

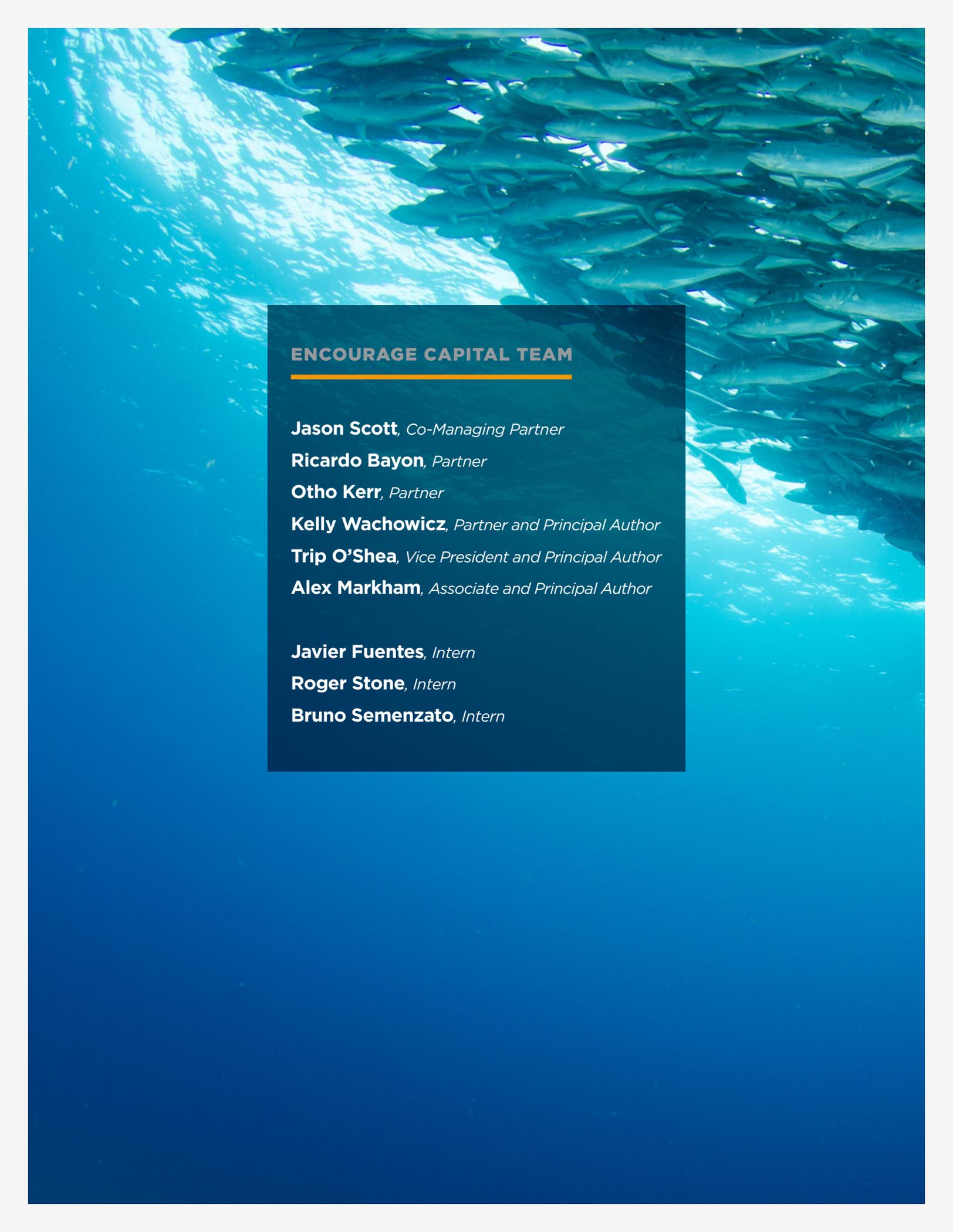


INVESTING  
FOR  
**SUSTAINABLE  
GLOBAL FISHERIES**

With support from:  
Bloomberg Philanthropies'  
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The Rockefeller Foundation

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**EXECUTIVE  
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**INVESTING FOR  
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## INTRODUCTION

The earth's oceans have been a source of sustenance and wonder to humankind since the dawn of time, supporting coastal populations for millennia and perhaps even playing a role in human evolutionary development.<sup>1,2</sup> To this day, our reliance on marine resources remains profound. Seafood currently provides 17% of daily animal protein consumed globally, yet fish stocks worldwide are imperiled, threatening marine ecosystems, global food security, and the economic livelihoods of millions of fishers. In fact, only 8.5% of global landings are in fisheries certified as sustainable,<sup>3</sup> while 40% of fisheries are considered to be overexploited or collapsed.<sup>4</sup> Impact investors can play a role in saving these fisheries.

Research suggests that impact-focused investors have approximately \$5.6 billion<sup>5</sup> in capital to deploy over the next five years and have the means to dramatically reshape the world's "blue economy." To better channel the flow of this capital to the need and opportunity of restoring global fisheries, Bloomberg Philanthropies' Vibrant Oceans Initiative and The Rockefeller Foundation supported Encourage Capital (Encourage) to undertake research and publish this report, *Investing for Sustainable Global Fisheries*, which includes six Investment Blueprints, each intended to serve as a roadmap for the growing number of investors, entrepreneurs, and fishery stakeholders seeking to attract and deploy private capital to scale and accelerate fisheries reform. Bloomberg Philanthropies' Vibrant Oceans Initiative simultaneously funded Oceana and Rare to implement policy and community stewardship programs, respectively, in Chile, Brazil, and the Philippines as part of a strategy to simultaneously reform industrial and small-scale fisheries and attract capital to catalyze and sustain these efforts. Encourage Capital's Investment Blueprints are designed to create a roadmap for private capital to further accelerate and scale success in each Vibrant Oceans country.

This publication is an Executive Summary of *Investing for Sustainable Global Fisheries*. This summary provides a brief overview of the work that was undertaken, a description of each Investment Blueprint, and some of the critical findings from the work. At the heart of each Investment Blueprint lies a proposed set of fishery management improvements and profitable investments that seek to have positive ecological and social impacts. On the ecological side, the goals are to maintain or restore fish stocks, reduce bycatch of non-target species, and protect and restore marine habitat. On the social side, the goals are to improve fisher livelihoods, empower local communities, and contribute to local and regional food security. We hope that this summary — and, the full report — offer practical and useful strategies for all stakeholders in the blue economy, including investors, entrepreneurs, NGOs, governments, and fishers. If these strategies prove successful in delivering financial and impact returns, we believe they could unlock larger pools of private capital for marine conservation to protect marine fisheries as a source of food, income, and inspiration for generations to come.

<sup>1</sup> Verhaegen, M., P. F. Puech, and S. Munro, 2002. "Aquriboreal Ancestors?" *Trends in Ecology and Evolution* 17:212-17.

<sup>2</sup> Hardy, A., 1960, "Was Man More Aquatic in the Past?," *New Scientist* 7:642-45.

<sup>3</sup> Marine Stewardship Council Certification, [mscglobalservices.com](http://mscglobalservices.com), 2015.

<sup>4</sup> Pauly et al., "What Catch Data Can Tell Us About the Status of Global Fishery," *Sea Around Us Project*, 2012.

<sup>5</sup> Encourage Capital and The Nature Conservancy, NatureVest Division, "Investing in Conservation," November 2014.



## FINANCIAL RETURNS AND IMPACTS

### FINANCIAL RETURNS

Our work shows that impact investors in the fisheries sector have a real opportunity to realize potentially attractive financial returns as well as social and environmental impacts. The Investment Blueprints show that impact-oriented business models benefiting from stock stabilization or restoration have the potential to generate equity returns between 5% and 35%, using conservative growth and exit assumptions. These returns are driven primarily by increased volumes linked to stock recoveries, improvements in supply chain efficiency, access to higher-value markets, and reductions in raw material supply volatility.

### IMPACTS

In each of the six Investment Blueprints, we propose to bundle investments in seafood companies and fishery assets with complementary investments that improve fishery management. In combination, the investments are aimed at generating positive environmental, social, and food security impacts.

### ENVIRONMENTAL OUTCOMES: PROTECT AND RESTORE FISH STOCKS

The central impact objective of the Investment Blueprints is to protect and restore wild-caught marine fisheries, which in turn support fishing livelihoods and supply meals to millions of people around the world. Depending on the fishery, the Investment Blueprints propose to do the following:

- Increase the estimated biomass of severely distressed stocks.
- Prevent further declines in and/or increase the biomass of stocks facing moderate distress.
- Reduce bycatch of non-target species or juvenile age cohorts of target stocks.
- Where possible and relevant, protect and restore critical marine habitat such as mangroves and coral reefs.



While the fishery management improvements proposed throughout the Investment Blueprints are ultimately expected to protect marine biodiversity across a wide range of ecosystems, we do not attempt to quantify those impacts. Monitoring of biodiversity levels could be further explored by investors seeking to explicitly achieve that impact objective.

#### SOCIAL OUTCOMES: SUPPORT FISHING LIVELIHOODS

The Investment Blueprints also target several impact objectives associated with fisher livelihoods and fishing community well-being. Depending on the fishery, the Investment Blueprints show the potential to do the following:

- Increase the aggregate income of fishers and fishing communities.
- Improve fishing community resilience.
- Empower fishing communities and fishers.

#### FOOD SECURITY OUTCOMES: FEED MORE PEOPLE

Each Investment Blueprint also targets the production of additional meals for local and regional

consumption or for export to international markets. Increased meal production can be generated by (a) projected increases in landings volumes (only expressed when in connection with stock biomass improvements of the target stock, and subject to the constraints of scientifically determined Total Allowable Catch limits); (b) increases in the utilization of previously discarded bycatch; and (c) reductions in supply chain spoilage. Based on the projected increases to final product volumes resulting from these drivers, the Investment Blueprints convert this additional volume to additional seafood meals to market, taking into consideration the processing yield of the particular species after removal of nonedible parts.<sup>6</sup>

Based on the relevant impact objectives for the specific fishery and fishing communities, Encourage Capital's Investment Blueprints establish quantifiable base-case impact targets for each of the primary environmental and social impact objectives. While the field of impact measurement is still evolving and impact outcomes can be difficult to measure, we propose the base case impact targets both as a means to build accountability into the Investment Blueprints and as a tool to promote continuous improvements in the proposed strategies over time.

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Based on the relevant impact objectives for the specific fishery and fishing communities, Encourage Capital's Investment Blueprints establish quantifiable base-case impact targets for each of the primary environmental and social impact objectives.

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<sup>6</sup> Assumes portions of 200 grams.



## THE SUSTAINABLE FISHERIES IMPACT INVESTMENT CONTEXT

The financial performance and overall impact of any sustainable seafood investment will be affected by the broader trends in raw material supply, demand, and prices, as well as by the competitive dynamics of the seafood supply chain.

### SUPPLY AND DEMAND

Over 1 billion people globally rely on seafood as their primary source of protein, with another 4.3 billion utilizing seafood for at least 15% of their animal protein consumption.<sup>7</sup> Over the next 35 years, food security economists project that seafood supplies for human consumption will need to increase by 70%, driven by population growth and economic development.<sup>8</sup>

However, scientists estimate that almost 40% of fisheries are overexploited or collapsed, with the remainder under threat as seafood demand increases over time.<sup>9</sup> Stock declines are primarily driven by the overfishing of the resource beyond its ability to replenish itself; however, the impacts of climate change, habitat destruction, and pollution are also taking a toll. In fisheries where access rights are not well defined, the “tragedy of the commons” phenomenon tends to play out, driving short-term extraction at the cost of long-term yield. This is especially true in developing countries where access rights are poorly defined and little to no monitoring or enforcement of fishing regulations occurs.

The projected growth in demand for seafood products, as set against the downward trend in marine landings, has generated strong price growth for seafood products globally of approximately 38% since 2002. Economists estimate that prices will continue to rise an additional 25% by the year 2022, relative to 2014 prices.<sup>10</sup> While prices for individual species can be volatile, we believe the overall price strength in global seafood markets can support sustainable seafood investing strategies over the long term.

<sup>7</sup> Food and Agriculture Organization of the United Nations, “The State of World Fishery and Aquaculture,” Rome, 2014.

<sup>8</sup> “Sustainable Fishery Financing Strategies,” EKO Asset Management Partners, March 2014.

<sup>9</sup> Daniel Pauly, “What Catch Data Can Tell Us About the Status of Global Fisheries,” *Marine Biology* 159, 2012.

<sup>10</sup> Food and Agriculture Organization of the United Nations, “The State of World Fisheries and Aquaculture,” Rome, 2014.

## SUPPLY CHAIN FACTORS

The seafood industry is extremely diverse, involving hundreds of species, each with its own unique biological, ecological, and commercial characteristics. Fishers and fishing fleets often lack high-quality commercialization infrastructure, especially in developing countries, where many fishers still land their catch on the beach with no ice or cold storage capacity to preserve product quality and increase shelf life. The high degree of perishability of the product and lack of access to markets often makes fishers “price takers,” vulnerable to manipulation and

the usurious practices of intermediaries, with price markups from dockside to table as high as 1,000%. Spoilage and waste can be as high as 50% in some small-scale fisheries before the product even reaches retail outlets. While these market conditions pose challenges to fishers, we believe they also present opportunities for investors to add significant value to ocean harvests by investing in businesses that both maximize the value of landed-catch volumes and benefit from the tailwinds of rising demand and prices.

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## THE OPPORTUNITY TO BE FOUND IN FISHERY RESTORATION

We believe that overall economic value creation associated with fisheries reform is compelling. A recent study conducted by the University of California Santa Barbara’s Sustainable Fisheries Group concluded that the restoration of distressed fisheries globally could increase global fish stocks by 36%, boost seafood production by an additional 12 million metric tons (mt) — or 14% of current wild capture production — and generate an additional \$51 billion in aggregate profits within 10 years.<sup>11</sup>

The global restoration potential offers an ample “seascape” of investment opportunities for impact investors, especially if management and governance improvements are linked with business models that profit from stable or improving stock health.<sup>12</sup> The restoration of the now healthy Northern Cod Stock is an example of the impact that a far-sighted fisheries management strategy can have on the recovery of a fishery.

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We believe that overall economic value creation associated with fisheries reform is compelling.

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<sup>11</sup> Costello, Hillborn, et al., “Ocean Prosperity Roadmap: Fishery and Beyond,” Synthesis Report, 2015.

<sup>12</sup> Costello, Hillborn, et al., “Ocean Prosperity Roadmap: Fishery and Beyond,” Synthesis Report, 2015.



## METHODOLOGY

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Taking into account the larger market context for sustainable seafood investment and the factors described above, we considered how best to achieve the targeted impact objectives, including the aims to protect and restore fish stocks, support fisher livelihoods, and feed more people, all while delivering attractive financial returns. Building on the investment theses presented in Encourage Capital's (then EKO Asset Management Partners) 2013 white paper titled *Sustainable Fishing Financing Strategies*, we first identified three distinct fishery typologies: (a) small-scale fisheries, focused on improving management of moderately distressed nearshore fish stocks landed by community-based, artisanal fishers using small vessels and a range of gear types; (b) industrial-scale fisheries, focused on improving management of severely distressed fish stocks landed by both artisanal and industrial fishers using a wide range of vessels and gear types; and (c) national-scale fisheries, focused on improving national-scale fisheries management.

We then developed six investment strategies — the Investment Blueprints — based on real case studies. Each of the six Investment Blueprints outlines a unique investing strategy for a specific fishery or set of fisheries intended to serve as a roadmap for the growing number of investors, entrepreneurs, and fishery stakeholders who are seeking to attract and deploy private capital both to scale and to accelerate fisheries reform.

Although the Investment Blueprints showcase hypothetical investment opportunities, they are based on real fisheries, companies, and challenges, and incorporate data and financial information uncovered during our research. We identified companies that displayed the attributes that we believed might make them promising investment opportunities for impact investors and/or other stakeholders. Upon identifying any such company during our research, we conducted additional due diligence. If upon further analysis we saw a compelling impact investment opportunity that effectively addressed the challenges of a given fishery, we developed an Investment Blueprint based, in part, on the company. However, to protect the identity and the sensitive financial information shared with us by these companies, we sought to anonymize the information by developing different yet illustrative financials reflecting the material dynamics of the underlying company. Accordingly, while our Investment Blueprints display some amended company financials, we believe that they nonetheless materially reflect the nature of real investment opportunities.

We developed the Investment Blueprints using a 10-step process, engaging in dialogue with a wide range of fishery stakeholders, advisors, and consultants, to develop and evaluate the challenges, opportunities, and risks profiled within each Investment Blueprint. For the impact investment strategy to be viable, Encourage Capital needed to determine, through the 10-step review process, whether the potential cash flow

generated by investments in fishing assets and seafood companies could generate a financial return sufficient to attract the capital necessary to implement comprehensive management improvements in the fishery. Figure 1 describes each step and the key questions we sought to answer in shaping and evaluating the investment opportunities that are the foundation of each Investment Blueprint.

FIGURE 1: 10-Step Blueprint Development Process—Key Questions

<b>1. Select Fishery and Species</b>	<ul style="list-style-type: none"> <li>• Is there commercial market demand for the species?</li> <li>• Does the fishery currently or will it potentially produce sufficient volume to generate commercial value?</li> <li>• Is the fishery in proximity to commercial markets or appropriate transport infrastructure to reach commercial markets?</li> </ul>
<b>2. Survey Fishery Conditions</b>	<ul style="list-style-type: none"> <li>• What is the estimated level of distress and depletion in the fishery?</li> <li>• What types of management improvements are required?</li> <li>• How large is the fishing fleet? Is it feasible to implement sustainable fishing practices sufficient to incorporate the minimum threshold necessary to affect the entirety of the stock and support stock restoration?</li> </ul>
<b>3. Profile Fishing Operators, Community, and History</b>	<ul style="list-style-type: none"> <li>• Which industrial fishing companies are active in the fishery? How consolidated is the existing industrial fishing fleet?</li> <li>• Is there existing organization, leadership, or local governance among fishers in the fishery?</li> <li>• What is the history of the industry and fishers' relationship with fisheries authorities and with each other?</li> <li>• Is the industry and/or are fishers in the given fishery interested in transitioning to sustainable fishing practices?</li> </ul>
<b>4. Evaluate Regulatory Framework</b>	<ul style="list-style-type: none"> <li>• How robust is the current regulatory framework?</li> <li>• Are there any regulatory tools that enable fishers and investors to gain tenure over the fishing resource (e.g., limited access fishing permits, Territorial Use Rights for Fishing or TURFs, Individual Transferable Quotas or ITQs, etc.)?</li> <li>• Are fisheries authorities willing to collaborate with private partners to implement fishery management improvements?</li> </ul>
<b>5. Design Fishery Management Improvements</b>	<ul style="list-style-type: none"> <li>• What management interventions are required to protect or restore the fishery?</li> <li>• Can project developers design a clear, viable plan to implement comprehensive fishery management improvements?</li> <li>• Are there effective implementation partners that can be engaged in the project?</li> <li>• What are the costs of the management improvements, and do the financial benefits earned by investors outweigh the costs of the improvements?</li> </ul>



FIGURE 1: 10-Step Blueprint Development Process—Key Questions *continued*

<p><b>6. Develop Business Plan</b></p>	<ul style="list-style-type: none"> <li>• Which seafood businesses or assets can generate cash flow or long-term asset value with improved fishery management?</li> <li>• Are there existing mission-aligned companies or social entrepreneurs capable of executing a viable business plan?</li> <li>• Are clear value drivers present to support a commercial business model, such as stock recovery, product certification, spoilage reduction, supply chain upgrades to increase efficiency, higher value markets, or disintermediation?</li> </ul>
<p><b>7. Quantify Fishery Restoration Potential</b></p>	<ul style="list-style-type: none"> <li>• What do scientific models suggest is the potential range of biomass recovery in the fishery and what is its likelihood based on the species' life cycle, fecundity, current biomass, fishing and natural mortality rates, and the proposed suite of management interventions?</li> <li>• What timelines for recovery do the models suggest?</li> </ul>
<p><b>8. Develop Financial Models and Scenarios</b></p>	<ul style="list-style-type: none"> <li>• Does the combined cost of fishery management improvements and commercial investment generate sufficient cash flow to reward fishers and repay investors?</li> <li>• What are the upside and downside cases of potential impact and financial performance?</li> </ul>
<p><b>9. Overlay Capital and Ownership Structures</b></p>	<ul style="list-style-type: none"> <li>• Based on the cash flow projections, how should the strategy be capitalized? With equity? With debt?</li> <li>• Are philanthropic capital or forms of credit enhancement required to generate sufficient returns to attract private capital?</li> </ul>
<p><b>10. Stress-Test Models and Evaluate Risks</b></p>	<ul style="list-style-type: none"> <li>• What are the primary risks that could impair the strategy's success?</li> <li>• Can those factors be mitigated through structuring decisions or other means?</li> </ul>

We developed the Investment Blueprints using a 10-step process, engaging in dialogue with a wide range of fishery stakeholders, advisors, and consultants, to develop and evaluate the challenges, opportunities, and risks profiled within each Investment Blueprint.



## INVESTMENT BLUEPRINTS

The Investment Blueprints present what we believe are compelling investment strategies based on specific fisheries in Brazil, Chile, and the Philippines,<sup>13</sup> covering more than 30 species. By analyzing these fisheries and their productivity (particularly current versus potential), ecology, management context, and supply-chain dynamics, we were able to design and structure investment strategies that incorporate real-world risks and return potential. We believe that the Investment Blueprints offer viable models that can be replicated across a wide array of fisheries and geographies, mobilizing private capital to protect and restore the oceans' bounty. The Investment Blueprints are crafted to engage the interest of impact investors by describing how sustainable fisheries investments can generate attractive financial returns while simultaneously achieving critical environmental and social impact goals, which are described in more detail in the full report.

We developed a total of six Investment Blueprints across the three typologies:

### Small-Scale Fisheries

- The Mariscos Strategy
- The Mangue Strategy
- The Isda Strategy

### Industrial-Scale Fisheries

- The Merluza Strategy
- The Sapó Strategy

### National-Scale Fisheries

- The Nexus Blue Strategy

What follows is a brief description of the three strategy typologies and the specific Investment Blueprints associated with each.

We believe that the Investment Blueprints offer viable models that can be replicated across a wide array of fisheries and geographies, mobilizing private capital to protect and restore the oceans' bounty.

<sup>13</sup> The three countries were chosen based on a combination of factors that are detailed in the full report.



## SMALL-SCALE FISHERIES INVESTMENT BLUEPRINTS

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The term “small-scale fishery” typically refers to any fishery in which fishers operate independent of larger corporations, using vessels ranging up to 18 meters (m) in length. In developing countries, small-scale fishers, sometimes called “artisanal fishers,” generally fish within 5–10 kilometers (km) of shore and rarely stay out at sea for more than one to three days at a time. The Food and Agriculture Organization of the United Nations (FAO) estimates that 50% of global landings are generated by small-scale fishers,<sup>14</sup> and that 90% of the total 30 million estimated fishers globally are small-scale.<sup>15</sup>

The small-scale fisheries Investment Blueprints focus on implementing management improvements across a portfolio of community-based, nearshore fisheries, which, in aggregate, enable production at sufficient scale to support the sourcing needs of a mission-aligned small to medium-size processing and distribution company. In addition to funding the design and implementation of tailored fishery management improvements, investments would upgrade supply chain infrastructure and operations in an effort to maximize catch value per unit volume. In doing so, the strategies seek to differentiate and improve small-scale fishery products that are currently sold as low-value commodities. The viability of the investment thesis and associated cash flow growth here is independent of premium pricing associated with sustainable certification, though this could present additional upside potential if realized. The resulting economic benefits could, in turn, be shared with fishers to reward compliance with sustainable fishing practices.

<sup>14</sup> The FAO defines small-scale fishers as “involving fishing households (as opposed to commercial companies), using relatively small amount of capital and energy, relatively small fishing vessels (if any), making short fishing trips, close to shore, mainly for local consumption.”

<sup>15</sup> Food and Agriculture Organization of the United Nations, “The State of World Fishery and Aquaculture,” Rome, 2014.

Figure 2 highlights examples of bundled investments relevant to the small-scale strategy, which would vary according to the fishery. While the specifics of each blueprint differ, the fundamental thesis behind all the small-scale fishery investment strategies is the vertical integration of diffuse, inefficient supply chains in order to improve efficiencies and generate higher product values.

Encourage Capital developed three Investment Blueprints to demonstrate how the small-scale fisheries strategies could work to generate both financial and impact returns. Encourage engaged with its partners and advisors to develop and evaluate the challenges, opportunities, and risks associated with each Investment Blueprint.

FIGURE 2: Small-Scale Fishery Seafood Supply Chain



The small-scale fisheries Investment Blueprints focus on implementing management improvements across a portfolio of community-based, nearshore fisheries, which, in aggregate, enable production at sufficient scale to support the sourcing needs of a mission-aligned small to medium-size processing and distribution company.



