁰

These companies typically import their products directly from overseas processors, labeled and ready for store shelves if going to the retail market.

Sashimi-grade tuna

The market for fresh/frozen yellowfin tuna in the US is more fragmented, with the top 10 importers/distribution companies accounting for approximately 45 percent of the market, and at least 182 other companies active in the marketplace. The top importers and their market share, as of September 2016, are as follows:

- ANOVA Food (subsidiary of Bumble Bee), 12 percent
- Sea Delight, 8 percent
- Hilo Fish Company, 5 percent
- Taiwan Seafood and Fish, 5 percent
- Osamu Corporation, 5 percent
- Seafarer Inc., 2 percent
- Long Beach Enterprise, 2 percent
- Everfresh Seafood Company, 2 percent
- Nissin International, 2 percent
- ESKO Inc., 2 percent¹¹

These companies in turn sell their products to grocery stores, catering companies, restaurants, processors, and other distributors in the US market. As such, these companies do not have consumer-facing brands.

¹⁰ Statista, U.S. population: Brands of tuna (can or pouch) consumed from 2011 to 2016. Retrieved 9 October 2017, from <https://www.statista.com/statistics/282508/us-households-brands-of-tuna-can-or-pouch-consumed-trend/>.

¹¹ Treated Tuna USA Arrival Report Q3 2016.

Supply Chain of U.S. Imports at National Level

In the following section, the supply chain for U.S. skipjack and yellowfin imports is examined for each of the five countries in the scope of this study. This looks at market trends; the sources of supply from domestic fisheries and from imports for processing (and subsequently for re-export); destinations and uses from direct export, and for local processing; exports to the US, and the extent to which sustainability and traceability systems have been implemented and are already in place.

Market trends

The figures below illustrate the change in volume and price from 2014 to 2016 for canned skipjack and frozen yellowfin fillets, the largest components of the skipjack and yellowfin trade for the countries in scope.

The price and volume of can/pouch Skipjack imports have largely decreased, though the four countries (as there are no direct US imports from PNG) all remain price competitive in this high-volume market. As for yellowfin fillets, volumes trended upward while prices increased slightly.

Figure 3: Market trends for can/pouch skipjack, 2014-2016

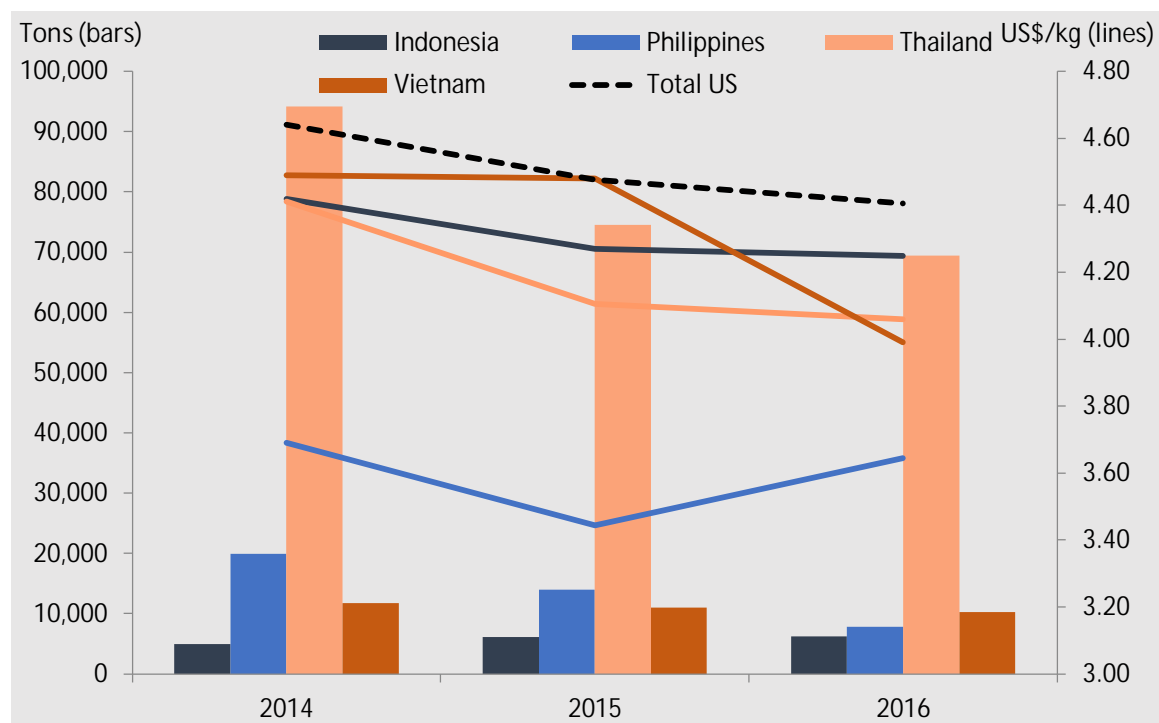
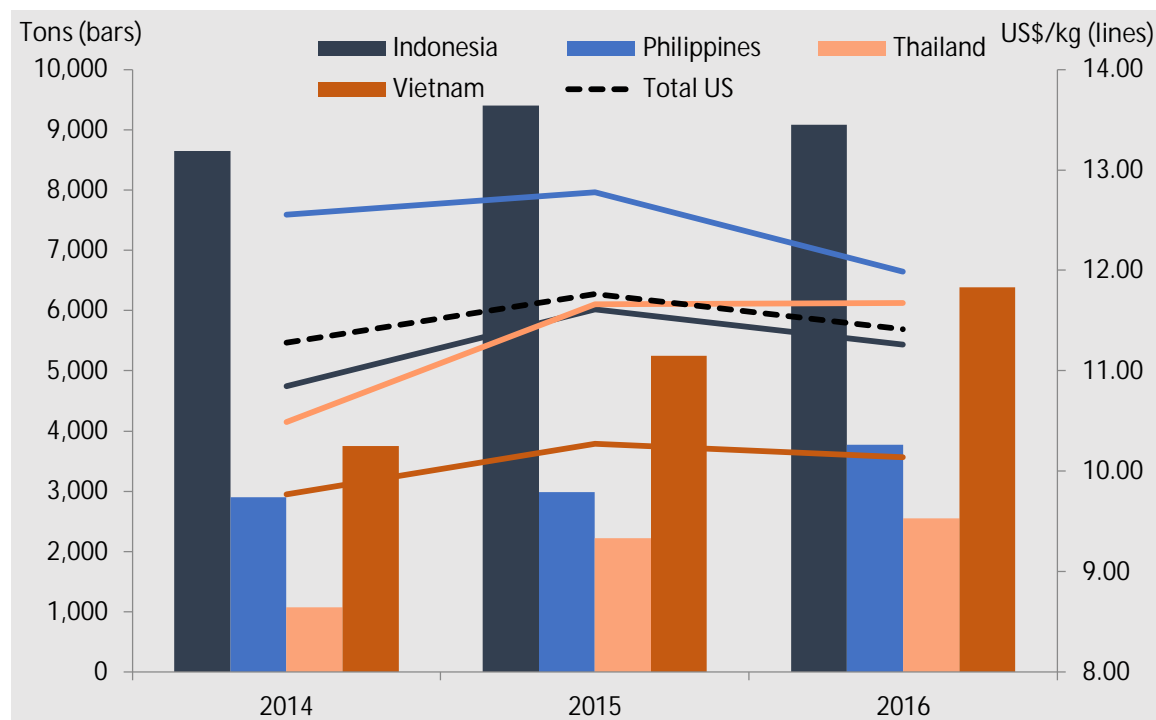


Figure 4: Market trends for frozen yellowfin fillets, 2014-2016



INDONESIA

Market overview

Given its vast archipelagic and EEZ waters and its location at the heart of the coral triangle, Indonesia is the world's largest producer of oceanic and neritic tuna.¹² Indonesia's size and level of economic development make governance of the country's waters challenging. Since the accession of a new president and minister of fisheries in 2014 there has been a concerted effort by the Indonesian government to improve fisheries management and combat IUU.

In 2014, the new government banned from Indonesian waters the foreign fishing fleets that often violated fisheries regulations. They also banned the practice of at-sea transfers of fish, or transshipments, which can facilitate IUU fishing. A regulation introduced in 2015 banned the use of trawls and seine nets, though this was later delayed after protests from industry.

These regulations have reduced the risk of illegally caught fish entering the Indonesian tuna supply chains, and reduced the risk of bycatch from purse seine vessels. However, this has simultaneously reduced industry harvests, employment, and exports.

¹² Ministry of Marine Affairs and Fisheries, Marine and Fisheries in Figures 2015.

Supply chain

Indonesia's tuna industry is comprised of various actors that play different roles throughout the supply chain: fishers, traders, processors, exporters, and industry associations. The tuna supply chains in Indonesia are often complex, with many different nodes between small-scale fishers in remote islands in the archipelago to industrial processors in Bitung and Java.

Domestic fishery landings

Total skipjack landings in Indonesia in 2015, the latest period for which figures are available, were approximately 507,000 tons. Yellowfin landings are not reported specifically, rather they are grouped with other tunas (bigeye, albacore) – harvest of these species was reported at 319,950 tons in 2015.¹³ Most of Indonesia's catch is taken in the WCPFC area, i.e. the archipelagic waters plus the Pacific EEZ, but excluding the Indian Ocean EEZ. The 2016 WCPFC catch of yellowfin and skipjack was estimated at 497,000 tons, up from 403,000 tons in 2015 as the industry rebounded from the regulatory shocks of the previous year.

Figure 5: Skipjack and yellowfin tuna catch by gear in the domestic fishery of Indonesia (WCPFC area), 2016

Gear	Pole and line	Handline large	Handline small	Longline	Purse seine	Other	Total
Skipjack	85,524	-	51,883	3,998	90,458	104,592	336,455
Yellowfin	19,884	20,650	23,583	14,659	33,328	48,314	160,418

Source: WCPFC Tuna Fishery Yearbook 2016

Imports of tuna

Tuna imports by Indonesia are small relative to domestic production – around 10,000 tons in total, worth US\$6.5 million, and mostly whole frozen tuna comprising purse seine skipjack (6,374 tons) from Papua New Guinea, Thailand and the Federated States of Micronesia for canning. Also included was 3,680 tons of yellowfin, possibly including high-graded purse seine fish from Thailand and China for canning/cooked loins.

It is assumed most of these imports in 2015 were to meet shortfalls in supply to canners during 2015, with the sharp drop in domestic purse seine catches that year (see above).

Domestic processing

There are 11 tuna processing facilities registered with the Indonesian Tuna Canning Association, while a number of other mostly sardine canneries process some tuna part-time. The tuna canneries are based in Bitung, Surabaya/Muncar, Sorong, and Jakarta and are potentially able to process over 100,000 tons of raw material annually, primarily for export of canned, pouch and cooked loins. Mostly skipjack and some yellowfin are processed in these facilities. PT Aneka Tuna Indonesia and PT Pahala Bahari Nusantara are the two largest processors; the former supplying canned product and the latter producing mostly cooked loins for export and domestic use.

¹³ Ibid.

There are also several value-added processing facilities for handline and longline tuna products including yellowfin in various locations or hubs around Indonesia. One such hub is Benoa Harbor in Bali where a number of companies are involved in producing value added exports of mostly yellowfin. Other plants exist in the islands closer to the raw material source such as in Ambon (PT Harta Samudra), Bitung (PT Blue Ocean International, PT Nutrindo and others), Sumbawa (PT Bali) and elsewhere where processing of yellowfin is conducted.

Tuna exports to the US

Ministry of Marine Affairs and Fisheries (MMAF) data indicate that total tuna exports (all species) totaled 142,000 tons valued at US\$491 million in 2015, sharply down from 2014 levels (207,000 tons, US\$692 million). The US remains the main export market by value for Indonesian tuna, with a total value of US\$135 million in 2015, this making up 23 percent of the total value of Indonesian tuna exports.

The US market for skipjack and yellowfin has mostly held steady, increasing by value and volume both in 2015 and 2016 for every category except frozen yellowfin fillets, where a decrease was reported in 2016.

Figure 6: US imports of skipjack and yellowfin tuna from Indonesia, 2014-2016

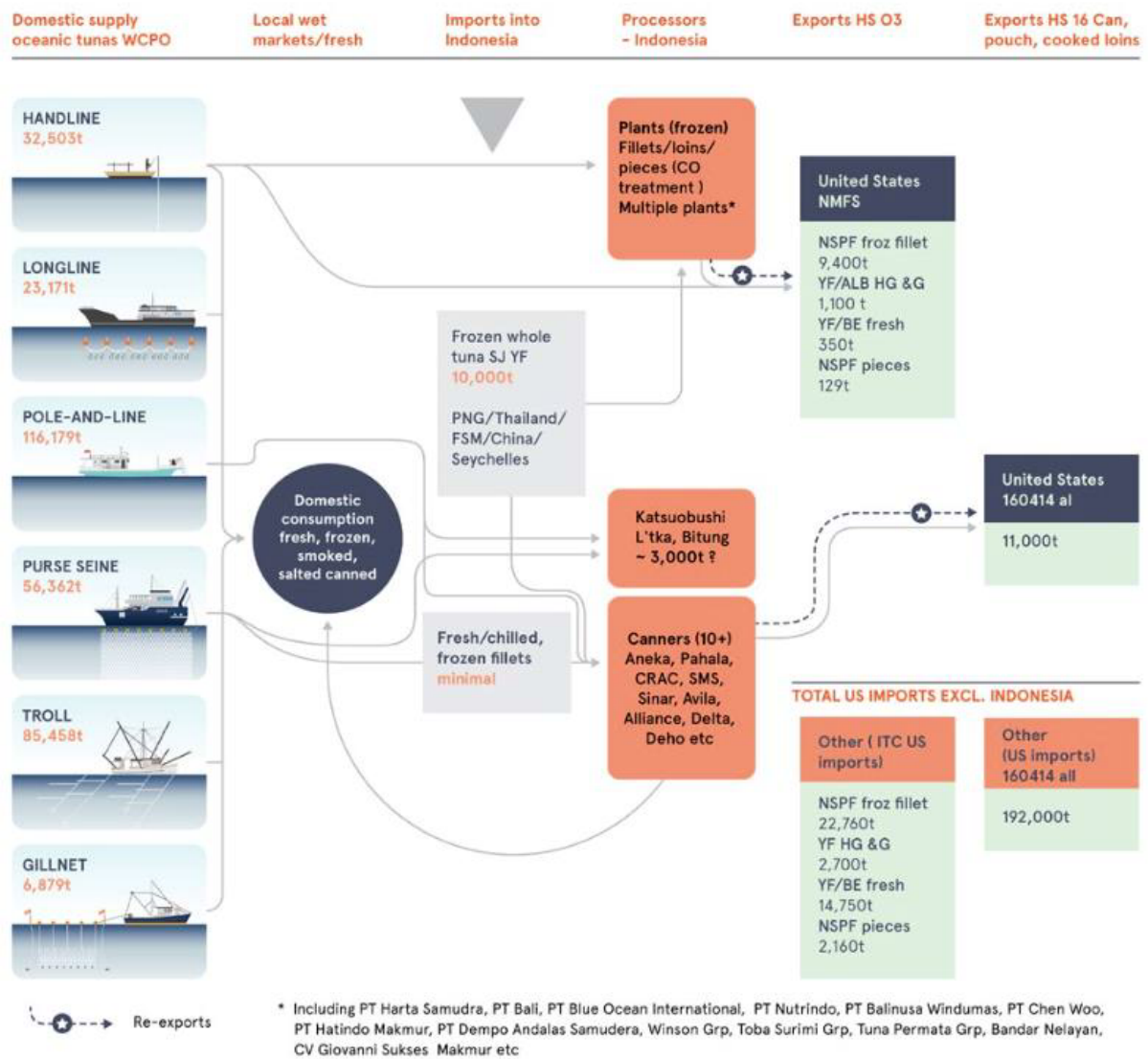
	2014		2015		2016	
	Tons	US\$ thousands	Tons	US\$ thousands	Tons	US\$ thousands
Skipjack (can/pouch)	4,926	21,767	6,161	26,305	6,245	26,534
Skipjack (frozen whole)	-	-	-	-	-	-
Yellowfin (frozen fillet)	8,650	93,829	9,398	109,121	9,078	102,209
Yellowfin (fresh/chilled)	105	1,304	63	802	149	1,637
Yellowfin (frozen whole)	804	6,348	1,407	7,308	1,414	8,860

Source: ITC data

Figure 7: Growth and pricing of US imports of skipjack and yellowfin tuna from Indonesia, 2014-2016

	2014		2015		2016	
		US\$/kg	Growth	US\$/kg	Growth	US\$/kg
Skipjack (can/pouch)		4.42	25.1%	4.27	1.4%	4.25
Skipjack (frozen whole)		-	-	-	-	-
Yellowfin (frozen fillet)		10.85	8.6%	11.61	-3.4%	11.26
Yellowfin (fresh/chilled)		12.42	-40.0%	12.73	136.5%	10.99
Yellowfin (frozen whole)		7.90	75.0%	5.19	0.5%	6.27

Figure 8: Indonesia tuna supply chain summary (most recent full-year data, i.e. 2015)



Financial flows

The largest commercial banks by assets in Indonesia are as follows:

Figure 9: Largest commercial banks in Indonesia, 2016

Bank	Total Assets (US\$ billions)
Bank Rakyat Indonesia (BRI)	61.07
Bank Mandiri	60.68
Bank Central Asia (BCA)	44.82
Bank Negara Indonesia (BNI)	35.45

Source: Jakarta Globe

These four institutions are by far the largest in Indonesia – the next largest has less than half the asset base of the smallest bank listed here.

Processors

Based on interviews with employees at multiple processors, commercial banks are the key lenders to the processing industry, and the primary uses of funds are capital expenditures and working capital. Debt financing is reportedly difficult until a firm is well established.

Small-scale fishers

Many Indonesian tuna fishers use handline on small vessels, presenting challenges for financing. Few small-scale fishers have access to basic consumer banking services, let alone credit from a formal banking institution. Even if banks' service areas include a fishing village, fishers' typically do not have the credit history or assets required as security for a loan.

In remote areas, intermediary buyers are sometimes the only market for fish and the sole source of financing. The intermediaries, who provide fuel and bait on credit prior to a fishing trip, are known to abuse their power in some cases, putting fishers in bonded labor through a combination of low purchase prices, delayed payment, and high interest rates.¹⁴

Medium-scale fishers

Medium-sized vessels in Indonesia include pole-and-line vessels harvesting skipjack. Owners of these vessels typically only have access to finance if they have other assets (such as real estate, machinery and equipment, or shares in a company) to use as security for a loan. When fish are landed, captains, crew and owners share the profits of the trip. Vessel ownership varies widely, from individuals to small and large fishing companies.¹⁵

Large-scale vessels

In the Indonesian context, vessels in this category include purse seiners harvesting primarily skipjack and some yellowfin. Indonesian banks reportedly do not finance vessel construction, nor do they accept vessels as collateral for long-term debt. The medium and large companies that own these vessels must provide assets from other business lines as security for commercial loans.¹⁶

Sustainability and traceability issues

Very little traceability is formally in place and government trade databases are generally very poor, with very little required detail for monitoring, i.e. species and/or HTS category. Although capture fisheries statistics have improved greatly, some uncertainty remains due to the uneven data collection performance at provincial level.

Prompted by international requirements and market demand for sustainably and transparently managed tuna, Indonesia has taken some encouraging steps towards

¹⁴ Based on industry interviews.

¹⁵ Ibid.

¹⁶ Ibid.

sustainable management in the past years. The government is in the process of establishing harvest control rules for its waters for skipjack and yellowfin tunas, and it aims to establish a compatible system to the RFMO requirements and ensure the sustainability credentials of its tuna fisheries.