Figure 3 provides a profile of the three small-scale Investment Blueprints in Chile, Brazil, and the Philippines:

FIGURE 3: Small-Scale Fisheries Investment Blueprint Summaries

	THE MARISCOS STRATEGY	THE MANGUE STRATEGY	THE ISDA STRATEGY
Country	Chile	Brazil	The Philippines
Proposed Investment Amount <sup>16</sup>	\$7.0 million	\$15.0 million	\$11.7 million
Investment Term	5 Years	9 Years	10 Years
Fishery/Species Focus	Multispecies, benthic focus on razor clams, scallops, stone crab, king crab, nylon shrimp, abalone, and mussels	Mangrove crab	At least 20 species, including tuna, mahi mahi, snapper, trevally, mackerel, lobster, octopus, squid, crab, and sea urchin
Core Investments	<ul style="list-style-type: none"> <li>• Fishery management improvements</li> <li>• Seafood company</li> </ul>	<ul style="list-style-type: none"> <li>• Fishery management improvements</li> <li>• Seafood company</li> </ul>	<ul style="list-style-type: none"> <li>• Fishery management improvements</li> <li>• Seafood company</li> </ul>
Number of Fishing Communities Incorporated	7	98	40 initially, up to 80
Number of Fishers Engaged	550	1,300	19,000
Targeted Impact Returns: Protecting and Restoring Fish Stocks	<ul style="list-style-type: none"> <li>• Protect existing biomass from overfishing with potential upside increase of 10%</li> </ul>	<ul style="list-style-type: none"> <li>• Protect existing biomass from overfishing with potential upside increase of 10%</li> </ul>	<ul style="list-style-type: none"> <li>• Protect existing biomass from overfishing with potential upside increase of 20%</li> </ul>
Targeted Impact Returns: Supporting Fishing Livelihoods	<ul style="list-style-type: none"> <li>• Pay a premium of 25% to market prices for raw materials sourced, increasing aggregate fisher income by \$1.8 million<sup>17</sup> over the investment period</li> <li>• Establish and fund a Fishing Community Trust</li> <li>• Empower fishing communities as long-term commercial partners</li> </ul>	<ul style="list-style-type: none"> <li>• Pay a premium of 33% to market prices for raw materials sourced, increasing aggregate fisher income by \$1.2 million<sup>18</sup> over the investment period</li> <li>• Establish and fund a Fishing Community Trust</li> <li>• Empower fishing communities as long-term commercial partners</li> </ul>	<ul style="list-style-type: none"> <li>• Pay a premium of 15% to market prices for raw materials sourced, increasing aggregate fisher income by \$11.9 million<sup>19</sup> over the investment period</li> <li>• Establish and fund a Fishing Community Trust</li> <li>• Empower fishing communities as long-term commercial partners</li> </ul>

<sup>16</sup> Total investment amount, including debt, equity, PRI, and grant capital. Presented in USD.

<sup>17</sup> In constant 2015 dollars.

<sup>18</sup> In constant 2015 dollars.

<sup>19</sup> In constant 2015 dollars.

FIGURE 3: Small-Scale Fisheries Investment Blueprint Summaries *continued*

Targeted Impact Returns: Feeding More People	<ul style="list-style-type: none"> <li>• Safeguards the supply of 5 million seafood meals annually</li> <li>• Increases meals to market through 13.5% reduction in spoilage, delivering an additional 150,000 seafood meals to consumers annually</li> </ul>	<ul style="list-style-type: none"> <li>• Safeguards the supply of 6.5 million seafood meals annually</li> <li>• Increases meals to market through 90% reduction in spoilage, delivering an additional 2.4 million seafood meals to consumers annually</li> </ul>	<ul style="list-style-type: none"> <li>• Safeguards the supply of 6.7 million seafood meals annually</li> <li>• Increases meals to market through a 13% reduction in spoilage in the supply chain, delivering an additional 800,000 meals to consumers annually</li> </ul>
Projected Financial Returns	<ul style="list-style-type: none"> <li>• Targets 11.1% unlevered equity return with exit sale to strategic buyer</li> </ul>	<ul style="list-style-type: none"> <li>• Targets 12.0% levered equity return with exit sale to strategic buyer</li> </ul>	<ul style="list-style-type: none"> <li>• Targets 20.7% unlevered equity return with exit sale to strategic buyer</li> </ul>

### THE MARISCOS STRATEGY

The Mariscos Strategy (Mariscos) is a \$7.0 million impact investment to protect seven small-scale shellfish and crustacean fisheries along the Chilean coastline. The investment would fund the implementation of management improvements across these fisheries and the communities harvesting them, known in Chile as *caletas*, and be used to expand an existing consumer packaged goods company producing “heat and eat” meals for Latin American consumers, referred to herein as “GustoMar”. Mariscos targets an 11.1% unlevered equity return.

Chile’s 6,435 km coastline constitutes one of the most biodiverse and productive nearshore marine environments in the world, accounting for 4% of the world’s fisheries catch.<sup>20,21</sup> This productivity can be attributed in large part to the physical heterogeneity of the coastline, with at least five unique ecoregions, as well as unique oceanographic conditions including upwelling, nutrient inputs, freshwater influx, temperature regime, and bathymetric complexity.<sup>22</sup>

The Mariscos Strategy seeks to incorporate seven multispecies fisheries and fishing communities into a regional, sustainable seafood sourcing operation for the manufacture and delivery of packaged seafood products to domestic and international

retailers and institutional food service operators. The species are believed to be under moderate fishing pressure, which make the fisheries vulnerable to overfishing as consumer demand continues to grow. Broadly speaking, Chile has a strong fisheries management regime, but does not actively manage all of its nearshore benthic fisheries. Although fishers and vessels are typically registered, illegal fishing occurs with regularity, and only one species of seven in the Mariscos portfolio undergoes a stock assessment, with no maximum catch levels established. Altogether, nearly 550 fishers with some 200 vessels harvest the aforementioned species, producing roughly 34,000 metric tons (mt) of seafood landings each year, with an aggregated estimated value of \$190 million in 2014.

The Mariscos Strategy thus seeks to preserve current stock levels, with the potential for modest biomass increases in caletas facing localized depletion. The value created through the strategy’s spoilage reduction and efficiency gains would be shared with fishers in the form of a 25% price premium to market ex-vessel raw material prices for participating supplier partners, with an expected aggregate increase of fisher revenues of approximately \$1.8 million over the five-year

<sup>20</sup> Food and Agriculture Organization of the United Nations, “The State of World Fisheries and Aquaculture,” Rome, 2014.

<sup>21</sup> This figure excludes China.

<sup>22</sup> Advanced Conservation Strategies, “A Coastal Marine Assessment of Chile,” a report prepared for the David and Lucile Packard Foundation, 2011.

investment horizon.<sup>23</sup> In addition, Mariscos offers economic incentives for participation in its fishery improvement activities through the allocation of a 20% equity share in GustoMar to participating caletas. Mariscos aims to reduce spoilage in the supply chain and as a result increase the number of meals to market by 13.5%, or 150,000 additional annual meals with no increase in landings.

We believe Mariscos has the potential to provide a novel, replicable model for sustainable seafood delivery from small-scale fishers in Chile, while showing that sustainable management and responsible sourcing can not only be profitable but also be a source of competitive advantage.

#### Potential Impact and Financial Returns

- Safeguards seven species stock levels with the potential to increase biomass by 10%, depending on fishery conditions
- Increases aggregate fisher revenues by \$1.8 million over a five-year period, and improves community resilience through the allocation of a 20% equity share in GustoMar to participating caletas
- Empowers fishers and fishing communities by creating more direct market linkages
- Increases meals to market through a 13.5% reduction in spoilage, delivering an additional 150,000 seafood meals to market annually
- Targets an 11.1% unlevered equity return over a five-year period

To accomplish these objectives, The Mariscos Strategy proposes the following bundled set of investments:

**1. An up-front investment of \$4.5 million into the Strategy to fund the design and implementation of fishery management improvements and the capitalization of Fishing Community Trusts in each of the seven portfolio caletas.** Chile

has a strong fisheries management regime, but does not actively manage most of its nearshore benthic resources. Although fishers and vessels are typically registered, illegal fishing occurs with regularity, with no maximum catch levels established for most species. The Mariscos Strategy seeks to protect these nearshore stocks by implementing fisheries management improvements that leverage the existing TURF system (a form of locally managed access limitation) and that utilize low-cost technology to improve compliance and fishery data collection. These management improvements would require an up-front investment of \$1.0 million, with ongoing improvement expenses paid out of the company's revenue.

Fishers willing to commit to fisheries management improvements and serve as suppliers to GustoMar's sourcing network would

be eligible to participate in Mariscos' Sustainable Fishing Rewards Program. The Program would offer economic rewards to fishers and fishing caletas in two ways: through the payment of higher prices per unit of catch to individual fishers, with GustoMar estimated to be able to pay 25% more than other buyers, and through a newly established profit sharing mechanism called the Fishing Community Trust, or "FCT,"<sup>24</sup> whereby each *caleta* would be allocated an economic interest in GustoMar's business, earning a share of GustoMar's profits over time.

Because GustoMar is not projected to generate significant profit until the 5th year of the investment, Mariscos would initially capitalize the FCT with \$3.5 million, vesting in equal shares over the first five years in order to provide a more immediate reward to fishers and communities implementing sustainable fishing practices. The FCT would be structured as a community reserve fund or insurance pool, where funds could be drawn down by participant caletas to fund near-term revenue shortfalls and cover costs borne by the community as it adopts the transition to more sustainable fishing practices. In this way, the FCT both strengthens community resilience with committed funds up front to support short-term

<sup>23</sup> In constant 2015 dollars.

<sup>24</sup> The concept and structure of the FCT is borrowed in part from the structures used by Fair Trade in distributing premiums earned on Fair Trade products to producing *caletas*



needs in the community, as well as a share of longer-term profits generated with the success of the caleta-GustoMar collaboration.

**2. An investment of \$2.5 million into the expansion of GustoMar, which would sell gourmet “heat-and-eat” meals to retail outlets and through the institutional food service channel.**

The investment would build supply-chain infrastructure, enabling the company to source raw materials directly from the seven fishing caletas described earlier, improve the quality

of products sourced from its portfolio, expand its manufacturing capacity, and extend the marketing and distribution of artisanally sourced seafood products from Chile.

Mariscos anticipates financing the \$7.0 million investment with equity (50%), a foundation grant (25%), and a government grant (25%). We believe this investment has the potential to generate an 11.1% equity return over five years with an exit through a sale to a strategic buyer.

### THE MANGUE STRATEGY

The Manguê Strategy (Manguê) is a hypothetical \$15.0 million impact investment to protect the mangrove crab (*Ucides cordatus*) fishery in the Brazilian state of Pará. The \$15.0 million would fund the implementation of critical fishery management improvements across the fishery, and would be used to launch an integrated processing, marketing, and export business. This would include the construction of strategically located raw material buying stations, and a modern processing facility designed to meet both domestic and international food safety standards. Manguê targets a 12.0% levered equity return while protecting crab stock biomass from current and future overfishing, enhancing up to 1,300 fisher livelihoods across 98 fishing communities, and increasing annual meals to market by 2.4 million within nine years. Additionally, the strategy would support the sustainable management of over 300,000 hectares of critical coastal mangrove forest within the Amazon Delta, protecting the ecosystem service value of this critical habitat.

The Manguê Strategy outlines an impact investing strategy across a large swath of the coastline in the state of Pará, spanning some 300,000 hectares and encompassing nearly 30% of Brazil’s total mangrove forest habitat. The state’s mangrove forests produce roughly 50% of the total mangrove crab landed nationally. Straddling the heart of the Amazon Basin, Pará consists of some of the most species-rich habitat on Earth, but is also facing intense pressure from destructive land-use activities including mining, aquaculture, and deforestation, making it the subject of much national and international environmental concern. Pará’s fisheries produce 50% of total mangrove crab landed nationally, with annual landings estimated at approximately 5,000 mt, representing an aggregate value of \$5.3 million in 2014.

A recent economic downturn in Brazil, combined with a devalued currency and strong international market demand for crabmeat, are expected to increase fishing effort in the 10 RESEX sites, as

The Manguê Strategy is a hypothetical \$15.0 million impact investment to protect the mangrove crab fishery in the Brazilian state of Pará.

community members look to the mangrove crab for subsistence and income. Such overfishing, in turn, could drive significant crab-stock declines, with ramifications for the broader ecosystem given the keystone role of the species. Moreover, there is increasing pressure being put on officials in Pará to allow the conversion of mangrove forests to shrimp aquaculture in an attempt to generate alternative livelihood opportunities, further threatening the mangrove crab fishery.

As such, the Manguê Strategy would attempt to implement robust management systems and provide an economic case for conservation *before* overfishing, habitat destruction, and stock depletion occur. Manguê aims to preserve current stock levels, with a modest upside potential of 10% in biomass and biodiversity gains due to reduced fishing

pressure.<sup>25</sup> The strategy aims to increase aggregate fisher incomes by 33%, offer greater community resiliency through profit-sharing mechanisms, and empower fishers through community organization and increasing market power. Manguê also has the potential to dramatically reduce spoilage in the supply chain, and increase the number of meals to market by up to 59%. In addition, we believe that by helping communities sustainably monetize the benefits of a healthy mangrove habitat, Manguê has the potential to generate nearshore biodiversity and coastal resilience co-benefits by limiting the conversion of critical mangrove forest habitats to aquaculture or other uses. Finally, our analysis suggests that Manguê has the potential to generate attractive financial returns, targeting a 12.0% levered equity return, with diversified cash flows stemming from both domestic and international markets over a nine-year horizon.

#### Potential Impact and Financial Returns

- Safeguards mangrove crab stock levels with the potential to increase biomass by 10%, depending on fishery conditions
- Increases aggregate fisher income by 33%, and improves community resiliency through a Fishing Community Trust (FCT) equity sharing structure
- Empowers fishers and fishing communities by extending formal recognition to newly organized professional associations that enable political, legal, and professional representation, thereby improving access to banking, credit, and government pension and health benefits and also raising social status
- Increases meals to market by 59%, delivering an additional 2.4 million meals to consumers annually
- Promotes local protection of 15% of Brazil's nearly 11,000 square kilometers mangrove forest from encroaching threats from development, mining, and shrimp farming by providing a more sustainable and profitable means of crab production
- Targets a 12% levered equity return over a nine-year period

To accomplish these objectives, Manguê proposes three core investments, split between fishery improvement activities and commercial operations, including:

- 1. Engagement with fisheries authorities and communities to secure specific fishery management policy reforms.** To protect mangrove crab biomass and mangrove forests,

an effective access and catch limitation must be in place in the fishery. Manguê would seek to have the government (a) establish a system of fisher licensing and registration, (b) increase enforcement resources to reduce illegal fishing entry, and (c) prohibit the sale of illegally harvested crab.

<sup>25</sup> While the Manguê Strategy believes that the potential exists for stock recovery, the business model and project economics assume that the fishery is maintained at current biomass levels.



**2. An up-front investment of \$3.5 million into the Strategy to fund the design and implementation of fishery management improvements and the capitalization of Fishing Community Trusts in each of the ten RESEX<sup>26</sup> zones.** \$1 million of this investment will go toward fishery management expenses incurred over the first three years of the project prior to the establishment of commercial operations, and a total of \$3.6 million over the lifespan of the project. These fishery management improvements incorporate design criteria that are aligned with international sustainability standards and best practices, and would be subject to third-party verification and auditing.

Fishers and fishing communities willing to commit to fishery management improvements and serve as suppliers to a proposed Crab Export Business (CEB) network (as described in investment #3 below) would be eligible to participate in Mangué's Sustainable Fishing Rewards Program. Mangué proposes to utilize the program as a financial incentive to catalyze and maintain the implementation of sustainable artisanal fishing practices to support habitat protection, stock preservation, and regulatory compliance across the 10 RESEX communities. The program would offer economic rewards to fishers and fishing communities in two ways: through the payment of higher prices per unit of catch, and through access to a Fishing Community Trust (FCT). CEB expects to be able to pay fishers 30% higher prices than current local market prices for live, whole-crab raw material due to a combination of improved supply chain efficiencies and resulting decreases in spoilage rates of up to 90%, as well as higher margin sales to export markets for finished goods. In addition to this premium for raw materials, \$2.5 million of government and foundation grant capital would be contributed toward funding a "Fishing Community Trust" (FCT), the proceeds of which would be drawn down over the first four years of the project to pay for a variety of community improvements. The goal of the FCT in

years 1 through 4 would be to provide incentives for the communities to participate in Mangué's fishery improvement efforts prior to CEB being able to pay out premiums for sourced raw materials.

**3. An investment of \$11.5 million into the establishment of a new Crab Export Business (CEB), funding the construction of 10 buying stations for sourcing raw materials, a processing facility, and new marketing and sales channels for Brazilian mangrove crab.** This investment, made concurrently with investments #1 and #2, would create a commercial platform capable of adding value to the mangrove crab products with a potential financial return of 12% to impact investors after equity paid out to fishers and management. The \$11.5 million investment would source sustainably caught mangrove crab from Mangué's network of communities, upgrade the supply chain infrastructure, and legally market and export high-quality mangrove crab products, including both cooked crabmeat and fresh crabs, to other Brazilian states besides Pará as well as to international markets.

The Mangué Strategy would most likely be attractive to an impact-oriented equity investor with both a long-term investing horizon (8-12 years) and a willingness to take on outsized risk if a commercial financial return can be attained alongside significant environmental and social impact. We assume the total share of equity to be about 73% of the total capital contributed, with sponsor equity comprising 57%, and vesting FCT grant capital comprising 17% of the total capital structure. Although no commercial debt is assumed in the development of the business, Program Related Investment capital rounds out the remaining 27% of the capital structure in our model. According to base case financial projections, this investment in the mangrove crab fishery has the potential to generate a 12.0% levered equity return over nine years.

<sup>26</sup> The crab fisheries are managed in a system of extractive coastal reserves, referred to as "RESEXs," which limit noncommunity members from fishing the crab resource while allowing virtually unlimited crab resource extraction by community members living within the reserve area.

## THE ISDA STRATEGY

The Isda Strategy<sup>27</sup> (Isda) is a hypothetical \$11.7 million impact investment to protect and restore small-scale fisheries incorporating 80 communities<sup>28</sup> across the Philippine archipelago and at least 20 species. The \$11.7 million investment would fund the implementation of fishery management improvements across both pelagic and nearshore fisheries, and be used to expand “TambaCo,”<sup>29</sup> an illustrative processing and distribution business producing premium seafood products for both domestic and international markets. We believe the Isda Strategy has the potential to generate a 20.7% base case equity return, while simultaneously protecting the multispecies stock biomass from current and future overfishing, enhancing the livelihoods of up to 19,000 fishers<sup>30</sup> across 80 fishing communities,<sup>31</sup> and safeguarding the supply of 6.7 million<sup>32</sup> meals to market annually.

The Philippines comprises over 7,100 islands, encompassing an estimated 23,000 km of coral reef habitat supporting more than 3,200 fish species and 10,000 invertebrate species, supporting the region’s designation as a global biodiversity hotspot.<sup>33</sup> Fishing generates approximately 2.3 million metric tons (mt) of catch per year, making the Philippines the 11th largest producer of seafood in the world. Despite the importance of its fisheries for both food production and tourism, it ranks 21st among the top 28 fish-producing nations in terms of fisheries management and governance, due to limited research capacity, lack of effective access limitations, and improving but still inadequate enforcement of existing regulations.<sup>34</sup> The species group proposed for inclusion in the Isda Strategy incorporates a mix of at least 20 species, including

tuna, mahi mahi, snapper, trevally, mackerel, lobster, octopus, squid, crab, and sea urchin, landed across 80 fishing communities<sup>35</sup> throughout the Philippines.<sup>36</sup>

While the tuna and mahi mahi species (referred to herein as “the pelagic species”) are managed by regional bodies and considered to be in good health, the nearshore species are virtually unregulated due to budgetary constraints and limited implementation capacity by regulatory authorities. No stock assessments or science-based catch limits are in place for many of these nearshore species or communities. Lacking critical elements of a robust management framework, nearly all these nearshore fisheries have been subjected to decades of overfishing and habitat destruction. Although data that tracks landings shows increases in national landings over time, catch per unit of effort (CPUE), a primary indicator of fishery distress, has plummeted from 30 to 45 kg per fisher per trip to 3 kg per fisher per trip over the last 30 years.<sup>37</sup> The Isda Strategy, therefore, proposes to implement robust fisheries management systems to prevent further depletion, create fishery data-collection systems to enable adaptive management improvements, and ultimately restore nearshore species and ecosystems. Similar management measures, particularly around vessel monitoring and catch documentation, would be implemented for the tuna and mahi mahi fisheries as well, to backstop and improve national and regional management efforts.

The Isda Strategy proposes an investment into a combination of fishery management improvements and “TambaCo,” seeking to remedy overfishing

<sup>27</sup> “Isda” is the Philippine word for fish.

<sup>28</sup> In this blueprint, “community” refers to a “*barangay*,” the Philippine term for a village, and the smallest administrative division in the Philippines.

<sup>29</sup> Based on “*tambakol*,” the Philippine word for yellowfin tuna.

<sup>30</sup> Assuming two fishers per vessel in nearshore fishing communities and three fishers per vessel in pelagic fishing communities.

<sup>31</sup> Comprising 40 pelagic and 20 nearshore sourcing communities.

<sup>32</sup> Assuming run-rate of 1,332 tons of finished goods sold per year from year 5 onward and 200 gram (g) portion sizes.

<sup>33</sup> Food and Agriculture Organization of the United Nations, “Country Profile: Philippines,” [fao.org](http://fao.org), 2014.

<sup>34</sup> “Oceans Prosperity Roadmap: Fisheries and Beyond,” Synthesis Report, [oceanprosperityroadmap.org](http://oceanprosperityroadmap.org), 2015.

<sup>35</sup> In this blueprint, “community” refers to a *barangay*, the Philippine term for a village, and the smallest administrative division in the Philippines.

<sup>36</sup> This list of species is indicative (not exhaustive) and based on preliminary assessment of raw material supply in target communities and market demand.

<sup>37</sup> Western and Central Pacific Fisheries Commission, 2015.



in its portfolio communities through a series of fishery management improvements, including the implementation of a TURF-reserve network, and roll-out of data collection technologies that aid in assessing stock health and fisher compliance with regulations. Isda's goal is to protect the existing biomass of the portfolio communities from further declines, with an opportunity to increase it by up to 20% in the nearshore communities over a 10-year period. In the Isda pelagic-species communities, the use of highly selective handline gear could reduce bycatch of sharks and billfish by up to 5,500 mt versus industrial longline alternatives over the 10-year investment period. Moreover, installation of vessel monitoring and catch accounting systems, implemented as part of the proposed suite of

fishery management improvements, could provide some of the first rigorous data collected for these species in the Philippines. In the nearshore fisheries, Isda has the potential to protect up to 1,000 hectares of coastal nearshore habitat as no-take zones across a network of TURF-reserves, and to increase coral cover by up to 150 hectares. From a social impact standpoint, Isda aims to increase fisher incomes by 15% in aggregate, offer greater community resilience through profit-sharing mechanisms, and empower fishers through access to better offtake channels. Finally, our analysis suggests that Isda has the potential to generate attractive financial returns, targeting a 20.7% equity return, with diversified cash flows stemming from both domestic and international sales.

### Potential Impact and Financial Returns

- Safeguards stock levels of at least 14 species, including both pelagic and nearshore, with the potential to increase biomass by 20%, depending on fishery conditions<sup>38</sup>
- Increases aggregate fisher revenue through a 15% premium paid per unit of raw material sourced by TambaCo, equivalent to a total of \$11.9 million<sup>39</sup> of additional income over the 10-year investment period
- Improves participant community resilience through the capitalization of a \$3.0 million Fishing Community Trust, vested over 10 years, and recapitalized with 10% of the proceeds generated by the sale of TambaCo, worth an estimated \$2.9 million<sup>40</sup>
- Avoids the harvest of an estimated 5,500 mt of bycatch, including shark and billfish, through the use of selective handline fishing gear<sup>41</sup>
- Increases community-designated "no-take zones" in each community TURF-reserve of at least 20% of the total area, totaling over 1,000 hectares
- Increases coral cover by 15% across the TURF reserve area, totaling 150 hectares of additional cover
- Increases meals to market through a 13% reduction in spoilage<sup>42</sup> in the supply chain, delivering an additional 800,000 meals to market annually<sup>43</sup>
- Targets a 20.7% equity return over a 10-year investment period

<sup>38</sup> A biomass increase is not built into the model.

<sup>39</sup> In constant 2015 dollars.

<sup>40</sup> In constant 2015 dollars.

<sup>41</sup> Assuming 2% bycatch in the artisanal handline fleet relative to approximately 30% in the industrial longline fleet applied to the total raw material sourced from this fishery by TambaCo over the 10-year investment period.

<sup>42</sup> Assuming TambaCo maintains spoilage rates of 2% or less versus an estimated 15% in the prevailing supply chain.

<sup>43</sup> Assuming a run-rate of 2,776 mt of raw material sourced by TC, a 45% processing yield, and 200 g portion sizes.

To accomplish these return objectives, The Isda Strategy proposes the following bundled set of investments:

**1. An up-front investment of \$6.2 million into the Strategy to fund the design and implementation of robust fishery management improvements across the 80 portfolio communities and the capitalization of a single Fishing Community Trust to be shared across the sourcing regions.**

The Isda Strategy proposes to expand the fishery improvement efforts of TambaCo and its partners from the 30 pelagic communities in which it currently operates to a total of 80 communities (60 pelagic and 20 nearshore) by the end of the fifth year of the strategy. The first-year cost of these fishery management improvements would be \$3.2 million, and total roughly \$19.4 million over the ten year strategy. By the end of the first year, the portfolio would consist of 35 communities predominantly landing the healthier pelagic species and five communities predominantly landing the nearshore species (including finfish, crustaceans, cephalopods, and echinoderms). As the logistics network reaches the breakeven point on the basis of its core tuna offerings, the Isda Strategy would expand the sourcing portfolio to include increasing numbers of nearshore species, as well as fishing communities. Given the profile of the sites and species in the contemplated portfolio of supplier communities, Isda proposes two improvement program models, one suited to the pelagic, or highly migratory, fishing communities, and the second model better suited to the nearshore multispecies fishing communities.

The principal management interventions in the nearshore communities would be the implementation of a TURF-reserve network. These areas would have designated no-take zones of at least 20% of the total area, and provide a de facto form of exclusive access for coastal communities. These zones would have specific fishery management plans outlining harvest, handling, and catch documentation practices, and likely would be designed and operated by a complementary operating partner.

The principal management intervention in the pelagic communities would be the installation of a technology package, designed for and

already tested in small-scale fishery settings. This package would include vessel tracking technology to record harvest location, composition, and gear-type, all of which would be captured passively and sent via Wi-Fi to a central receiver in a landing station. Landings would then be weighed at the landing station, and a unique bar code would be generated for each harvest batch that accompanies the product through the supply chain for traceability purposes. The data systems would be installed on all vessels targeting the species of interest for sourcing, and would feed a common database that provides information on fleet movements in space and time, catch and bycatch in weight by species, landings by vessel and species, and full traceability of products back to the vessel of origin. Most important, the system would capture landed and removed biomass for every fishing trip, thereby limiting Illegal, Unreported, and Unregulated (IUU) fishing.

By gathering this data across many different fishers and species, the system would create a rich database of metrics essential for adaptive fisheries management. The Isda Strategy could then analyze the data to generate user-specific reports that empower fishers to better control their actions, allow commercial partners such as TambaCo to ensure that they are sourcing fresh and sustainably harvested raw materials, and provide valuable data to authorities to inform management efforts. These data would ultimately be used to evaluate the status of stocks, set total allowable catch limits, assess the environmental impact of fisheries, and work out mitigation strategies.

Fishers willing to commit to fishery management improvements and serve as suppliers to TambaCo's sourcing network would be eligible to participate in Isda's Sustainable Fishing Rewards Program. Isda proposes to utilize the program as an incentive to catalyze and sustain the implementation of sustainable fishing practices. The program would offer economic rewards to fishers and fishing communities in two ways: through the payment of 15% higher prices per unit of catch, and through access to a Fishing Community Trust (FCT). The FCT would be precapitalized with \$3 million, the proceeds of which would be distributed to provide business-interruption insurance or other relief in the event of extended periods of

inclement weather or natural disasters for portfolio communities and their fishers. The Philippines is the country with the highest incidence rate for tropical storms, so the availability of these funds would, it is hoped, provide a strong incentive for compliance. The Isda Strategy would allocate 10% of the proceeds from its sale of TambaCo in the tenth year of the strategy implementation to recapitalize the FCT upon sale of the company.

**2. An investment of \$5.5 million into the expansion of TambaCo, a mission-aligned company with a record of success in the processing and distribution of high-grade fresh and chilled tuna products.** The commercial investment thesis for Isda is centered on building a robust logistics network to source, process, and distribute high-value seafood products, particularly yellowfin tuna, from across the Philippines and primarily destined for export. The investment would fund the expansion of the company's sourcing portfolio, upgrade and expand its processing and cold-chain logistics, and extend the marketing and distribution of sustainably sourced artisanal seafood products from the Philippines.

The investment would enable TambaCo to extend its cold-chain "backbone" logistics network to support eight core geographic clusters of product sourcing equipped with two to three buying stations per cluster. The buying stations would serve as collection and consolidation points for raw materials to be transported to the processing facilities in the capital, Manila, as well as centers for fishery management improvement outreach and commercial interaction with fishery stakeholders. In the buying stations, seafood raw materials would be procured from

fishery stakeholders, inspected against quality parameters and sustainability requirements, labeled with RFID tags that would serve as the core of the traceability program, and be prepared for loading and transport to Manila.

Once the core infrastructure is in place, TambaCo would be in a position to add incremental volumes of lower-value nearshore species for sale in the domestic, regional, or export markets with sufficient contribution margin to supplement profitability and positively affect artisanal fishing communities participating in its supply chain network. Nearshore species are expected to strengthen TambaCo's business by diversifying its product line, eventually adding incremental profitability through economies of scale.

Nearshore species would be marketed under a newly developed branding program called the "Responsible Seafood Basket." TambaCo proposes to offer the Responsible Seafood Basket as a way to enable incorporation of fisheries earlier in the cycle of fisheries management improvements implementation, before they have been in place long enough to comply with traditional sustainability standards. The fisheries management improvements will still be subject to high standards of sustainability but, given the level of expected depletion, will also allow for a longer period of rebuilding and restoration to take place while still enabling a limited volume of product to be sold in the marketplace to support fisher livelihoods.

Isda anticipates financing the \$11.7 million investment with equity (74%) and a foundation grant (26%). We believe this investment has the potential to generate a 20.7% equity return over 10 years.

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The Isda Strategy proposes an investment into a combination of fishery management improvements and "TambaCo," seeking to remedy overfishing in its portfolio communities through a series of fishery management improvements ... and roll-out of data collection technologies that aid in assessing stock health and fisher compliance with regulations.

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## INDUSTRIAL-SCALE FISHERIES INVESTMENT BLUEPRINTS

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The term “industrial-scale fishery” refers to severely distressed, large-scale fisheries in the countries we evaluated, where stocks have been reduced to as low as 10% of their estimated biomass at maximum sustainable yield ( $B_{MSY}$ ) and existing management efforts have proven ineffective. While this degree of distress poses clear management challenges as well as real risks to impact investors, it also offers potentially outsized investment returns in the event that the strategy succeeds in restoring the targeted stock. As in conventional distressed assets investing, the panic and short-termism that often surround collapse creates opportunities for those with capital to spend and a plan for restoring value. With distressed fisheries this is generally the case, as valuable assets such as fishing rights, vessels, and processing infrastructure can often be purchased at a steep discount, while those players choosing to stay in the fishery are often most amenable to change.

The industrial-scale fishery Investment Blueprints propose investing in *comprehensive* fishery management improvements, acquiring fishery assets (such as fishing quotas or vessels) that increase in value as stocks recover, and investing in seafood companies to increase and maximize the value of increasing catch volumes over time. At the heart of each strategy lies a proposed set of fishery management improvements that seek to protect and restore fish stocks, reduce bycatch of unwanted species, and protect and restore marine habitat. Therefore, the industrial-scale blueprints target a robust set of interventions and multiple channels for ensuring fisher compliance. Similarly, the asset acquisition component of the strategy aims to allow investors to realize potential outsized returns to justify the upfront risks undertaken.

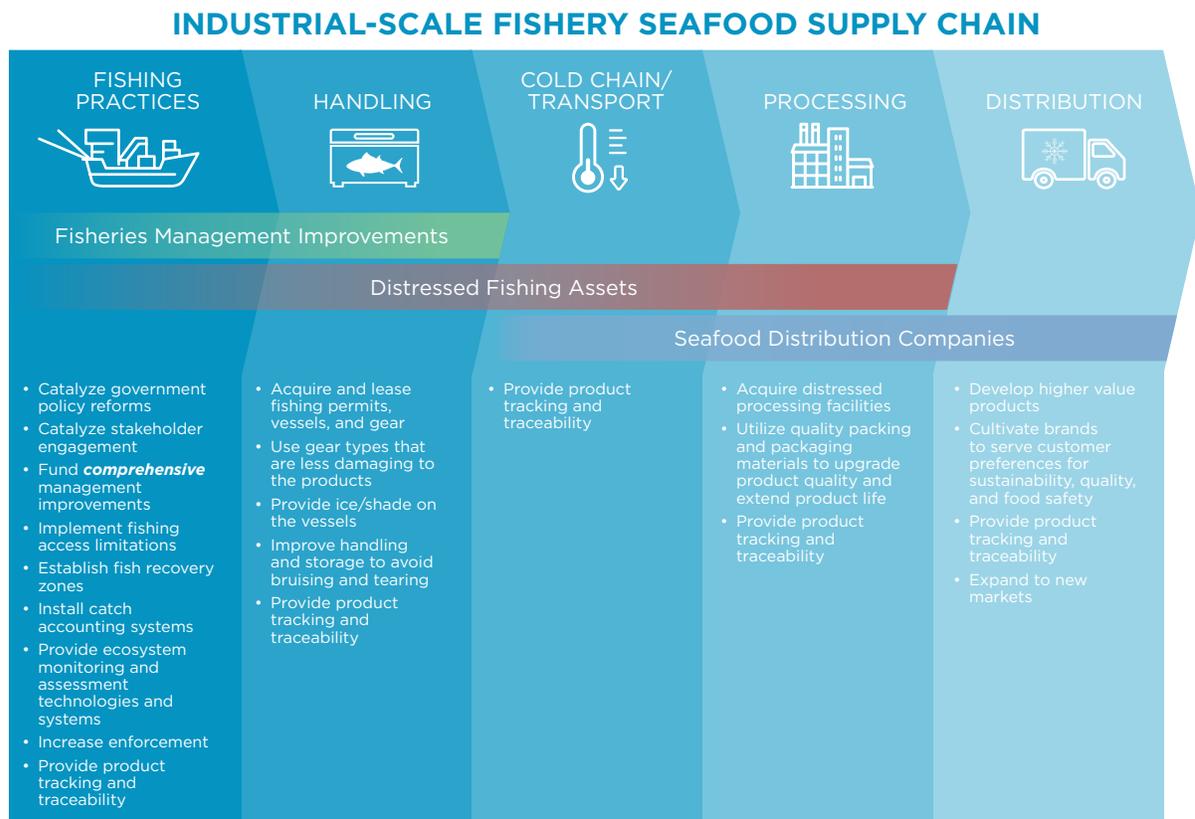
Because there is large impact and financial upside potential tied to the restoration of depleted stocks, each strategy seeks first to implement *comprehensive* fishery management reforms that affect the entirety of the fishery, and then to acquire assets that appreciate in value as the stock size and landings increase. Similar to the small-scale fishery strategies, value is also generated through increased supply chain efficiencies and value addition to the products. This market connectivity increases each strategy’s capacity to implement broad-scale improvements that might otherwise be undermined by the existing supply chain. By bundling investments into comprehensive fishery management improvements with investments into fishing assets and seafood companies, investors can support sustainability, generate cash flow, and own assets with value that is tightly correlated to fishery health, a value that rises over time as stocks recover. The economic

benefits generated through the investments can, in turn, be offered to fishers as rewards for compliance with sustainable fishing practices, creating a strong financial incentive for stewardship that counters the existing incentives that drive short-term depletion.

The industrial-scale fishery Investment Blueprints propose to fund change on the water, look to the

supply chain investments to deliver baseline returns, and turn to the fishing asset ownership to generate potential upside returns correlated with long-term fishery restoration. Figure 4 shares examples of the potential bundled investments, depending on the fishery and geographic location.

FIGURE 4: Industrial-Scale Fishery Seafood Supply Chain



Encourage Capital developed two Investment Blueprints to demonstrate how the industrial-scale fishery strategies could work to generate both financial returns and impact. Encourage engaged with its partners and advisors to develop and evaluate the challenges, opportunities, and risks associated with each Investment Blueprint. Each Investment Blueprint is tailored to the fishery’s

unique stakeholder participants, regulatory context, supply chain, market dynamics, and intervention cost estimates to propose “ground-truthed” investment proposals and analysis.

Figure 5 below provides a profile of the two industrial-scale fishery Investment Blueprints in Chile and Brazil.

FIGURE 5: Industrial-Scale Fisheries Investment Blueprint Summaries

	THE MERLUZA STRATEGY	THE SAPO STRATEGY
Country	Chile	Brazil
Proposed Investment Amount	\$17.5 million	\$11.5 million
Investment Term	10 years	11 years
Fishery/Species Focus	Common Hake	Monkfish
Core Investments	<ul style="list-style-type: none"> <li>• Fishery Management Improvements</li> <li>• Fishing Quota</li> <li>• Seafood Company</li> </ul>	<ul style="list-style-type: none"> <li>• Fishery Management Improvements</li> <li>• Fishing Vessels and Permits</li> <li>• Seafood Company</li> </ul>
Targeted Fish Stock Impacts	<ul style="list-style-type: none"> <li>• Increase stock biomass by 177% to 269% from current levels</li> </ul>	<ul style="list-style-type: none"> <li>• Increase stock biomass by 100% from current levels</li> </ul>
Targeted Fisher Livelihood Impacts	<ul style="list-style-type: none"> <li>• Pay fishers 50% premium for raw materials</li> <li>• Empower fishing communities as commercial and conservation partners</li> </ul>	<ul style="list-style-type: none"> <li>• Pay fishers 30% premium for raw materials</li> <li>• Empower fishing communities as commercial and conservation partners</li> </ul>
Targeted Increase in Meals Produced	<ul style="list-style-type: none"> <li>• 136 million additional meals annually by year 10</li> </ul>	<ul style="list-style-type: none"> <li>• 7.5 million meals annually by year 11</li> </ul>
Projected Financial Returns <sup>44</sup>	<ul style="list-style-type: none"> <li>• 16.4% base case with up to 35% equity return with exit sale to strategic buyer</li> </ul>	<ul style="list-style-type: none"> <li>• 18% base case with up to 22% equity return with exit sale to strategic buyer</li> </ul>

The industrial-scale fishery Investment Blueprints propose investing in comprehensive fishery management improvements, acquiring fishery assets that increase in value as stocks recover, and investing in seafood companies to increase and maximize the value of increasing catch volumes over time.

<sup>44</sup> The targeted financial returns assume conservative EBITDA exit multiples and quota valuations with sales to strategic buyers in year 10.



### THE MERLUZA STRATEGY

The Merluza Strategy (Merluza) is a hypothetical \$17.5 million impact investment to restore the hake (*Merluccius gayi*, or “merluza común” as it is known in Spanish) fishery in Chile to its full biological and economic potential. The \$17.5 million would fund the implementation of comprehensive fishery management improvements, acquire 36% of the total fishing rights (or “quota”) in the fishery, and create a new hake processing and distribution business incorporating jumbo squid products and sales. The Merluza Strategy’s impact thesis is predicated on the assumption that by reducing overall fishing effort through a comprehensive set of interventions affecting over 70% of the stock, hake mortality can be sufficiently reduced to allow the stock to recover, thus improving fisher livelihoods and increasing food supplies over time. Merluza’s innovative approach would reduce the hake fishing effort by at least 27%, utilizing robust data collection and technology systems to improve fisher compliance with sustainable fishing practices, and offer financial incentives that reward sustainability over time.<sup>45</sup>

At its heart, the Merluza Strategy seeks to dramatically improve the stock status and commercialization of the common hake fishery and, in the process, meaningfully improve artisanal fisher livelihoods in the most important hake-fishing caletas in Chile. If successful, Merluza would restore the common hake stock to 75% of its  $B_{MSY}$ , an 177% increase from current levels, within a 10-year time-frame, allowing for increased landings of up to 70,000 mt per year, and putting the stock on a path to full recovery. In addition, through dramatic improvements in the harvest, handling, and supply chain, Merluza targets a payout of \$104 million in additional revenue to fishers over 10 years, to be divided among 1,800 participant artisanal fishers, plus the creation of approximately 136 million additional seafood meals. Merluza has the potential to generate a levered equity return of 16.4% in the base case over a 10-year horizon, with additional upside in the case of a more robust stock recovery.

#### Potential Impact and Financial Returns

- Increases hake stock biomass by 177% in the base case, and 269% in the upside case
- Increases incomes for almost 1,800 artisanal fishers across 12 communities through premium payout of over \$58,000 per fisher, or a total of \$104 million over the 10-year period in the base case<sup>46</sup>
- Increases meals to market by 685 million meals over the 10-year period of the investment, and 136 million annually thereafter in perpetuity
- Targets a base-case 16.4% levered equity return over the 10-year period

<sup>45</sup> This reduction only includes the retirement of 20% of Merluza’s quota holdings and a vessel retrofit program in Region VII. The actual reduction in hake fishing mortality should be much larger as IUU fishing is reduced in each of the target caletas through improved management plans, backed by robust monitoring, enforcement, and economic incentives.

<sup>46</sup> These numbers are discounted to present value.



To accomplish these impact objectives, The Merluza Strategy proposes the following bundled set of investments:

- 1. An investment of \$2.0 million up front, and a total of \$4.5 million over 10 years,<sup>47</sup> into a fisheries management company (FMC) to implement comprehensive fishery management improvements in the 12 largest hake-fishing caletas.** The investment would fund the establishment of a fisheries management company that would implement a wide range of fishery improvements. These activities would include the implementation of full vessel monitoring and catch documentation coverage, replacement of all nets below a minimum mesh size, the retrofitting of possibly 70% of hake fishing vessels in the region with the highest IUU fishing to fish jumbo squid instead, and the coordination of extensive technical assistance and broader stakeholder engagement programs.
- 2. An investment of \$9.4 million into the acquisition of 60% of the industrial hake quota, 80% of which would be reallocated to artisanal fishers in Merluza caletas, while 20% would be held, unfished and in reserve, to reduce fishing mortality and support stock recovery.<sup>48</sup>** The quota ownership would give Merluza a means by which to immediately legalize a large portion of the IUU landings in the participant caletas. Quota would only be allocated to caletas fully engaged in Merluza improvement activities and where the Chilean fisheries regulatory authority

(Sernapesca) was present to inspect and certify all landings as legal. The quota asset would also give investors significant upside exposure to a stock recovery, as the value of the quota could rise dramatically with the stabilization and restoration of the fishery.

- 3. An investment of \$6.1 million<sup>49</sup> into the creation of a vertically integrated hake and squid processing and distribution company (called “HakeCo”) that would source and commercialize hake and squid from the participant caletas, reconfiguring the prevailing supply chain while also modernizing artisanal fishing and landing practices to generate higher value for lower volumes.** HakeCo would use financial incentives to reward fishers complying with fishery management improvements, paying an estimated 50% price premium relative to current market ex-vessel prices for all raw materials that met Merluza compliance standards.

Fundamentally, the Merluza Strategy can be conceived of as a pay-for-performance mechanism through which the return to investors is tied directly to the extent to which the fishery management improvements that they finance are successful in increasing the total stock biomass and landings. The share of equity necessary to finance the investment is assumed to be about 96% of the total capital contributed, and commercial debt 4%. We believe this investment in hake has the potential to generate a 16.4% equity IRR over 10 years.

The Merluza Strategy (Merluza) is a hypothetical \$17.5 million impact investment to restore the hake (*Merluccius gayi*, or *merluza común* as it is known in Spanish) fishery in Chile to its full biological and economic potential.

<sup>47</sup> Additional fishery management expenses are paid for through the quota leasing fees generated by FMC.

<sup>48</sup> This is the maximum share of industrial quota that can go unfished without being reallocated.

<sup>49</sup> This represents only the initial costs to establish the commercial operations.

## THE SAPO STRATEGY

The Sapó Strategy (Sapó) is a hypothetical \$11.5 million impact investment to restore the Brazilian monkfish (*Lophius gastrophysus*) stock to its full productive potential, while eliminating the most damaging bycatch and shifting activity away from destructive trawl practices. The \$11.5 million investment would finance a greenfield business, referred to here as “MarketCo,” seeking to acquire at least 85% of gillnet licenses and associated vessels, while creating a processing, marketing, and distribution business focused on value-added export products. In addition to international markets, MarketCo would also focus on developing a new domestic market among promising segments of the Brazilian population. Sapó targets an 18% levered equity return.

However, due to the dearth of good data on this fishery and species, as well as concerns about the potential for bycatch of threatened species, as part of its required due diligence Sapó would undertake detailed scientific assessments of the fishery to evaluate risk and determine the feasibility of management improvements prior to making a long-term commercial investment. In addition, Sapó must first engage with fishery authorities to cement policy reforms and ensure commitments around management, licensing, and enforcement activities that only the public sector can provide before other investments would be viable. The entire investment case depends upon this step being successfully achieved, as the business would not likely be viable from either a sustainability or financial perspective without effective governance and secure tenure over the resource.

If the findings of the scientific assessments and feasibility study confirm the viability of the strategy, MarketCo would fund and implement comprehensive fishery management improvements across the gillnet fishery, while acquiring and retiring up to 15 trawl vessels, which are currently harvesting monkfish unsustainably with little oversight, and implementing management reforms including strict access and catch limits among the remaining trawl vessels. Sapó targets an 18% base case levered equity

return with upside potential ranging to 30%, while simultaneously restoring monkfish stock biomass, reducing bycatch of threatened species, generating \$7.9 million in additional revenue for fishers and operators over the life of the project, and increasing annual monkfish meals to market by 7.5 million portions by year 11.

Once called the “the poor man’s lobster,” monkfish is now among the top 10 highest-value seafood products in the world, with a global import market of over \$400 million annually, and demand is growing. Unfortunately, Brazil’s monkfish fishery fell into distress starting in 2001, the result of overfishing by foreign charter vessels catching nearly 10,000 mt per year.<sup>50</sup> During this period, the foreign and domestic fleets targeting the species, composed of both gillnet and trawl vessels, generated significant bycatch, including the highly threatened angel shark and wreckfish species. While the foreign vessels are now gone, production by domestic gillnetters and double-rigged trawlers continues at an estimated annual volume of 1,500–2,000 mt.

Today, local fishery experts believe that to successfully reform the management of these fisheries, the government must limit vessel access, set strict minimum size limits, require gear modifications to minimize bycatch, enforce Total Allowable Catch (TAC) limits, identify and implement seasonal closed areas, and rotate fishing grounds throughout the year. Above all, Sapó’s success will fundamentally depend upon ongoing scientific assessment, monitoring, and data collection programs in order to restore the fishery and ensure the long-term sustainability of the resource.<sup>51</sup>

Sapó would seek to collaborate with four stakeholder groups to roll out the strategy. First, Sapó would work with NGOs, researchers, and government authorities to leverage recent efforts to reform the demersal trawl fishery as a core piece of Sapó’s value proposition to this segment. Second, Sapó would establish a joint venture with a best-in-class seafood processing, distribution and marketing team, hereafter referred to as “MarketCo,” responsible

<sup>50</sup> Perez et al., “Deep-water fishery in Brazil: history, status and perspectives,” *Latin American Journal of Aquatic Research* 37(3), 2009.

<sup>51</sup> Perez et al., “A bycatch assessment of the gillnet monkfish *Lophius gastrophysus* fishery of Southern Brazil,” *Fishery Research* 72, 2005.



for implementing and managing local processing and distribution operations and also for developing the marketing and sales channels in Europe and Asia as well as niche domestic high-value food service markets. Third, Sapo would invest in fleet improvements and new vessels (as science-based catch limits and regulations dictate) in partnership with monkfish fishers organized under the newly established “CatchCo” — a non-profit association of fishers and operators that would manage the gillnet fishing operations, implement fishery improvements, and provide economic and social benefits to its members. Fourth, Sapo would partner with NGOs, regulators, and the fishery management committee to help finance and implement an MSC Fisheries Improvement Program, with the ultimate goal of MSC certification of the gillnet monkfish fishery.

The Sapo impact investment thesis relies upon the following four strategic drivers:

1. Reduction of between 40% and 60% of legal and IUU trawl fleet monkfish catch through vessel buybacks, catch limits, and management improvements, to less than 15% of total landings;

2. 75% reduction of juvenile monkfish catch, further enabling stock recovery and stabilization;
3. Reduction of overall bycatch by 50%, of bycatch of threatened species by 75%, and of total discards by 60% through science-based improvements to the fisheries management plan;
4. The use of financial incentives to reward fishers for compliance with fisheries management improvements

Sapo's fundamental objective is to restore the distressed monkfish fishery to full stock health at  $B_{MSY}$  over the life of the 11-year investment while enabling a 100% to 200% increase in regulated, sustainable TAC and landings, reaching a target MSY after seven years, while eliminating substantially all bycatch of threatened species.<sup>52</sup> The successful implementation of Sapo has the potential to generate approximately 7.5 million additional seafood meals to market each year and an 18% levered equity IRR over an 11-year investment horizon, with significant upside potential.

#### Potential Impact and Financial Returns

- Increases monkfish stock biomass and/or associated sustainable TAC, through better science and management, by 100% in the base case and 200% in the upside case
- Increases annual meals to market by almost 7.5 million by year 11, an increase of 375%
- Increases revenues to CatchCo fishers and operators of \$7.9 million in aggregate over 11 years, while growing the number employed in the gillnet fishery from 18 to 90 people, and creating ~100 new jobs in the business' operations
- Provides professional benefits including insurance, profit sharing, back office support, education, improvement in on-board living conditions, and training
- Targets a base case 18% levered equity return over an 11-year period

The Sapo Strategy (Sapo) is a hypothetical \$11.5 million impact investment to restore the Brazilian monkfish stock to its full productive potential, while eliminating the most damaging bycatch and shifting activity away from destructive trawl practices.

<sup>52</sup> Wahrlich, et al., “Structure and Dynamics of the Monkfish *Lophius gastrophysus* Fishery of Southern and Southeastern Brazil,” *Boletim do Instituto do Pesca*, São Paulo, 2002.