Some private efforts are underway, including Fair Trade certification, the world's first for a wild-capture fishery, of handline-caught yellowfin in the province of North Maluku. In addition, there is a Fishery Improvement Program (FIP) in place for pole-and-line and handline fishers targeting skipjack and yellowfin in East Indonesia, led by an industry association known as AP2HI. Finally, American and Indonesian NGOs Sustainable Fisheries Partnership (SFP) and LINI are also implementing a FIP with regard to some of the longline fleets in the Indian Ocean that catch and export yellowfin and bigeye to the US.

Processors, large-scale traders, and larger industrial fleets have traditionally been the most influential actors in the industry. Industry associations have typically played an important role in the tuna sector – particularly of sector aggregation; liaising between member companies and national and local governments; and representing the interest of the members to other key stakeholders, such as the MMAF, international buyers and foreign investors.

While associations serve as an important aggregation point for companies involved in the trade and processing of tuna, they cannot receive direct investments, or directly invest in member companies.

The Indonesian Chamber of Commerce and Industry, KADIN, is the main coordinating organization for industry associations in Indonesia. KADIN's focus is to represent the industry to government and support foreign investments in Indonesia. There are six associations involved in the tuna industry in Indonesia: Astuin, ATLI, KTI, AP2HI, ASPERTADU and HNPN.

Recent regulatory changes have transformed the dynamics of the fisheries sector, paving the way for elevating industry associations in particular supporting the artisanal fleet – some in a strategic position to realize Indonesia's potential to be a leader of sustainably caught tuna.

The Indonesian hand-line tuna fishery is considered artisanal in structure, with vessels ranging from 5 to 10 GT. There is an opportunity to further promote this catch method based on its relatively low capital requirements and the one-by-one nature of the catch associated with this gear type. On the other hand, this tuna fishery is the most fragmented, with informal landing sites and majority of vessels unregistered. These last two points will be an obstacle for meeting US IUU regulations.

PAPUA NEW GUINEA

Market overview

Papua New Guinea (PNG) is home to one of the world's most productive skipjack and yellowfin tuna fisheries, its archipelagic and EEZ waters yielding approximately 175,000 tons of each species in 2016.¹⁷ Though world-beating, these figures are low compared to previous years. PNG skipjack and yellowfin catch peaked at 700,000 tons around 2010 – while the yellowfin catch has held steady over time, the recent drop in catch volumes might be driven by climate-change-related El Nino events causing skipjack stocks, which live at shallower depths than yellowfin, to move eastward in search of cooler waters.

Foreign-flagged purse seine vessels account for most of the catch and pay a day rate for access rights under a Vessel Day Scheme (VDS). Despite the abundance of fish in its waters, PNG processed just 80,000 tons of canned tuna in 2016 due to its high-cost environment, low labor productivity, poor infrastructure, and weak rule of law.

To encourage more onshore processing, the government instituted State Agreements in which foreign fishing companies were given access to sovereign waters at concessionary rates in return for foreign direct investment (FDI) in local processing capacity. However, the rates were so concessionary and the quotas so much higher than the processing capacity installed that it is evident the agreements were primarily about fishing access. The State Agreements were poorly enforced and the government failed to deliver needed wharf infrastructure, so the companies subject to them continued to transship catch to lower cost areas such as Thailand and the Philippines, leaving the onshore processing plants running at very low capacity.¹⁸

The government has since begun charging all fishing fleets, including those with State Agreements, the full VDS price. To incentivize onshore processors to increase production, the government will pay a subsidy of US\$400 per ton for catch processed locally. Some in industry have countered that this rebate is too low and have threatened to close their plants unless an alternative deal can be agreed upon.¹⁹

Supply chain

Four skipjack yellowfin processors operate in PNG, all of which were established under State Agreements. Frabelle Cannery and Majestic Cannery (a joint venture between Thai Union and Filipino tuna companies Century Tuna and Frabelle Corporation) are based in Lae. RD Tuna Cannery, owned by a Filipino company, is based in Madang. South Seas Tuna

¹⁷ Based on industry interviews and data presented at the 2017 Pacific Tuna Forum; the WCPFC Tuna Fishery Yearbook does not publish exact figures as vessels from multiple countries fish in PNG waters.

¹⁸ Based on industry interviews.

¹⁹ Undercurrent News, "PNG's foreign-owned tuna canneries face closure under fishing discount cuts", accessed 24 January 2018 at <https://www.undercurrentnews.com/2018/01/22/pngs-foreign-owned-tuna-canneries-face-closure-under-fishing-discount-cuts/>

Corporation, located in Wewak, is a joint venture between FCF (a Taiwanese company and one of the Big 3 international traders) and “PNG interests”.²⁰

PNG and the EU have an economic partnership agreement (EPA) in place, whereby PNG exports enjoy duty-free access to EU markets. Of the canned skipjack processed onshore, 10 to 20 percent is consumed locally²¹ while the primary export market is the EU. The EU is also the primary export market for frozen yellowfin tuna, and Japan is the sole export market for fresh yellowfin. No skipjack or yellowfin tuna was exported from PNG to the US in recent years.²² The primary destination of the catch in PNG waters not landed in PNG is Thailand and the Philippines, often via the Big 3 international traders. After processing, those countries re-export to the US and other countries.²³

Financial flows

Three institutions dominate the commercial banking sector in PNG: Bank of the South Pacific (BSP), Australia and New Zealand Banking Group (ANZ), and Westpac Bank. BSP is the largest bank in the country by assets and is 10 percent owned by the International Finance Corporation (IFC).

Processors

The head of trade finance at BSP indicated that despite banks’ willingness to engage the industry, no PNG-based banks have outstanding loans to the onshore tuna processors, as they cannot compete on interest rates. The processors’ parent companies are located outside PNG and can secure debt offshore against their parent or group consolidated balance sheet, and can therefore access lower rates given the broader portfolio of assets and supporting cash flows.

Large fishing companies

We interviewed employees at large companies²⁴ that own vessels operating in the waters of PNG and other Pacific island nations. One interviewee indicated that long-term financing for vessel construction can be secured from Taiwanese banks, and all interviewees indicated that American banks are not willing to finance even US-flagged vessels, as these banks will not accept vessels as collateral for long-term debt. Mainland Chinese banks have reportedly entered the market and are willing to finance fleets at lower rates than Taiwanese banks. Both Chinese and Taiwanese banks provide lines of credit for one American-owned fleet’s working capital needs. As for trading, most transactions are reportedly between companies with longstanding relationships and trade finance is used on a limited basis.

²⁰ Retrieved 6 October 2017, from <http://www.southseastuna.com/>.

²¹ Based on industry interviews and data presented at the 2017 Pacific Tuna Forum; percentages of local consumption vary by facility. For example, RD imports “red meat” from China, and 30 percent of sales are in PNG, the highest among all processors. RD representatives note this is fundamental to their profitability.

²² ITC Trade Map: Trade Statistics for International Business Development.

²³ Based on industry interviews and data presented at the 2017 Pacific Tuna Forum.

²⁴ The employees and the companies did not wish to be identified.

Sustainability and traceability issues

Given the sophistication of the large-scale fishing companies, large traders, and large processors associated with the PNG skipjack and yellowfin fisheries, traceability of catch within PNG archipelagic and EEZ waters is robust.

The primary sustainability concern with skipjack and yellowfin in PNG is fishing overcapacity. Most of the skipjack and yellowfin in PNG waters is caught by purse seine, with the balance (i.e. large yellowfin) caught by longline, with very small amounts from pole and line. Approximately 60 percent of purse seine catch is on fish aggregation devices (FADs). Purse seining on FADs (versus free school) is associated with higher take of yellowfin and bigeye juveniles.²⁵

As one of the Parties to the Nauru Agreement (PNA; other members include the Federated States of Micronesia, Kiribati, Marshall Islands, Nauru, Palau, Solomon Islands and Tuvalu), PNG has instituted a three-month FAD ban every year since 2008, though exemptions for locally flagged vessels are common. The sustainability of FAD use is complicated and a topic of debate, and we note the purse seine catch on anchored FADs in the Solomon Islands is MSC certified.

The VDS described above was introduced to cap catch effort in the PNA/PNG tuna fisheries. In practice, VDS has become so lucrative (US\$350 million in 2015) that PNA countries have increased the availability of days over time. Enforcement has also been inconsistent, with vessels being allowed, for example, to unilaterally redefine “catch day” in their favor if they fish at night or fish for a partial day. In addition, under a program of “islandization” PNA nations are allowed to introduce new vessels into their waters, a practice banned for all other countries. As a result, and despite official protestations to the contrary, catch effort in PNA waters has likely increased.²⁶ VDS does not address catch effort in the high seas, where catch effort has increased significantly, nearly doubling since 2010.²⁷ Most of that increased effort is from longline vessels, whose bycatch levels far exceed purse seiners fishing on FADs.

As a PNA member, PNG’s free school skipjack fishery has been MSC certified since 2011, with free school yellowfin certified in 2016. However, less than 5 percent of catch is MSC certified despite approximately 40 percent of PNA purse seine catch being free school. This is due to multiple factors. In markets such as Japan and Korea (the latter’s vessels fish mostly on free school and much of their catch goes to these two markets), there is little demand for MSC-certified product. Additionally, PNA has granted a monopoly to the company marketing its MSC-certified fish, so those who do not wish to market their fish through that channel forego MSC certification. Finally, for those vessels that set on FADs, FAD fishing is so much more productive than free school that any premium pricing for MSC-certified catch is far outweighed by increased effort associated with FAD-free.²⁸

²⁵ Based on industry interviews and data presented at the 2017 Pacific Tuna Forum.

²⁶ Ibid.

²⁷ Parties to the Nauru Agreement, accessed 6 October 2017 at <https://www.pnatuna.com/node/312>.

²⁸ Based on industry interviews.

THE PHILIPPINES

Market overview

The Philippines is a major exporter of fresh, frozen, and processed skipjack and yellowfin tuna to the US. The sources of this tuna vary from artisanal handline vessels in archipelagic waters, to large purse seine vessels operating in the WCPO, and nearly everything in between.

By the standards of Southeast Asia, the national regulatory body, the Bureau of Fisheries and Aquatic Resources, is relatively well regarded and has put in place a fairly complex set of catch, transshipment and processing reporting requirements. As a result, the various sources of skipjack and yellowfin are relatively well documented.

In early 2015, the EU granted full removal of customs tariffs to the Philippines through the Special Incentive Arrangement for Sustainable Development and Good Governance (Generalized Scheme of Preference, or GSP+) for catch by Philippine-flagged vessels and processed on Philippines soil.

For Filipino processing companies, one of the key challenges of exporting to the US market is the emergence of competition from “chunk light” from China. US regulations allow imports of pouch (but not canned) bonito to be referred to as “chunk light”. The pouch market caters primarily to large foodservice companies serving hotels, large institutions, and restaurants such as Subway. As bonito is a lower-value fish than skipjack, processors in the Philippines have been undercut in the US pouch market to the point that the price for raw material (skipjack) exceeds what their customers are willing to pay for finished goods.

Supply chain

As noted, the Philippines skipjack and yellowfin supply chains are complex and fragmented. The center of the Filipino tuna industry is General Santos, home to most of the country's processing capacity.

Domestic fishery landings

The domestic catch of skipjack and yellowfin tunas in the Philippines EEZ plus a small amount in the adjacent high seas pocket by Philippines vessels is provided below, by gear, and reached approximately 140,000 tons in 2016, well down on historical catches but relatively stable in recent years. Most of the catch is taken by commercial surround nets (purse seine and ring net) but with a significant catch of yellowfin made by handline and available for value-added processing and export.²⁹

²⁹ WCPFC Tuna Fishery Yearbook 2016.

Foreign longline vessels are permitted to land and transship in Davao, where 1,853 tons were unloaded in 2016. Over half of this was retained for local processing and consumption, with the remainder (high quality product) exported by air.³⁰

Figure 10: Skipjack and yellowfin tuna catch by gear in the Philippines domestic fishery, 2016

Gear	Ring net	Handline large	Handline small	Purse seine	Other	Total
Skipjack	26,475	1,954	5,864	41,415	6,420	82,128
Yellowfin	8,290	17,593	14,188	15,967	2,546	58,584

Source: WCPFC Tuna Fishery Yearbook 2016

Imports of tuna

Considerable quantities of tuna are imported into the Philippines, mostly to meet shortfalls in cannery raw material supply. ITC data shows large imports of whole frozen tuna: skipjack 86,756 tons and yellowfin 40,626 tons, valued at US\$145 million.³¹ The main suppliers are Taiwan, PNG, China and Korea, presumably by the industrial purse seine fleets of these countries.

Domestic processing

The Philippines is one of the world's largest tuna processors (cans, pouch, cooked loins) with typically over 200,000 tons of raw material being processed annually. Six canneries in General Santos process skipjack tuna mostly for export to the EU, US, and Japan: Alliance Tuna International, Celebes Canning, PhilBest Canning, GenTuna, Ocean Canning, and Seatrade. The primary exporters to the US are Philbest and Celebes.

Much of the handline catch supplies fresh and frozen higher-grade tuna to processors for export, with some for domestic consumption. There are 17 frozen tuna exporters in Philippines, with at least 12 of these in the General Santos area.³²

Most of the processing involves the use of carbon monoxide to enhance the red color of tuna steak flesh, acceptable in the US under current FDA regulations but not in many other markets. In terms of domestic consumption, municipal tuna catches are a key element of food security in the Philippines, especially when neritic tunas are added, and small pelagics (round scads, sardines etc.). Most of the commercial oceanic tuna catch is however directed to domestic cannery processors, supplemented with imports as noted.

Tuna exports to the US

The ITC data indicates US skipjack imports from Philippines in 2016 were valued at just under US\$30 million, down from nearly US\$75 million two years prior. Import volumes fell by nearly 60 percent over the same period. The Philippines' other main export markets, Japan and the EU, performed better over the same period.³³

³⁰ The Philippines Annual Report Part 1 for WCPFC Records 2016.

³¹ ITC Trade Map: Trade Statistics for International Business Development.

³² The Philippines Annual Report Part 1 for WCPFC Records 2016.

³³ ITC Trade Map: Trade Statistics for International Business Development.

Frozen whole yellowfin exports to the US, though small, have dropped precipitously, to under 50 tons, while fresh/chilled yellowfin has stayed nearly flat (after halving in 2015) and frozen yellowfin fillet exports increased by 25 percent in 2016.

Figure 11: US imports of skipjack and yellowfin tuna from the Philippines, 2014-2016

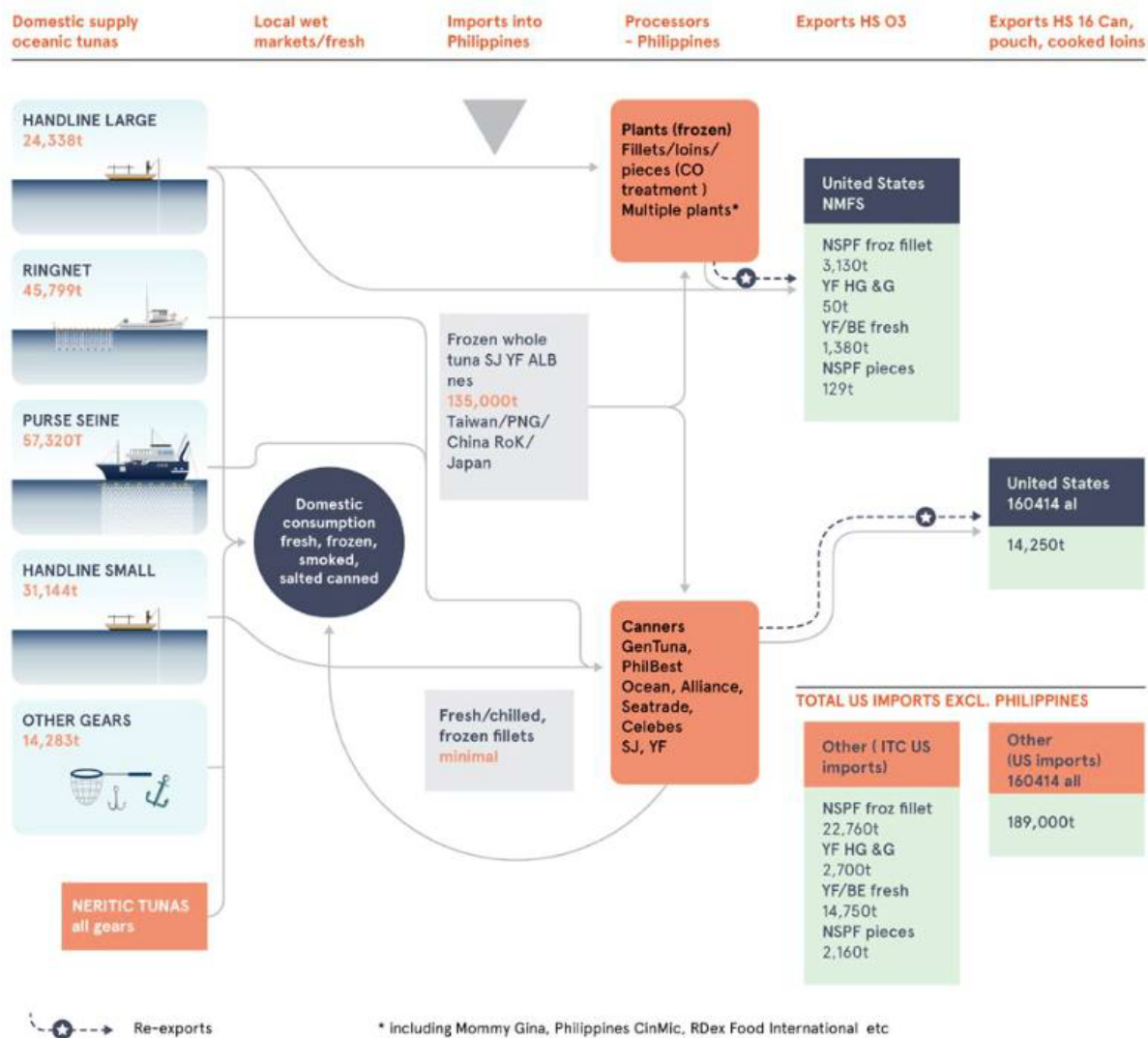
	2014		2015		2016	
	Tons	US\$ thousands	Tons	US\$ thousands	Tons	US\$ thousands
Skipjack (can/pouch)	19,876	73,351	14,019	48,287	7,850	28,613
Skipjack (frozen whole)	48	126	15	36	77	110
Yellowfin (frozen fillet)	2,903	36,449	2,986	38,147	3,768	45,162
Yellowfin (fresh/chilled)	1,493	22,469	771	10,463	1,285	19,117
Yellowfin (frozen whole)	639	2,397	45	636	49	374

Source: ITC data

Figure 12: Growth and pricing of US imports of skipjack and yellowfin tuna from the Philippines, 2014-2016

	2014		2015		2016	
	US\$/kg	Growth	US\$/kg	Growth	US\$/kg	Growth
Skipjack (can/pouch)	3.69	-29.5%	3.44	-44.0%	3.64	
Skipjack (frozen whole)	2.63	-68.8%	2.40	413.3%	1.43	
Yellowfin (frozen fillet)	12.56	2.9%	12.78	26.2%	11.99	
Yellowfin (fresh/chilled)	15.05	-48.4%	13.57	66.7%	14.88	
Yellowfin (frozen whole)	3.75	-93.0%	14.13	8.9%	7.63	

Figure 13: Philippines tuna supply chain summary (most recent full-year data, i.e. 2015)



Financial flows

The largest commercial banks by assets in the Philippines are as follows:

Figure 14: Largest commercial banks in the Philippines, 2017

Bank	Total Assets (US\$ billions)
BDO Unibank Inc.	44.19
Metropolitan Bank and Tco	31.05
Bank of the Philippine Islands	28.35
Land Bank of the Philippines	26.87

Source: Philippines Central Bank

These four institutions are by far the largest in the Philippines – the next largest has just over half the asset base of the smallest bank listed here.

Processors

Based on interviews with employees at multiple processors, government and commercial banks are the key lenders to the processing industry, and the primary uses of funds are capital expenditures and working capital. Debt financing is reportedly difficult until a firm is well established.

Large fishing companies

We interviewed an employee at a large Filipino company³⁴ that owns purse seine vessels operating in the waters of the Philippines and Papua New Guinea. The interviewee indicated that long-term financing for vessel construction can be secured from Taiwanese banks as long as there is a Taiwanese JV partner. For used vessels, the company utilizes its lines of credit with Filipino banks, as these banks will not accept vessels as collateral for long-term debt. In another industry interview, it was reported the Land Bank of the Philippines is known to finance vessel construction.³⁵

Small-scale fishers

Many Filipino tuna fishers use small-scale handline vessels, presenting challenges for financing. In remote areas, intermediary buyers are often the only market for fish and the sole source of financing. As noted above, only larger-scale operations have access to commercial finance. The intermediaries, who provide fuel and bait on credit prior to a fishing trip, are known to abuse their power in some cases, putting fishers in bonded labor through a combination of low purchase prices, delayed payment, and high interest rates.

Medium-scale fishers

In the areas surrounding General Santos, most handline fishing is done by mother ships of approximately 30 gross tons (GT) containing up to 20 small handline boats (pakura) that disperse upon arrival at the fishing grounds. When fish are landed, captains reportedly receive approximately 25 percent of profit and crew approximately 20 percent, with boat owners receiving the rest.³⁶

Vessel ownership varies widely, from individuals to small and large fishing companies. Sometimes the mother vessels (whose construction reportedly costs at least US\$30,000) and pakura (costing at least US\$1,000) do not have the same owner;³⁷ individual fishermen who own a pakura may enter into a profit-sharing arrangement with the mother ship owners, though this is reportedly rare.³⁸

³⁴ The employee did not wish to be identified.

³⁵ Based on industry interviews.

³⁶ Australian Centre for International Agricultural Research, Preliminary Assessment of the handline fishery in General Santos City.

³⁷ Ibid.

³⁸ Based on industry interviews.

Some yellowfin tuna processors reportedly own vessels and provide starting capital to fishermen,³⁹ while some independent vessel owners are able to attain bank financing,⁴⁰ presumably secured by personal guarantee or other assets in the owner's portfolio.

Sustainability and traceability issues

There appears to be no formal traceability system in place for the main source of yellowfin landings, the General Santos handline fishery, but this may not be a difficult task given that exports of frozen fillets/loins product seem to be almost entirely sourced from domestic landings. The barriers to improving catch documentation for small operators include the ability to pay for increased CDT, both in terms of time as well as installing any necessary e-reporting and monitoring equipment such as electronic logbooks. There are also considerable skill and human capacity issues that have to be addressed.⁴¹

At the port in General Santos we interviewed an exporter to the US of fresh yellowfin and bigeye caught by handline. He indicated that implementing a more formal traceability system for handline would be relatively easy. This trader buys only grade A fish at auction, and to facilitate payment each fish is marked with tail tape indicating which boat/fisher was responsible for the catch. Capture location is not currently recorded in this informal system but could easily be done.

Based on our conversations with multiple skipjack processors in General Santos, traceability in the purse seine fisheries is relatively robust and the interviewees did not foresee any problems meeting the new traceability requirements for the US market. For both processors and exporters of fresh/frozen tuna, all current documentation is reportedly paper-based.

The key hurdle to sustainability in the Philippines is that its fisheries are open access and there is little if any incentive to limit catch effort. Long supply chains and lack of cold storage reduces the price paid to some fishers, which in turn requires more catch effort to earn enough to feed themselves. WWF Philippines is working closely with two handline yellowfin FIPs in the Mindoro Strait and Lagonoy Gulf. These FIPs were established in 2013, with traceability (VMS) as a primary goal, plus access to credit, market access, and quality improvements also part of the project. This project comprises approximately 1,500 fishers and annual catch of approximately 4,000 tons.

³⁹ Australian Centre for International Agricultural Research, Preliminary Assessment of the handline fishery in General Santos City.

⁴⁰ Based on industry interviews.

⁴¹ USAID Oceans and Fisheries Partnership, Philippines Combined Value Chain Assessment Report.

THAILAND

Market overview

Thailand is home to the world's largest, most efficient, and most sophisticated tuna processing industry, yet catches almost none of the primary processed species (i.e. skipjack and yellowfin) within its waters. The industry originally drew on now-depleted local longtail tuna stocks, but now the vast majority of the raw material for processing is imported from fleets operating out of the Western Pacific and Indian Oceans, often via the Big 3 traders (FCF, Tri Marine, and Itochu).

The EU issued a yellow card to Thailand in April 2015 over destructive fishing and poor labor practices by fish and shrimp trawlers operating in Thailand's EEZ waters. While this has received much attention, it apparently was not in reference to nor has it had any discernable impact on the tuna processing industry. In response to the yellow card, the Thai government has launched a Seafood Taskforce, which has subgroups focused on issues such as traceability, aquaculture, and labor.⁴²

Thailand does not have any preferential trade treaties, and the largest markets for its canned tuna and tuna loins are the Middle East and the US. The EU and Japan are also major export markets.⁴³

Supply chain

Domestic fishery landings

As noted, domestic tuna fishery production in Thailand is very small, with just 216 tons of skipjack and yellowfin recorded in 2015.⁴⁴ The catch is presumably mostly small fish from purse seine, ring net and gillnet.

Imports of tuna

Thai imports of tuna are huge, and overwhelmingly dominated by frozen whole fish for canning – 530,000 tons in 2016, and as much as 670,000 tons in previous years. In 2016, the main suppliers were the purse seine fleets of Taiwan, Korea, US, PNG, and Kiribati (all contributing more than 50,000 tons of skipjack) with China, Micronesia, Marshall Islands, and Maldives pole-and-line all exceeding 15,000 tons of skipjack.⁴⁵

Imports of higher-value product are relatively small – 5,850 tons of fresh/chilled tuna, mostly yellowfin. It is probable that some high-graded yellowfin from purse seine imports is processed and re-exported; most of the fresh/chilled re-exports are likely longline fish.

⁴² Based on industry interviews.

⁴³ Thai Tuna Industry Association presentation.

⁴⁴ UN FAO Fisheries Global Information System.

⁴⁵ ITC Trade Map: Trade Statistics for International Business Development.

Domestic processing

Thailand has firmly established itself as the world's leading producer of canned tuna. Consequently it is also the largest market and global price leader of canning-grade frozen tuna. The country is host to over 25 active canneries, the largest of which are Thai Union and Sea Value, and mostly based in Samut Sakhon, near Bangkok. Development of Thailand's canning industry commenced in the early 1980s and has grown exponentially since then.⁴⁶

A number of factors were instrumental in fuelling the development of Thailand's tuna processing industry, including:

- A large, export orientated economy with a low cost and highly productive labor force and excellent shipping infrastructure;
- An already well-established food processing industry (shrimp, chicken, fruit and vegetables) with supporting industries (i.e. can production, packaging, labeling, cold storage, etc.) that could extend to tuna processing, help achieve economies of scale, and allow cross subsidization between different production lines;
- A strategic location to source raw materials from both the Pacific and Indian Oceans, ensuring continuity of supply;
- Trade financing available for raw material purchases and processing;
- Strategic commercial "co-packing" relationships developed with firms in the US and EU, enabling market access and penetration in these key markets; and
- The Thai government's pro business policy focusing strongly on the provision of supporting infrastructure and incentives for the development of export-oriented industries.⁴⁷

Tuna exports to the US

Exports of skipjack from Thailand to the US decreased by more than 25 percent from 2014 through 2016, which is in line with the overall trend in US imports in that category. By contrast, export volumes of frozen yellowfin fillets doubled in 2015 and increased by another 15 percent in 2016.⁴⁸

Thailand's overall export quantities of can/pouch skipjack decreased by just 6 percent between 2014 and 2016 as processors developed new markets in the Middle East, Latin America, and Eastern Europe.⁴⁹

⁴⁶ Hamilton et al., Market and Industry Dynamics in the Global Tuna Supply Chain.

⁴⁷ Ibid.

⁴⁸ ITC Trade Map: Trade Statistics for International Business Development.

⁴⁹ Ibid.

Figure 15: US imports of skipjack and yellowfin tuna from Thailand, 2014-2016

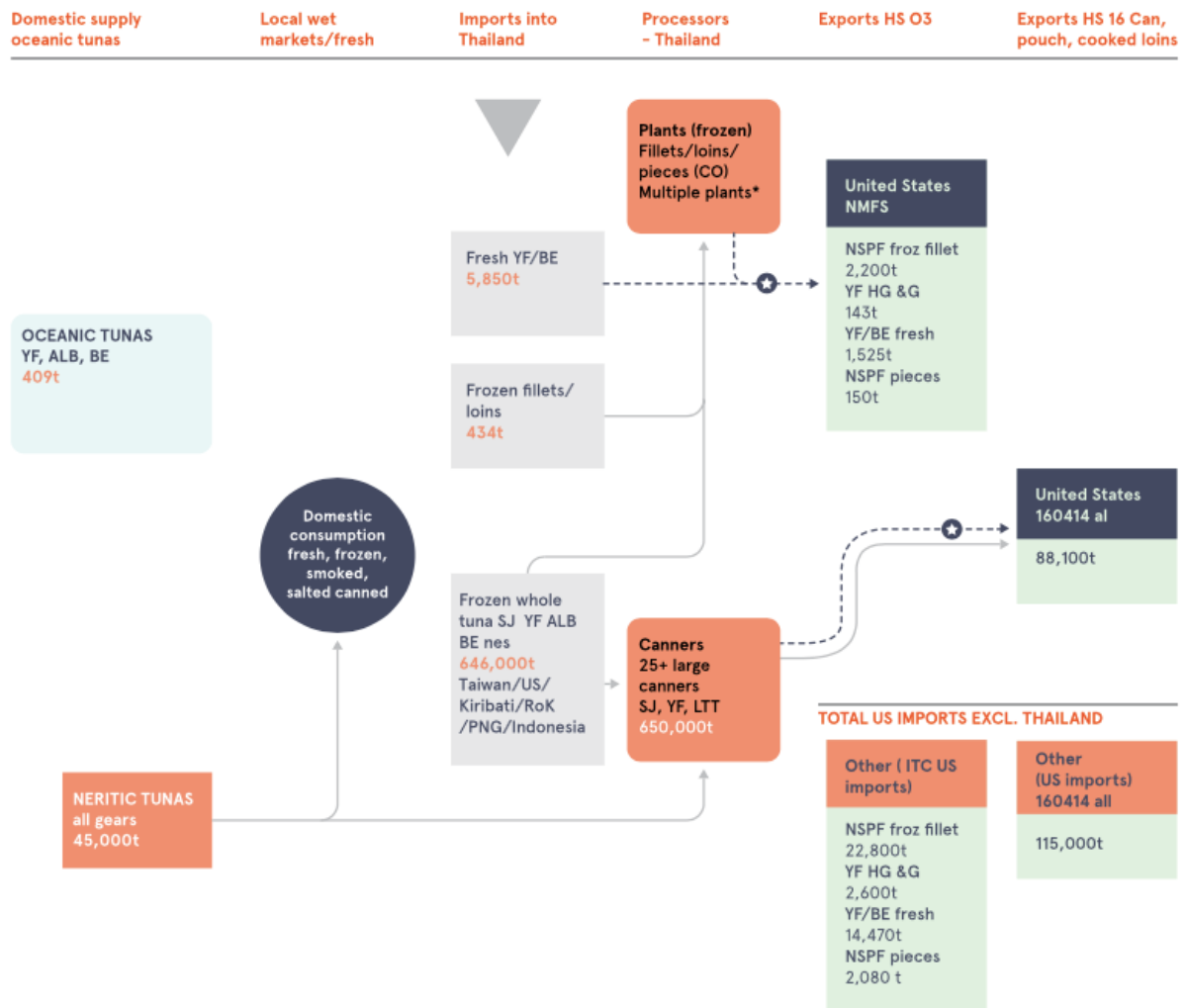
	2014		2015		2016	
	Tons	US\$ thousands	Tons	US\$ thousands	Tons	US\$ thousands
Skipjack (can/pouch)	94,117	415,240	74,558	306,100	69,433	281,908
Skipjack (frozen whole)	-	-	-	-	-	-
Yellowfin (frozen fillet)	1,079	11,319	2,219	25,873	2,547	29,739
Yellowfin (fresh/chilled)	564	7,700	1,052	12,442	585	6,842
Yellowfin (frozen whole)	118	1,152	143	1,443	136	1,236

Source: ITC data

Figure 16: Growth and pricing of US imports of skipjack and yellowfin tuna from Thailand, 2014-2016

	2014		2015		2016	
		US\$/kg	Growth	US\$/kg	Growth	US\$/kg
Skipjack (can/pouch)		4.41	-20.8%	4.11	-6.9%	4.06
Skipjack (frozen whole)		-	-	-	-	-
Yellowfin (frozen fillet)		10.49	105.7%	11.66	14.8%	11.68
Yellowfin (fresh/chilled)		13.65	86.5%	11.83	-44.4%	11.70
Yellowfin (frozen whole)		9.76	21.2%	10.09	-4.9%	9.09

Figure 17: Thailand tuna supply chain summary (most recent full-year data, i.e. 2015)



Financial flows

The largest commercial banks by assets in Thailand are as follows:

Figure 18: Largest commercial banks in Thailand, 2016

Bank	Total Assets (US\$ billions)
Bangkok Bank	83.6
Siam Commercial Bank	81.4
Krungthai Bank	81.0
Kasikornbank	70.8

Source: Banks Daily Banking Directory

These four institutions are by far the largest in Thailand – the next largest has less than half the asset base of the smallest bank listed here.

Processors

Based on interviews with employees at multiple processors, commercial banks are the key lenders to the processing industry, and the primary uses of funds are capital expenditures and working capital. Long-term debt financing is reportedly difficult until a firm is well established. Lines of credit are particularly useful for Thai processors as they typically purchase raw material from the Big 3 traders, who often require payment on delivery. Meanwhile, the buyers of finished goods sometimes pay up to 90 days after delivery, creating a mismatch in the timing of cash flows.

Sustainability and traceability issues

With most Thai commodities being imported, processed and re-exported by large, sophisticated operators, comprehensive traceability systems able to comply with US regulations are reportedly already in place, according to the processors we interviewed.

There are certainly sustainability issues with trawlers in Thai EEZ waters, but those are out of the scope of this study as nearly all of the US imports from Thailand are re-exported fish, nearly 90 percent of which are caught in the WCPO.⁵⁰ For those fish, see the above discussion of sustainability in PNA/PNG waters.

VIETNAM

Market overview

Vietnam's tuna canneries process a mixture of domestically caught and imported raw material. As record keeping and government oversight of the industry is generally poor, this raises traceability and IUU concerns. As a result, the EU issued a yellow card to Vietnam in October 2017.⁵¹ The immediate effects of the yellow card on the industry are unclear, though it is feared the warning could cause hesitation among foreign buyers of Vietnamese seafood products.

At the time of writing, the Vietnamese government's response to the yellow card has included passing a revised fisheries law in which fishing boat owners and captains would face fines of US\$44,000 for engaging in IUU and have their fishing licenses revoked.^{52 53} The law revision provides legal recognition to community groups, better allowing for effective marine resources protection at a local level, and strengthens management of marine protected areas. A law/regulations enforcement, implementation and monitoring program

⁵⁰ Ibid.

⁵¹ European Commission press release, "Commission warns Vietnam over insufficient action to fight illegal fishing", 23 October 2017.

⁵² Undercurrent News, "Vietnam passes revised law on fisheries to tackle IUU", accessed 21 January 2018 at <https://www.undercurrentnews.com/2017/12/11/vietnam-passes-revised-law-on-fisheries-to-tackle-iuu/>.

⁵³ Seafood Source, "Vietnam unveils white book on IUU", accessed 23 January 2018 at <https://www.seafoodsource.com/news/environment-sustainability/vietnam-unveils-white-book-on-iuu>.

is reportedly a primary goal of the government in 2018.⁵⁴ The government has also issued a national action plan, which aims to create a working group to combat IUU fishing.⁵⁵

Discussions with various industry actors revealed frustration at the lack of capacity of the government regulator, the Directorate of Fisheries. The key traceability issues facing the domestic industry include inconsistent usage of logbooks and VMS, and for international trade the key improvement is better collection and dissemination of customs data.

Supply chain

Domestic fishery landings

The total catch in Vietnam EEZ waters for 2015 was estimated at 76,275 tons for skipjack and 24,918 tons for yellowfin. The oceanic tuna catch has been increasing steadily, partly as a result of improved reporting but also increasing fleet development promoted by Vietnamese government.

Approximately 80 percent of the catch is taken by purse seine and gillnet, with nearly 20,000 tons taken by handline/longline, this catch mainly being high value adult yellowfin (and bigeye) tuna. Handline vessels in Vietnam are typically former longline or squid vessels refit for gear, larger than the smallest handline vessels found in Indonesia and the Philippines.

Note, however, that serious doubts about the reliability of government catch figures have been raised by at least one interview subject.⁵⁶

Imports of tuna

Approximately 78,000 tons of frozen whole tuna were imported in 2015 (the latest period for which information is available), likely purse seine skipjack and yellowfin for canning and re-export, with some higher-value yellowfin and albacore included. Around 2,700 tons of the imports are declared as higher value product – this is probably mostly yellowfin from Indonesia etc. for value-added processing and re-export.⁵⁷ The main countries exporting to Vietnam, by value, are Taiwan, Korea, China and the US. It is not possible to distinguish what proportion of the imports are purse seine fish and longline yellowfin, but the list of importing countries suggest it may be mostly purse seine fish.

Domestic processing

Vietnam has five medium-sized tuna canneries (and smaller opportunistic plants) processing a mix of local and imported fish, mostly skipjack, for export: Food Tech, Yueh Chyang, Highland Dragon, Everwin, and Hai Vuong. Production (raw material inputs) is around

⁵⁴ “Vietnam Government Empowers Fisherman in Landmark Passage of Amended Fisheries law”, accessed 22 January 2018 at <http://mcdvietnam.org/vietnam-government-empowers-fisherman-in-landmark-passage-of-amended-fisheries-law/>

⁵⁵ “Vietnam approves national action plan on illegal fishing”, accessed 30 January 2018 at <https://www.undercurrentnews.com/2018/01/25/vietnam-approves-national-action-plan-on-illegal-fishing/>

⁵⁶ Based on industry interviews.

⁵⁷ ITC Trade Map: Trade Statistics for International Business Development.

50,000 tons per annum and increasing, and mostly based in the Ho Chi Minh City (northern Mekong delta) area, with the possible construction of more plants in other localities e.g. Khanh Hoa.

Three of the top five total tuna exporters for Vietnam are plants processing whole tuna and frozen loins/fillets into value-added product: Dragon Waves, Bidifisco, and Amanda.⁵⁸ Many plants are concentrated in the Suoi Dai Industrial Zone near Nha Trang, with others in Quy Nhon and the Ho Chi Minh City area.

Exports to the US

Three processors reportedly comprise 90 percent of exports of skipjack and yellowfin to the US: Sustainable Seafood Company, Thinh Hung Company, and Hong Ngoc.⁵⁹ Compared to the other countries in this study, Vietnam's prepared skipjack exports to the US have held up well, decreasing just 13 percent in volume between 2014 and 2016. Growth in yellowfin exports more than counterbalanced this, as export volumes of frozen fillets increased by 70 percent over the same period. Fresh/chilled yellowfin decreased in value by the same amount that frozen whole increased.