Upon the investor commitment of \$11.5 million to establish MarketCo, the capital would be deployed, in part, as follows:

- 1. Invest \$750,000 in robust monkfish stock and bycatch assessments across both gear types to collect baseline data, establish sustainability targets, collaborate with stakeholders, define scope of management improvements, and determine the feasibility of meaningful improvements and key success factors. To take place during years 1 and 2.**
- 2. Working with an NGO advocacy partner, secure binding regulatory commitments from fisheries managers and stakeholders before committing any long-term capital investment, to ensure that managers implement and enforce strict, science-based access limits and vessel quotas for the double-rigged trawl fleet.<sup>53</sup>**
- 3. Invest a \$2.8 million into a voluntary trawl vessel buyback program to retire up to 15 trawl vessels currently fishing monkfish during the first two years, reducing overall trawl fishing effort<sup>54</sup> and eliminating juvenile monkfish catch by up to 75% with the transition to deep-water gillnets.**
- 4. Invest the \$750,000 in fisheries management improvement reserve funds and current income from MarketCo's commercial operations (Step 5) to fund the implementation and operations of a comprehensive fishery management improvement program in the monkfish gillnet fishery to be implemented by CatchCo, with a focus on:**
  - a.** Significant reduction of bycatch – Particularly focused on threatened species, by means of the actions recommended following Step 1
  - b.** Monkfish stock recovery and stabilization at near  $B_{MSY}$  and fund a plan to sustainably optimize yield.
  - c.** International market-recognized sustainability designation(s) such as Marine Stewardship Council ('MSC') certification and SeafoodWatch "green" or "yellow" labels
- 4. Invest \$2 million to launch "MarketCo," an asset light monkfish processing, distribution, and marketing business, and work with existing operators to establish "CatchCo", an independent NGO that will serve as an association to recruit, train, and employ fishers, provide social benefits, administer the Sustainable Fishing Rewards Program (SFRP) and implement fisheries management improvements.**
  - a.** Establish two subsidiaries under MarketCo, an operating company (OpCo) and an fisheries infrastructure asset company (AssetCo)
- 6. Invest up to \$5 million in equity funded by the remaining capex reserve and current income from MarketCo's commercial operations in staged investments to exercise purchase options<sup>55</sup> on quota and licenses and expand the gillnet fishing fleet under AssetCo<sup>56</sup> ownership and control as the TAC increases over time; and invest in landing infrastructure and in-house processing capability as the product throughput reaches appropriate scale and project risks/uncertainties are removed.**
  - a.** A combination of equity and follow-on commercial mortgage loans will finance the capital plan over a 5-year period starting in year 4

By bundling government reforms together with private investment in the supply chain, Sapo aims to ensure compliance with sustainable management practices by eliminating destructive or illegal activities, controlling the key assets and leverage points required to implement sustainable fishing practices, and creating positive economic incentives for all participants.

The impact equity investor for such a strategy should have a 10- to 12-year investment horizon. The assumed share of equity is 80% of the total initial capital contributed, with PRI debt comprising the balance. We believe this investment in monkfish has the potential to generate an 18% leveraged equity return.

<sup>53</sup> Step 2 is a critical lynchpin for this strategy to be in a position to succeed.

<sup>54</sup> Dependent upon Step 2 to limit catch/vessel and establish overall TACs.

<sup>55</sup> Obtained through the retirement of the double rigged trawl vessels.

<sup>56</sup> AssetCo is a subsidiary under MarketCo that holds all of the hard infrastructure assets, while the other subsidiary, MarketCo's Operating Company, would seek an asset light strategy.



## NATIONAL-SCALE FISHERIES INVESTMENT BLUEPRINT

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The term “national-scale fishery” refers to fisheries that face critical barriers to effective governance stemming from a lack of infrastructure, data, institutional capacity, and political will to deliver effective regulations and public commitments. These fundamental deficiencies in resources, information, institutional capacity, and technology inhibit effective fisheries management at the national- or supranational-scale, distort market incentives and are at the root of Illegal, Unregulated, and Unreported (IUU) fishing.

Among the greatest challenges to national-level fisheries reform in emerging markets is the lack of transparency and data on the status of the underlying resource and the flow of products through the supply chain. Lack of data prevents authorities, seafood buyers, and other stakeholders from knowing who is fishing illegally, where they are fishing, how much they are catching, and where that product is being sold, which makes good fisheries management difficult, if not impossible. Greater control of information offers significant potential to tip this system in a positive direction, and while it will not directly increase fish stocks, it will provide a foundation for good fisheries management. The growth in low-cost data management technologies and “big data” also offers promising solutions.

We sought to address this challenge by developing a public-private partnership (PPP) model to finance, develop, implement and operate infrastructure and services necessary to address critical information gaps. This approach identifies the key pressure points in the system where relatively small investments in infrastructure can have outsized social and environmental impact. By employing a PPP model, the private sector can help finance complementary IT and monitoring infrastructure, such as vessel monitoring systems (VMS) and electronic catch accounting, where the public sector has failed to deliver these resources. This in turn enables fisheries authorities to focus limited monitoring and enforcement resources on the regions and situations where these interventions can be most impactful.



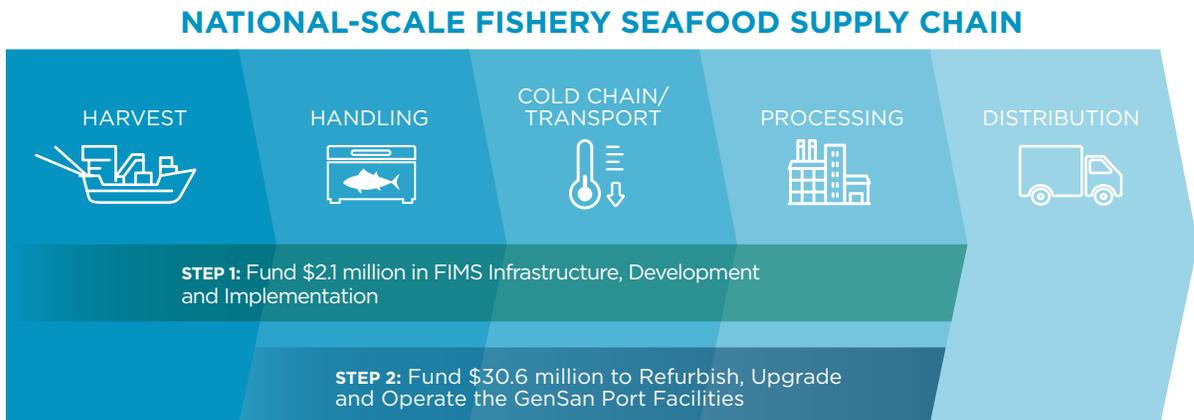
These solutions deliver fisheries management interventions through two categories of bundled investments, as highlighted in Figure 5:

1. Comprehensive fisheries information management systems (FIMS) packages, including shore-based and on-the-water tools such as monitoring, control, and surveillance (MCS), traceability systems, and electronic catch accounting.

2. The assets and operations of “brick and mortar” fishing port infrastructure at key landing and market access points, which serves as the basis for a long-term government concession.

By bundling a FIMS data-management investment together with port infrastructure and operations, the national-scale strategy offers a stable revenue stream to support the public good provided by information access and transparency.

FIGURE 6: The National-Scale Fishery Seafood Supply Chain



## THE NEXUS BLUE STRATEGY

The Nexus Blue Partnership Strategy (Nexus Blue) is a hypothetical \$34.0 million<sup>57</sup> public-private partnership investment structure to finance and implement targeted infrastructure and IT solutions that would enable management reforms throughout the supply chain of the Philippines' high-value regional tuna fisheries. This strategy seeks to upgrade the operations and infrastructure of the General Santos Fish Port Complex (GenSan), and the port, in turn, serves as the platform for implementing and operating a comprehensive fisheries information management system (FIMS) PPP. GenSan acts as a "bridge" between on-the-water production and high-value export markets, offering a natural leverage point in the otherwise complex and diffuse supply chain.

Highly migratory tuna populations are the source of more than 90% of total fish landings at GenSan. While seemingly strong Filipino, regional and international regulations and standards exist to govern these stocks, fisheries authorities are often unable to implement and enforce these laws. Reasons for this vary, but budgetary constraints, industry opposition and limited data are commonly cited. Nexus Blue is designed to address these challenges and restore and protect the tuna fishery.

Nexus Blue's FIMS component would deliver critical data to the Philippine National Stock Assessment Program's (NSAP) databases and the Western Central Pacific Fisheries Commission (WCPFC), which manages highly migratory fish stocks across the region. At the same time, the GenSan modernization component would restore the facility

while making improvements to sanitation, markets, and post-harvest facilities. The modernization initiative would also install solar power generation, build 3,000 mt of new cold storage capacity, and increase operational efficiencies alongside shore-based governance capabilities. As the only port with certification from the EU and U.S. to export fresh and canned seafood products to those markets, GenSan represents a critical path to market that industry cannot ignore.

While Nexus Blue as a standalone initiative cannot restore fish stocks in short-term, and is not designed to, it has great potential to catalyze positive reform momentum and provide the information and controls needs as a foundation for sustainable fisheries management. This would require the commitment of Philippine fisheries authorities to complete implementation of fishery-wide vessel registration and establish maximum catch limits for the tuna and sardine fisheries as a part of the PPP process. However, the strategy aims to catalyze better fisheries management in the Philippines and across the region, as the innovative financing structure for a high-quality data management solution offers a replicable model for fisheries management improvements. In addition, economies of scale have the potential to drive down adoption costs for subsequent, commercially less valuable fisheries. Nexus Blue has the potential to generate stable and attractive financial returns, targeting a 15% unlevered project IRR, with equity returns upwards of 20% over an assumed 33-year project life (3-year construction period and 30-year concession period).

### Potential Impact and Financial Returns

- Creates a best-in-class data collection system in partnership with the Philippines government capable of electronic monitoring and reporting, traceability, and near real-time data transmission
- Addresses EU requirements for Vessel Monitoring Systems (VMS), traceability, and reporting, while informing regional stock assessments with improved catch accounting
- Targets a 15% blended equity return over a 33-year project life

### Potential Indirect Impact Returns

- Catalyzes implementation of science-based catch limits across Philippine fisheries
- Removes barriers to migratory fish stock restoration and management improvements in the Philippines
- Serves as a model for replication in the region

<sup>57</sup> The combined CAPEX investments for the project sum to \$32.7 million; the remaining \$1.3 million out of the total \$34.0 million investment covers transaction costs and financing fees.

To accomplish these objectives, Nexus Blue proposes a PPP with the Philippines government with the following two components:<sup>58</sup>

**1. Upon establishing a project company special purpose vehicle (NexusCo), an investment of \$2.1 million into a subsidiary of NexusCo (referred to hereafter as “FIMSCo”), which would be dedicated to the development and implementation of a comprehensive Fisheries Information Management System (FIMS).**

The FIMS would have two interdependent components: 1) at sea, “on-the-water” IT infrastructure and tools for data collection, monitoring, traceability, and enforcement; and 2) port-based IT Infrastructure and tools for catch accounting, market transparency/efficiency, traceability, and enforcement.

**2. A simultaneous investment of \$30.6 million in a second subsidiary of NexusCo, referred to as “PortCo,” which would be dedicated to port infrastructure renovations and long-term operations of the General Santos Fish Port Complex.** Specifically, this would restore the port to the environmental, safety, sanitation and food safety standards that it was originally designed to meet, increase the efficiency and quality of operations, logistics, post-harvest services (processing and cold storage facilities) and market activities, to the benefit of GenSan’s users. Investment in 2.4 MW of reversible solar power

would buffer electricity prices and enable power to be sold back onto the grid as an added venue source. In addition, management and operational efficiencies promise to put GenSan back on a path to financial viability, and establish a world-class operation that could serve as a model throughout the region.

By bundling the FIMSCo activities and investments with the PortCo as a port-based PPP, the operator would be positioned at a key gateway in the supply chain between the regulators and the regulated as a neutral intermediary. The complementary nature of hard infrastructure and fisheries IT investments would address the needs of the Philippines Amended Fisheries Law while simultaneously: (a) shifting the financial compliance burden of VMS requirements from fishers; (b) adding value to industry by improving and maintaining high-quality industry operations and supply chain efficiency; and (c) promoting the rapid deployment of electronic monitoring (EM)/electronic recording (ER) technology to capture the data needed by regulators for monitoring, control and surveillance (MCS) and fisheries science. The combination of technology deployment and value-added improvements at GenSan would in turn build support for, or at least acceptance for, the adoption of activities required under the Amended Fisheries Law on the part of industry, which to date has represented a key barrier to reform.

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The Nexus Blue Strategy (Nexus Blue) is a hypothetical \$34.0 million public-private partnership investment structure to finance and implement targeted infrastructure and IT solutions that would enable management reforms throughout the supply chain of the Philippines’ high-value regional tuna fisheries.

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<sup>58</sup> The combined project CAPEX investments for the project sum to \$32.7 million; the remaining \$1.3 million out of the total \$34.0 million investment covers transaction costs and financing fees.



## RECOMMENDATIONS FOR KEY STAKEHOLDERS

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**T**he goal of Encourage Capital's sustainable fishing Investment Blueprints is to engage the interest of investors and entrepreneurs in funding and creating projects and businesses that have the capacity to profit from the protection and restoration of marine fisheries. We hope that fishery stakeholders consider supporting the strategies outlined in each of the three study countries, and that the blueprints can serve as design templates for replication of the strategies in a broad range of fisheries and countries.

We offer the following conclusions and recommendations to fishery stakeholders seeking to mobilize private capital to accelerate fishery reforms globally:

### 1. Private Investors

Private capital can play several key roles in advancing sustainable fisheries. Investors' holistic approach and return-seeking discipline can foster greater accountability in the design of fisheries management improvements, by aligning financial performance to successful fisheries management. Private investors can also use investments to selectively reward and incentivize successful social entrepreneurs and participating fishers and fishing companies, and fill funding gaps that government or philanthropy are unable or unwilling to provide. Most importantly, private investors, in aggregate, have sufficient funds to scale fishery management efforts far more broadly.

### 2. Foundations and Grantmakers

In addition to traditional grant programs focused on policy advocacy, certification strategies, etc., foundations and grantmakers are uniquely positioned to use their capital to fund analyses and research that can support project development by a wide range of actors, including the profiling of multiple opportunities, the analysis of specific fishery conditions, narrowing of opportunities to those with the highest impact potential, identification of commercial partners, and transaction structuring and modeling. Many private investors are unwilling to fund such activities as early stage project development costs because the risks of failure are simply too high, and prefer to invest once a project has met key milestones in terms of analysis and stakeholder engagement.

In addition, until there are strong case studies of successful fisheries-oriented impact investments that can offer evidence of impact and financial performance, private investors will continue to be reluctant to undertake the perceived complexity involved in fisheries reform. Grantmakers can play an important role in catalyzing private capital flows towards sustainable fisheries by supporting impact investing pilot projects through the provision of grants, program-related investments, loan guarantees, or other forms of credit enhancement to better demonstrate their viability.

### **3. Multilateral Institutions**

Multilateral institutions are well positioned to utilize their large balance sheets and funding pools to provide a range of credit enhancement, lending products, insurance, and technical capacity support to impact investment strategies. Sustainable fishery investments can offer a compelling return profile that fulfills critical institutional priorities around food security and economic development. Depending on the specific institution and its resources, multilateral capital available for financing specific transactions, or leveraging capital at the so-called fund level could catalyze local government or banking engagement and enable scale-up of promising strategies.

### **4. Non-Governmental Organizations and Not-for-Profits**

NGOs and not-for-profits can play an essential role in setting the appropriate sustainability standards, advocating for foundational policy reforms, and advancing the state of scientific understanding. To best support impact

investment opportunities, NGOs and not-for-profits could design and package fisheries management and community engagement as services, more easily paired to and partnered with commercial strategies, to increase investor confidence that complex projects can be effectively implemented on the ground. NGOs and not-for-profits with global reach and activities are also well-positioned to generate transaction opportunities for investors seeking to support sustainable fisheries, and can partner with fund managers, foundations, or family offices to originate investment opportunities at lower cost than might otherwise be possible. Properly resourced and appropriately skilled NGOs and not-for-profits should also consider making investments themselves.

### **5. Social Entrepreneurs**

Social entrepreneurs are another critical audience in the sustainable fisheries equation. Entrepreneurs can develop effective, low-cost fisheries management strategies, technologies, and community engagement mechanisms. They can bring creative branding and marketing ideas to bear, challenging traditional market mechanisms and supply chain management that has for too long maintained the status quo. Successful implementation of the complex strategies required to transform fisheries will require strong leadership, and investors with money to invest will be eager to embrace teams and individuals willing and able to design business models that generate financial returns from fishery recovery.

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The goal of Encourage Capital's sustainable fishing Investment Blueprints is to engage the interest of investors and entrepreneurs in funding and creating projects and businesses that have the capacity to profit from the protection and restoration of marine fisheries.

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## CONCLUSION

As the world's population grows and becomes more prosperous, the demand for animal protein will continue to increase exponentially. Wild-caught seafood can — and should — continue to play an important role in meeting this demand, particularly since its production requires no land, needs minimal fresh water, and results in the lowest greenhouse gas emissions of any major animal protein.

Unfortunately, in the absence of sustainable management, commercial-scale wild seafood production could largely disappear. This outcome has the potential to meaningfully alter our relationship with the ocean, with massive ramifications for marine ecosystems, for the 30 million fishers and the 90 million people overall who rely on wild fisheries for employment and for global food security.

To date, philanthropic and government resources alone have proven insufficient to curtail overfishing on a global scale. As such, Encourage Capital's Investment Blueprints seek to engage the interest of impact investors in funding companies and projects that generate financial returns from the protection and restoration of marine fisheries. Although the Investment Blueprints examine opportunities in only a small subset of the world's fisheries, the strategies presented have the potential to be replicable across many, perhaps even most, species and geographies.

If these new approaches to seafood production prove successful in delivering durable financial and impact returns, we believe they could unlock much larger pools of private capital for marine conservation to catalyze and scale fishery improvement efforts. This outcome could fundamentally change the landscape of the seafood industry — protecting our oceans and providing an ongoing source of food and income for generations to come.

# INTRODUCTION

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## INTRODUCTION

The earth's oceans have been a source of sustenance and wonder to humankind since the dawn of time, supporting coastal populations for millennia and perhaps even playing a role in human evolutionary development.<sup>1,2</sup> To this day, our reliance on marine resources remains profound. Seafood currently provides 17% of daily animal protein consumed globally, yet fish stocks worldwide are imperiled, threatening marine ecosystems, global food security, and the economic livelihoods of millions of fishers. In fact, only 8.5% of global landings are in fisheries certified as sustainable,<sup>3</sup> while 40% of fisheries are considered to be overexploited or collapsed.<sup>4</sup> Impact investors can play a role in saving these fisheries.

In an effort to protect and restore global fisheries, an estimated \$1.1 billion in philanthropic funding over the past 5 years<sup>5</sup> has supported advances in fisheries policy, community stewardship, science, sustainable certification strategies, and consumer awareness campaigns. This growing global movement of advocacy for marine conservation and sustainable fishing has laid a strong foundation for fisheries restoration and has proven that well-managed fisheries can recover. We therefore know how to fix fisheries, but we need more capital to fix them, faster, to allow the ocean to continue to feed and inspire us into the coming century.

We have good reason to hope that the capital will indeed flow, as healthy fisheries are more profitable than fisheries in distress. Healthy fisheries produce more fish at lower costs, strengthen coastal fishing communities, and feed more people. Recent research published by University of California-Santa Barbara projects that restoration of distressed fisheries globally could increase global fish stocks by 36%, increase marine food production by 14%, and generate an additional \$51 bn in aggregate profits, all within a 10-year time frame.<sup>6</sup> This fundamental alignment between long-term economic benefit and social and environmental benefit invites a new wave of profitable and impactful fisheries investment globally.

<sup>1</sup> Verhaegen, M., P. F. Puech, and S. Munro, 2002. "Aquarboresal Ancestors?" *Trends in Ecology and Evolution* 17:212-17.

<sup>2</sup> Hardy, A., 1960, "Was Man More Aquatic in the Past?," *New Scientist* 7:642-45.

<sup>3</sup> Marine Stewardship Council Certification, [mscglobalservices.com](http://mscglobalservices.com), 2015.

<sup>4</sup> Pauly et al., "What Catch Data Can Tell Us About the Status of Global Fishery," *Sea Around Us Project*, 2012.

<sup>5</sup> California Environmental Associates, unpublished analysis, 2015.

<sup>6</sup> Costello et al., "Status and Solutions for the World's Unassessed Fisheries," *Science* 338, 2013.

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## Seafood currently provides 17% of daily animal protein consumed globally, yet fish stocks worldwide are imperiled, threatening marine ecosystems, global food security, and the economic livelihoods of millions of fishers

Against this backdrop, research suggests that impact-focused investors have approximately \$5.6 bn in capital to deploy over the next five years and are actively seeking investment opportunities that deliver environmental, social, and financial returns.<sup>7</sup> Put simply, impact investors have the means to dramatically reshape the world's "blue economy."

To better channel the flow of this capital to the sustainable fisheries need and opportunity, Bloomberg Philanthropies and The Rockefeller Foundation supported Encourage Capital (Encourage) to develop six Investment Blueprints, each intended to serve as a roadmap for the growing number of investors, entrepreneurs, and fishery stakeholders seeking to attract and deploy private capital both to scale and to accelerate fisheries reform.

The Investment Blueprints profile hypothetical investment strategies for application to three types of fisheries, including (a) small-scale fisheries, focused on improving management of moderately distressed near-shore fish stocks landed by community-based, artisanal fishers using small vessels; (b) industrial-scale fisheries, focused on improving management of severely distressed fish stocks landed by both artisanal and industrial fishers using a wide range of vessels and gear types; and (c) national-scale fisheries, focused on implementing specific national-scale management improvements.

The Investment Blueprints present investment strategies based on prototype fisheries spanning three countries and more than 25 species. By analyzing specific fisheries' current productivity, ecology, potential long-term yield, management regime, and supply-chain dynamics, Encourage was able to design and structure investment strategies that incorporate real-world risks and return potential. We believe that the Investment Blueprints offer viable models that can be replicated across a wide array of fisheries and geographies, mobilizing private capital to protect and restore the oceans' bounty.

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<sup>7</sup> Encourage Capital and The Nature Conservancy, NatureVest Division, "Investing in Conservation," November 2014.



## ENCOURAGE CAPITAL TEAM

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**Bruno Semenzato**, *Intern*

## TARGETED FINANCIAL RETURNS AND IMPACTS

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The six Investment Blueprint strategies are crafted to engage the interest of impact investors by describing how sustainable fisheries investments can generate attractive financial returns while simultaneously achieving critical environmental and social impact goals.

### FINANCIAL RETURNS

Our work shows that impact investors in the fisheries sector have a real opportunity to realize potentially attractive financial returns as well as social and environmental impacts. The Investment Blueprints show that impact-oriented business models benefiting from stock stabilization or restoration have the potential to generate equity returns between 5% and 35%, using conservative growth and exit assumptions. These returns are driven primarily by increased volumes linked to stock recoveries, improvements in supply chain efficiency, access to higher-value markets, and reductions in raw material supply volatility.

### IMPACTS

In each of the six Investment Blueprints, we propose to bundle investments in seafood companies and fishery assets with complementary investments that improve fishery management. In combination, the investments are aimed at generating positive environmental, social, and food security impacts.



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The six Investment Blueprint strategies are crafted to engage the interest of impact investors by describing how sustainable fisheries investments can generate attractive financial returns while simultaneously achieving critical environmental and social impact goals.

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### ENVIRONMENTAL OUTCOMES: PROTECT AND RESTORE FISH STOCKS

The central impact objective of the Investment Blueprints is to protect and restore wild-caught marine fisheries, which in turn support fishing livelihoods and supply meals to millions of people around the world. Depending on the fishery, the Investment Blueprints propose to do the following:

- Increase the estimated biomass of severely distressed stocks.
- Prevent further declines in and/or increase the biomass of stocks facing moderate distress.
- Reduce bycatch of non-target species or juvenile age cohorts of target stocks.
- Where possible and relevant, protect and restore critical marine habitat such as mangroves and coral reefs.

While the fishery management improvements proposed throughout the Investment Blueprints are ultimately expected to protect marine biodiversity across a wide range of ecosystems, we do not attempt to quantify those impacts. Monitoring of biodiversity levels could be further explored by investors seeking to explicitly achieve that impact objective.

### SOCIAL OUTCOMES: SUPPORT FISHING LIVELIHOODS

The Investment Blueprints also target several impact objectives associated with fisher livelihoods and fishing community well-being. Depending on the fishery, the Investment Blueprints show the potential to do the following:

- Increase the aggregate income of fishers and fishing communities.
- Improve fishing community resilience.
- Empower fishing communities and fishers.

### FOOD SECURITY OUTCOMES: FEED MORE PEOPLE

Each Investment Blueprint also targets the production of additional meals for local and regional consumption or for export to international markets. Increased meal production can be generated by (a) projected increases in landings volumes (only expressed when in connection with stock biomass improvements of the target stock, and subject to the constraints of scientifically determined Total Allowable Catch limits); (b) increases in the utilization of previously discarded bycatch; and (c) reductions in supply chain spoilage. Based on the projected increases to final product volumes resulting from these drivers, the Investment Blueprints convert this additional volume to additional seafood meals to market, taking into consideration the processing yield of the particular species after removal of nonedible parts.<sup>5</sup>

Encourage Capital's Investment Blueprints establish quantifiable base-case impact targets for each of the primary environmental and social impact objectives. While the field of impact measurement is still evolving and impact outcomes can be difficult to measure, we propose the base case impact targets both as a means to build accountability into the Investment Blueprints and as a tool to promote continuous improvements in the proposed strategies over time.



## THE CORE PARTNERS

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**A**s part of Bloomberg Philanthropies' Vibrant Oceans Initiative, Encourage Capital undertook the Investment Blueprint development process with support from The Rockefeller Foundation, with input from Oceana, the largest international advocacy organization focused solely on ocean conservation, and from Rare, a pioneering organization empowering local communities to shift from being resource users to environmental stewards.

Bloomberg Philanthropies' Vibrant Oceans Initiative simultaneously funded Oceana and Rare to implement policy and community stewardship programs in Chile, Brazil, and the Philippines, with the hope that Encourage Capital's Investment Blueprints could create a pathway for private capital to further accelerate and scale success in each Vibrant Oceans' country context. With Oceana's and Rare's guidance, we analyzed priority fisheries across the three countries over a period of two years, engaging with fishers, local and international NGOs, government officials, and technical experts to craft each investment strategy.

Given the sheer complexity of fisheries management more generally, this pioneering collaboration gave Encourage Capital the opportunity to create investment strategies that explore the interdependence of policy, community, and financial resources and can be applied beyond the three primary study countries to build additional momentum and scale for a broader fisheries management transformation. The result of that effort is presented in the form of six Investment Blueprints, each offered as a model transaction, capable of attracting private capital to support sustainable fisheries.

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Bloomberg Philanthropies' Vibrant Oceans Initiative simultaneously funded Oceana and Rare to implement policy and community stewardship programs in Chile, Brazil, and the Philippines.

## WHAT IS AN INVESTMENT BLUEPRINT?

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In 2012, Bloomberg Philanthropies and The Rockefeller Foundation supported Encourage Capital to work with Oceana and Rare to develop investment concepts that were tailored to support their policy reform and community stewardship strategies by providing a private capital funding source that could accelerate and amplify their success. The investment concepts were published in Encourage Capital's *Sustainable Fisheries Financing Strategies* and can be found at [www.encouragecapital.com](http://www.encouragecapital.com).

Bloomberg Philanthropies and The Rockefeller Foundation then provided ongoing support to Encourage Capital to test the investment theses against real fishery conditions, which vary widely depending on species and geography, and to prepare the Investment Blueprints as a synthesis of the investment research. The proposed strategies therefore take into account factors such as local fishery and ecosystem conditions, regulatory challenges, potential fishery management interventions, supply chain dynamics, market factors, and detailed cost estimates to incorporate practical realities “on-the-ground” into the design of each Investment Blueprint. The Investment Blueprints incorporate both published and primary research and data, drawing from the wide range of analyses to form a hypothetical investment strategy, tailored to the selected species and fishing communities, to achieve social and environmental impact objectives and deliver a financial return. Development and evaluation of each potential investment strategy necessarily involved the engagement of multiple technical and commercial advisors alongside discussions with local fishers and government authorities.

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The Investment Blueprints incorporate both published and primary research and data, drawing from the wide range of analyses to form a hypothetical investment strategy, tailored to the selected species and fishing communities, to achieve social and environmental impact objectives and deliver a financial return.

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The Investment Blueprints are at times limited by the quality of data available across the three focus countries and fisheries, which varied widely. For example, The Merluza Strategy proposes an impact investment to restore the common hake fishery, a large, intensively studied, highly regulated fishery in Chile, and benefited from the availability of extensive academic and government publication of fishery data, interviews with numerous industry executives, and widely accessible market-related information. In contrast, The Mangue Strategy, which proposes an impact investment to protect and restore the



mangrove crab fishery in the Brazilian state of Pará, was constrained by the complete absence of fishery data, and by the limited presence of fisheries authorities, formal companies, and NGOs in the region. Impact Investors interested in applying or replicating the proposed strategies would need to conduct their own due diligence to consider the impact of such data limitations in making investment determinations.

Each Investment Blueprint was written to take into account the content of an investment memorandum, a format typically used by private investors in evaluating potential investment

opportunities, including strategy descriptions, cost estimates, transaction structures, and financial models.

By designing investment strategies that reflect and incorporate the conditions affecting the specific exemplar fisheries, and then by evaluating them in a rigorous manner, we hope that the Investment Blueprints serve as highly credible, replicable investment design templates that offer actionable guidance to fishery stakeholders and impact investors in attracting and deploying private capital to restore the oceans and feed the world.

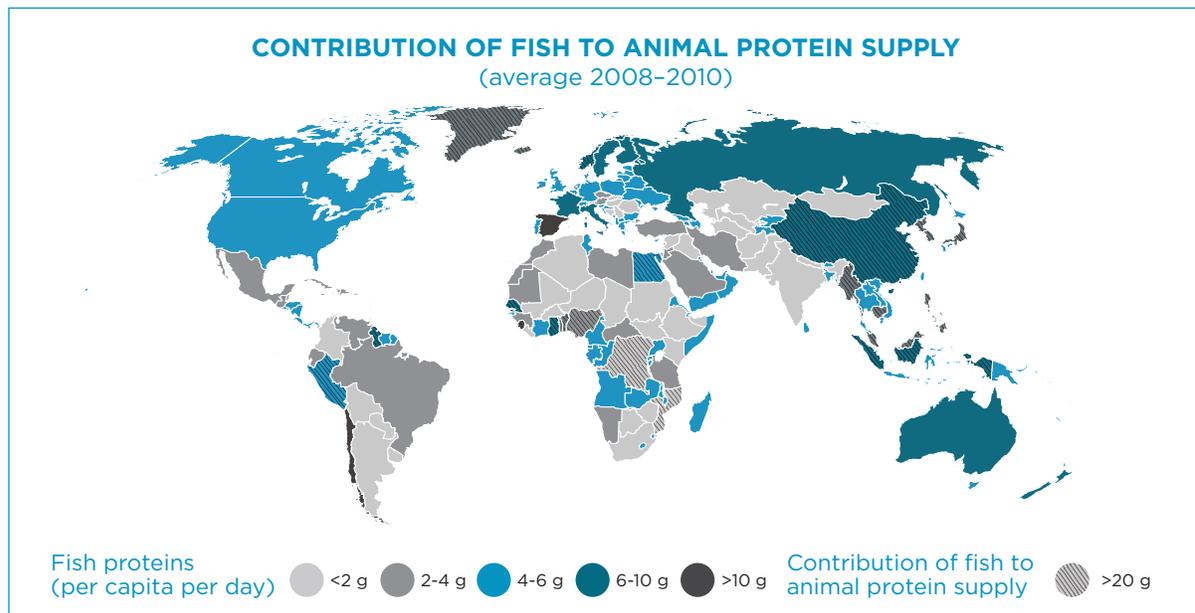
## THE SUSTAINABLE FISHERIES IMPACT INVESTMENT CONTEXT

The financial performance and overall impact of any sustainable seafood investment will be affected by the broader trends in raw material supply, demand, and prices, as well as by the competitive dynamics of the seafood supply chain.

### RIISING SEAFOOD DEMAND

Over 1 billion people globally rely on seafood as their primary source of protein, with another 4.3 billion utilizing seafood for 15% of their animal protein consumption.<sup>8</sup> See Figure 1 for a map showing the contribution of fish to animal protein supply across the globe. In total, we consume an estimated 160 million metric tons of seafood annually, half of which are caught in the ocean.<sup>9</sup> Some 30 million fishers across 200 countries carry on time-honored traditions of putting boats to water, casting nets, drifting lines, and setting traps to feed the world, with seafood exports of \$130 billion annually representing approximately 10% of total global agricultural exports, and only the first stage in the estimated \$900 billion<sup>10</sup> seafood supply chain from hook to plate.<sup>11</sup> Compared to other sources of animal protein, seafood tops the rankings as the healthy option with the lowest carbon footprint, being 10 times more efficient than beef and 3.5 times more efficient than chicken, respectively, in terms of CO<sub>2</sub> emissions.<sup>12</sup> Food security economists project that in order to meet the growing worldwide protein demand driven by population growth and economic development, global fisheries production for human consumption must expand by 70% over the next 35 years.<sup>13</sup>

FIGURE 1: Contribution of Fish to Animal Protein Supply



Source: The State of World Fisheries and Aquaculture, FAO, 2014.

<sup>8</sup> Food and Agriculture Organization of the United Nations, "The State of World Fisheries and Aquaculture," Rome, 2014.

<sup>9</sup> Food and Agriculture Organization of the United Nations, "The State of World Fisheries and Aquaculture," Rome, 2014.

<sup>10</sup> L. Ababouch, World Seafood Congress, 2015.

<sup>11</sup> Food and Agriculture Organization of the United Nations, "The State of World Fisheries and Aquaculture," Rome, 2014.

<sup>12</sup> Weber et al., "Food-Miles and the Relative Climate Impacts of Food Choices in the United States," *Environment Science & Technology* 42(10), 2008.

<sup>13</sup> Food and Agriculture Organization of the United Nations, "The State of World Fisheries and Aquaculture," Rome, 2014.

## DECLINING STOCK ABUNDANCE

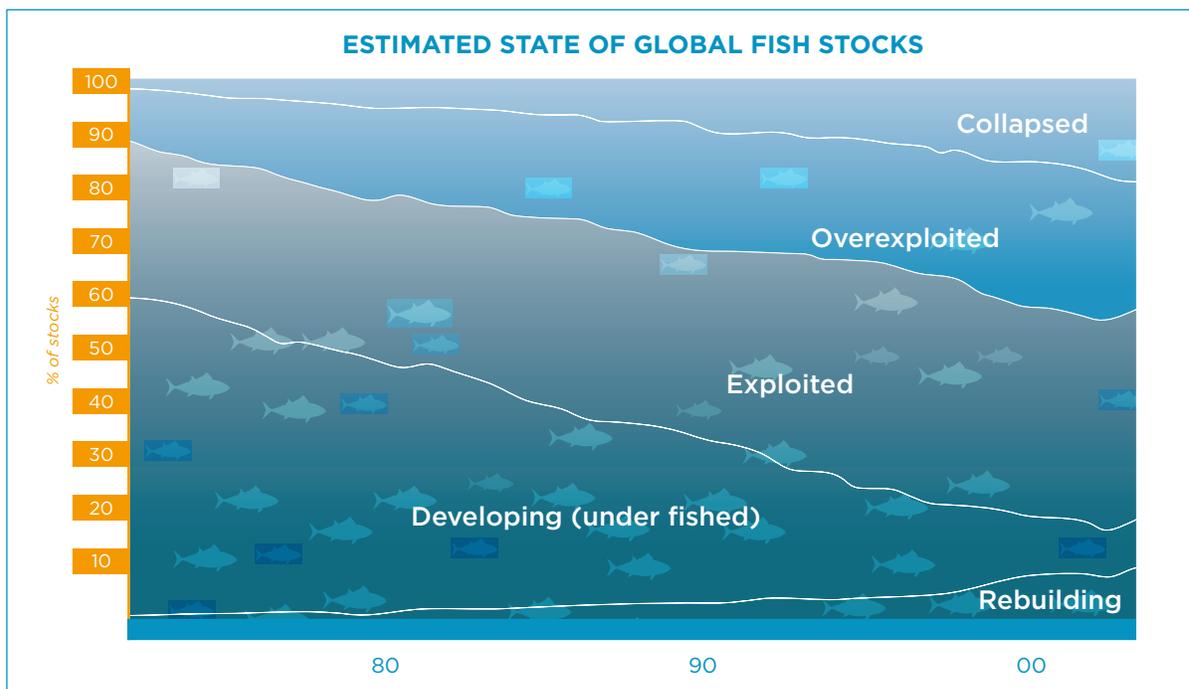
In spite of the importance of the ocean to our global well-being, our reliance on and relationship with ocean resources is imperiled. Scientists estimate that almost 40% of fisheries are overexploited or collapsed, with the remainder under threat as seafood demand increases over time.<sup>14</sup> While some advances have been made around the globe to restore depleted fisheries, only 8.5% of global landings are in fisheries certified as sustainable by the Marine Stewardship Council, the leading fisheries certification body.<sup>15</sup>

Fishery declines are primarily driven by the overfishing of stock resources beyond their ability to reproduce enough to offset the takings from the oceans. Larger, faster industrial vessels that stay at sea for days or weeks at a time can each store up to 7,000 tons of processed fish on board, enough to serve over 18 million meals, caught on a single fishing trip.<sup>16</sup> Overfishing caused by overcapacity of both small-scale and industrial fishing fleets as well as illegal fishing by unregistered or otherwise noncompliant fishers leads to declining

stock levels. Suboptimal gear can cause bycatch of unwanted species, including keystone or threatened species such as dolphins or sea turtles, as well as lesser-known inhabitants of the diverse ocean ecosystem. Some fishing methods cause direct damage to ecosystems by dragging nets across sensitive underwater habitats or, worse, damaging reefs and poisoning the waters with explosive devices or cyanide. Finally, fishing practices that do not respect nursery grounds or spawning seasons, or that otherwise capture significant numbers of juveniles, can quickly diminish biomass and yields.

More broadly, in fisheries where governance and management are weak, the “tragedy of the commons” phenomenon plays out, in which the race to catch the most fish before they disappear quickly leads to stock decimation. This is especially true in coastal fishing communities in developing countries where population growth and economic vulnerability drive small-scale fishers to overexploit marine resources in order to survive.

FIGURE 2: Global Fish Stocks



Source: Daniel Pauly, 2012.

<sup>14</sup> Daniel Pauly, “What Catch Data Can Tell Us About the Status of Global Fisheries,” *Marine Biology* 159, 2012.

<sup>15</sup> Marine Stewardship Council Certification, [mscglobalservices.com](http://mscglobalservices.com), 2015.

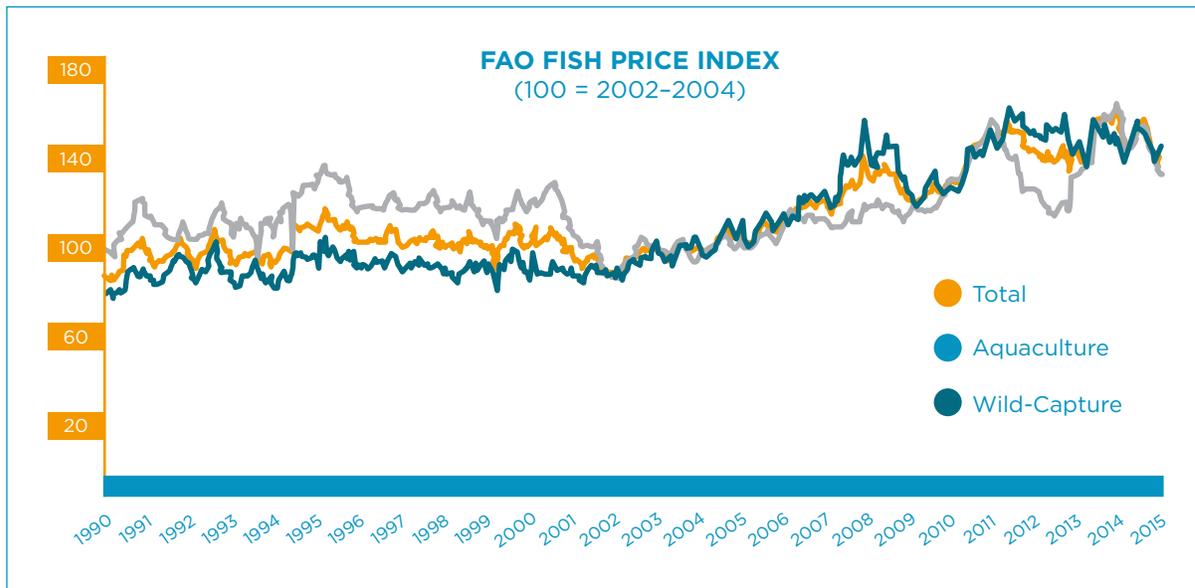
<sup>16</sup> Lorna Siggins, “Irish Ports to Greet Atlantic Dawn,” *Irish Times*, 2000.

### CONSTRUCTIVE PRICE DYNAMICS

The projected growth in demand for seafood products, as set against the downward trends in ocean productivity, has generated strong price growth for seafood products globally by approximately 38% since 2002, notwithstanding price declines during the global economic recession. Economists with the United Nation's Food and Agriculture Organization (FAO) project that prices

will continue to rise by an estimated 25% by the year 2022, relative to 2014 prices,<sup>17</sup> depending in part on the growth of the aquaculture sector in offering some degree of product substitution for wild-caught species. While prices for individual species can be volatile, the overall price strength in global seafood markets can support sustainable seafood investing strategies over the long term. (See Figure 3).

FIGURE 3: FAO Fish Price Index<sup>18</sup>



### SUPPLY CHAIN FACTORS

The seafood industry is extremely fragmented relative to other protein sectors, involving hundreds of species, each with its own life cycle, geographic range, fecundity, and commercial value. Fishers and fishing fleets often lack high-quality market infrastructure, especially in developing countries, where many fishers still land their catch on the beach with no ice or cold storage to preserve product quality and increase shelf life. The high degree of perishability of the product generally makes fishers "price takers," vulnerable to manipulation and the usurious practices of intermediaries, with price markups from dockside to table as high as 1,000%, in some cases trading hands in the supply chain four and five times with

no incremental value-addition beyond transport. Waste and spoilage can be as high as 50% in some small-scale fisheries, without taking into account the value losses accruing from underuse of products that may fetch high prices as fresh or packaged goods but are instead sold as low-value commodities for lack of proper handling, adequate cold storage, and enforced food safety standards.

While these market conditions pose challenges to fishers, they also present opportunities for investors to add significant value to ocean harvests by investing in businesses that both maximize the value for landed-catch volumes and benefit from the tailwinds of rising demand and prices.

<sup>17</sup> Food and Agriculture Organization of the United Nations, "The State of World Fisheries and Aquaculture," Rome, 2014.

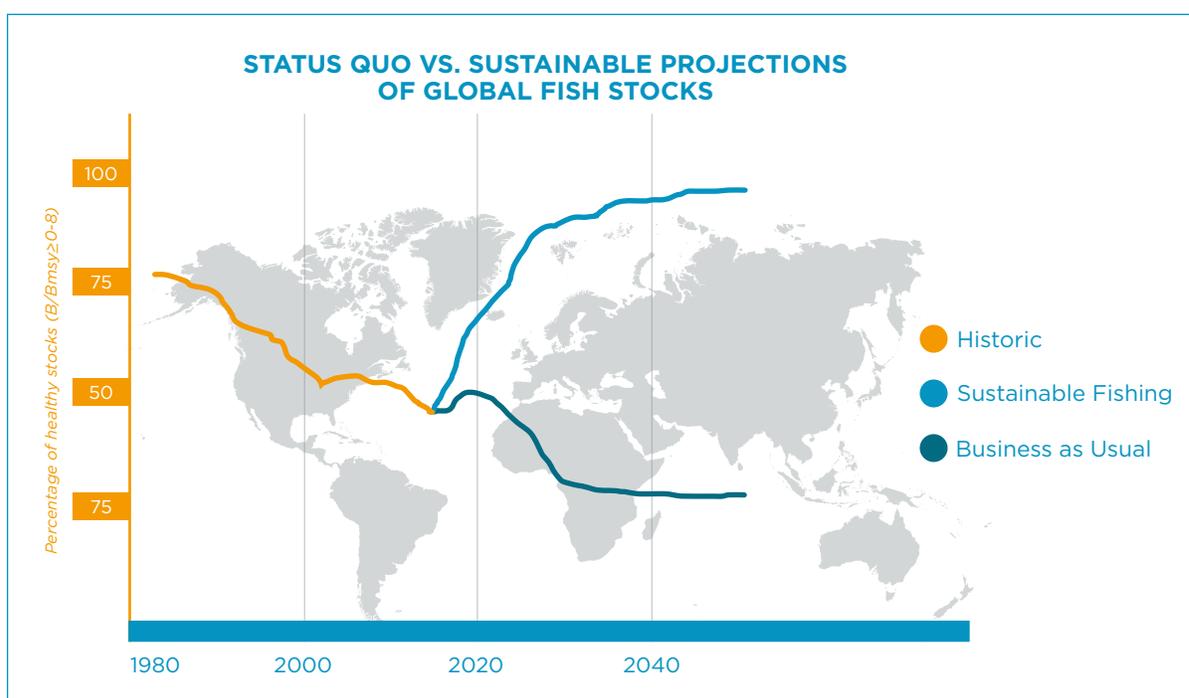
<sup>18</sup> Norwegian Seafood Council, FAO, "FAO Fish Price Index," July 2015.

## PROSPECTS FOR FISHERY RESTORATION

While it can be difficult to marshal the stakeholder collaboration and funding required to restore depleted fisheries, the economic value creation associated with fisheries reforms is compelling. A recent study conducted by the University of California Santa Barbara's Sustainable Fisheries Group found that global restoration of distressed fisheries could increase stocks by 36%, boost yearly seafood production by 12 million metric

tons (14% of current wild-capture production), and generate an additional \$51 billion in annual profits within 10 years.<sup>19</sup> The global restoration potential offers an ample "seascape" of investment opportunities for impact investors to consider. Figure 4 shows the projected difference between "Business-as-Usual" and the transition of fish stocks to sustainable fishing practices.

FIGURE 4: Status Quo vs. Sustainable Projections of Global Fish Stocks



Source: "Ocean Prosperity Roadmap: Fisheries and Beyond," Synthesis Report, 2015.

The global restoration potential offers an ample "seascape" of investment opportunities for impact investors to consider.

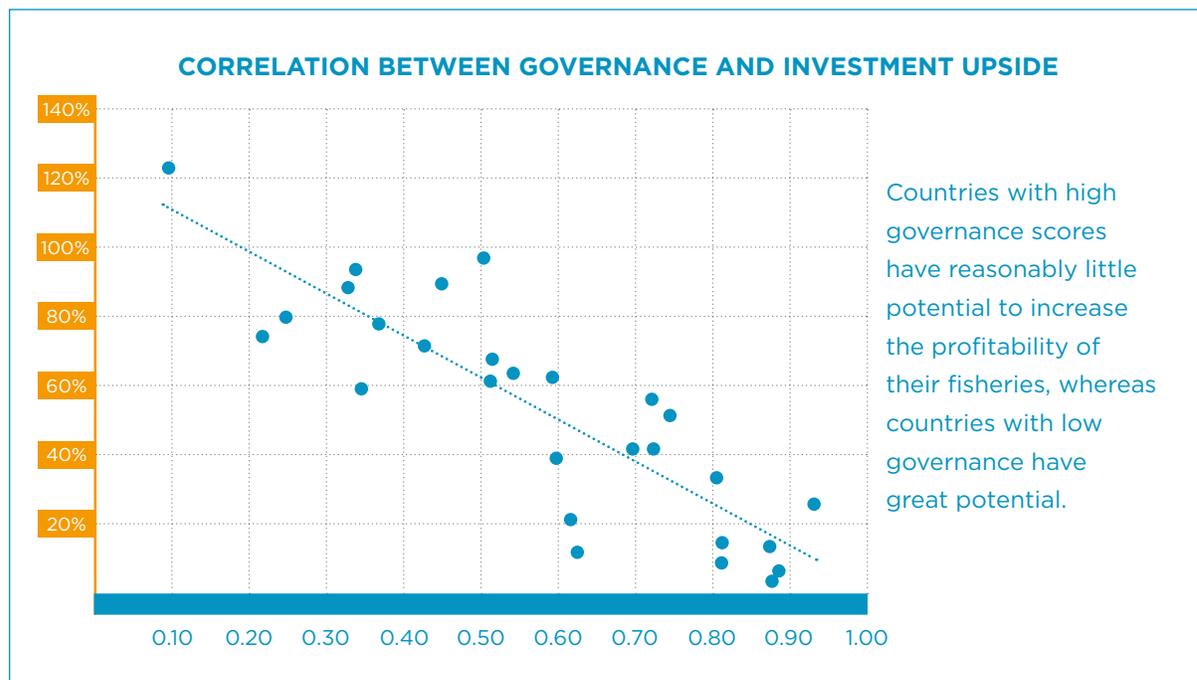
<sup>19</sup> Costello, Hillborn et al. "Ocean Prosperity Roadmap: Fisheries and Beyond," Synthesis Report, 2015.



The same analysis then examined the correlation between a country's fisheries governance and the potential for growth and recovery in its fisheries sector. Figure 5 shows that countries with poor governance have greater upside potential to increase their fisheries' profitability than do

countries with strong governance already in place. The Investment Blueprints explore ways in which to link management and governance improvements with seafood businesses that profit from stable or improving fishery health.<sup>20</sup>

FIGURE 5: Correlation between Governance and Investment Upside



Source: "Ocean Prosperity Roadmap: Fisheries and Beyond," Synthesis Report, 2015.

<sup>20</sup> Costello, Hillborn et al. "Ocean Prosperity Roadmap: Fisheries and Beyond," Synthesis Report, 2015.

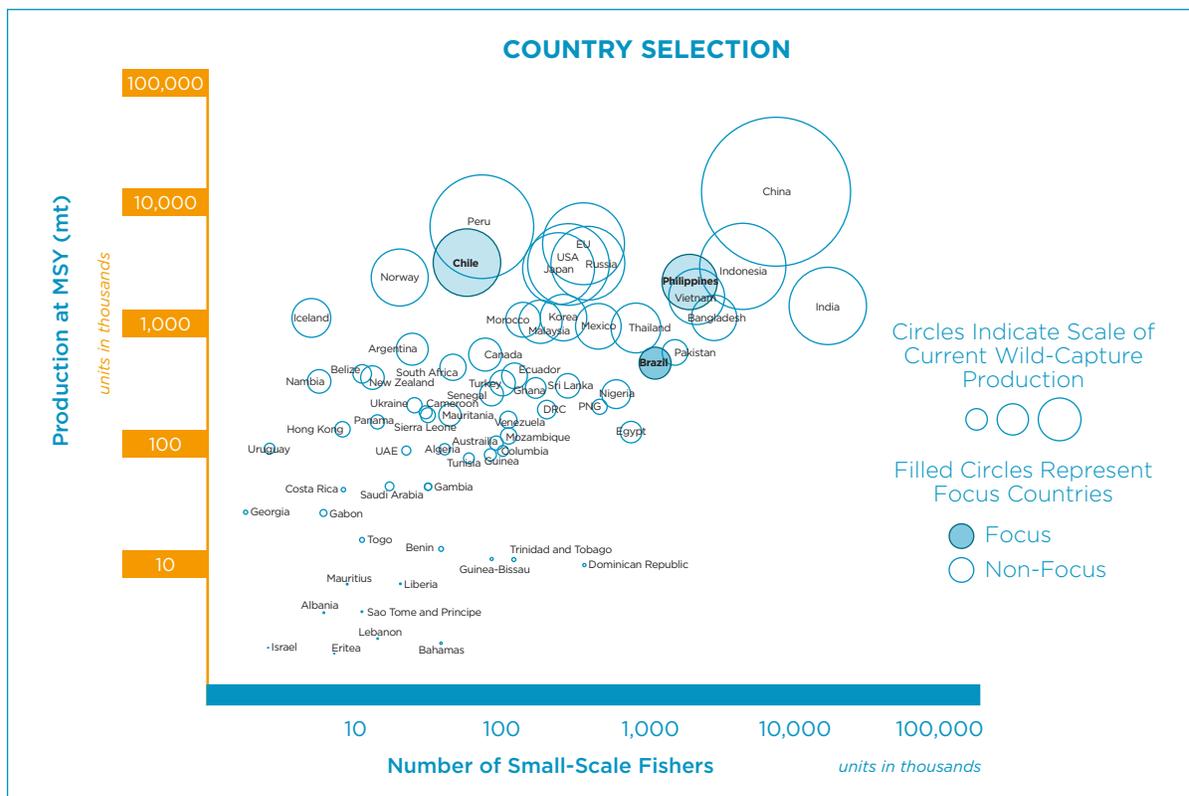
## THE FOCUS COUNTRIES

The Encourage Capital Investment Blueprints profile specific sustainable fishery investment opportunities in Chile, Brazil, and the Philippines. The countries were chosen by Oceana, Rare, and Encourage Capital based on a combination of factors, including the following:

- Each country's importance as a fishing nation, as measured by current landings volume and potential landings at maximum sustainable yield<sup>21</sup>
- The overall condition of fisheries within each country's fishing territory and the need for sustainable fishing interventions
- The degree of coastal community dependence on fishing activity
- The relative strength of each country's overall investment climate
- The regional importance of each country as a potential exemplar of success
- The potential to achieve meaningful impact in a five-year period

All countries with fishing activity were evaluated as candidates for the partner collaboration, as shown in Figure 6, with the selected countries of Chile, Brazil, and the Philippines highlighted:

FIGURE 6: Country Selection<sup>22, 23, 24, 25</sup>



<sup>21</sup> The maximum level at which a fishery can be routinely exploited without long term depletion.