Figure 19: US imports of skipjack and yellowfin tuna from Vietnam, 2014-2016

	2014		2015		2016	
	Tons	US\$ thousands	Tons	US\$ thousands	Tons	US\$ thousands
Skipjack (can/pouch)	11,724	52,640	10,987	49,220	10,273	40,994
Skipjack (frozen whole)	62	148	38	77	75	144
Yellowfin (frozen fillet)	3,747	36,601	5,252	53,948	6,383	64,718
Yellowfin (fresh/chilled)	918	14,987	525	8,378	317	4,375
Yellowfin (frozen whole)	2,099	4,611	2,728	9,809	3,277	14,244

Source: ITC data

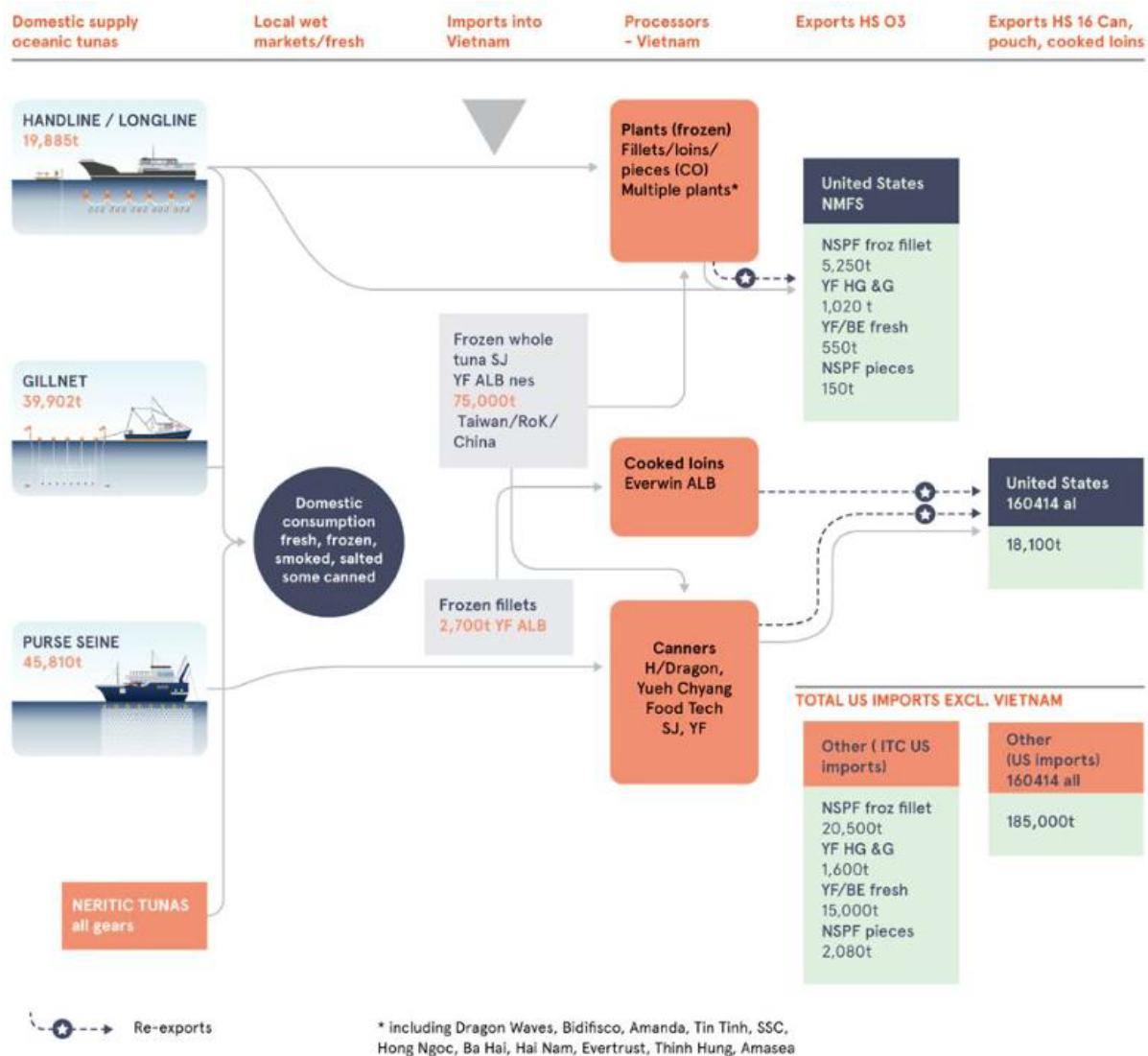
Figure 20: Growth and pricing of US imports of skipjack and yellowfin tuna from Vietnam, 2014-2016

	2014		2015		2016	
	US\$/kg	Growth	US\$/kg	Growth	US\$/kg	Growth
Skipjack (can/pouch)	4.49	-6.3%	4.48	-6.5%	3.99	
Skipjack (frozen whole)	2.39	-38.7%	2.03	97.4%	1.92	
Yellowfin (frozen fillet)	9.77	40.2%	10.27	21.5%	10.14	
Yellowfin (fresh/chilled)	16.33	-42.8%	15.96	-39.6%	13.80	
Yellowfin (frozen whole)	2.20	30.0%	3.60	20.1%	4.35	

⁵⁸ VASEP data.

⁵⁹ Based on industry interviews.

Figure 21: Vietnam tuna supply chain summary (most recent full-year data, i.e. 2015)



Financial flows

The largest commercial banks by assets in Vietnam are as follows:

Figure 22: Largest commercial banks in Vietnam, 2016

Bank	Total Assets (US\$ billions)
Agribank	43.12
BIDV	41.68
Vietinbank	39.64
Vietcombank	32.46

Source: Reuters

These four institutions are by far the largest in Vietnam – the next largest has less than half the asset base of the smallest bank listed here.

Processors

Vietnamese banks are reportedly very active lenders to established companies in the processing industry. The owner of one processor said that banks sometimes approach him unsolicited to ask whether his company is in the market for a loan. Interviewees mentioned the following banks by name when discussing institutions willing to lend to processors: Techcombank, Vietcombank, Agribank, Eximbank, and BIDV.

Medium-scale fishers

Based on our discussions, the only financing available to owners of handline and longline vessels is in the informal sector.⁶⁰

Sustainability and traceability issues

With the important role of imports being processed for export in the Vietnam industry, there is a need for both great improvements in national trade monitoring statistics to support traceability within all supply chains, and specifically traceability of imports/re-exports. One yellowfin processor we interviewed noted that he only buys domestically caught fish because traceability is so poor for imports.

On the domestic side, WWF Coral Triangle launched a FIP in 2014 to improve traceability and sustainability in Vietnamese handline and longline yellowfin fisheries. Founded and managed alongside the Vietnam Tuna Association (Vinatuna), a local NGO, the FIP includes approximately 2,000 vessels and an estimated 18,000 tons of annual yellowfin catch.⁶¹ This FIP is discussed in more detail later in the report.

The common theme of discussions with most stakeholders in Vietnam is that the government needs to step up and create/enforce regulations around traceability and sustainability, but capacity and political will are lacking. In this regard, outside interventions such as the EU yellow card and US traceability regulations are welcomed by many of those we interviewed as a way to impose improvements on governance.⁶²

⁶⁰ Ibid.

⁶¹ Based on WWF Coral Triangle website and interviews with WWF officials.

⁶² Based on industry interviews.

The Business Case for Increased Sustainability of Tuna Production

Presented below are two business cases for transition to increased sustainability in the supply chains of skipjack and yellowfin tuna, as well as potential intervention points for investment in the transition. Note these cases were selected for further study based on feedback received at the FGD, and refer to Annex C for the initial ideas considered.

Overview: The importance of long-term contracting for buyers

Without long-term contracts or relationships with suppliers of fish (i.e. fishers and processors), buyers (i.e. retailers and international traders) risk quality assurance and security of supply, especially when sourcing certified fish. Numerous retailers and traders across the world have made commitments to vastly increase their sourcing of MSC certified fish by 2020.⁶³ Meanwhile, consumer demand for Fair Trade certified fish is also robust, especially in the US where the label has higher brand recognition than MSC. These factors have boosted demand for certified catch and could leave those companies without off-taker contracts unable to fulfill their sustainability commitments or capitalize on a market opportunity. In addition, the costs of quality control can increase when buyers source from unfamiliar fisheries or supply chains. Thus, buyers that lack long-term contracts or relationships with suppliers potentially face increased costs and reputational risks, and ultimately decreased earnings and market share.

From the buyers' perspective, long-term contracting could be justified purely as an instrument to secure supply and control costs. What makes long-term contracting potentially transformative is that these agreements could be leveraged to enable access to financing and support sustainability and social goals in artisanal fisheries. This idea is explored in the first business case presented below.

Sustainability-minded retailers and traders are focused on increasing the amount of MSC-certified product, and are supporting FIPs and MSC certification with grant funds in pursuit of this goal. Though their support typically entails multi-year commitments, a significant proportion of fisheries fail to achieve certification or drop out at recertification. The second business case argues for a longer-term, blended funding approach in which financial planning is an integral part of the FIP process and long-term debt capital is made available for the costs of MSC certification and recertification. This could be the best way to ensure industry's grant funding for FIPs has a durable impact.

⁶³ For full list see Marine Stewardship Council, "EU Our Ocean 2017 – Commitments", <https://www.msc.org/2020-leaders>.

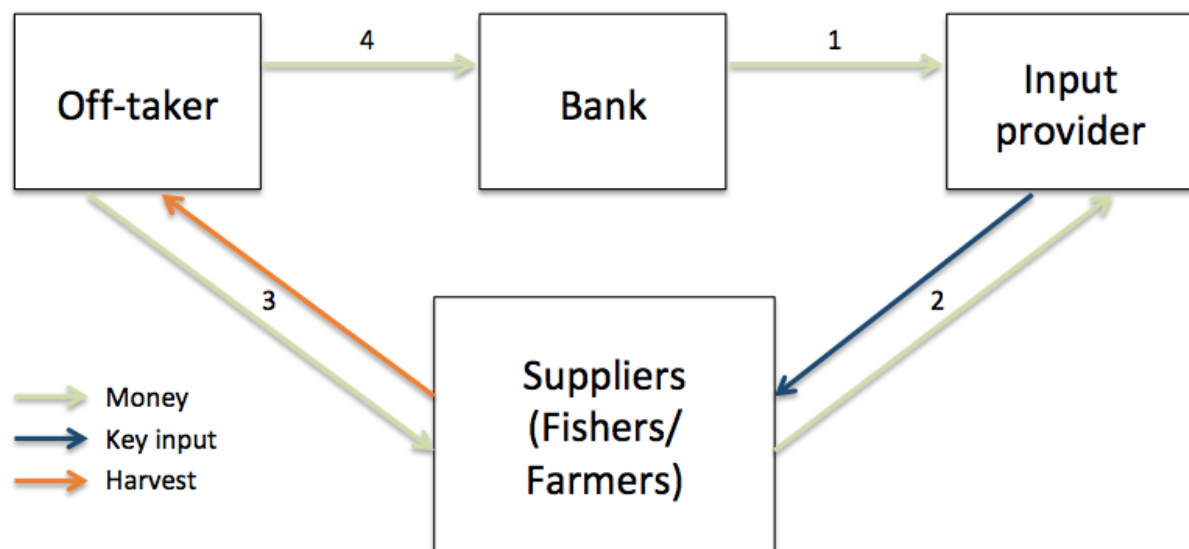
The business case for long-term contracting in artisanal fisheries: facilitating value chain financing

Fisheries at the small-scale often lack access to both international markets and to formal providers of credit, foregoing investments in equipment such as vessels, outboard motors, communications technology, fish processing and ice manufacturing facilities, and even ice chests and knives as a result. Without proper handling, storage, and processing, poor quality fish receives a low price in the marketplace, perpetuating financial insecurity for artisanal fishers and leading to increased pressure on fish stocks.

Value chain financing (VCF) entails a long-term contract between suppliers and an off-taker in which the security of the off-taker agreement allows suppliers to borrow for assets related to production. Off-takers are thus guaranteed supply from fisheries, while fisheries are able to secure stable off-takers, market access, and access to credit. This framework has been successfully implemented in agriculture the world over but only recently introduced in fisheries.

There are multiple permutations of VCF frameworks, including the following example currently in use in Indonesia’s agricultural sector: Under the agreement, farmers can borrow up to 50 percent of the purchase price of a key input, e.g. seeds. To mitigate risk and lower banking costs, a financial institution/lender disburses funds directly to a seed provider rather than to the farmers. The farmers then purchase from the seed provider, paying the balance for the seeds not already covered by the loan. At harvest, the farmers sell to the off-taker at a discount, effectively repaying the loan with interest. The loan is then repaid to the bank by the off-taker.

Figure 23: Example of Value Chain Financing Framework



Source: SAFIRA and Marine Change

This structure can include more traditional disbursement and repayment to a bank by farmers, but the framework illustrated above ensures the disbursed funds are used as intended. Equally important, it simplifies the banking process and lowers banking costs as funds are disbursed to a single entity (the seed provider) and repaid by another (the off-taker) rather than by hundreds of individual farmers. Historically the rate of non-performing loans (NPL) in VCF frameworks in Indonesia has been approximately 2 percent. SAFIRA (Strengthening Agricultural Finance in Rural Areas), an Australian-funded NGO that has designed and implemented multiple VCF frameworks in Indonesia, reports that NPLs are primarily due to defaults by off-takers rather than by farmers.⁶⁴

An off-taker can link any agreement to operational, sustainability, and traceability requirements, which can improve quality of fish, and efficiency, safety, and quality of life on the water for fishers, all while protecting the fishery resource. Agreements of this sort already exist and are an integral part of Fair Trade certification. Based on the case study presented below, we believe there is a compelling case for linking long-term contracting, VCF, and Fair Trade certification in artisanal fisheries.

Fair Trade fishery in Buru, Indonesia: A case study

In 2014 the yellowfin handline fishery in Buru, North Maluku province, Indonesia became the world's first wild-capture fishery certified Fair Trade. Fair Trade's primary focus is empowerment and economic development, working to address some of the most pressing needs of small-scale fishers. Environmental sustainability is a longer-term goal of the program, as incremental traceability and sustainability milestones must be met over a six-year period. The theory of change underpinning Fair Trade is that sustainability cannot be achieved without first addressing livelihoods and economic hardship.⁶⁵

Figure 24: Location of Buru, Indonesia



⁶⁴ Based on Marine Change discussions with SAFIRA, November 2017.

⁶⁵ Meghan E. Borland, A tale of two standards: A case study of the Fair Trade certified Maluku handline yellowfin tuna (*Thunnus albacares*) fishery.

Compared to MSC certification, whose considerable upfront costs can be prohibitive for artisanal fisheries, Fair Trade's incremental approach emphasizes getting fisheries on the path to sustainability and allows for much lower upfront expense as compliance is spread over the six years after certification. In addition, Fair Trade provides a direct incentive for small-scale fishers by immediately increasing their dockside earnings for high-grade fish. Low-grade fish is not eligible for export and is sold at lower prices locally.

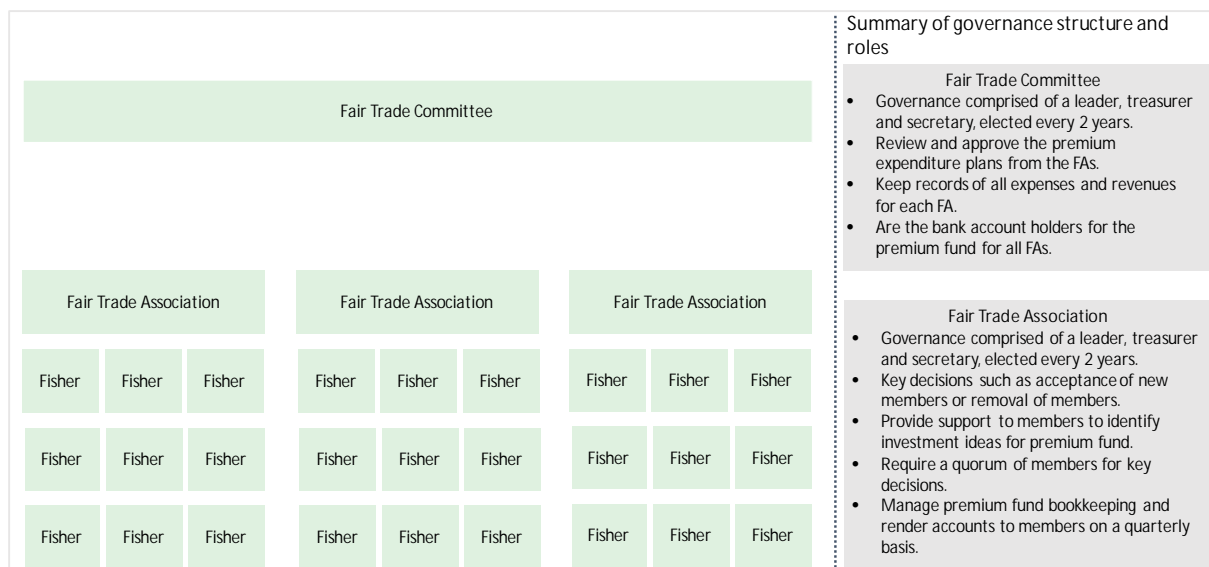
Figure 25: Purchase price per kilogram of yellowfin paid by processor in Buru, Indonesia

Grade	FT price/kg (US\$)	Non-FT price/kg (US\$)
A/B	3.83	3.76
C	n/a	2.56
D-Rejects	n/a	0.90

Source: Marine Change

Along with earning a higher price, fishers receive a Fair Trade premium (US\$0.30 per kilogram in Buru, or a 7 percent dockside premium) on harvest sold through the program. The premium is paid into a fund collectively managed by the fishers via Fair Trade committees (FTC) and associations (FAs). See the figure below for the community governance structure.

Figure 26: Governance of the Fair Trade Program



Source: Marine Change

Based on Fair Trade sustainability guidelines, 30 percent of the premium earned must be allocated to environmental activities. The remaining 70 percent can be allocated to

community investments. To date, 170 fishers across 9 FAs in Buru have earned total premiums exceeding US\$100,000.⁶⁶

Figure 27: Summary of premium earnings and expenses for fishers' associations in Buru, Indonesia (figures in US\$)

FA #	Date formed	Fishers	Premium earned	Premium spent	Average premium per member	Annual average	LTM ⁶⁷ premium fund - community	LTM premium fund - environment
1	Dec-13	21	19,677	61%	937	6,644	4,153	1,780
2	Dec-14	23	2,704	49%	118	1,068	183	79
3	Dec-14	15	15,631	65%	1,042	6,174	2,874	1,231
4	Dec-14	12	10,688	50%	891	4,222	3,259	1,397
5	Dec-14	19	10,111	52%	532	3,994	3,853	1,651
6	Feb-15	16	9,749	69%	609	4,172	2,163	927
7	Apr-15	19	8,889	63%	468	3,981	2,341	1,003
8	Mar-15	30	15,006	18%	500	6,528	9,078	3,891
9	Mar-15	15	9,609	53%	641	4,180	3,264	1,399
		170	102,063	53%	600		31,168	13,358

Source: MDPI, July 2017

Examples of investments made in Buru, where the first Fair Trade fish were sold in 2014, include handheld GPS devices, knives, and ice chests (see photo below), each contributing to quality improvements. Other community investments include mosque rehabilitation, donations to orphanages, improvements to the fish landing area, school uniforms for children, and traditional clothes for fishers' wives. Environmental investments to date include the introduction of enumerators, and programs and awareness raising campaigns related to turtle nesting and waste management.⁶⁸

⁶⁶ Based on Marine Change research, 2017.

⁶⁷ Latest twelve months.

⁶⁸ Based on Marine Change research, 2017.

Figure 28: Cool boxes purchased with premium earnings, Buru, Indonesia



Source: Marine Change

However, a clear need for additional supply chain improvements remains, especially for ice and processing facilities. Fair Trade premium earnings vary greatly across fishers' associations (FAs): figure 27 above indicates the highest-earning FA (#3) earns nearly 10x more per fisher than does the lowest-earning FA (#2). While post-harvest handling by fishers is very likely a factor, the disparity between initial processing facilities in Buru is stark. See figure below. The best facilities use modern equipment and meet international standards of sanitation, while the worst operate in open air with live animals in close proximity.

Figure 29: Unhygienic “processing facility” (top) juxtaposed with a modern, hygienic facility (bottom), Buru, Indonesia



Source: Marine Change

The need for additional investment is evident in the overall production figures as well. Based on figures provided by one of the main traders in Buru, a staggering 37 percent of fish are rejected due to poor quality.

Figure 30: Example of Fair Trade sales as a proportion of total landings, January through July 2017, Buru, Indonesia

Sold as Fair Trade Certified	Large yellowfin - clean loin (kg)	Large yellowfin - dirty loin (kg)	Total (kg)	% of total
No	1,834	4,947	6,781	37%
Yes	2,159	9,591	11,749	63%
Total	3,993	14,537	18,530	100%

Source: MDPI, July 2017

Based on the pricing differential from figure 25, i.e. US\$3.83 for Fair Trade grade A/B and US\$2.56 for grade C, the 6,781 kilograms of fish not sold as Fair Trade represents a loss in value of over US\$8,600, with an additional US\$2,000 in foregone premium income. This data is from a single trader and all of this fish could be processed at a single facility. Considering a basic mini-plant for improved processing could be built for perhaps as little as US\$1,500, the return on investment for such a facility would be extremely high, with a payback period of less than one month.

Extrapolating to Buru as a whole, over the same period of January to July 2017, 75,238 kilograms of yellowfin were sold as Fair Trade certified. Assuming a similar rejection rate, approximately 43,000 tons failed quality testing. Using the same pricing as above, this amounts to a loss in value of over US\$55,000 from grading and US\$13,000 in foregone premiums – equivalent to US\$400 in lost value for each of the 170 fishers in the Fair Trade program over just a seven-month period. The introduction of VCF to fund processing improvements in such a fishery could be transformational for the community.

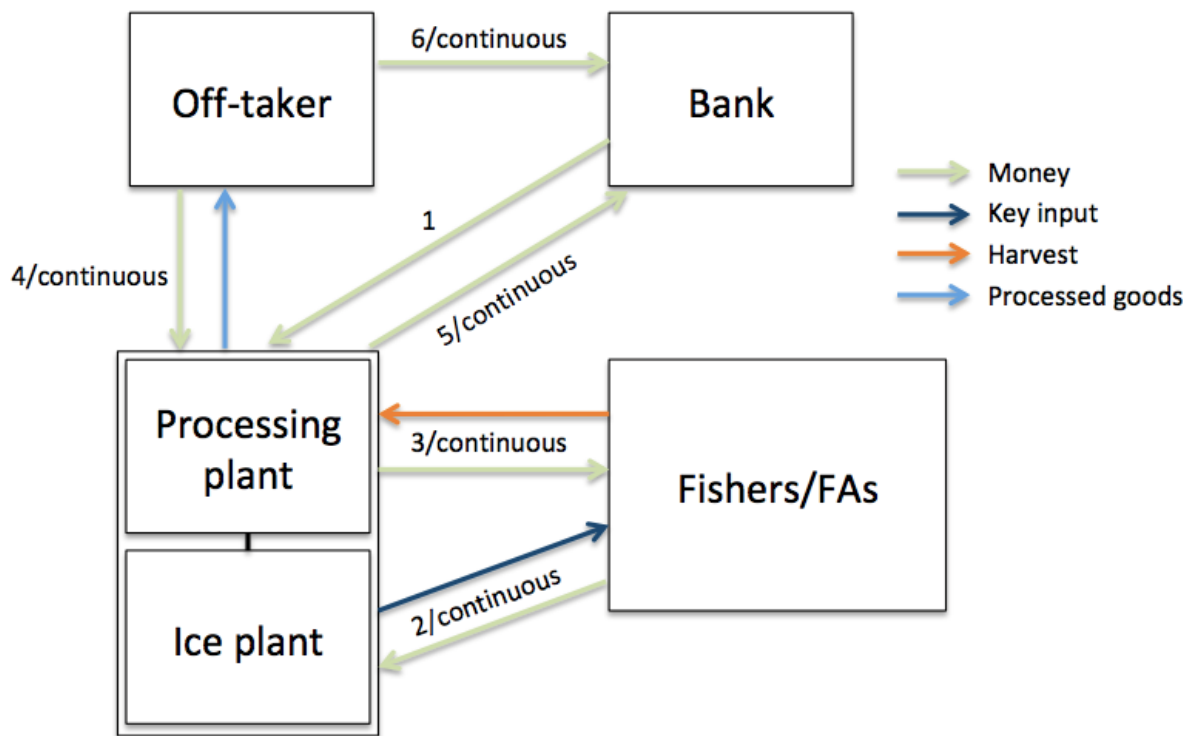
Linking VCF with Fair Trade certification in fisheries

Fair Trade certification complements VCF as it includes/requires/incentivizes the following:

1. Long-term contracts between fishing communities and off-takers
2. Improved post-harvest handling, as only high-grade fish is eligible for the Fair Trade premium
3. The establishment of FAs and FTCs to manage the premium received for certified fish, allowing for collective decision-making and group purchasing of inputs

Group purchasing plus increased demand for improved processing and ice are key enabling factors for VCF in fisheries. In turn, VCF could facilitate lending for durable inputs such as communications technology, outboard motors, ice chests, knives, etc., as well as capital improvements/investments for ice manufacturing and fish processing facilities. Lending both for facilities and for fishers to utilize the facilities' services could create a mutually reinforcing and interdependent value chain in which facilities and fishers conduct business with each other, thus reducing the overall risk of the loan. Put another way, lending to both fishers and facilities would reduce NPL risk compared to lending solely to one or the other. See figure 31 below for an illustration of this value chain.

Figure 31: Proposed Value Chain Financing Framework for Fisheries – Ice Manufacturing and Fish Processing



Source: Marine Change

Farmers' and fishers' cards as enablers of VCF

In the Indonesian context, the Ministry of Agriculture uses a *kartu tani*, or farmers' card, to disburse fertilizer subsidies in central Java. In order to receive the subsidy, farmers must use the card at authorized retailers to purchase qualified items, which are provided at a discount. To qualify for the card, farmers must be a member of a farmers' association and register with the government. Cards are issued by a bank and are linked to a personal account, so they are effectively standard debit/ATM cards with an additional component. Many, probably most, of farmers in Indonesia are unbanked, so this can be a relatively inexpensive and straightforward way of including them in the formal banking system. Some of Indonesia's largest banks (BNI, BRI, Mandiri) have partnered with the program as card issuers.

Once in a farmer's hands, the card can also be used to deposit harvest earnings from designated off-takers. The similarities with VCF are clear: funds are disbursed for a specific input from a designated input provider, and sales are to a designated off-taker. Indeed, banks in Indonesia have leveraged the farmers' cards as security for VCF loans and as conduits for disbursing loans.

In Indonesia's fisheries sector, the government has introduced a *kartu nelayan*, or fishers' card. This card is essentially a fishing license, but cardholders receive life/accident insurance and fuel subsidies as well. Similar to the farmers' card, a fishers' card could be utilized in a VCF framework and bring previously unbanked communities into the formal financial sector. Banks such as BNI are already considering such a mechanism.

In Indonesia's agricultural sector, national and regional banks have been lenders in VCF frameworks. In addition to commercial banks, other institutions focused on fisheries and community lending include Rabo Rural Fund and Meloy Fund.

Rabo Rural Fund (RRF)

RRF, part of the Rabobank Group, supports producers in the food and agriculture sectors by providing finance to SMEs and cooperatives in emerging economies. The US\$20 million revolving fund focuses specifically on organizations too large for microcredit yet not served by commercial banks, with the aim of facilitating sustainable food production. RRF provides short-term trade finance and risk-sharing instruments (i.e. credit guarantees and co-financing) ranging from US\$200,000 to US\$2 million. During the first three to four years of the fund's existence it focused on agriculture, but since has expanded its services to the fisheries sector. The fund is active in Africa, Asia, and Latin America, and within the scope of this project it works in Indonesia, the Philippines, and Vietnam. In several instances, RRF has invested in structures very similar to value chain financing.⁶⁹

In 2016, RRF and Aavishkaar, an Indian impact investor, agreed to finance fish processing facilities to be managed by Bali Seafood International. The funding also supports auxiliary businesses that will sell gear and equipment and provide finance for purchases. When it was announced, the investment totaled US\$3.3 million for four processing facilities located on the island of Sumbawa.⁷⁰ At the time of writing, one facility has been constructed and reportedly became operational in late 2017.

This is VCF in practice: investment from an outside financial institution into an off-taker who then provides services and credit to fishers, driving quality improvements and ultimately increasing fishers' incomes. While this is an important example that could be replicated elsewhere, it is a special case in which the investee is a foreign-owned company with an explicit social goal, an exporting hub on Bali, and direct access to international markets via its parent company, North Atlantic, Inc. The vast majority of artisanal fisheries without the luxury of this sort of operator will require alternative solutions.

Meloy Fund

The Meloy Fund was launched by Rare, a conservation-focused NGO, to finance fishing-related enterprises that support sustainable coastal fisheries and critical marine habitat conservation in the Philippines and Indonesia. The fund has raised US\$17.1 million of its US\$20 million goal, with the Global Environment Facility as the anchor investor. The fund can make debt or equity investments, ranging from US\$500,000 to US\$2 million, with a maximum period of 10 years (expected average is six years). Target returns are 10 to 15 percent.⁷¹

⁶⁹ Rabobank Rural Fund presentation, and 2016 Annual Report.

⁷⁰ Impact Alpha, "PT Bali Seafood: Netting Fresh Fish through Community Investment in Indonesia", accessed 1 February 2018 at <http://impactalpha.com/investing-in-local-fish-and-local-communities-in-indonesias-coral-triangle/>

⁷¹ Based on Marine Change discussions with Meloy Fund, 2017.

The fund managers expressed their interest in investments in companies with a high ratio of fixed assets and a track record of profitable operations. They are seeking to finance capital expenses such as processing and storage facilities, refrigerator trucks, and communications technology.⁷²

Meloy Fund and ANOVA Food (subsidiary of Bumble Bee and buyer of Fair Trade yellowfin in Indonesia) held initial discussions to finance ice-manufacturing facilities to improve the quality of fish and reduce the very high rejection rate in Buru. Meloy was willing to lend to the project but interest rate terms could not be agreed upon. In such an instance, a risk-sharing arrangement with RRF or program-related investment (PRI) could bridge the gap.

Potential off-takers

In terms of off-takers, Thai Union has been very active in supporting sustainable sourcing and might be amenable to a VCF framework. ANOVA Food, as noted above, is already sourcing Fair Trade fish in Indonesia and is a natural fit for a VCF approach.

Sainsbury's has attempted to engage with Fair Trade fisheries (shrimp) in Indonesia and is another strong candidate for partnership. In 2017, the company announced the pilot of its own "Fairly Traded" marque to replace the Fairtrade International label on some of its tea products. The stated purpose of the new scheme is to create a closer, long-term relationship with suppliers and to share relevant market data to allow for improved decision-making, while continuing the pricing and premiums received under the Fairtrade standard. The pilot is currently underway with seven producer groups in East Africa, in partnership with Farm Africa, an NGO.⁷³ As the company potentially continues to roll out this new standard to other commodities, VCF could be an attractive mechanism for supplier engagement.

Overall, this new VCF approach to fisheries will likely require further development and refinement as potential off-takers and financial institutions provide feedback.

The business case for strategic, long-term investment in FIPs and MSC certification

As MSC certification is considered the gold standard for sustainable fisheries management and comprehensive FIPs are stepping-stones to certification, sustainability-minded retailers and traders have invested in FIPs in an attempt to secure and increase the supply of sustainable seafood. However, these investments, whether made by industry or civil society, are often made without a review of the commercial viability of certification. The result of this lack of planning is evident in the MSC assessment statistics:

Dropout ratio. Approximately 10 percent of the fisheries that entered initial assessment did not receive certification, while 13 percent of fisheries that received certification no longer

⁷² Ibid.

⁷³ Sainsbury's corporate website: <https://www.about.sainsburys.co.uk/discover-more/fairly-traded>

use the label.⁷⁴ That is, approximately one-fifth of the fisheries that undertook the effort and expense of certification eventually failed or dropped out.

Reassessment. An estimated 20 percent of small-scale fisheries that receive MSC certification do not undergo recertification. (Approximately 67 percent of fisheries currently certified will require reassessment by 2020.)⁷⁵

Longer-term support for fisheries is likely necessary to improve these figures. The current grant-funding model mainly focuses on FIPs and the initial achievement of MSC certification – the missing piece is the ability of fisheries to pay for continued improvement after certification and for recertification every five years. In a resource-constrained environment, rather than expect or continue grant funding indefinitely after certification, debt financing for commercially viable fisheries entering MSC assessment can improve long-term outcomes and increase the impact of industry’s sustainability budgets.

Ultimately the only way to mobilize debt financing for sustainable fisheries is through rigorous financial analysis of the returns to MSC certification. When establishing and structuring a FIP, it is essential to consider how certification (and recertification) will be funded as early in the process as possible. This analysis serves four key functions:

1. Identifies funding gaps (i.e. financing required) to achieve certification
2. Illustrates the rate of return on investment in MSC certification
3. Tests the viability of the certificate holder’s business model
4. Demonstrates the ability (or not) to repay a loan

To highlight the importance of financial analysis for FIP planning and MSC certification, we have performed preliminary modeling for FIPs currently underway in Indonesia, the Philippines, and Vietnam. (See Annex A for summary cash flows.) Our analysis makes clear that the central financial challenges of MSC include the timing of cash flows and whether there is adequate certified tonnage in the fishery.

For the certificate holder, the duration of initial assessment is approximately one year. This can create an initial US\$ six-figure funding gap as MSC certified fish can’t be sold until the assessment is complete. However, once certified, if sufficiently large volumes of fish are sold as MSC and can command an ample price premium, the upfront compliance costs can be recouped within just a few years – longer if relatively small volumes of fish are traded as MSC or the premium is low.

This analysis applies only to fisheries entering full assessment, and assumes a blended financing model in which grants would cover FIP expenses and certification would be financed with debt.

⁷⁴ Marine Change review of MSC internal database, April 2017.

⁷⁵ Ibid.

Indonesia FIP: handline yellowfin and pole-and-line skipjack/yellowfin

This FIP was spearheaded by an industry group, the Indonesian Pole-and-line and Handline Fisheries Association (known by its Indonesian acronym, AP2HI). AP2HI consists of pole and line and handline tuna fishing, trading, and processing companies organized with the expressed purpose of promoting sustainability and achieving MSC certification. Its mission is to represent the various industry actors to government and market partners, coordinate business activities, and drive innovation in transparency and traceability of catch and chain of custody. Its funding sources include membership fees and grants from philanthropic and bilateral organizations.

Launched in 2014, AP2HI has 24 member companies in Indonesia, which together represent over 35,000 tons of tuna from almost 1,000 vessels throughout the country. These companies adhere to a code of conduct that has been developed to align with the Food and Agriculture Organization of the United Nations (FAO), RFMOs, and national guidance and regulations. The code of conduct covers improving record-keeping of fishing vessel, certifications and licenses; prevention from catching sharks, sea turtles, dolphins and sea birds; avoidance of threatened species such as bigeye tuna; and prohibition on fish from irresponsible fishing practices or IUU fishing.

Although pole-and-line and handline fishing has always been present in Indonesia’s fisheries sector, the industry appears to have shifted toward increased use of these gear types. Both catch methods receive a 10 percent price premium in the market for sustainability. However, it is estimated that only 10 to 20 percent of Indonesian pole-and-line tuna reaches the market labeled and eligible to receive the price premium.

Working with AP2HI as the potential certificate holder, we have developed a cash flow model to determine the financing required to achieve MSC certification, and the ability to repay the loan. The table below summarizes the assumptions used in the model.

Figure 32: Summary of assumptions for Indonesia MSC model

Assumption	Amount (US\$)	Timing
Total AP2HI operating cash flow	-90,000, 5% annual inflation	All years, based on actual figures
Tax rate	30%	All years
MSC expenses:		
Full assessment	200,000	Upfront and every 5 years for reassessment
Total support and compliance	228,000, 5% annual inflation	Some upfront with all costs incurred annually after certification
MSC revenues:		
Total MSC entry fees paid by members	145,000	Upfront; to be conservative, no new future members assumed
Total member tonnage	35,100 tons	All years, based on 2015 landings
Tonnage fee	1.5% of dockside price	All years

Dockside price per ton	SKJ 2,000 YFT 4,000	All years
Percentage of catch certified	25% (year 2), 50% (year 3), 75%	75% at year 4 and beyond
Loan terms (scenario 1):		
Amount	550,000	
Term	5 years	
Rate	12% annually	
Loan terms (scenario 2):		
Amount	395,000	
Term	5 years total, 1 year grace period	
Rate	12% annually	

Source: AP2HI and Marine Change

Given these baseline assumptions, the model makes clear the commercial viability of MSC certification in this case. Without external financing, monthly cash flows are consistently positive starting in month 14 – this is because, as noted above, MSC-certified fish can't be sold until a year after initial assessment begins. The maximum negative cash balance of the project reaches US\$257,000 in month 25, but cash balance turns positive by month 32 (i.e. in the middle of the third year). These numbers demonstrate the anticipated tonnage and premium are more than adequate to justify the initial investment as well as the costs of reassessment. For AP2HI, the internal rate of return (IRR) for MSC certification over 15 years is greater than 75 percent.

Assuming an interest rate of 12 percent and a 5-year term with payback starting immediately, a loan of US\$550,000 would be required to finance certification. Given the project's extremely high return on investment, the loan could be repaid given current assumptions. Note this loan amount is more than double the maximum negative cash balance cited above due to the mismatch in the timing of cash flows and immediate principal and interest payments. Assuming a one-year grace period, capitalized interest at 12 percent and a 4-year repayment period thereafter, the project would require US\$395,000 in loaned funds. A lower interest rate, longer grace period, or longer term would further reduce the financing required.

Philippines FIP: handline yellowfin in Mindoro Strait and Lagonoy Gulf, artisanal fisheries
 WWF Philippines is working closely with two handline yellowfin FIPs in the Mindoro Strait and Lagonoy Gulf. Established in 2013, social empowerment of fishers is a critical component of the project; traceability (VMS), access to credit, market access, and quality improvements are also major goals. This fishery comprises approximately 1,500 fishers and annual catch of approximately 4,000 tons.

The FIPs are currently being sustained by grants from the German Investment and Development Company (DEG). This funding was set to expire in December 2017 and has been extended through June 2018. WWF Germany has committed funding to continue the

project, though a funding gap remains. This is exactly the type of situation financial planning and long-term FIP investments could prevent.

The fishers in each FIP are organized into a federation, which is the presumptive MSC certificate holder. Working with preliminary inputs provided by WWF Philippines, we have developed an MSC cash flow model. See below for assumptions used in the model.