<sup>22</sup> L.S.L. Teh and U.R. Sumalia, "Low Discounting Behavior Among Small-Scale Fishers," *Sustainability* 3: 897-913, 2011.

<sup>23</sup> Christopher Costello and Steven D. Gaines, "Status and Solutions for the World's Unassessed Fisheries," *Science* 338, 2013.

<sup>24</sup> Food and Agriculture Organization of the United Nations, "Wild Capture Production," 2011.

<sup>25</sup> Sovereign Credit Ratings, S&P, 2014.

Chile, Brazil, and the Philippines are each important fishing nations, ranked 7th, 29th, and 11th, respectively, by marine capture, and together comprise 7.7% of global landings (excluding

China).<sup>26,27</sup> The three study countries produce an estimated total \$15.2 billion in seafood landings annually. (See Figures 7 and 8).

FIGURE 7: Global Marine Landings <sup>28</sup>

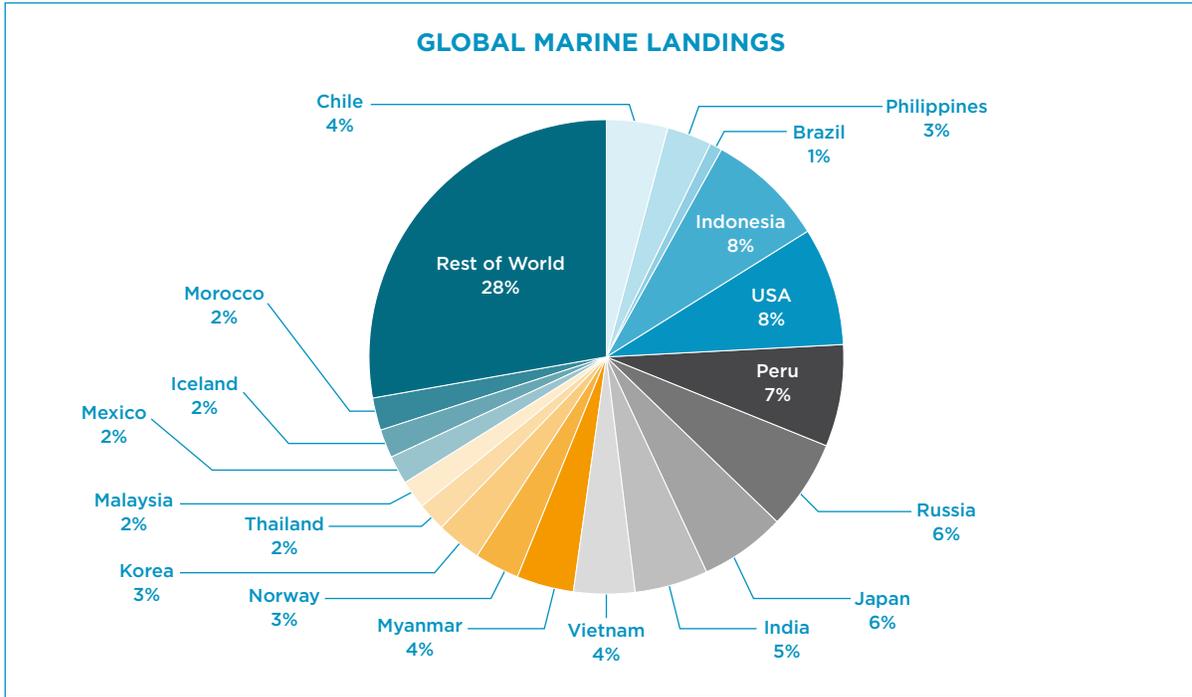


FIGURE 8: Landings by Study Country <sup>29, 30, 31</sup>

	CHILE	BRAZIL	PHILIPPINES
Total Landings Value	\$7.3 bn	\$1.0 bn	\$6.9 bn
Top 10 Species	\$6.0 bn	\$884 mil	\$4.2 bn

<sup>26</sup> China's reported 13.9 million mts in landings would rank it first among producing countries with over 17% of global production, but it is sometimes excluded from rankings as its reported landings are thought to contain large errors of consistency and accuracy.

<sup>27</sup> FAO Fisheries and Aquaculture Department, "Global Capture Production Statistics," Rome 2014.

<sup>28</sup> Food and Agriculture Organization of the United Nations, "The State of World Fisheries and Aquaculture," Rome, 2014.

<sup>29</sup> Food and Agriculture Organization of the United Nations, "Fish and Aquaculture Country Profile: Chile, Brazil, Philippines," fao.org, 2014.

<sup>30</sup> Bureau of Agricultural Statistics, Republic of the Philippines, "Fisheries Statistics," Factsheet, 2013.

<sup>31</sup> Philippines estimate includes aquaculture.

## FISHERY CONDITIONS

Government tracking of fishery health in each of the study countries shows declines in landings, and is likely to underreport the true state of depletion, given the lack of robust data collection systems

that exist across many of the species and small-scale fishing communities. Figures 9, 10, and 11 show total fishery landings over time in each of the three study countries.

FIGURE 9: Chilean Marine Landings<sup>32</sup>

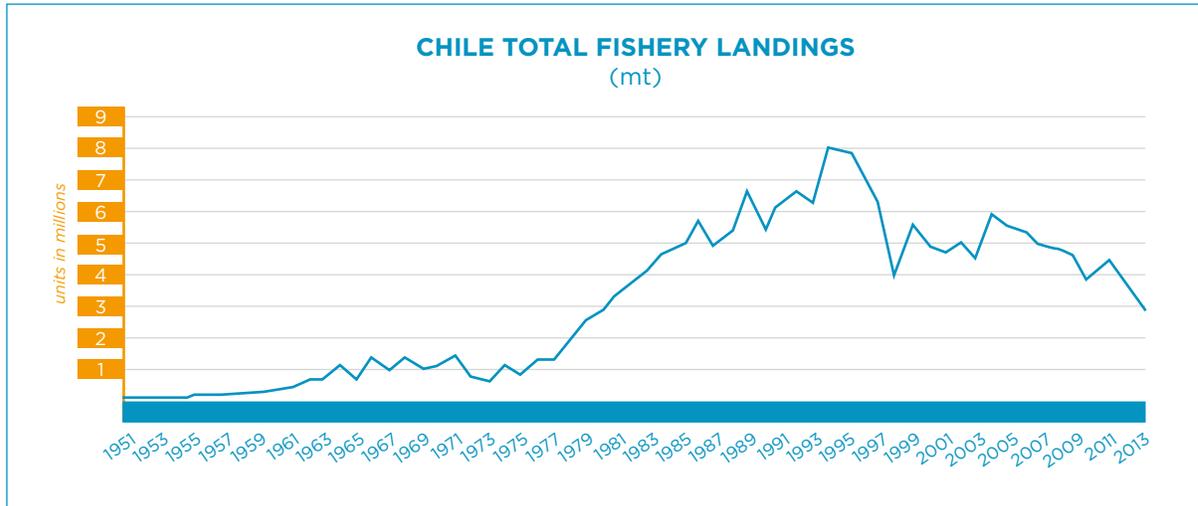
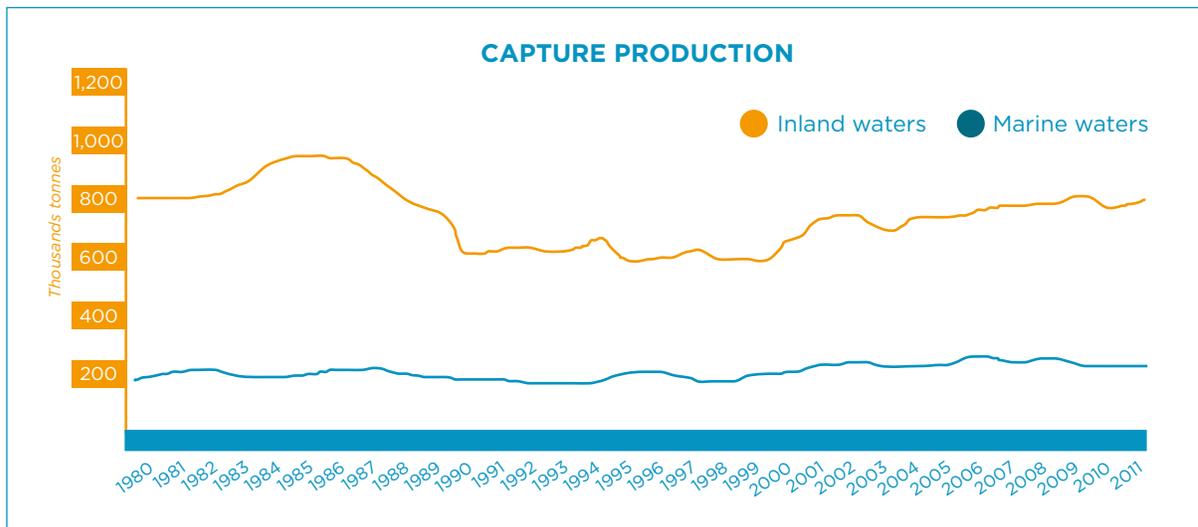


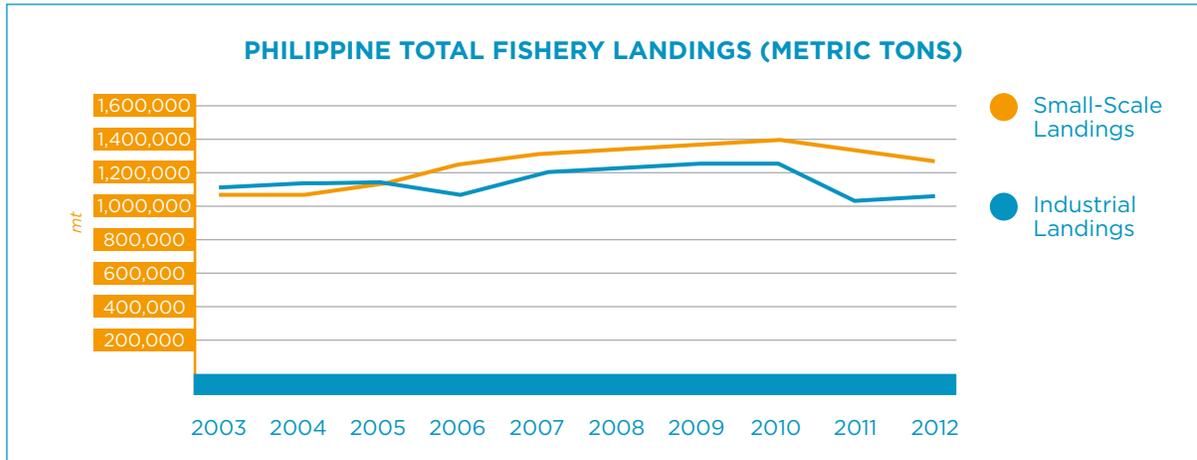
FIGURE 10: Brazilian Marine Landings<sup>33</sup>



<sup>32</sup> Ministerio de Agricultura de Chile, "Sector Pesquero: evolucion de sus desembarques, uso y exportacion en las ultimas decadas," Oficina de Estudios y Politicas Agrarias, 2014.

<sup>33</sup> Food and Agriculture Organization of the United Nations, "Fishery and Aquaculture Country Profile: Brazil," fao.org, 2015.

FIGURE 11: Philippines Marine Landings (mt)<sup>34</sup>



Fisheries scientists estimate that near-shore stocks, often left unassessed by fisheries authorities, have suffered even more significant declines as population growth, socioeconomic

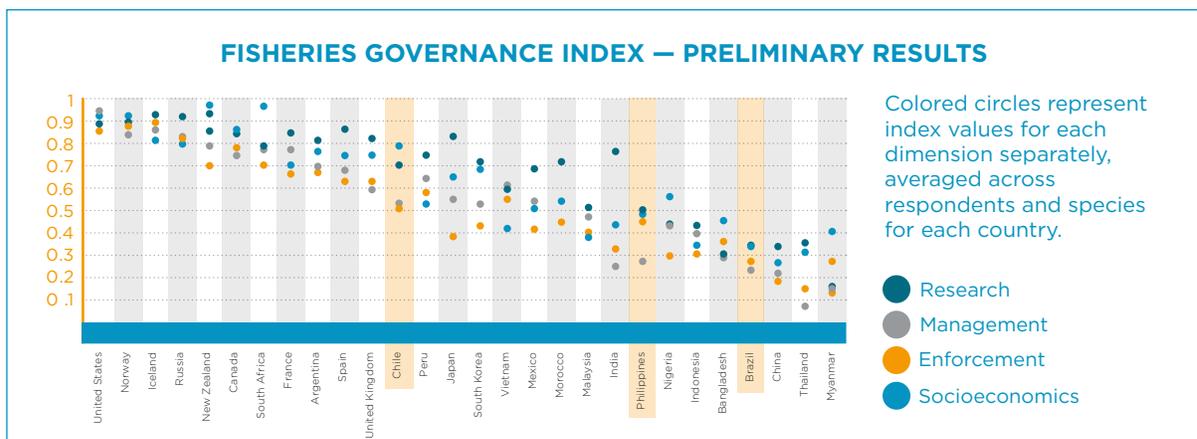
vulnerabilities, and weak fisheries governance at local levels have driven severe overfishing among artisanal, or small-scale, fishers especially in developing countries.

### FISHERY GOVERNANCE

Recent analysis as shown in Figure 12, conducted by Ray Hillborn and Michael Melnychuk from the University of Washington ranked Chile, Brazil, and the Philippines at 0.63, 0.30, and 0.42 on a scale from 0 to 1 on their new fisheries governance index, which ranked countries based on the quality of their research program, management capacity, enforcement, and programs to support

socioeconomic conditions.<sup>35</sup> In many cases across these three countries, fisheries authorities lack even basic estimates of current stock sizes of numerous species, do not set maximum catch limits, have insufficient rules in place to limit bycatch or the catch of juvenile fish, do not protect spawning areas, and are seemingly unable to halt illegal fishing activity.

FIGURE 12: Fisheries Governance Index – Preliminary Results<sup>36</sup>



Source: "Ocean Prosperity Roadmap: Fisheries and Beyond," Synthesis Report, 2015.

<sup>34</sup> Philippines Bureau of Fisheries and Aquatic Resources, "Philippine Fisheries Profile 2013," Department of Agriculture, 2013.

<sup>35</sup> Hillborn, et al. "Ocean Prosperity Roadmap: Fisheries and Beyond," Synthesis Report, 2015.

<sup>36</sup> Hillborn, et al. "Ocean Prosperity Roadmap: Fisheries and Beyond," Synthesis Report, 2015.

## FISHERS AND COMMUNITIES

While biological fluctuations can occur, and other factors such as ocean pollution and coastal development can affect fishery health, fishers often significantly contribute to fisheries decline, as they are often driven to overfish for economic and livelihood reasons. The FAO estimates that while 50% of landings are generated by small-scale fishers,<sup>37</sup> 90% of the total 30 million estimated fishers globally are small-scale fishers, generally using vessels less than 18 meters in length, often

without motors, and relatively simple gear.<sup>38</sup> Some fishing communities and fishers have longstanding fishing traditions and family relationships with other fishers, while others are recent entrants driven to fishing as an economic activity of last resort. Figure 13 summarizes the number of small-scale and industrial fishers estimated to be active in each of the study countries who are partially if not entirely dependent on marine resources for their livelihoods.

FIGURE 13: Fishers by Type and Study Country

	CHILE <sup>39</sup>	BRAZIL <sup>40</sup>	PHILIPPINES <sup>41</sup>
<b>Total Fishers</b>	125,000	560,000	1,372,000 <sup>42</sup>
<b>Total Small-Scale Fishers</b>	72,000	504,000	1,355,000
<b>Total Industrial Fishers</b>	53,000	56,000	17,000

The FAO estimates that while 50% of landings are generated by small-scale fishers, 90% of the total 30 million estimated fishers globally are small-scale fishers, generally using vessels less than 18 meters in length, often without motors, and relatively simple gear.

<sup>37</sup> The FAO defines small-scale fishers as “involving fishing households (as opposed to commercial companies), using relatively small amount of capital and energy, relatively small fishing vessels (if any), making short fishing trips, close to shore, mainly for local consumption.”

<sup>38</sup> Food and Agriculture Organization of the United Nations, “The State of World Fisheries and Aquaculture,” Rome, 2014.

<sup>39</sup> Instituto Nacional de Estadísticas, “Primer Censo Nacional Pesquero Y Acuicultor Año 2008–2009,” 2009.

<sup>40</sup> Ministerio da Pesca e Aquicultura de Brasil, “Boletim Estatístico de Pesca Y Acuicultura,” 2009.

<sup>41</sup> Bureau of Fisheries and Aquatic Resources, “Philippine Fisheries Profile 2013,” Department of Agriculture, Republic of the Philippines, 2013.

<sup>42</sup> The Philippines government estimates provided by the Bureau of Fisheries and Aquatic Resources are significantly different from those in the work by Daniel Pauly and Maria Lourdes Palomares at the Fisheries Centre of the University of British Columbia (Pauly, D. & Palomares, M.L., “Philippines Marine Fisheries Catches: A Bottom-Up Reconstruction, 1950 to 2010”, Fisheries Centre Reports, University of British Columbia, 2014), suggesting that over 450,000 small-scale fishers operate across the country, while only 6,400 industrial vessels and 2,400 industrial vessel operators are active. Because the government data is thought to contain inaccuracies, the Palomares/Pauly data is used throughout this report with respect to Philippines fishery statistics.



### INVESTMENT CLIMATE

The three study countries were also chosen for meeting a threshold of basic investability. Sovereign credit rankings are strong for Chile, are strengthening for the Philippines, and were attractive for Brazil at the time this research was initiated. Recent macroeconomic and regulatory difficulties in Brazil offer particular investment challenges for sustainable fisheries investments there, but may also present attractive investment opportunities given the steep currency devaluation and associated fall in asset values. Corruption

issues and bureaucracy could inhibit business formation and seafood business growth prospects, particularly in the Philippines and Brazil. In the latter country, labor costs driven by strong employee protections have, in recent years, slowed economic growth and weakened the competitive position of Brazilian seafood products in global markets, but those effects may be mitigated by recent economic weakness. Figure 14 summarizes the credit, corruption, and ease of doing business ratings and rankings for each of the study countries.

FIGURE 14: Credit and Related Rankings by Country

	CHILE	BRAZIL	PHILIPPINES
Moody's Sovereign Credit Ranking <sup>43</sup>	Aa3 Stable	Baa3 Stable	BBB Stable
S&P Credit Ranking <sup>44</sup>	AA- Stable	BB+ Negative	Baa2 Stable
Fitch Credit Ranking <sup>45</sup>	A+ Stable	BB+ Negative	BBB- Stable
Transparency International Ranking <sup>46, 47</sup>	21	69	85
Ease of Doing Business Ranking <sup>48</sup>	41	120	95

<sup>43</sup> Moody's Sovereign & Supranational Ratings, moodys.com, 2015.

<sup>44</sup> Standard & Poor's Ratings Services, Government Ratings, standardandpoors.com, 2015.

<sup>45</sup> Fitch Solutions, Credit Ratings: Sovereign and Supranational, fitchsolutions.com, 2015.

<sup>46</sup> Transparency International, Corruption Perception Index, transparency.org, 2015.

<sup>47</sup> Transparency International scores countries each year on how corrupt their public sectors are seen to be.

<sup>48</sup> World Bank Group, Ease of Doing Business Rankings, doingbusiness.org, 2015.

## THE INVESTMENT THESES

Taking into account the larger market context for sustainable fishing investments, Encourage Capital considered how best to achieve the targeted impact objectives, including the aims to protect and restore fish stocks, support fisher livelihoods, and feed more people, all while delivering financial returns. Building from the investment theses presented in Encourage Capital’s (then EKO Asset Management Partners) 2013 white paper titled “Sustainable Fishing Financing Strategies,” we first identified three distinct fishery typologies, then developed three distinct investment strategies optimized for each type of fishery.

### THREE FISHERY TYPOLOGIES

The three types of fisheries with the highest impact and financial return potential include: small-scale fisheries, composed of artisanal fishing communities fishing near-shore stocks; industrial-scale fisheries, consisting of large, severely distressed fisheries often with active industrial and artisanal fishing fleets; and national-scale fisheries, where there are opportunities to implement national-scale management interventions. Each fishery typology, as defined for the purposes of this analysis, has certain characteristics that lead to investment strategies with distinct return drivers and risk profiles. Encourage Capital defines the fishery typologies as shown in Figure 15.<sup>48</sup>

FIGURE 15: Three Fishery Typologies Defined

DEFINING CHARACTERISTICS	SMALL-SCALE FISHERIES	INDUSTRIAL-SCALE FISHERIES	NATIONAL-SCALE FISHERIES
<b>Fishery Size and Level of Stock Distress</b>	<ul style="list-style-type: none"> <li>Community-scale, often multispecies fisheries</li> <li>Moderate distress</li> </ul>	<ul style="list-style-type: none"> <li>Large, single-stock fisheries</li> <li>Severe distress</li> </ul>	<ul style="list-style-type: none"> <li>Large fisheries</li> <li>Moderate to severe distress</li> </ul>
<b>Types of Fishers</b>	<ul style="list-style-type: none"> <li>Hundreds or thousands of small-scale, independent fishers in the targeted fishing communities</li> <li>Small vessels not greater than 18 meters in length</li> <li>Typically fishing within 15 km of the shoreline</li> <li>Typically returning to shore daily or at maximum every 3–4 days</li> </ul>	<ul style="list-style-type: none"> <li>Between 1 and 50 industrial vessels in the targeted fishery</li> <li>Industrial vessels typically greater than 18 meters in length and equipped with sophisticated gear and technology</li> <li>Can include a small-scale fleet component</li> </ul>	<ul style="list-style-type: none"> <li>No limit to number of vessels</li> </ul>

<sup>48</sup> Note that Encourage Capital is not suggesting that the fishery typologies are all-inclusive or representative of all fishery types, but rather that the Investment Blueprints are designed for fisheries with the characteristics shown for each typology definition herein.

Not all fisheries are suited for investment capital. Encourage Capital found that conventional commercial and impact investing strategies might not be well suited for small-scale fisheries that have such severe depletion that they cannot generate sufficient harvest to support a minimum

threshold of financial return necessary for more commercially motivated investors. Such fisheries might require concessionary investment capital and/or philanthropic support to enable them to achieve a minimum level of seafood production before they can attract return-seeking capital.

### THREE INVESTING STRATEGIES

The defining characteristics of the three fishery typologies point to differing investment approaches. While all three strategies propose investments to fund fisheries management improvements, and anticipate monetization of the

investments through commercial interests, they each emphasize different impact objectives and generate financial returns from different value drivers. Figure 16 highlights the key distinctions between the three investing strategies.