Figure 33: Summary of assumptions for Philippines MSC model

Assumption	Amount (US\$)	Timing
MSC expenses:		
Full assessment	100,000	Upfront and every 5 years for reassessment
Total support and compliance	140,000, 2% annual inflation	All years, based on preliminary estimates
MSC revenues:		
Total tonnage	4,000 tons	All years, based on historical landings
Tonnage fee	3.0% of dockside price	All years
Dockside price per ton	3,500	All years
Percentage of catch certified	50% (year 2), 60% (year 3), 70% (year 4)	75% at year 5 and beyond
Tax rate	30%	All years
Loan terms:		
Amount	155,000	
Term	5 years	
Rate	12% annually	

Source: WWF Philippines and Marine Change

This artisanal fishery is in stark contrast with the AP2HI FIP, which is nearly 10 times larger (35,000 tons versus 4,000) and driven by large companies. With the relatively low volumes in this fishery, a premium of 1.5 percent, as expected in Indonesia, is insufficient to sustain MSC certification. In addition, similar to Buru, Indonesia as described in the previous section, poor handling and processing have reduced the quality and value of harvest. Less than 30 percent of catch in this fishery is currently graded as A or B, the only grades eligible for MSC. Given the price disparity between grades this represents a loss in total value of at least 40 to 50 percent.

In this instance, our initial financial analysis demonstrates that volumes of certifiable fish must be increased (by improving quality) and a higher tonnage fee must be earned in order for certification to be commercially viable. If these criteria are not met, the project will be cash flow negative and require continued donor funding or drop out of certification.

The table above lays out some assumptions under which the fishery could sustain certification and repay a loan. Note that by year 2 (i.e. the first year post-certification) the

assumed percentage of catch going to MSC is 50 percent, increasing incrementally to 75 percent in year 5. These quality improvements are critical to commercial viability; even with increased quality, the required premium to achieve feasibility is around 3.0 percent, or US\$105 per ton. (If 100 percent of catch in this fishery were certified MSC, the required premium would be 1.9 percent, or US\$67 per ton.) Under these assumptions the required loan amount is US\$155,000, with a maximum negative cash balance of US\$114,000 for the venture. The IRR is a remarkably high 72 percent: in this case where volumes are relatively low, the timing of MSC cash flows (i.e. a large assessment fee every five years) seems to require a very high IRR to sustain debt financing.

There have been preliminary discussions between WWF Philippines and Fair Trade regarding these FIPs. If the fishery becomes Fair Trade certified, quality improvements would be further incentivized and could help sustain MSC certification.

Vietnam FIP: handline and longline yellowfin, medium-scale vessels

WWF Coral Triangle launched this FIP in 2014 to improve traceability and sustainability in Vietnamese handline and longline yellowfin fisheries. Founded and managed alongside the Vietnam Tuna Association (Vinatuna), a local NGO, the FIP's unit of assessment includes approximately 2,000 vessels and an estimated 18,000 tons of annual yellowfin catch.⁷⁶

Current FIP partners in good standing include the following distributors:

- ANOVA Food USA
- Beaver Street Fisheries (US)
- Binca Seafoods (Germany)
- Coral Sea Fishing (Australia)
- Culimer BV (Netherlands, China, Vietnam, Dubai)
- Hilo Fish (US)
- Lotus Seafood (US)
- Norpac Fisheries Export (US)
- Sea Delight LLC (US)
- Stoney (US)
- Western United Fish Company (US)

Until the end of 2017, each FIP partner paid a fixed annual fee of US\$8,000 to participate in the program. These fees covered only about 20 percent of the operating budget of the FIP, with the balance supported by grant funding. In an attempt to make the system fairer, the FIP partners agreed to change the payment procedures. Under the current agreement that came into effect in January 2018, partners pay a fee of US\$0.02 per kilogram for FIP-qualifying fish. It is unclear what impact this will have on the cash flows of the FIP as the tonnage figures are being tabulated at the time of writing.

Several Vietnamese processors have made a commitment to adopt of the FIP traceability system and provide FIP-eligible products to the FIP partners. The list of participating processors includes:

⁷⁶ Based on WWF Coral Triangle website and interviews with WWF officials.

- Hai Vuong
- Ben Vung – Sustainable Seafood Company (SSC)
- Tin Thinh
- BIDIFISCO
- Hong Ngoc TPE
- Ba Hai
- Mai Tin (Evertrust)
- Amanda
- Amasea
- Thinh Hung
- Hai Nam

The processors have not yet been willing to financially support the FIP; Vietnamese law does not mandate the traceability requirements and there are few perceived benefits of FIP cooperation.

Working with preliminary inputs from WWF Coral Triangle, we have developed a cash flow model. We expect the analysis to help the FIP partners systematically assess the viability of the program in its current state and inform their decisions regarding future investment. The table below summarizes the assumptions used in the model.

Figure 34: Summary of assumptions for Vietnam MSC model

Assumption	Amount (US\$)	Timing
MSC expenses:		
Full assessment	100,000	Upfront and every 5 years for reassessment
Total support and compliance	140,000, 2% annual inflation	All years, based on preliminary estimates
MSC revenues:		
Total tonnage	18,000 tons	All years, based on 2015 landings
Tonnage fee	40 per ton, or 0.7% of dockside price	All years
Dockside price per ton	5,500	All years
Percentage of catch certified	20% (year 2)	Increasing by 10% per year until plateauing at 75% in year 7
Tax rate	30%	All years
Loan terms:		
Amount	208,000	
Term	5 years	
Rate	12% annually	

Source: WWF Coral Triangle and Marine Change

By tonnage, the Vietnam yellowfin fishery is approximately half the size of the AP2HI FIP. The primary lesson learned from preliminary financial analysis is that the current premium

of US\$0.02 per kilogram is insufficient to sustain the costs of MSC certification at current volumes covered by the FIP. WWF Coral Triangle estimates that roughly 30 percent of the fishery's 18,000 tons are processed and traded by FIP partners, though it is unknown what proportion of that would be eligible or diverted to MSC. For the purposes of this preliminary analysis it is assumed that 20 percent of total volume would be certified initially (the actual value could be lower), increasing by 10 percent per year as the premium paid for MSC attracts more raw material.

Given these tonnage assumptions, a premium of US\$40 per ton (a 0.7 percent premium on dockside price), or double what FIP partners currently pay, would be necessary to achieve commercial viability. Under this scenario, a loan of US\$208,000 would be required to finance certification, and would be repaid. As with the other fisheries analyzed, the IRR is quite high, 67 percent in this instance. Maximum negative cash flow is in month 14 (year 2), equal to US\$101,000, and cash flows turn positive in month 40 (year 4).

The primary drivers of bankability are tonnage and premium: if certified tonnage increases faster than expected, the required premium can decrease; if tonnage is lower, the premium must be higher. As this is an industry-driven FIP, the tradeoffs should be emphasized to the partners, allowing them to plan accordingly. Finally, as the inputs for the financial analysis of this FIP were particularly unrefined, further consultation and analysis would be necessary to better quantify the challenges facing certification of this fishery.

Mobilizing debt financing for MSC certification

As observed above, a fishery may not generate positive cash flows consistently until several years post-certification due to the substantial upfront and recurring costs of MSC certification and the mismatch in the timing of cash flows. Even in the case of the AP2HI FIP in Indonesia, which has a relatively strong investment profile, commercial banks are unwilling to finance a venture with no fixed assets for collateral. Thus, the development of a tailored financial mechanism to support MSC certification is likely necessary to reach sustainability goals.

In the near term, a financial mechanism could provide debt financing to fisheries to undergo MSC assessment and grant funding to provide long-term support for FIPs. In the longer term, it could serve as a platform to demonstrate the return on investment of certification, particularly in developing countries.

Revolving certification fund

One potential financing structure is a revolving certification fund that sustainability-minded retailers and traders could individually or collectively invest some portion of their FIP/MSC budgets into. This could be cost-neutral for industry if grant funds earmarked for MSC certification were diverted into the fund (to be on-lent to the fishery for which the funds were intended), or if a retailer diverted their entire fisheries budget (effectively outsourcing their sustainability funding to professionals).

The fund would consider fisheries investments in a long-term, systematic way, considering both commercial returns and broader sustainability goals, while testing different investment

hypotheses and supporting institutions at all levels to access certification. Grant funds could be used for investments at the FIP stage which are unlikely to yield a commercial return but are necessary for the fisheries to obtain certification (e.g. research and general fisheries management), while the debt funds would be deployed to cover costs of MSC assessments. Depending on its capitalization model, rates charged by the fund could be concessionary or market-based. Partner NGOs could take a first loss position to attract investors, while philanthropies (with PRI) could be recruited to fully capitalize the vehicle.

The fund should be managed independently and staffed with professionals with experience in investment and fisheries. Dedicated board seats for investors would safeguard their institutions. This structure will ensure rigorous assessment of each new loan to prospective certification holders, focusing on all potential risk elements, such as governance, internal management, and capacity to manage the certification process. Additionally, arrangements can be established with third-party certifiers to flag other risks, such as slow or delayed certification, to ensure that only fisheries with strong potential enter full assessment and incur the associated costs.

Ultimately, the development of this fund would send a strong signal to the market and could help prove the commercial viability of certification and the financial returns to certified fisheries both from market access and increased profitability.

Annex A: Cash Flow Overview for MSC Certification Indonesia

Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
AP2HI Operating Revenues	67,962	70,885	73,808	76,731	79,654	80,654	81,654	82,654	83,654	83,654	83,654	83,654	83,654	83,654	83,654
AP2HI Operating Expenses	(158,692)	(166,627)	(174,958)	(183,706)	(192,891)	(202,536)	(212,663)	(223,296)	(234,461)	(246,184)	(258,493)	(271,418)	(284,989)	(299,238)	(314,200)
AP2HI Net Operating Cash Flow	(90,731)	(95,742)	(101,151)	(106,975)	(113,238)	(121,882)	(131,009)	(140,642)	(150,807)	(162,530)	(174,839)	(187,764)	(201,335)	(215,584)	(230,546)
MSC-Related Revenues	145,000	315,578	631,155	946,733	946,733	946,733	946,733	946,733	946,733	946,733	946,733	946,733	946,733	946,733	946,733
MSC-Related Expenses	(256,000)	(230,800)	(242,340)	(254,457)	(267,180)	(480,539)	(294,566)	(309,294)	(324,759)	(340,997)	(558,047)	(375,949)	(394,746)	(414,484)	(435,208)
Net MSC-Related Cash Flow	(111,000)	84,778	388,815	692,276	679,553	466,194	652,167	637,438	621,974	605,736	388,686	570,784	551,986	532,249	511,525
Tax expense	-	-	86,299	175,590	169,895	103,293	156,347	149,039	141,350	132,962	64,154	114,906	105,195	94,999	84,294
Total AP2HI Net Cash Flow After Tax	(201,731)	(10,965)	201,365	409,710	396,421	241,018	364,810	347,757	329,817	310,244	149,693	268,114	245,456	221,665	196,685
Net Borrowing	551,182	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net Repayment	(134,868)	(147,129)	(147,129)	(147,129)	(147,129)	(12,261)	-	-	-	-	-	-	-	-	-
Total AP2HI Net Cash Flow After Financing	214,583	(158,094)	54,236	262,581	249,292	228,757	364,810	347,757	329,817	310,244	149,693	268,114	245,456	221,665	196,685
AP2HI Members	30	32	34	36	38	39	40	41	42	42	42	42	42	42	42
AP2HI Members Participating in MSC	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
Annual MSC Tons: HL-YFT	-	1,742	3,484	5,227	5,227	5,227	5,227	5,227	5,227	5,227	5,227	5,227	5,227	5,227	5,227
Annual MSC Tons: PL-YFT	-	2,352	4,705	7,057	7,057	7,057	7,057	7,057	7,057	7,057	7,057	7,057	7,057	7,057	7,057
Annual MSC Tons: PL-SKJ	-	4,683	9,365	14,048	14,048	14,048	14,048	14,048	14,048	14,048	14,048	14,048	14,048	14,048	14,048
IRR	79%														



The Philippines

Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
MSC-Related Revenues	-	210,000	252,000	294,000	315,000	315,000	315,000	315,000	315,000	315,000	315,000	315,000	315,000	315,000	315,000
MSC-Related Expenses	(100,000)	(140,400)	(143,208)	(146,072)	(148,994)	(251,973)	(155,013)	(158,113)	(161,275)	(164,501)	(267,791)	(171,147)	(174,570)	(178,061)	(181,622)
Net MSC-Related Cash Flow	(100,000)	69,600	108,792	147,928	166,006	63,027	159,987	156,887	153,725	150,499	47,209	143,853	140,430	136,939	133,378
Tax expense	-	20,880	32,638	44,378	49,802	18,908	47,996	47,066	46,117	45,150	14,163	43,156	42,129	41,082	40,013
Total Net Cash Flow After Tax	(100,000)	48,720	76,154	103,549	116,204	44,119	111,991	109,821	107,607	105,349	33,046	100,697	98,301	95,857	93,364
Net Borrowing	154,962	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net Repayment	(37,917)	(41,364)	(41,364)	(41,364)	(41,364)	(3,447)	-	-	-	-	-	-	-	-	-
Total FIP Net Cash Flow After Financing	17,044	7,356	34,790	62,185	74,840	40,672	111,991	109,821	107,607	105,349	33,046	100,697	98,301	95,857	93,364
Annual MSC Tons: HL-YFT	-	2,000	2,400	2,800	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
IRR	72%														



Vietnam

Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
MSC-Related Revenues	-	144,000	216,000	288,000	360,000	432,000	540,000	540,000	540,000	540,000	540,000	540,000	540,000	540,000	540,000
MSC-Related Expenses	(100,000)	(140,000)	(142,800)	(145,656)	(148,569)	(251,541)	(154,571)	(157,663)	(160,816)	(164,032)	(267,313)	(170,659)	(174,072)	(177,554)	(181,105)
Net MSC-Related Cash Flow	(100,000)	4,000	73,200	142,344	211,431	180,459	385,429	382,337	379,184	375,968	272,687	369,341	365,928	362,446	358,895
Tax expense	-	1,200	21,960	42,703	63,429	54,138	115,629	114,701	113,755	112,790	81,806	110,802	109,778	108,734	107,669
Total Net Cash Flow After Tax	(100,000)	2,800	51,240	99,641	148,002	126,322	269,800	267,636	265,429	263,177	190,881	258,539	256,149	253,712	251,227
Net Borrowing	207,547	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net Repayment	(50,784)	(55,401)	(55,401)	(55,401)	(55,401)	(4,617)	-	-	-	-	-	-	-	-	-
Total FIP Net Cash Flow After Financing	56,762	(52,601)	(4,161)	44,240	92,601	121,705	269,800	267,636	265,429	263,177	190,881	258,539	256,149	253,712	251,227
Annual MSC Tons: HL&LL-YFT	-	3,600	5,400	7,200	9,000	10,800	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500
IRR	67%														

Source: Marine Change

Annex B: Traceability Considerations

The US Seafood Import Monitoring Program (SIMP)

The US Government National Marine Fisheries Service (NMFS) and National Ocean and Atmospheric Administration (NOAA) have recently launched their new rule under the Magnuson-Stevens Act that seeks to prohibit the import and trade, in interstate or foreign commerce, of fish taken, possessed, transported or sold in violation of any foreign law or regulation or in contravention of a treaty or a binding conservation measure of an RFMO to which the US is a party.

This final rule establishes permitting, reporting and recordkeeping procedures relating to the importation of certain fish and fish products, identified as being at particular risk of IUU fishing or seafood fraud. The collection of catch and landing documentation will be accomplished through the government-wide International Trade Data System (ITDS) by electronic submission of data through the Automated Commercial Environment (ACE) maintained by the Department of Homeland Security, Customs and Border Protection (DHS).

For the list of species falling under the rule, in the first instance this will cover defined "at risk species" including albacore, bigeye, yellowfin, skipjack and bluefin tunas. For tuna species the date of compliance for the rule that entered into force 9 January 2017 will be 1 January 2018. In regards to in-scope tuna fisheries and especially the imports of fresh/frozen category tuna the following aspects of the rule are important to consider:

- The scheme is a business-to-government reporting scheme, and the reporter responsible for the data collection, its accuracy and correct and timely entry is the import license holder. [NOTE: No flag state or national verification of the data is required, unlike in the EU scheme].
- The record from each harvest event needs to specify total quantity/weight of the product(s), landed/delivered, harvest or landing date, fishing area and species.
- Evidence of authorization to fish (permit or license number) must be provided
- Fishing area can be reported as a national EEZ area classification or using the ISO 2-alpha codes or the major FAO fishing area classification codes for high seas.
- Fishing gear should be specified as categorized by the Competent Authority of the export origin.
- The records need to contain the vessel's unique identification number (UVI) or a national/RMFO registration number.
- For small scale vessels of less than 12 meters in length or less than 20 GT, no vessel details need to be submitted (hence no UVI or registration details are required) but an aggregated harvest report can be compiled for a harvest from a single collection point in a single calendar day, or additionally if small-scale vessels use collector vessels, detailed information of the landing by a vessel to which small-scale vessels landings were made at sea.

- Point of first landing and name of the entity to which the fish was landed or delivered must be provided.
- In its current form no detailed chain of custody related information must be reported by the importer, beyond any information on processing and re-processing and co-mingling of product. This excludes any possible transshipment-related information.⁷⁷
- The importer is required to keep records regarding the chain of custody of the fish or fish product from harvest to point of entry into U.S., and the authorities might audit these.
- Segregation of individual harvest events is not required; mass balance will not be conducted at the time of entry as not all fish from one event may enter the US market.
- The importer must keep the records for two years (digital format accepted).
- For tuna the rule is aligning closely with the Tuna Trading and Verification Scheme and the HTS codes are matched so that the data only need to be entered once.

Other important points to note:

- The data collected will be treated as confidential as it is collected for intelligence and enforcement purposes in order to detect any IUU fish or seafood fraud, before it enters the US market. For this purpose, it will be the responsibility of the importer to enter data in a timely manner to allow for this assessment at the time of entry of product.
- A system of preferential trading partners is being established at the moment that may simplify/speed up some of the procedures.
- It is also anticipated that technological improvements will emerge that will simplify the data collection and entry interphase for the importers leading to time savings and efficiencies in due course (electronic data capture).

Before the implementation begins, it is unclear how effectively the authorities will be able to monitor or review the data entered, the chain of custody data held by the importers, and the data's accuracy. Further, it is unclear how the authorities will act on incomplete, inaccurate or fraudulent information, and what the costs and consequences of the importers and their consequent supply chains will be. Certainly some of the existing databases will need to be upgraded and improved to accommodate the traceability requirements.

Current capacity to meet the requirements

In general, as the rule requires no intervention from harvest origin or flag state government, the system is much more simplified in terms of procedure and preparedness of the import origin than the current EU catch documentation scheme. As each of the countries in the

⁷⁷ It appears from the final rule that transshipments are currently not under the rule but are being considered for addition later on. <https://www.federalregister.gov/documents/2016/12/09/2016-29324/magnuson-stevens-fishery-conservation-and-management-act-seafood-import-monitoring-program>

project scope already has existing trade with EU, many companies should already be accustomed to similar levels of data collection as will be needed for the US rule (i.e. the data points collected are very similar). The current HACCP practices in place also require the one-up and one-down recording of supply chain partners, and the need to report processing and re-processing partners after the point of landing should not provide an additional burden for obtaining the chain of custody related information.

As the US rule data entry requirements are focused on catch-related information and not on chain of custody related information (although records need to be maintained), the first mile (catch to first stage processing) is critical for the catch-related data capture and retention. The simplified “harvest event” provisions for small scale vessels, and no need for vessel registration details for vessels less than 12 meters or 20 GT, make it significantly easier for small-scale fleets to provide catch information as a starting point.

Although influenced by the nuances of the individual company, their technical and administrative capacity and previous trade history with the EU market, the complexity of their supply chain and existing level of data collection and chain of custody records for HACCP, implementation of the new rule does provide some challenges which are discussed in more detail below. These impressions are based on a series of interviews conducted with medium to large Southeast Asian tuna processing/US import companies as well as any prior such information and impressions obtained by the authors that is relevant.

Data capture

The larger size tuna vessels who keep logbooks⁷⁸ (approximately 30 GT and above in some countries but not in others) or even wheelhouse logs should relatively easily be able to provide information on their trips, the catch locations and amounts/species, for the trader/exporter party to record as long as this is clearly requested (some differences in the logbook data and the data requested by the SIMP data may be present). This will require some added human capacity which can be laborious especially if a paper-based system is used to transfer information. Electronic logbooks would speed up the process significantly, as would any verification of the vessel movements such as access to GPS/VMS data e.g. the MDPI tracking system.

For longline vessels, which catch the majority of the volume of the yellowfin, complications for traceability can be caused by transshipments. For domestic vessels that only fish in the national EEZ and return to port for landing this is not such an issue as they should be easily able to recall the area of fishing for the purpose of the SIMP. This is more complicated for international longline fleets that fish in the high seas (both Southeast Asian and distant water nation flagged) and that may transship catches either at sea or in distant ports and then the product is moved to the ASEAN area for processing before export to the US. For example, much product is processed in Vietnam that originates from WCPFC convention

⁷⁸ Logbook submission requirements and coverage rates vary greatly amongst the five countries, but coverage is generally poor except for large industrial scale vessels in PNG and the Philippines; it is however improving in Indonesia and Vietnam under some FIPs, but is not relevant in Thailand with respect to domestic vessels.

area, and other ASEAN countries e.g. Indonesia. Under current record keeping and traceability in place in many of the international distant water fleets there is limited chain of custody of fish on board and the logbook records can be vague in regards to the SIMP details. Almost certainly some of the key data would get omitted at current transshipment events and as product co-mingles. This aspect of traceability is not easily addressed as many of these vessels are flagged to countries other than ASEAN and as large transshipments result in selling product to multiple markets, obtaining the complete paper trail may not be a priority unless the fishing fleet, transshipment and processor/exporter are a vertically integrated operation that specifically targets the US market.

In addition, if and where multiple traders and/or middlemen move the product, it might be difficult to keep the catch records accurate unless the exporters work with specific suppliers to ensure the correct data are collected and maintained. This is especially so where the fish may mingle with other "paperless fish" and mixing may occur.

For small-scale vessels, for which in many countries there is no need for logbooks, it might be challenging to capture the necessary data at the point of landing as many fishers will not keep records, although the system provides for "an aggregated harvest report (that) can be compiled for a harvest from a single collection point in a single calendar day".

For vertically integrated operations with only one or two nodes between catch and export, this can be easier if the first trader/collector is properly informed and trained by the export party to capture this information at the landing site or on the collector vessel. If their supply chains currently are more complex or include ad hoc spot buying practices and many unpredictable players, this will of course get complicated as it is unlikely they will be able easily obtain the necessary data needed for the SIMP.

For the importer the challenge may come, in addition to ensuring harvest and catch data are at hand, from having all the accurate data in place about the processing, re-processing and matching the correct paperwork with the right consignments of products that might be co-mingling with products from other harvest events and supply chains. i.e. compiling a report for a container might require quite a lot of detective work unless the paper trail is well maintained by all nodes of the supply chain. The ability of the different nodes, especially smaller and more informal traders and or processors to maintain this, will vary.

In addition, the interviewees seemed positive towards electronic data capture and traceability solutions; some already have this in operation for part of their supply chains and others are developing internal electronic systems such as Thai Union for very large volumes of fish that they source for processing. Others mentioned that this was interesting for them and that they would be willing to invest in it, but only if they can get some market differentiation (in profile mainly) as a result, as is the case for the Vietnam FIP currently underway.

Figure 35: Roles and responsibilities in collecting and recording SIMP data

Player	Role in SIMP data collection	Ability/challenges
Small-scale fisher	Provide catch information	Limited capacity to report and unlikely to keep accurate records of trips, likely to depend on the first trader to have the knowledge to capture this information.
Collector vessels	Detailed information of the landing by a vessel to which small-scale vessels landings were made at sea	Good capacity to do this - mostly individual large fish in small numbers
Large-scale fisher/captain	Provide catch information	Moderate capacity to report, may have logbooks and VMS records to verify. Might be problematic for distant water long-line fleets that bring transshipped product to ASEAN for processing as chain of custody of fish likely to get interrupted on board transshipments.
Small-scale trader (informal)	Record accurate catch information	May have limited knowledge and understanding of data collection needs and problems with record keeping.
Large trader/aggregator (more formal)	Record accurate catch information	Should have a moderately good understanding of catch documentation and good understanding of record keeping. Product separation and mixing might be problematic especially if no EU experience.
Small processor/exporter	Collect, record and separate accurate catch information (per consignment)	Should have moderate record keeping ability, might have problems with obtaining correct catch information if uses many informal sources of product/does not own fleets. Product separation and mixing might be problematic especially if no EU experience. One up and one down paper trail of products in place.
Large processor/exporter	Collect, record and separate accurate catch information (per consignment)	Should have good record keeping ability, more likely to use select fleets and suppliers so easier to request and capacity build catch documentation ability. Should have ability to deal with product separation. One up and one down paper trail of products in place.
Importer	Collect and timely enter the required catch documentation.	One up and one down paper trail of products in place but will depend on the supply chain providing the accurate paper work and ensure the correct product is passed on with the paper work, will need to make judgments on the ability of the trader/processor companies to do this as will bear responsibility (and fines and financial losses). This may lead into changes in purchasing habits and aggregate customers.

General preparedness

Some of the interviewees seemed to think the ASEAN industry is well prepared, especially if they already had to deal with the EU catch certificates and any complicated HACCP auditing system that requires good record keeping, chain of custody and separation of products (different landing events/vessels are kept separate). As a result, they did not see extra information collection on their catches as a huge additional burden.

Their opinion was that as long as there is a lucrative market, and the US market was seen as paying a higher price for frozen product than for example the EU market, the industry would do what is necessary rather than consider shifting markets.

Many referred to the existing HACCP requirements of reporting and record keeping that already provide the one-up and one-down business traceability system that will ensure the importer can have the requested chain of custody information in regards to the processing information. In practice though, this information is currently in paper format and may take a long time to trace back. Improvements will likely need to be made to make the complete information transfer to the importer more streamlined and complete without delays and errors. A good system of product separation needs to also be in place by the entire supply chain to ensure no product mixing.

Some of the industry contradicted this by saying that especially the smaller ad hoc players within ASEAN who only send 100 to 300 tons annually⁷⁹ (one or two containers every few months) and who as a group make up to 60 percent of the total fresh/frozen tuna export volume will struggle with this level of information required, as they have not necessarily dealt with the EU market and its data needs. They, or their supply chains may not have all the information at hand without additional capacity building and training in regards to filling the data sheets. Different players may also lack the knowledge of their responsibility in maintaining the chain of custody of the product. The catch information and product potentially getting mixed in common store rooms and transport modes will provide a challenge. This was already identified as one of the main bottle necks in a recent MSC CoC study conducted for tuna supply chains in Indonesia (even though CoC per se will not be required in the SIMP).

In addition, it was mentioned that they will not necessarily be aware of the requirements and so far have not had Customs pay attention to them as the regular inspections on food safety are targeted at players with larger volumes. This may lead them into believing that they will not get inspected or that incomplete paper work will get them access to the market.

It also seems likely that smaller and less-established operations in very remote areas such as Eastern Indonesia, some parts of Vietnam or Philippines and who only occasionally send product to suppliers that sell to the US market will encounter problems in collecting and

⁷⁹ One commercial analysis of FDA data for US imports of treated tuna noted that 182 companies, mostly from the four ASEAN countries, were involved in October 2016, and the number continues to increase

recording the SIMP related information. This can be due to incomplete information about the new requirements, as infrequent product flow would make them low priority for the exporters to engage with in the beginning.

In terms of the longline operators interviewed, none claimed to be buying fish from the problematic high seas fleets/transshipments and claimed the fish was all either caught within the EEZ and delivered directly to the port of processing or was transferred on a reefer but from a controlled EEZ fishery elsewhere such as the WCPFC Convention Area. They also gave assurance that it would not be a problem to obtain the necessary paper work from these vessels/supply chains. It should be noted however that unregulated high seas longline fisheries and associated transshipments are one of the most notorious for IUU fishing and exactly the type of fishery targeted by the SIMP rule. Hence it can be expected that some of this product will move away from the US market due to the difficulty of meeting the requirements, as perhaps intended.⁸⁰

For vessels that land in major ports it is also possible that different price scales will emerge for fish with the correct paper work and fish without, as has been the case with the EU catch certificates in ports such as General Santos, Philippines.

⁸⁰ http://www.fisheries.noaa.gov/ia/iuu/msra_page/2015noaareptcongress.pdf

Figure 36: Summary comparison of traceability key data elements across multiple standards

POINT OF CATCH	WWF standards in development ^{iv}	US requirements	EU requirements
Scientific name (species)	✓	✓	✓
Common market name		✓	
ASFIS # or product code		✓	
Estimated weight			
Verified weight/volume (quantity)	✓	✓	✓
Location of catch	✓	✓	
Catch description			✓
Date of departure			
Date & time of catch	✓	Date only	
Date of landing			
Type of gear/method	✓	✓	✓
Name of fisher(s)			
Name of captain/master			✓
Nationality(ies) of fishers/crew			
Company name		✓	
Fishing vessel owner name			✓
Address & contacts		✓	✓
Name of vessel	✓	✓	✓
Unique vessel id/registration #	✓	✓	✓
VMS unit #			✓
Vessel type/ tonnage			✓
Fishing license #	✓	✓	✓
Flag state of vessel	✓	✓	✓
Date, time, location of trans-shipment	✓	✓	

Source: Marine Change research

Annex C: Financing Frameworks Considered in Phase I

In order to understand how to re-direct capital flows or attract new capital to finance the transition to sustainable production, it is necessary to outline the key barriers to such a transition, drawing on the field research and analysis above. This will enable key areas of further research to be developed around specific business cases for action and identification of key actors to engage around this business case. While not an exhaustive list, some key barriers to sustainability are as follows:

Barrier 1: small-scale fisheries are often locked in a cycle of overfishing, low or negligible profit margins and cycles of debt.

Barrier 2: lack of differentiation in the supply chain between sustainable and non-sustainable products leading to a need for increased certification and traceability

Barrier 3: lack of differentiation in the commercial finance sector between sustainable and non-sustainable opportunities, leading to a need for more robust due diligence/guidelines

Barrier 4: overcapacity in the catching sector and processing sector

Business cases for transition and potential intervention points for investment in the transition in the supply chains of skipjack and yellowfin are presented below. Note these are preliminary ideas and discussion points and will be refined further in the second phase of the study, following the FGD.

Nearly everyone in industry we spoke to about sustainability mentioned the problem of overcapacity in both fishing and processing. It therefore follows that financing to expand capacity in either of these areas runs counter to sustainability.

Fair Trade and access to finance for small-scale fishers

- Barrier to sustainability: Small-scale fishers are often poor, have little access to credit or banking services, and little incentive for environmental stewardship
- Intervention: Fair Trade certification increases incomes for artisanal fishers who receive a premium for qualified fish. In return the fishers agree to abide by regulations and environmental standards that tighten over time
- Business case: supply of Fair Trade certified tuna is outstripped by demand

Small-scale fishers in the context of this study include mostly handline fishers in Indonesia and Philippines operating vessels below 5 or 10 GT. Many of these fishers are food insecure, have few bankable assets, and rarely have access to formal credit or even basic consumer banking services. When credit is available, it is at very high rates via local moneylenders or middlemen who provide pre-financing (i.e. bait and fuel) for fishing trips. While these informal sources of finance play an important role in communities, the loan terms can make it difficult for borrowers/fishers to ever get out of debt. This insecurity can lead small-scale fishers to increase catch effort.

In 2014 in North Maluku province, Indonesia, the yellowfin handline fishery became the world's first wild-capture fishery certified Fair Trade.⁸¹ This brings direct benefits to fishers as they are paid a premium for certified product. Part of this premium goes straight into their pocket, while a portion goes into a community fund. In concert with MDPI, a local NGO, and USAID, one financing framework being explored is to invest the community fund in a peer-to-peer microfinance institution (MFI). This is expected to expand access to credit in the fishers' communities while providing a return on investment that will enhance financial security for fishers and their families. Another framework under consideration is value chain finance, in which input suppliers receive commercial bank loans to on-lend to individual borrowers (i.e. farmers or fishers) who then repay these loans post-harvest. This scheme is currently in place in agriculture, but perhaps could be adapted to fisheries.

Fair Trade's primary focus is empowerment and economic development, working to address some of the most pressing needs of small-scale fishers; environmental sustainability is a longer-term goal of the program. The theory of change underpinning Fair Trade is that sustainability cannot be achieved without first addressing livelihoods and economic hardship.⁸²

Compared to MSC certification, which can be price prohibitive for artisanal fisheries, Fair Trade provides a direct, immediate incentive for small-scale fishers by increasing their incomes. In return, fishers must agree to obey local, national, and international laws, as well as the FAO Voluntary Guidelines for Sustainable Small-Scale Fisheries. Additional traceability and sustainability milestones must be met over a six-year period, after which a fishery is fully certified. Achieving Fair Trade certification is less onerous, less expensive, and less comprehensive than MSC, but as people in these fishing communities are often poorly educated and financially insecure, a stepwise approach such as this might be the most effective way to change behavior.

An increase in sale price could increase catch effort and put additional pressure on fish stocks, but these communities are generally considered too small to have a major impact on stocks such as yellowfin or skipjack. Once sustainability improvements are made and enough fishers are in the program to justify the costs, then obtaining MSC certification could be a viable option as it allows this fish to be traded across a broader base.

Incentivizing sustainability via commercial banks

Based on our conversations with actors from across the industry, commercial banks primarily interact only with owners of mid-sized and large-scale vessels, traders, and processors. Financing is based purely on commercial considerations, i.e. collateral and cash flows.

⁸¹ Fair Trade USA website.

⁸² Meghan E. Borland, A tale of two standards: A case study of the Fair Trade certified Maluku handline yellowfin tuna (*Thunnus albacares*) fishery.

Mid-sized vessels

Mid-sized vessels in the context of this report include the handline mother ships operating out of General Santos, Philippines; the longliners and converted handliners operating in Vietnamese waters; and pole-and-line vessels operating in Indonesia. These vessels typically range from 10 to 30 GT. Financing from commercial banks is limited for these vessels unless the owner has additional assets with which to secure the loan.

Large-scale vessels

Large-scale vessels refer to purse seine and longline vessels operating in PNG and elsewhere in the WCPO that export their fish to processors in Thailand, Philippines, Vietnam, and Indonesia, among others. The vessels comprise the distant water fleets of nations such as Taiwan, South Korea, Japan, China, the US, and the Philippines and are typically owned by large (sometimes diversified and/or vertically integrated) corporations. These vessels are greater than 30 GT, but often over 100 GT.

Access to financing for such vessels varies. Some banks in China and Taiwan (and the Philippines to a lesser extent) are reportedly willing to finance vessel construction and/or purchase, while banks in the US are not. This does not mean US vessel owners do not have access to finance; rather they must approach banks in the countries mentioned above.

One interviewee at a large Filipino fishing company indicated his company has purchased vessels in the past using a bank line of credit from a Filipino bank – clearly a company must be large to be able to do such a thing and presumably has little problem accessing finance. Indeed, this same company was able to finance vessel construction in Taiwan by entering into a JV with a Taiwanese firm.

Big 3 traders

As of the writing of this report, we have interviewed industry actors associated with two of the Big 3 international traders. The traders also have interests in and associations with larger-scale vessels discussed above. As large multinational corporations, the Big 3 have ready access to both long-term financing and lines of credit, though they reportedly make use of the latter much more frequently. As with the standalone processors, the traders have mismatches in cash flows, e.g. when they provide fuel and bait to a large purse seiner prior to a trip and are not paid until the catch is sold. The traders also have processing interests, so they face similar cash flow constraints (see processors below).

When trading, they often have longstanding relationships with both their suppliers and buyers. In these instances trade finance is unnecessary. In some circumstances, however, trade financing is utilized.

Processors

Due to their relatively stable operations and fixed assets that can be used as collateral, established processors reportedly have access to both long-term debt and lines of credit from commercial banks in each of the countries in this study. Due to the fragmented nature of processing versus the relative market power of the traders and buyers (especially for

skipjack), processors reported terms of trade in which they must pay for raw material on delivery and wait up to 90 days for payment after delivery of finished goods.

As with the Big 3, processors usually have relationships with their suppliers and customers, but make use of trade finance in some circumstances.

Incentivizing sustainability

There are two frameworks we propose to explore further: the implementation of minimum sustainability guidelines when underwriting corporate debt, and trade financing at preferential rates via a Sustainable Shipment Letter of Credit.

Sustainability guidelines for commercial loans

- Barrier to sustainability: banks lend solely based on commercial considerations, and irresponsible but profitable industry actors can be rewarded with access to credit
- Intervention: introduce sustainability guidelines for underwriting of commercial loans, such as those promoted by IFC, Rabobank, and ISSF
- Business case: access to capital from IFC; brand enhancement and risk mitigation for banks due to avoidance of funding unethical practices

IFC has relationships, often debt or equity investments, with commercial banks located in each of the five countries in this study. In order to receive investment from IFC, banks must agree to abide by a detailed set of guidelines laid out in the IFC Performance Standards (PS) on Environmental and Social Sustainability. The standards are as follows:

- PS 1: Assessment and Management of Environmental and Social Risks and Impacts
- PS 2: Labor and Working Conditions
- PS 3: Resource Efficiency and Pollution Prevention
- PS 4: Community Health, Safety, and Security
- PS 5: Land Acquisition and Involuntary Resettlement
- PS 6: Biodiversity Conservation and Sustainable Management of Natural Resources
- PS 7: Indigenous Peoples
- PS 8: Cultural Heritage

Prior to any debt or equity investment, an environmental and social action plan (ESAP) must put into place based on the above PS. The investee bank must abide by these guidelines for every loan it makes, regularly monitor its loans against the ESAP, and review the ESAP on an annual basis. In return, investee banks receive access to capital.

For commercial banks in the countries in the scope of this study, the IFC has made the following investments:

- Bank Danamon (Indonesia): US\$75 million in debt to finance small and medium enterprises (SMEs); US\$75 million in debt to finance development of Islamic trade finance
- BTPN (Indonesia): US\$100 million in debt to finance micro-enterprises and SMEs
- BSP (PNG): 10 percent equity stake
- TMB (Thailand): US\$100 million in debt to finance SMEs
- Vietinbank (Vietnam): 10 percent equity stake
- TPBank (Vietnam): 5 percent equity stake
- ABBank (Vietnam): US\$150 million in senior debt to finance SMEs
- VIC (Vietnam): US\$200 million in senior debt to finance SMEs
- VPBank (Vietnam): US\$57 million convertible loan to finance SMEs

In the next phase of this study we propose to determine the activity of these banks in the fisheries sector, and how the IFC sustainability guidelines could garner wider adoption among commercial banks.

Other standards will be explored as well, including those set out by Rabobank and the International Seafood Sustainability Foundation (ISSF).

Sustainability incentives for trade finance

- Barrier to sustainability: banks issue trade finance solely based on commercial considerations, and irresponsible but profitable industry actors can be rewarded with access to export markets
- Intervention: introduce Sustainable Shipment Letter of Credit (or other similar scheme currently under development) for certified sustainable products
- Business case: reduction in cost of trade finance for certified sustainable products compared to non-certified goods; brand enhancement and risk mitigation for banks due to avoidance of enabling unethical practices

To incentivize sustainable production in the palm oil sector, a working group of banks, importers, traders and industry bodies (including WWF) developed a Sustainable Shipment Letter of Credit (SSLC). This approach, with the support of IFC, enables banks to reduce the cost of exporting certified sustainable palm oil. IFC is able to reduce the cost of a letter of credit through its Global Trade Finance Program (GTFP), which banks use to offload risk and benefit from the IFC's AAA-rated credit rating. Less risk equals price reductions for clients choosing to trade sustainably certified palm oil.