FIGURE 16: Investment Strategies Defined

IMPACT AND FINANCIAL RETURNS	SMALL-SCALE FISHERIES	INDUSTRIAL-SCALE FISHERIES	NATIONAL-SCALE FISHERIES
<b>Impact Targets:</b> <b>Protecting and Restoring Fish Stocks</b>	<ul style="list-style-type: none"> <li>Prevention of future declines, with some potential for moderate stock restoration</li> <li>Bycatch reduction, ranging from 10% to 20% against baseline estimates</li> <li>Habitat protection</li> </ul>	<ul style="list-style-type: none"> <li>Significant stock restoration, aimed at achieving 50%-100% of stock biomass levels at maximum sustainable yield</li> </ul>	<ul style="list-style-type: none"> <li>Significant improvements to a specific national management activity, such as data collection</li> </ul>
<b>Impact Targets:</b> <b>Supporting Fishing Livelihoods</b>	<ul style="list-style-type: none"> <li>Increased fisher incomes</li> <li>Increased community resiliency</li> <li>Empowerment of fishers and fishing communities</li> </ul>	<ul style="list-style-type: none"> <li>Increased fisher incomes</li> <li>Increased community resiliency</li> </ul>	<ul style="list-style-type: none"> <li>Support existing and create new employment opportunities in fishing communities</li> </ul>
<b>Impact Targets:</b> <b>Feeding More People</b>	<ul style="list-style-type: none"> <li>Protect existing meals produced, with modest increases possible</li> </ul>	<ul style="list-style-type: none"> <li>Significant increase to meals produced</li> </ul>	<ul style="list-style-type: none"> <li>Not targeted in the short term</li> </ul>
<b>Financial Return Targets</b>	<ul style="list-style-type: none"> <li>Targets 5%-10% equity returns over 5-10 year time horizons</li> </ul>	<ul style="list-style-type: none"> <li>Targets base case 15% equity returns with upside potential of 35% or more over 10 year time horizons</li> </ul>	<ul style="list-style-type: none"> <li>Targets minimum return goals stipulated by regulatory framework, or approximately 12%-15% on a levered basis over a 10-20 year time horizon</li> </ul>
<b>Financial Return Drivers</b>	<ul style="list-style-type: none"> <li>Reduction of waste</li> <li>Capture of greater share of supply-chain margins</li> <li>Sale into higher value market segments</li> </ul>	<ul style="list-style-type: none"> <li>Stock recovery</li> <li>Sale into higher value market segments</li> <li>Price premium for sustainability</li> </ul>	<ul style="list-style-type: none"> <li>Infrastructure usage fees</li> <li>Government fee-for-service payment streams</li> </ul>



With these distinctions framing the optimal approach for each fishery typology, Encourage Capital identified specific fisheries in each country, around which we developed the six Investment Blueprints. A preliminary analysis screened over 40 fisheries to select the six profiled in the Investment Blueprints. Each selected fishery or group of fisheries was deemed a sustainability priority by one or more local NGO, industry, or community stakeholders and demonstrated some type of community or industry partner willingness to implement sustainable fishing practices. All selected fisheries are of sufficient

scale or aggregate value to generate commercial interest. Finally, Encourage Capital endeavored to identify fisheries that, in combination, represented a range of fishery typologies in terms of species, community, and existing management regime.

Three of the Investment Blueprints focus on small-scale fisheries, two focus on industrial-scale fisheries, and one focuses on a national-scale fisheries strategy. Of the six, two Investment Blueprints were produced for each of Chile, Brazil, and the Philippines. Figure 17 and 18 set forth a brief summary of each Investment Blueprint.

FIGURE 17: Investment Blueprint Fisheries Characteristics

	INVESTMENT BLUEPRINT	COUNTRY	FLEET TYPE	FISHERY CONDITION	SPECIES FOCUS
<b>Small-Scale Fishery Investment Blueprints</b>	The Mariscos Strategy	Chile	Artisanal Fishers	Moderate Distress	Near-shore species including razor clams, mussels, king crab, stone crab, nylon shrimp, scallops, and abalone
	The Mangue Strategy	Brazil	Artisanal Fishers	Moderate Distress	Coastal mangrove crab fishery
	The Isda Strategy	Philippines	Artisanal Fishers	Moderate to Severe Distress	Yellowfin tuna, albacore tuna, mahi mahi, and at least 20 near-shore species
<b>Industrial-Scale Fishery Investment Blueprints</b>	The Merluza Strategy	Chile	Industrial and Artisanal Fishers	Severe Distress	Common hake
	The Sapó Strategy	Brazil	Industrial Fishers	Severe Distress	Monkfish
<b>National-Scale Fishery Investment Blueprints</b>	The Nexus Blue Strategy	Philippines	Industrial Fishers	Moderate to Severe Distress	Primarily multiple tuna species, but including a wide range of other finfish caught in Philippine waters and across the Coral Triangle

FIGURE 18: Investment Blueprint Strategy Summaries

<b>The Mariscos Strategy</b>	Invest \$7.0 million to protect 7 near-shore multispecies fisheries by partnering with fishing communities, implementing fishery management improvements, and growing a “heat and eat” consumer packaged goods company.
<b>The Mangue Strategy</b>	Invest \$15.0 million to protect and restore a mangrove crab fishery by partnering with fishing communities, implementing fishery management improvements, and launching a crab export company.
<b>The Isda Strategy</b>	Invest \$11.7 million to prevent bycatch and restore near-shore multispecies fisheries by partnering with up to 80 fishing communities, implementing fishery management improvements, and expanding a fresh and chilled seafood processing and distribution company.
<b>The Merluza Strategy</b>	Invest \$17.5 million to restore the common hake fishery by implementing comprehensive fishery management reforms, acquiring fishing permits, and launching a squid and hake processing and distribution company.
<b>The Sapo Strategy</b>	Invest \$11.5 million to restore the monkfish fishery by securing a regulatory commitment, implementing a vessel buyback, implementing fishery management improvements, and launching a vertically integrated vessel leasing and monkfish distribution company.
<b>The Nexus Blue Strategy</b>	Invest \$34.0 million to implement a stock assessment and data collection program and to renovate the General Santos fishing port.

Stakeholders wishing to consider fisheries impact investments should look first to the Investment Blueprints that best match their desired typology, then explore the tools and approaches set forth

therein. The differing fishery characteristics and return drivers necessitate particular structures and terms to achieve the targeted impact and financial returns.

### SPECIAL RISKS FOR SUSTAINABLE FISHERIES INVESTORS

Impact investors interested in sustainable fisheries must contend with specific challenges affecting the sector. From a technical point of view, the problems of distressed fisheries are reasonably well understood among fisheries scientists, management authorities, and fishers themselves. Overfishing, unwanted bycatch, and habitat destruction, whether caused by economic forces or industry development interests, can severely damage fisheries. These challenges can be overcome through proper fisheries management and community engagement, yet there are several factors worth noting that make fisheries restoration different from the stewardship of other environmental resources:

- **Tragedy of the Commons:** Many fisheries are classic examples of the “tragedy of the commons,” where no single responsible fisher can be assured of benefiting from the long-term health of the fishery without the compliance of all fishers to sustainable practices, thereby creating strong incentives for fishers to maximize short-term yields even at the expense of long-term fishery performance. Securing total fisher compliance is an especially difficult task, likely requiring strong monitoring and enforcement, which has historically been prohibitively expensive. Rights-based management regimes such as Territorial Use Rights Fisheries and Individual Transferable Quotas tend to end the tragedy of the commons and result in higher compliance, lower discards, and higher profits, but can be challenging to put into place.

- **Biology:** The oceans' dynamic ecological fluctuations make long-term harvest planning difficult, which can lead fishers and fishing businesses to focus on the short term.
- **Science:** The high cost of gathering the data necessary to have better scientific understanding of local ecosystem dynamics can make it difficult to determine specific stock status and recovery timelines.
- **Stakeholder Collaboration:** For fisheries management to work, multiple stakeholders must commit to and comply with complex and evolving rules and systems, adapting to changing biological conditions as necessary. Stakeholders often have competing interests and economic vulnerabilities that make collaboration difficult.

- **Capital Constraints:** Government funding constraints, amplified by political obstruction, can often serve as barriers to fisheries management and restoration. Fisher capital constraints can block the development of more efficient seafood businesses. Wherever fishers and government have been capital constrained, management and stewardship have often been the casualties.

While these factors pose clear challenges to fisheries investing, they also present compelling investment opportunities for those who can employ innovative approaches or tools to overcome these barriers to success.

## KEY INVESTMENT ATTRIBUTES FOR SUCCESS

In the development of the Investment Blueprints, Encourage Capital has identified eight leadership qualities, management tools, and commercial drivers that we believe drive the impact and

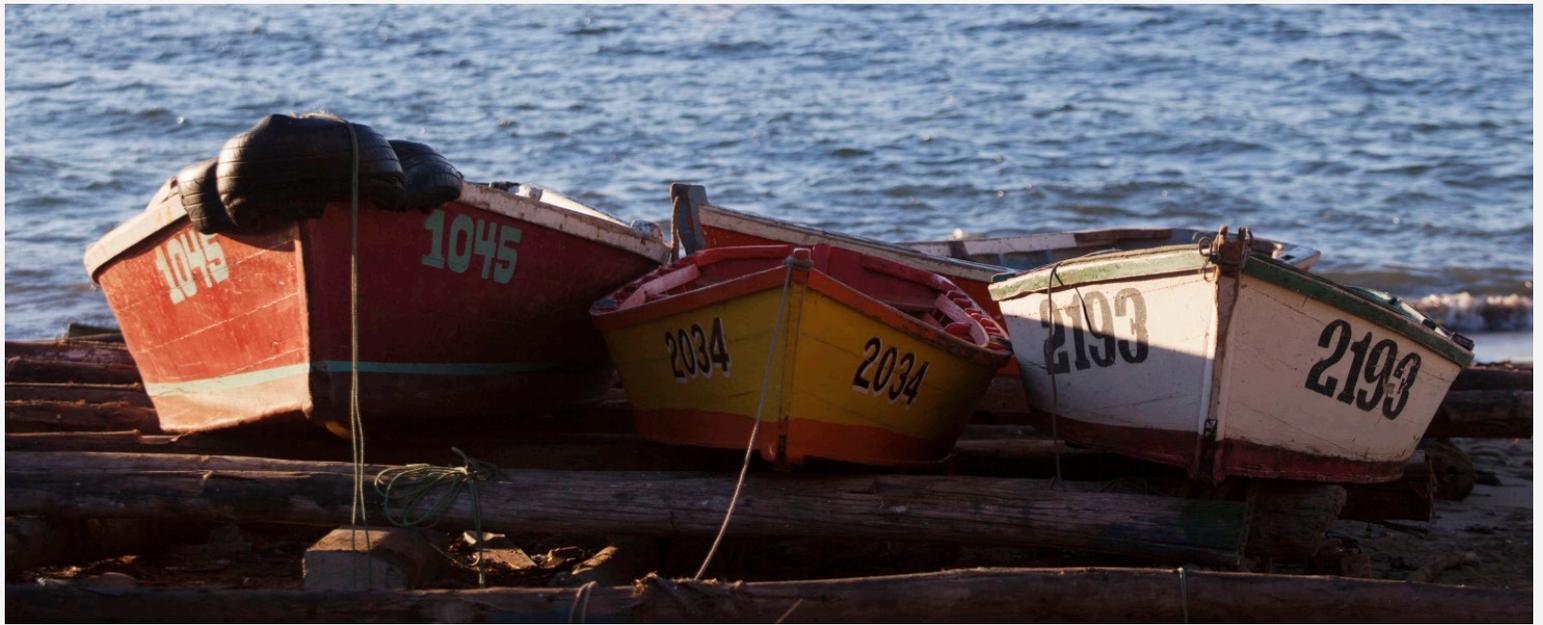
financial returns for fisheries strategies. The Investment Blueprints propose strategies that each embody the characteristics listed in Figure 19.

FIGURE 19: Core Investment Attributes for Success

INVESTMENT ATTRIBUTE	DESCRIPTION
Leadership	<b>1. Robust Collaboration</b> Encourage Capital has identified key stakeholder roles that must be fulfilled in the implementation of the investment strategies, including roles played by the government, the fishing community, community liaisons, fisheries management designers, fisheries management implementers, and downstream commercial or industry partners. Robust stakeholder engagement systems are critical factors to success yet are rarely in use. Successful strategies will incorporate best practices for stakeholder engagement and relationship management.
	<b>2. Fisher Readiness to Embrace Change</b> Encourage Capital's experience with fishers suggests that many fishing communities and businesses are eager for change, but are constrained by economic vulnerabilities, lack of ability to coordinate stakeholder collaboration, and lack of access to capital. Without willing partners among fishers themselves, attempts to implement management reforms will likely falter.
	<b>3. Project Developers</b> Many attempts at fisheries restoration have been impeded by the paucity of strong implementation partners with adequate financial resources. Positive government regulatory reforms tend to underfund the full range of activities required for success, and pioneering entrepreneurs have struggled to implement strategies with limited resources or insufficient technical expertise. The Investment Blueprints require expert project developers supported by holistic funding programs to ensure successful execution of the strategies.

FIGURE 19: Core Investment Attributes for Success *(continued)*

INVESTMENT ATTRIBUTE	DESCRIPTION
<p><b>Leadership</b> <i>(continued)</i></p> <p><b>4. Use of Capital to Catalyze Stakeholder Action</b></p>	<p>Given the capital constraints present in most fisheries, the prospect of impact-investor funding of sustainable fishing strategies has the power to create a positive feedback loop, building momentum and buy-in for solutions. In some cases the Investment Blueprints propose explicit quid pro quo opportunities, offering private investment in exchange for specific regulatory reform or advancement. Successful strategies will leverage the power of capital to enlist the maximum possible regulatory support in a given fishery. Depending on the state of the current management regime, some strategies are even explicitly conditioned on regulatory movement by fisheries authorities in advance of any investment.</p>
<p><b>Essential Management Tools</b></p> <p><b>5. Access and Catch Limits</b></p> <p><b>6. Use of New and Existing Data Technologies and Systems</b></p> <p><b>7. Use of Explicit Financial Rewards for Sustainable Practices</b></p>	<p>The fisheries management improvements require limits to fishing activity through the use of any one or more types of fishing effort limitations such as fishing permits or “quota” systems, Territorial Use Rights Fisheries (TURF) systems, Total Allowable Catch (TAC) limits, and so forth. Without adequate limits to access or catch volumes, responsible fishers are too easily undermined by new or illegal entrants to the fishery, or excessive harvesting activity. Each Investment Blueprint incorporates access limitations and/or catch limits as part of proposed management improvements.</p> <p>Many fishery science, monitoring, and enforcement programs and activities that have historically been cost prohibitive, are now possible through the use of new data technologies and devices. Global Fishing Watch, developed by Oceana, Google, and Skytruth, which identifies and tracks fishing behavior, or small vessel passive data collection devices such as those provided by Shellcatch or Pelagic Data Systems, as well as mobile technology applications, can allow fishing community leadership, fisheries authorities, and third parties to actively monitor compliance of fishers to a wide range of important rules and practices. Each Investment Blueprint incorporates the use of new data technologies to improve management systems.</p> <p>Fisher participation in processes aimed at reforming fisheries and their compliance with management reforms are critical to the success of sustainability strategies. The Investment Blueprints offer explicit financial incentives through higher unit prices, profit sharing, and community endowments to create positive financial incentives for short-term sacrifices as fishers transition to sustainability.</p>
<p><b>Commercial Drivers</b></p> <p><b>8. Addressing the Undervaluation of the Products</b></p>	<p>Encourage Capital found that virtually every fishery examined was undervaluing the products delivered to market. The Investment Blueprints therefore incorporate investments that are aimed at increasing product value through improved handling, increased supply chain efficiencies, reduced waste, and access to higher value customers and markets. Even where sustainability may not generate any actual price premium, better business practices can allow fishers and seafood businesses to capture higher margins.</p>



The Investment Blueprints present detailed proposals to protect and restore fisheries, support fisher livelihoods, and feed more people, all the while potentially generating attractive financial returns. We believe that each proposal capitalizes on the trends and opportunities present in the seafood sector, incorporates the eight core attributes for success, and is structured to address the special challenges and risks with which

fisheries investments must contend. We hope that a broad range of fishery stakeholders—including entrepreneurs, investors, NGOs, multilateral institutions, philanthropies, the seafood industry, and other sustainable fisheries advocates—can make use of the strategies to achieve real change, protecting and restoring marine ecosystems, supporting fishers, and helping to feed the world.

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## GLOSSARY

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### Artisanal Fisheries

Traditional fisheries involving fishing households (as opposed to commercial companies), using relatively small amount of capital and energy, relatively small fishing vessels (if any), making short fishing trips, close to shore, mainly for local consumption. In practice, definition varies between countries, e.g. from a one-man canoe in poor developing countries, to more than 20 m. trawlers, seiners, or long-liners in developed ones. Artisanal fisheries can be subsistence or commercial fisheries, providing for local consumption or export.

### Benthic Species

The benthic zone is the ecological region at the lowest level of a body of water such as an ocean or a lake, including the sediment surface and some sub-surface layers.

### Biomass

Biomass refers to the total mass of organisms in a given area or volume.

### Bivalves

A bivalve is an aquatic mollusk that has a compressed body enclosed within a hinged shell. This includes oysters, clams, mussels, and scallops.

### Biomass at Maximum Sustainable Yield ( $B_{MSY}$ )

Biomass at maximum sustainable yield refers to the total biomass of a fish stock required for it to consistently deliver the maximum sustainable yield.

### Bycatch

Bycatch refers to the unwanted fish and other marine creatures caught during commercial fishing for a different species.

### Caleta

Intergenerational landing sites utilized by one or more fishing communities. Caletas function in much the same way as cooperatives or unions in other countries, such as Mexico, in which an individual fisher generally pays an annual fee and agrees to follow certain bylaws in order to enjoy the benefits of being part of the larger organization, including access to the fishery, access to social services, and enhanced political leverage and market power.

### Capital Expenditure (CAPEX)

Capital expenditure, or CAPEX, are funds used by a company to acquire or upgrade physical assets such as property, industrial buildings or equipment. It is often used to undertake new projects or investments by the firm. This type of outlay is also made by companies to maintain or increase the scope of their operations. These expenditures can include everything from repairing a roof, to purchasing a piece of equipment, or building a brand new factory.

### Cephalopod

Animals (mollusks) with tentacles converging at the head, around the mouth (examples: squids, cuttlefish, and octopus).

### Cold Chain

A cold chain is a temperature-controlled supply chain. An unbroken cold chain is an uninterrupted series of storage and distribution activities which maintain a given temperature range for the product.

### Collapsed Fishery

Fisheries for which current biomass is below 10% of biomass at maximum sustainable yield

### Commercial Operations Date (COD)

The date on which an independent engineer certifies that a facility has completed all required performance tests and/or is built to the specifications outlined in an engineering procurement and construction contract.

### Contribution Margin

The result of subtracting all variable expenses from revenues. It indicates the amount available from sales to cover the fixed expenses and profit.

### Catch Per Unit Effort (CPUE)

Catch per unit effort is the catch of fish or animals in numbers or weight taken by a defined period or amount of effort.

### **Crustaceans**

Crustaceans form a very large group of arthropods, usually treated as a subphylum, which includes such familiar animals as crabs, lobsters, crayfish, shrimp, krill and barnacles.

### **Debt Service**

The cash that is required for a particular time period to cover the repayment of interest and principal on a debt.

### **Demersal Species**

Demersal fish live in the band of water close to the floor of the sea or a lake.

### **Development Finance Institution (DFI)**

A development finance institution is an alternative financial institution that typically plays a crucial role in providing credit in the form of higher risk loans, equity positions and risk guarantee instruments to private sector investments in developing countries. DFIs can include microfinance institutions, community development financial institutions and revolving loan funds.

### **Discards**

Discards, or discarded catch, is the portion of the total organic material of animal origin in the catch which is thrown away, or dumped at sea for whatever reason. It does not include plant materials and post-harvest waste such as offal. The discards may be dead or alive.

### **EBITDA Margin**

A measurement of a company's operating profitability. It is equal to earnings before interest, tax, depreciation and amortization (EBITDA) divided by total revenue.

### **Electronic Log (E-Log)**

An electronic log, or E-log, is an electronic alternative to record key catch and navigation metrics, port calls, and operational activities on board fishing vessels. Marine Electronic logbooks must meet the specific reporting requirements of relevant states. Manually inserted information is normally combined with data recorded from the vessel's instruments to meet these requirements.

### **Exclusive Economic Zone (EEZ)**

A zone under national jurisdiction (up to 200-nautical miles wide) declared in line with the provisions of 1982 United Nations Convention

of the Law of the Sea, within which the coastal State has the right to explore and exploit, and the responsibility to conserve and manage, the living and non-living resources.

### **Exhausted Fishery**

A fishery in which catches are well below optimal yields irrespective of the amount of fishing effort exerted.

### **Exit**

The method by which an investor or business owner intends to get out of an investment that he or she has made in the past.

### **Ex-Works**

A trade term referencing the requirement of a seller to deliver goods at his or her own place of business while all other transportation costs and risks are assumed by the buyer.

### **Fish Aggregating Device (FAD)**

A fish aggregating (or aggregation) device is a man-made object used to attract ocean going pelagic fish such as marlin, tuna and mahi-mahi. FADs usually consist of buoys or floats tethered to the ocean floor with concrete blocks.

### **Stock Assessment**

The process of collecting and analyzing biological and statistical information to determine the changes in the abundance of fishery stocks in response to fishing, and, to the extent possible, to predict future trends of stock abundance. Stock assessments are based on resource surveys; knowledge of the habitat requirements, life history, and behavior of the species; the use of environmental indices to determine impacts on stocks; and catch statistics. Stock assessments are used as a basis to assess and specify the present and probable future condition of a fishery.

### **Fishery Improvement Project (FIP)**

A fishery improvement project operates via an alliance of seafood buyers, suppliers, and producers. These stakeholders work together to improve a specific fishery by pressing for better policies and management, while changing purchasing and fishing practices to reduce problems such as illegal fishing, bycatch, and habitat impacts.

### **Fishery**

A unit determined by an authority or other entity that is engaged in raising and/or harvesting fish. Typically, the unit is defined in terms of some or all of the following: people involved, species or type of fish, area of water or seabed, method of fishing, class of boats and purpose of the activities.

### **Fixed Assets**

Fixed assets are assets that are purchased for long-term use and are not likely to be converted quickly into cash, such as land, buildings, and equipment.

### **Freight on Board (FOB)**

Freight on Board (FOB) is a term of sale under which the price invoiced or quoted by a seller includes all costs up to placing the goods on board a ship at the port of departure specified by the buyer.

### **Fully Exploited Fishery**

Fully exploited fisheries are operating at or close to optimal yield/effort, with no expected room for further expansion.

### **Gillnet**

A gillnet is a wall of netting that hangs in the water column, typically made of monofilament or multifilament nylon. Mesh sizes are designed to allow fish to get only their head through the netting, but not their body. The fish's gills then get caught in the mesh as the fish tries to back out of the net.

### **Handline Fishing**

Handline fishing, or handlining, is a fishing technique where a single fishing line is held in the hands. One or more fishing lures or baited hooks are attached to the line. This is not to be confused with hand fishing.

### **Holdco**

A holding company (Holdco) is a firm that is established in order to exercise control over one or more other firms.

### **Internal Rate of Return (IRR)**

Internal rate of return (IRR) is a metric used in capital budgeting that measures the profitability of potential investments.

### **Illegal, Unreported, and Unregulated (IUU) Fishing**

Illegal, unreported and unregulated fishing is fishing that is conducted contradictory to legal conservation and management measures currently in place around the world.

### **Longline Fishing**

Longline gear is a type of deep-sea fishing gear consisting of a long main line anchored to the bottom to which shorter lines with baited hooks are fastened at intervals.

### **Marine Protected Area (MPA)**

A protected marine intertidal or subtidal area, within territorial waters, EEZs or in the high seas, set aside by law or other effective means, together with its overlying water and associated flora, fauna, historical and cultural features. It provides degrees of preservation and protection for important marine biodiversity and resources; a particular habitat (e.g. a mangrove or a reef) or species, or sub-population (e.g. spawners or juveniles) depending on the degree of use permitted. In MPAS, activities (e.g. of scientific, educational, recreational, extractive nature, including fishing) are strictly regulated and could be prohibited.

### **Maximum Sustainable Yield (MSY)**

The highest theoretical equilibrium yield that can be continuously taken (on average) from a stock under existing (average) environmental conditions without affecting significantly the reproduction process.

### **Operational Expenditure (OPEX)**

A category of expenditure that a business incurs as a result of performing its normal business operations.

### **Over-exploited Fishery**

Over-exploited fisheries are being exploited above the optimal yield/effort which is believed to be sustainable in the long term, with no potential room for further expansion and a higher risk of stock depletion/collapse.

### **Pelagic Species**

Fish that spend most of their life swimming in the water column with little contact with or dependency on the bottom. Usually refers to the adult stage of a species.

**Property, Plant and Equipment (PP&E)**

Property, plant and equipment (PP&E) is a term that describes an account on the balance sheet. The PP&E account is a summation of all a company's purchases of property, manufacturing plants and pieces of equipment to that point in time, less any amortization.

**Program Related Investment (PRI)**

Program Related Investments are investments made by foundations to support charitable activities that involve the potential return of capital within an established timeframe.

**RESEX**

An extractive reserve (RESEX) is an area, generally state-owned where access and use rights, including natural resource extraction, are allocated to local groups or communities.

**Same Store Sales**

A metric used in retail industry analysis that compares the sales of stores that have been open for at least one year. Same store sales compare revenues earned by established outlets over a certain time period, such as a fiscal quarter or on a seasonal basis, for the current period and the same period in the past (usually the same period of the previous year). Same store sales allow investors to determine what portion of new sales has come from sales growth and what portion can be attributed to the opening of new stores.

**Spawning Stock Biomass (SSB)**

Spawning Stock Biomass (SSB) refers to the total weight of the fish in a stock that are old enough to spawn.

**Stock**

A stock is a subpopulation of a particular species of fish, for which intrinsic parameters (growth, recruitment, mortality and fishing mortality) are traditionally regarded as the significant factors determining the stock's population dynamics.

**Total Allowable Catch (TAC)**

The Total Allowable Catch is the total catch allowed to be taken from a resource in a specified period (usually a year), as defined in the management plan. The TAC may be allocated to fisheries stakeholders in the form of quotas as specific quantities or proportions of a catch amount.

**Trawling**

Trawling is a method of fishing that involves pulling a net through the water behind one or more boats. The net that is used for trawling is called a trawl. Trawl doors are components of the trawl that can drag along the seafloor and cause damage to seabed ecosystems.

**Territorial Use Rights for Fishing (TURF)**

Area-based fishing rights, commonly referred to as Territorial Use Rights for Fishing programs, or TURFs, allocate secure, exclusive privileges to fish in a specified area to groups, or in rare cases individuals. Well-designed TURFs have appropriate controls on fishing mortality and hold fishermen accountable to comply with these controls.