Apart from debt financing, tuna processors and the Big 3 traders indicated they make use of trade finance for some transactions. The lower rates associated with sustainable trade finance could incentivize these companies to trade in fish with improved sustainability profiles.

For the countries in this study, the following institutions act as issuing banks in the GTFP:

- Bank Danamon (Indonesia)

- BSP (PNG)
- PBB (Philippines)
- TMB (Thailand)
- Vietinbank (Vietnam)
- TPBank (Vietnam)
- ABBank (Vietnam)
- VIC (Vietnam)
- VPBank (Vietnam)

In the next phase of the study we propose to further explore the applicability of the SSLC to the tuna industry. One obvious question that arises is what standard(s) will be acceptable for sustainability certification. Another is whether the volumes of certified products are sufficient for such a program to make sense. Finally, it is unclear whether such a scheme would be welcomed by industry and whether it would actually change incentives in practice.

The SSLC is the first sustainable trade finance product to have launched, and more schemes are reportedly in development. Part of the next phase will be to determine whether other trade finance frameworks are suited to the tuna industry.

Corporate sustainability bonds for consumer/retail brands

- Barrier to sustainability: MSC certification is expensive, not guaranteed, and its costs are front-loaded, therefore commercial banks are unwilling to lend for certification
- Intervention: issuance of sustainability bond to provide debt financing for certification of fisheries demonstrating a clear business case; issuer could be a retailer, certification body, or another actor along the supply chain
- Business case: brand enhancement for issuer and MSC; all else equal, the market prefers investments with positive environmental impact and debt will be priced accordingly; increased market access for certification holders

In 2016, Starbucks raised US\$500 million in debt financing with a “corporate sustainability bond”. The proceeds are being used to purchase coffee certified against the Coffee and Farmer Equity (CAFE) standards, environmental and social standards for its coffee growers. The funds are also being used for the provision of US\$50 million in loans to coffee growers to help them meet the standards. In 2017 the company raised a further US\$736 million with a second corporate sustainability bond denominated in Japanese Yen.

Along the same lines, the Climate Bonds Initiative, an NGO specializing in the issuance of retail bonds focused on low-carbon investment, has begun developing standards for investments in fisheries. The argument for the issuance of these bonds is that all else equal, the market prefers investments with a positive environmental impact.

In the next phase of the study we propose to explore whether and how sustainability bonds could apply to the tuna industry. Though on a much smaller scale, possible examples include a bond to promote pole-and-line skipjack/handline yellowfin fisheries attaining MSC certification. Examples of bond issuers could include a retailer such as Whole Foods, a certification body such as MSC, or other industry actors. Proceeds could be used for loans to fund certification costs for fisheries able to demonstrate a business case for external financing.

Comprehensive FIPs / industry associations as platforms for collaboration on sustainability

- Barrier to sustainability: tragedy of the commons; MSC certification is expensive and its costs are front-loaded, therefore it is often cost prohibitive and/or not profitable for individual actors
- Intervention: competitors join an industry association or comprehensive FIP to introduce sustainability guidelines and eventually pursue MSC certification; analysis of return on investment for MSC certification should be a key component of FIP structuring
- Business case: increased market access with FIP/MSC; avoidance of stock depletion and loss of future profits

Industry associations and comprehensive FIP initiatives (i.e. those that specifically pursue MSC certification) can be important mechanisms to bring sustainability practices to a fishery. They can be a platform to engage a large number of actors and effectively implement sustainability practices and improved data collection throughout the value chain. These industry frameworks can act as a conduit for third party certification and allow costs of a certification to be spread across multiple actors. Just as important, industry frameworks can provide the scale necessary for outside investors to positively influence the fishery. Finally, frameworks set the stage for NGO partners to increase demand for sustainable seafood.

Apart from industry associations and FIP initiatives themselves, one framework for bringing industry together is Seafood Savers, a WWF initiative that facilitates implementation of FIPs and allows member companies to use an interim, off-product ecolabel. Those who join Seafood Savers must commit to pursue MSC certification.

The following FIPs are currently underway in the geographies/species relevant to this report:

Indonesia: handline yellowfin and pole-and-line skipjack via industry association

This FIP was spearheaded by an industry association, the Indonesian Pole-and-line and Handline Fisheries Association (Asosiasi Perikanan Pole & Line dan Handline Indonesia, or AP2HI). AP2HI is an industry group of pole and line and handline fishing, trading, and processing companies organized with the expressed purpose of promoting sustainability

and achieving MSC certification. AP2HI is an alliance of tuna fishing and processing companies in Indonesia whose mission is to represent the various industry actors to government and market partners, coordinate business activities of fishers and processors, and drive innovation in transparency and traceability of catch and chain of custody. The association's current focus is the implementation of a FIP and working toward MSC certification. Its funding sources include membership fees and grants from philanthropic and bilateral organizations.

In the three years since its launch, AP2HI has expanded its membership to 24 member companies in Indonesia, which together represent over 35,000 tons of tuna from almost 1,000 vessels throughout the country. These companies adhere to a code of conduct that has been developed to align with the Food and Agriculture Organization of the United Nations (FAO), Regional Fisheries Management Organizations (RFMOs) and national guidance and regulations. The code of conduct covers improving record-keeping of fishing vessel, certifications and licenses; prevention from catching sharks, sea turtles, dolphins and sea birds; avoidance of threatened species such as bigeye tuna; and prohibition on fish from irresponsible fishing practices or IUU fishing.

Although pole-and-line and handline fishing has always been present in Indonesia's fisheries sector, the industry appears to have shifted toward increased use of these gear types. Both catch methods receive a 10 percent price premium in the market for sustainability. However, it is estimated that only 10 to 20 percent of Indonesian pole-and-line tuna reaches the market labeled and eligible to receive the price premium.

Working with AP2HI, we have developed a financial model to demonstrate the cost effectiveness of MSC certification with AP2HI as the certificate holder. That is, given the upfront costs of certification (approximately US\$150,000 for full assessment and for reassessment every five years) plus ongoing administrative and recertification costs (approximately US\$70,000 annually for compliance, management, and evaluation in the first five years, and US\$50,000 annually thereafter), how many member companies must take part in the scheme and how many tons of fish must be certified each year and at what price for the venture to be financially viable.

Given baseline assumptions over multiple scenarios, this financial model demonstrates the timing at which annual cash flows could turn positive, the payback period for the initial investment, and the return on investment over a set timeline. This analysis could be presented to a lender (unlikely a commercial bank) to illustrate the ability to repay a loan to fund third-party certification such as MSC and make the financial case for using external financing. See below for examples of this analysis:

Figure B1: Example annual net cash flow in MSC scenarios

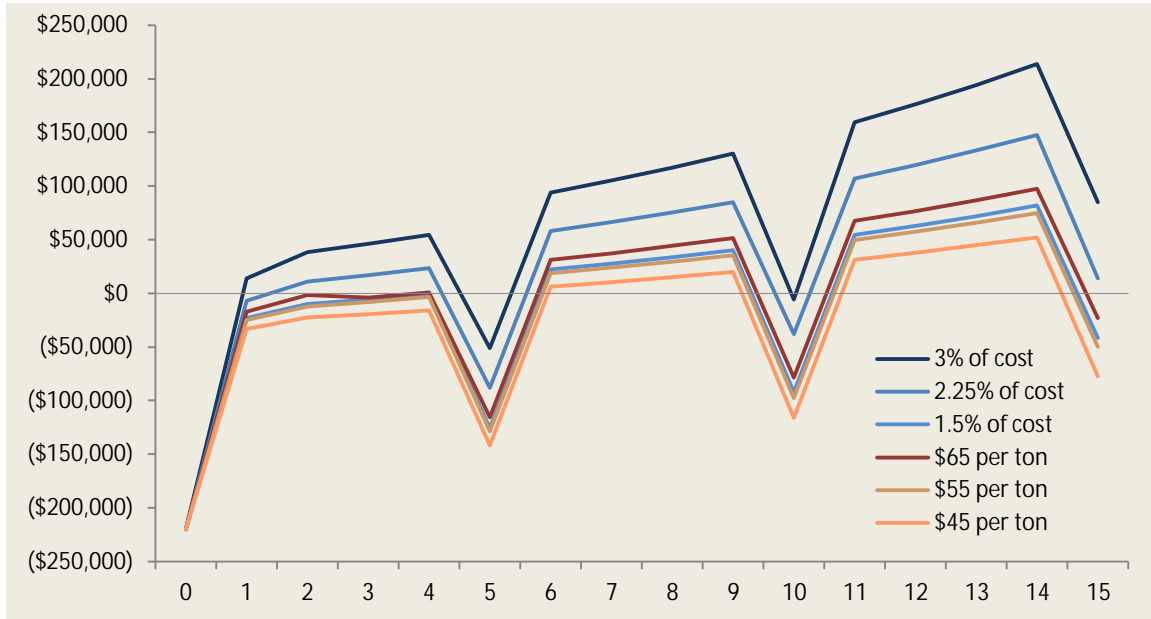
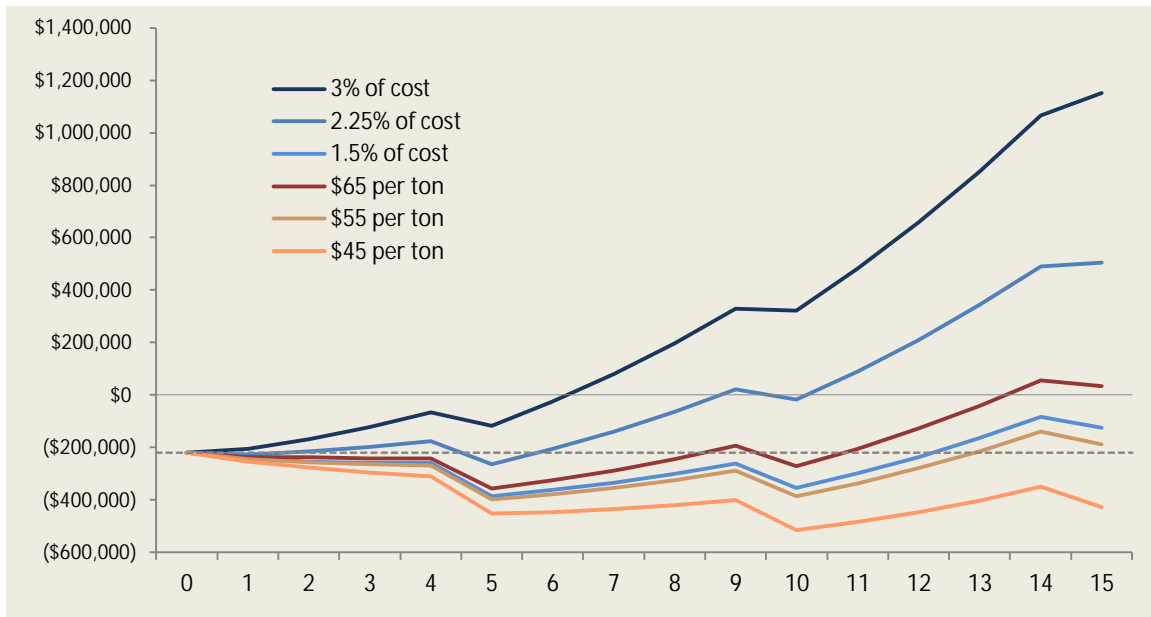


Figure B2: Example cash balance in MSC scenarios



Source: Marine Change

When establishing and structuring a FIP, it is essential to conduct this analysis and consider how certification will be funded as early in the process as possible.

Indonesia: longline yellowfin (primarily) in Indian Ocean via NGO and industry consortium

This FIP was initiated in 2012 by an American NGO, SFP, and is focused primarily on traceability. Participants include one company that owns 28 longline vessels (representing

10 percent of the overall fleet), and six distribution companies. No activity has been posted on the official FIP website since 2015 and current status is unknown.⁸³

Indonesia: handline yellowfin and pole-and-line skipjack via NGO and individual processors

WWF Indonesia has initiated three FIPs in East Indonesia over the past several years, and intends to enter each of these FIPs into full MSC assessment within the next three to five years. Each FIP has been launched with the partnership of one processing company.

Considering the relatively small volumes covered by each of these FIPs, this could be a useful case study regarding the number of fishers and processors that would be required for MSC certification to be profitable. We propose to undertake this analysis in the next phase of this study.

Philippines: handline yellowfin in Mindoro Strait and Lagonoy Gulf via NGO and small-scale vessels

WWF Philippines is working closely with two handline yellowfin FIPs in the Mindoro Strait and Lagonoy Gulf. These FIPs were established in 2013, with traceability (VMS) as a primary goal, plus access to credit, market access, and quality improvements also part of the project. This project comprises approximately 1,500 fishers and annual catch of approximately 4,000 tons.

Given the socio-economic circumstances of the fishers in this program, this could be a good fit for Fair Trade certification coupled with savings and access to credit via an MFI, as well as analysis regarding the number of fishers and fishers' cooperatives that would be required for MSC certification to be profitable. We propose to undertake these analyses in the next phase of this study.

Vietnam: handline and longline yellowfin, medium-scale vessels

WWF Coral Triangle launched a FIP in 2014 to improve traceability and sustainability in Vietnamese handline and longline yellowfin fisheries. Founded and managed alongside the Vietnam Tuna Association (Vinatuna), a local NGO, the FIP includes approximately 2,000 vessels and an estimated 18,000 tons of annual yellowfin catch.⁸⁴

The FIP is prototyping the application of Fit as FIP⁸⁵ traceability to ensure that Vietnam yellowfin tuna is differentiated in the marketplace. This requirement is particularly important in Vietnam where export volume exceeds domestic catch and over half of total exports (i.e. frozen yellowfin steak and loins) use foreign raw material that is re-exported.

⁸³ <http://fisheriesimprovementindonesia.org/longline-indian-ocean/longline-tuna-pt-intimas-surya/>

⁸⁴ Based on WWF Coral Triangle website and interviews with WWF officials.

⁸⁵ Name given to the traceability scheme, well designed to ensure product traceability meets requirements

FIP Partners are required to have a traceability system in place within one year of signing their Agreement, and for this system to be audited by an independent 3rd party within 18 months. These measures will help ensure unqualified products do not dilute the marketplace with inappropriate FIP fish i.e. "green washing". We interviewed Keith Symington, FIP coordinator, and he indicated the traceability introduced under the program would meet the new US requirements.

Current FIP partners in good standing include the following distributors:

- Anova Food USA
- Coral Sea Fishing (Queensland, Australia)
- Culimer BV (Netherlands, China, Vietnam, Dubai)
- Norpac Fisheries Export (US)
- Sea Delight LLC (US)
- Simplot Australia
- Western United Fish Company (US)
- Hilo Fish (US)
- Lotus Seafood (US)

Under the current agreement, each FIP partner pays a fixed annual fee of US\$8,000 to participate in the program. These fees cover only about 20 percent of the operating budget of the FIP, with the balance supported by grant funding. In an attempt to raise additional funds and make the system fairer, there are discussions among the FIP partners to change the payment procedures. The most likely scenario will be a fee per kilogram for FIP-qualifying fish, though this fee will likely be low (US\$0.02 per kilogram) and not increase cash flows.

Several Vietnamese processors have made a commitment to adopt of the FIP traceability system and provide FIP-eligible products to the FIP partners. The list of participating processors includes:

- Hai Vuong
- Ben Vung - Sustainable Seafood Company (SSC)
- Tin Thinh
- BIDIFISCO
- Hong Ngoc TPE
- Ba Hai
- Mai Tin (Evertrust)
- Amanda
- Amasea
- Thinh Hung
- Hai Nam

The processors have not yet been willing to financially support the FIP; as Vietnamese law does not mandate the traceability requirements and there are few perceived benefits of FIP cooperation.

In the next phase of the study we propose to build a financial model for this FIP to help the FIP partners systematically assess the financial viability of the program in its current state and inform their decisions regarding future investment in the program.

Special Purpose Vehicle to support third-party certification

- Barrier to sustainability: MSC certification is expensive and its costs are front-loaded, therefore commercial banks are unwilling to lend for certification
- Intervention: establishment of SPV to provide debt financing for certification of fisheries demonstrating a clear business case; investors could include the certifying body, partner NGOs, and philanthropies
- Business case: brand enhancement and increased market share for MSC; proof of concept for debt funding of certification; mutually agreed targets and skin in the game; increased market access for certification holders

Considering the substantial upfront and recurring costs of certification such as MSC, a fishery may not generate positive cash flows consistently until several years post-certification (we have termed this “the seven-year hump”). As commercial banks are unlikely to be willing to finance a venture with this cash flow profile, the development of a tailored financial mechanism to support third-party certification can be an attractive strategy to reach short- and medium-term sustainability goals. In the short-term, this financial mechanism can provide debt financing to fisheries to undergo assessment. In the medium-term, this mechanism can serve as a platform to demonstrate the return on investment of certification, particularly in developing countries (see Annex A: Cash Flow Overview for MSC Certification).

One potential structure is to establish a Special Purpose Vehicle (SPV) for a Certification Fund. Investors could include the certifying body (e.g. MSC) and partner NGOs, and the pipeline of potential fisheries seeking certification would determine fund size. The SPV would have its own governance structure, with dedicated board seats for investors to ensure there is no reputational risk to their institutions. Depending on the structure of the fund, the SPV could have a pre-determined lifetime, or be open ended. Under this structure, investors could appoint an external party to manage the SPV.

Philanthropic investors and companies with strong commitments to certification can also be recruited to fully capitalize the vehicle. The selection of partners with different expertise to join the SPV would strengthen the fund’s abilities and be beneficial for both the fisheries and SPV partners.

Furthermore, the development of a dedicated financial mechanism sends a strong signal to the market, indicating the financial viability of certification and improving its credibility among other funds and stakeholders.

Creating this fund would allow for testing of different investment hypotheses and support institutions at all levels to access certification. This debt fund would complement current

grant funds available (e.g. MSC's Global Fisheries Sustainability Fund). Grant funds could be used for investments unlikely to yield a commercial return but necessary for the fisheries to obtain certification (e.g. research and general fisheries management), while debt funding can be deployed to cover costs of assessments.

The key risks of this structure are related to the performance of the investments financed by the SPV. Inherent risks of the transactions can include:

- Fund recipient does not pass certification assessment
- Price premiums anticipated as part of the certification are not realized within the investment period or are below projections at the time of the investment
- Market shocks disrupt projected market prices assumed for the duration of the investment
- Fund recipients seize operations as a result of operational issues unrelated to the certification
- Management issues, or other policy decisions in the fishery cause the suspension of the certification during the investment period
- Improvement costs are higher than anticipated and threaten the possibility of re-certification
- Market demand for certified sustainable seafood is slower than anticipated

The fund's procedures can be structured to mitigate several of the risks outlined above. For example, market outreach can be done during investment due diligence to mitigate price fluctuations and off-taker risks by brokering long-term off-taker agreements prior to investment. These arrangements will in turn increase the chances of successful loan repayment and enhance the certification's brand.

The SPV should be managed by an external fund manager and staffed with professionals with strong experience in investment and fisheries. This will ensure a strong assessment of each new loan to prospective certification holders, focusing on all potential risk elements, such as governance, internal management and capacity to manage the certification process.

Additionally, arrangements can be established with third-party certifiers to flag other risks, such as slow or delayed certification, to ensure that only fisheries with strong potential enter full assessment and incur the associated costs.

Depending on its capitalization model, rates charged by the fund could be concessionary or market-based. Further analysis, particularly on the demand side, would be required to ascertain the return assumptions. To attract other investors into the fund, the certifying body or partner NGOs could take a first loss position.

This financial mechanism could demonstrate that certification can be financially viable and outline the financial returns to certified fisheries both from market access and increased profitability.