**Value-chain**

Value-chain refers to the process or activities by which a company adds value to a product, including production, marketing, and the provision of after-sales service.

**Vessel Monitoring System (VMS)**

The VMS is a vessel tracking system (usually satellite-based) that provides management authorities with accurate information on fishing vessels position, course and speed at various time intervals. Specific equipment and operational use will vary with the requirements of the nation of a given vessel's registry, and the regional or national water in which the vessel is operating.

**Working Capital**

Working capital refers to the capital of a business that is used in its day-to-day operations, calculated as the current assets minus the current liabilities.

## LIST OF ACRONYMS

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**ADB** - Asian Development Bank

**AO** - Administrative Order

**A-PPP** - Assessment Public-Private Partnership

**BAS** - Bureau of Agriculture Statistics

**BFAR** - Bureau of Fisheries and Aquatic Resources

**B<sub>MSY</sub>** - Biomass at Maximum Sustainable Yield

**CMM (WCPFC)** - Conservation and Management Measure

**CPUE** - Catch Per Unit Effort

**DA** - Department of Agriculture

**DAO** - Department Administrative Order

**DILG** - Department of Interior and Local Government

**EAFM** - Ecosystem Approach to Fisheries Management

**FAO** - Fisheries Administrative Order

**FAO (UN)** - Food and Agriculture Organization - United Nations

**FISAT** - FAO-ICLARM Stock Assessment Tool database system

**FPC** - Fish Port Complex

**GSFPC** - General Santos Fish Port Complex

**HACCP** - Hazard Analysis and Critical Control Point

**HSP1** - High Seas Pocket 1

**IRR** - Implementing Rules and Regulations

**IUCN** - International Union for the Conservation of Nature

**LCEM** - Landed Catch and Effort Monitoring

**LGU** - Local Government Unit

**MSY** - Maximum Sustainable Yield

**MCS** - Monitoring Control and Surveillance System

**NFPC** - Navotas Fish Port Complex

**NFRDI** - National Fisheries Research and Development Institute

**NMFDC** - National Marine Fisheries Development Center

**NGO** - Non Government Organization

**NOAA** - National Oceanic and Atmospheric Administration

**NSAP** - National Stock Assessment Program

**PFC** - Philippine Fisheries Code

**PFDA** - Philippine Fisheries Development Authority

**P-FS** - Pre-Feasibility Study

**PTRP** - Philippine Tuna Research Project

**PRIMEX, Inc.** - Pacific Rim Innovation Management Exponents, Incorporated

**P-PPP** - Port-Public-Private Partnership

**PECAN** - Philippine Cannery database system

**RFU** - Regional Field Unit

**ROP** - Regional Observer Program

**RTTP** - Regional Tuna Tagging Program

**SPC** - South Pacific Commission

**TNC** - The Nature Conservancy

**TUFMAN** - Tuna Fisheries Management database system

**USAID** - United States Agency for International Development

**WCPFC** - Western and Central Pacific Fisheries Commission

**WCPO** - Western Central Pacific Ocean

**WC** - Worldfish Center

**WPEA-OFM** - Western Pacific East Asia-Oceanic Management Fisheries project



# SMALL-SCALE FISHERIES

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## INVESTMENT BLUEPRINTS

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## SMALL-SCALE FISHER CHALLENGES

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**A**lthough no single definition exists for “small-scale”, or “artisanal”, in the seafood industry, the term typically refers to fishers operating independently from a corporate entity, using vessels ranging up to 18 meters in length (or sometimes longer in developed countries), and rarely fishing for more than three days at a time. These fishers are often afforded special status and fishing rights that attempt to protect their fishing grounds from industrial fishing activity. Many countries designate nearshore fisheries within a certain distance from the coast as off limits to industrial vessels, while others distribute fishing quotas or permits to small-scale fishers that ensure their share of total fishery catch allocations over time.

In spite of these protections, small-scale fishers tend to be vulnerable to the economic forces that shape the seafood industry. In developing countries, small-scale fishers may rely on their production for subsistence, and stock depletions in those instances can be especially devastating to local communities. Small-scale fishers are exposed to a wide range of additional risks driven by their reliance on an unpredictable biological resource. Changing or severe weather can impair income generation, and even under good conditions fishing with rudimentary gear can be dangerous. Population growth strains coastal communities, and income inequality and capital constraints limit the ability of fishers to finance fishery management improvements without government subsidy, philanthropy, or other funding sources.

Small-scale fishers are also vulnerable to commercial exploitation, often lacking market power due to product perishability, their lack of individual or community-level scale, distance from larger markets, and the poor or non-existent infrastructure which limits access to higher value buyers. Many small-scale fisheries want for even the most basic product cold-storage capacity, such as ice machines and refrigeration, much less the hygienic primary processing facilities required to create additional value by cleaning and preparing landed species for transport. Nonetheless, because of their intimate knowledge of the resource, and their role in extracting marine products, artisanal fishers are critical partners to the success of any desired fisheries management improvements (FMIs).



## THE SMALL-SCALE FISHERIES INVESTMENT THESIS

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**T**he small-scale fisheries investment strategy is focused on financing the implementation of fisheries management improvements across a portfolio of community-based, nearshore fisheries, which, in aggregate, provide production volumes of sufficient scale to source mission-aligned downstream supply-chain partners. In addition to funding fisheries management improvements tailored to the target fishery, the investments also include supply chain infrastructure upgrades, logistics, operations, processing, and marketing as a means to maximize the post-harvest value of landed products.

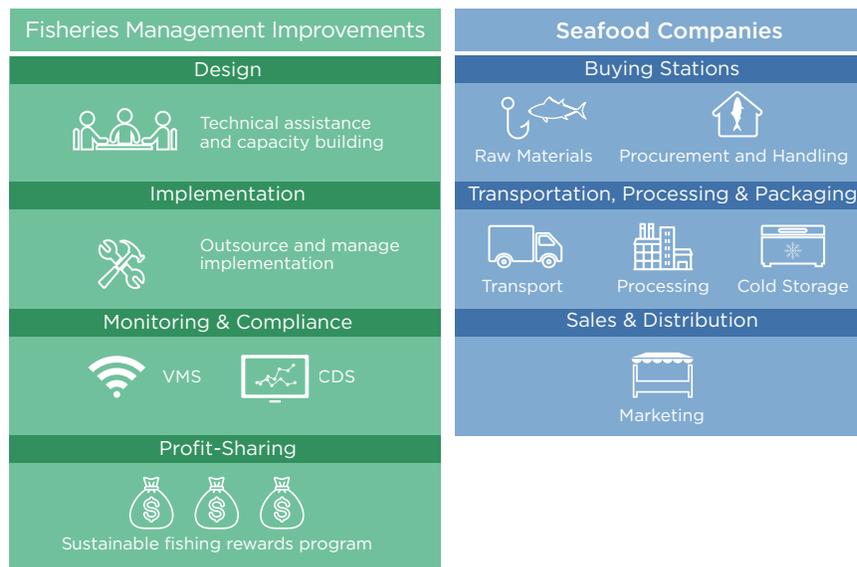
By bundling fisheries management improvements with investments in seafood processing and distribution companies, investors can generate earnings through the sale of the responsibly-sourced seafood products while ensuring the long-term sustainability of the resource. Financing fisheries management improvements does not by itself generate positive cash flow, just as investments in commercialization without proper management measures do not ensure the long term stewardship of the resource and surrounding marine environment. In fact, the latter may exacerbate fishery distress by failing to restrain harvest effort while simultaneously offering higher value to fishers for their landed catch, thus increasing the incentive to overfish in search of short-term gains. However, by financing small-scale fisheries management improvements as a pre-condition for commercial investment, the small-scale investment strategy creates a virtuous cycle which supports sustainability objectives as well as economic viability, delivering both impact and financial returns in the process.

From a financial standpoint, the small-scale fisheries investment strategy recognizes an opportunity to add value to products currently sold as undifferentiated commodities, with little attention to quality, food safety, higher value markets, or product branding. Fisheries management improvements generate value by stabilizing and potentially increasing supply sources, while commercial investments improve

product quality, increase supply chain efficiencies, and expand sales channels to more lucrative customers. These commercial value drivers have the potential to grow cash flow without relying on premium pricing for sustainability branding or fish stock recovery to increase income and generate financial returns. Ultimately, these economic

benefits generated can, in turn, be shared with to fishers as a reward for compliance with sustainable practices, in turn creating a strong financial incentive for stewardship in place of the existing motivations driving short-term overfishing and depletion (see Figure 1).

FIGURE 1: Investment Components, Small-Scale Fisheries



The small-scale investment strategy supports sustainability outcomes and profitability by bundling investment into small-scale fisheries management improvements with investment into commercial activities to deliver both impact and financial returns.



## A PROPOSED INVESTMENT DESIGN METHODOLOGY

### THE INVESTMENT BLUEPRINT DEVELOPMENT PROCESS

Encourage Capital undertook a 10-step process, engaging in dialogue with a wide range of fisheries stakeholders, advisors, and consultants, to develop and evaluate the challenges, opportunities, and risks profiled within each small-scale fisheries Investment Blueprint.

Encourage Capital's review process sought to determine whether the potential cash flow generated by investments in sustainable seafood companies could generate a financial return sufficient to attract the capital required to implement management improvements in the fishery. Figure 2 illustrates the 10 key steps involved in the profiling and analysis of each fishery, the development of the fisheries management and business plans, and the financial modeling and structuring associated with each proposed small-scale fisheries investment strategy.

FIGURE 2: Blueprint Development Process

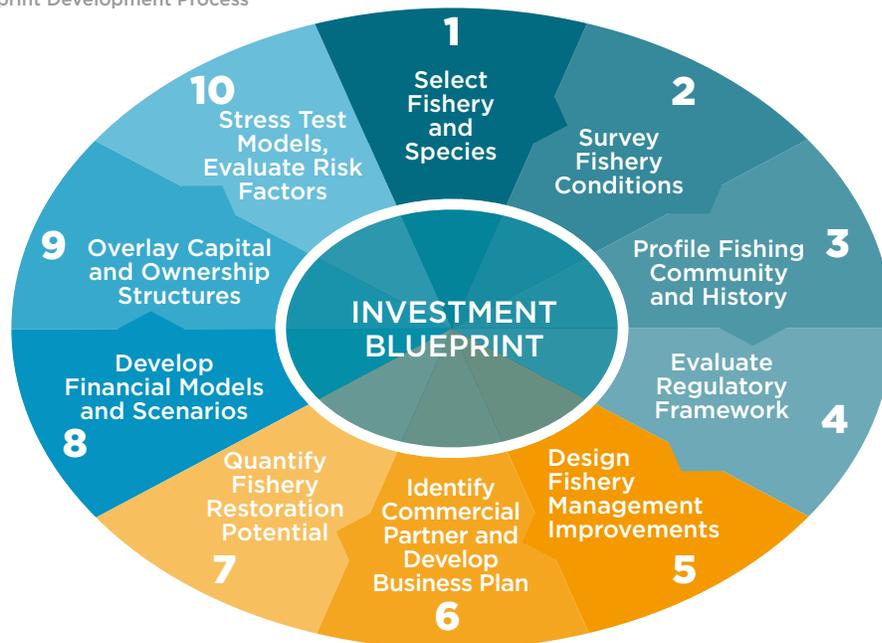


Figure 3 briefly summarizes the key questions that our 10-step analysis sought to answer, in order to shape and evaluate the investment opportunities.

FIGURE 3: 10-Step Blueprint Development Process: Key Questions

10-STEP REVIEW	KEY QUESTIONS AND EVALUATION CRITERIA
<b>1. Select Fishery and Species</b>	<ul style="list-style-type: none"> <li>• Is there commercial market demand for the species?</li> <li>• Does the fishery or group of fisheries currently or potentially produce sufficient volume to generate commercial value?</li> <li>• Is the fishery or community in proximity to commercial markets or a transport infrastructure to reach commercial markets?</li> </ul>
<b>2. Survey Fishery Conditions</b>	<ul style="list-style-type: none"> <li>• Is the fishery currently distressed or under threat of distress?</li> <li>• Does the fishery require management improvements?</li> <li>• How large is the fishing fleet, and is it feasible to implement sustainable fishing practices?</li> </ul>
<b>3. Profile Fishing Community and History</b>	<ul style="list-style-type: none"> <li>• Is there existing organization, leadership, or local governance among fishers in the given community or fishery?</li> <li>• What is the history of the fishers' relationship with fisheries authorities and with each other?</li> <li>• Are fishers in the given community or fishery interested in making a transition to sustainable fishing practices?</li> </ul>
<b>4. Evaluate Regulatory Framework</b>	<ul style="list-style-type: none"> <li>• How robust is the current regulatory framework?</li> <li>• Are there any regulatory tools that enable fishers and investors to have tenure over the fishing resource (e.g., limited access fishing permits, Territorial Use Rights Fisheries or TURFs, Total Allowable Catch systems, and so on)?</li> <li>• Are fisheries authorities willing to collaborate with private partners to implement fishery management improvements?</li> </ul>
<b>5. Design Fishery Management Improvements</b>	<ul style="list-style-type: none"> <li>• What management interventions are required to protect or restore the fishery?</li> <li>• Can project developers design a clear, viable plan to implement fishery management improvements?</li> <li>• Are there effective implementation partners that can be engaged in the project?</li> <li>• What are the costs of the management improvements, and do the financial benefits earned by investors outweigh the costs of the improvements?</li> </ul>
<b>6. Develop Business Plan</b>	<ul style="list-style-type: none"> <li>• What seafood businesses or assets can generate cash flow or long-term asset value with improved fishery management?</li> <li>• Are there existing mission-aligned companies or social entrepreneurs who are capable of executing a viable business plan?</li> <li>• Are there clear value drivers to support a commercial business model such as waste reduction, supply chain upgrades to increase efficiency, higher value markets, margin capture, or long-term increases to landings or Total Allowable Catches?</li> </ul>

FIGURE 3: 10-Step Blueprint Development Process: Key Questions (continued)

10-STEP REVIEW	KEY QUESTIONS AND EVALUATION CRITERIA
<b>7. Quantify Fishery Restoration Potential</b>	<ul style="list-style-type: none"> <li>• What do our scientific models suggest is the potential range for recovery in the fishery given species' life cycles and fecundity, current biomass state, expected fishing effort and mortality, predation factors, and other management interventions?</li> <li>• What timelines for recovery do the models suggest?</li> </ul>
<b>8. Develop Financial Models and Scenarios</b>	<ul style="list-style-type: none"> <li>• Does the combined program of fishery management improvements and commercial investment generate sufficient cash flow to reward fishers and repay investors?</li> <li>• What are the upside and downside cases of potential impact and financial performance?</li> </ul>
<b>9. Overlay Capital and Ownership Structures</b>	<ul style="list-style-type: none"> <li>• Based on the cash flow projections, how should the strategy be capitalized? With equity? With debt?</li> <li>• Are philanthropic capital or forms of credit enhancement required to generate sufficient returns to attract private capital?</li> </ul>
<b>10. Stress-Test Models, Evaluate Risk Factors</b>	<ul style="list-style-type: none"> <li>• What are the primary risk factors that could impair the strategy's success?</li> <li>• Can those factors be mitigated through structuring decisions or other means?</li> </ul>

At the heart of each Investment Blueprint are the proposed fisheries management improvements that seek to protect and restore fish stocks, reduce bycatch of unwanted species, and to protect and restore marine habitat.

### THE APPROACH TO FISHERIES MANAGEMENT IMPROVEMENTS

At the heart of each Investment Blueprint are the proposed fisheries management improvements that seek to protect and restore fish stocks, reduce bycatch of unwanted species, and protect and restore marine habitat. As stated in the recently published *Governance and Marine Fisheries: Comparing Results Across Countries and Stocks* states: "The elements of effective fisheries management are well-understood. Strong management means enacting measures to both prevent overfishing and, more importantly, implementing measures to reduce fishing pressure if stocks become depleted. Key practices include evaluating the status of fish and shellfish stocks, designing appropriate management measures to limit

fishing mortality, and enforcing these regulations to prevent or reduce negative fishing impacts."<sup>1</sup>

In practice, such measures could include the development of stock assessment programs with robust catch accounting systems and scientific research focused on species of specific concern, registration of and limit to the number of fishing vessels in a given fishery, establishment of maximum catch limits as determined by scientific research, the use of rules to set minimum individual fish size, closed seasons, no-take zones (sometimes called marine protected areas), and the use of rigorous enforcement resources, with on-board human

<sup>1</sup> Hillborn, et al., "Ocean Prosperity Roadmap: Fisheries and Beyond," Synthesis Report, 2015.



observer coverage, the use of electronic monitoring devices, policing activity, and criminal prosecution when necessary.

In addition to government-sponsored management improvements, significant philanthropic funding has flowed to sustainable fisheries certification and consumer awareness strategies over the past 10 years in an effort to influence market demand and pressure the seafood industry to adopt sustainable practices and source responsibly from well-managed fisheries. The Marine Stewardship Council (MSC), considered among the certification bodies with the highest sustainability standards, has developed extensive tools to assess and certify fisheries, as well as design privately funded fisheries management improvements. The World Wildlife Fund and the Sustainable Fisheries Partnership have also developed the notion of Fisheries Improvement Projects, or “FIPs”, offering design frameworks to support both incremental and comprehensive management improvements that enable eligibility for certification status, even in fisheries that require significant recovery time.

Each approach to improving fisheries management practices has its benefits and limitations. Government interventions can be broad in reach, but are often underfunded and lack the resources to ensure fisher compliance. Certification strategies have engendered robust standards and created incentives for industry-funded management improvements, yet have been critiqued as being ill-suited for fisheries with long recovery horizons and cost-prohibitive for small-scale fisheries without resources to fund the extensive scientific activities required for certification. To date, only about 8.5% of global fisheries landings have achieved MSC certification.<sup>2</sup> FIPs have been implemented in approximately 150 fisheries but lack uniform standards or progress measurements, making it difficult to assess their performance.<sup>3</sup>

Encourage Capital seeks to borrow from the best practices set forth by these important fishery stakeholders, tailoring its proposed fisheries management improvements to the conditions and context of each specific fishery profiled.

<sup>2</sup> Marine Stewardship Council, “MSC in numbers,” [msc.org](http://msc.org), 2015.

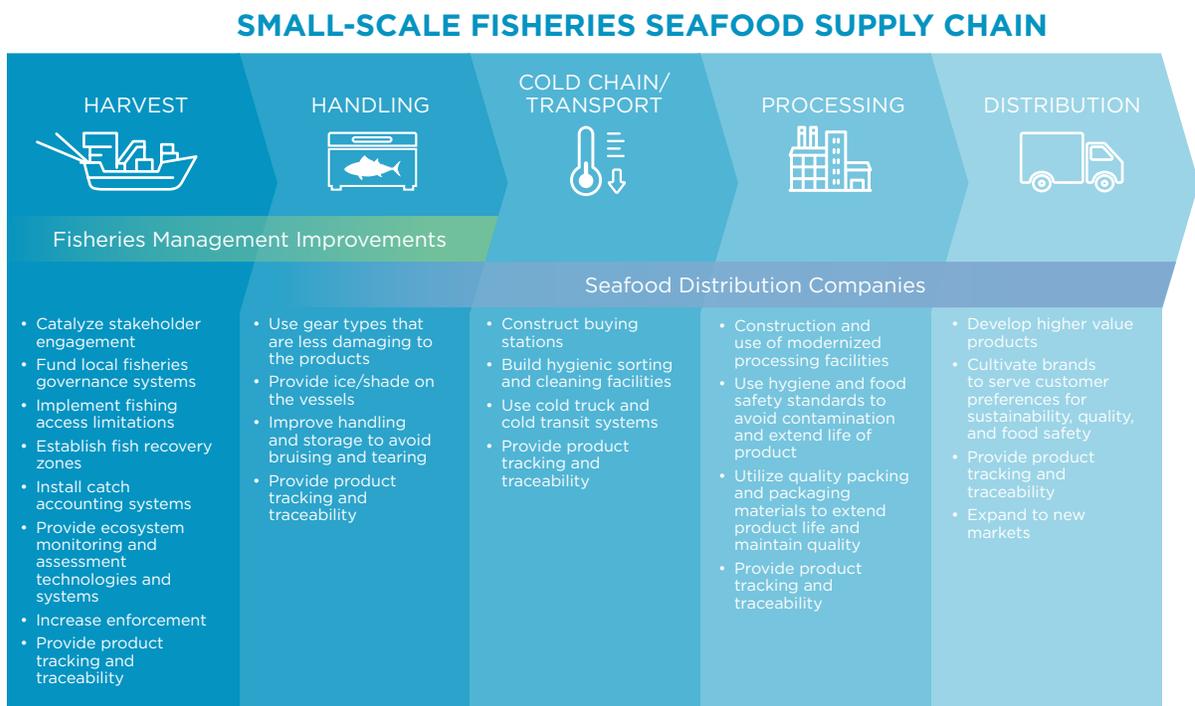
<sup>3</sup> T. McLanahan and J. Castilla, “Fisheries Management: Progress Toward Sustainability,” The David and Lucille Packard Foundation, Blackwell Publishing, 2007.



## THE SMALL-SCALE FISHERIES INVESTMENT PROFILE

It is against this backdrop that the Small-Scale Investment Blueprints propose bundling investments to finance fisheries management improvements together with seafood processing and distribution businesses, with the goal of generating both compelling impact and financial returns. As Figure 4 illustrates, the Small-Scale investment strategies are essentially proposing to vertically integrate supply chains, generating operating efficiencies and higher product values while funding management improvements and creating incentives for “on-the-water” resource stewardship.

FIGURE 4: Small-Scale Fisheries Supply Chain



## CORE VALUE DRIVERS

Encourage Capital identified eight value drivers critical to achieving impact and generating profits, which are incorporated into each of the Investment Blueprints. For the investments to perform over time, specific leadership characteristics, essential management tools, and critical market dynamics must be present, specifically the following:

1. Strategy design and implementation requires collaboration across a range of fishery stakeholders, such as fishing communities, government, the commercial partners, and project developers, to create and refine the necessary fisheries management improvements.
2. Strategies should be implemented in partnership with fishers interested in transitioning to sustainable practices.
3. Strategies require the engagement of strong project developers and implementation partners with the ability to design and implement fisheries management improvements, and to manage a complex execution of multiple environmental, community, and commercial activities .
4. Investment funds are used, in part, to catalyze additional government investment or policy reform at the local level.
5. Fisheries management improvements must include enforceable access and harvest limits.
6. Strategies should use new data technologies to reduce the cost of fisheries management improvements and increase fisher compliance.
7. Strategies should use explicit financial incentives to reward fishers for sustainable practices, including higher prices, profit sharing, and community endowments.
8. Strategies incorporate such commercial value drivers as:
  - Increasing the yield from the landed catch volumes through reduction of waste
  - Improving and upgrading the product quality
  - Improving supply chain efficiencies to capture additional margin
  - Packaging the raw materials into new product forms
  - Reaching higher value customer segments
  - Boosting exit sales to strategic buyers eager either to lock in additional high-quality supply sources in the face of growing consumer demand against limited supply alternatives, expand their product portfolios, or both

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For the investments to perform over time, specific leadership characteristics, essential management tools, and critical market dynamics must be present.

## RISK FACTORS TO CONSIDER

While the small-scale investment thesis has the potential to tie sustainability with financial returns by bundling management improvements with commercial investments, the strategy poses several key risks for impact investors, including the following:

- Fisheries management improvement implementation could prove to be more costly than is budgeted.
- Fisher compliance with sustainable fishing practices may not improve as much as is projected.
- Fisheries authorities may not provide promised enforcement resources or may even undermine efforts entirely with poorly established policies.
- The commercial business operations may not be competitive or successful against lower-cost models that do not invest in sustainable or responsible sourcing.
- The complex overall project execution could fail to complete project implementation, or could prove to have unintended consequences.
- Exit strategies may not generate the targeted values.

It is important to note that the Small-Scale Investment Blueprints do not rely on a sustainability premium or a stock recovery to generate the targeted financial returns, but instead look to the baseline performance of the commercial investments to generate cash flow.

## STRUCTURE AND TERMS

The Small-Scale Fisheries Investment Blueprints propose investments of debt, equity, and, in some cases, philanthropy to achieve the targeted impact and financial returns. The more severely depleted the portfolio of small-scale fisheries is, the less commercial value it can generate in the short term, and the more likely it is that philanthropic efforts will be required to finance a transition to sustainability. Although the seafood company investments are expected to be profitable in the short to medium term, impact investors supporting this strategy should have a longer-term time horizon, with three- to five-year terms on the debt tranches, and five to ten-year investment horizon for the equity and impact returns.

Certain of the Small-Scale Fisheries Investment Blueprints also contemplate the establishment of a Technical Facility (TF) either for use in funding a portion of the contemplated fisheries management improvements, or as a reserve for unanticipated additional improvements that may be required.

The TF could be funded with grant capital or funding from multilateral or development finance institutions interested in supporting small-scale fisheries strategies. The Technical Facility could aggregate a pool of such capital to implement a portfolio of similar projects, which capital could be disbursed by fishery-specific project implementers in alignment with the project design process, impact priorities, and fisheries management improvements described herein.

In addition, the Small-Scale Fisheries strategies propose the establishment of Fishing Community Trusts (FCT), where profits generated through the commercial seafood company's activities can be deposited on a regular basis, and distributed to fishers or fishing communities according to community priorities. The FCTs would therefore offer a financial incentive mechanism that requires ongoing sustainability compliance by individual fisher members in order to participate in the

The Small-Scale Fisheries Investment Blueprints propose capital structures that utilize debt, equity, and, in some cases, philanthropy to achieve the targeted impact and financial returns.

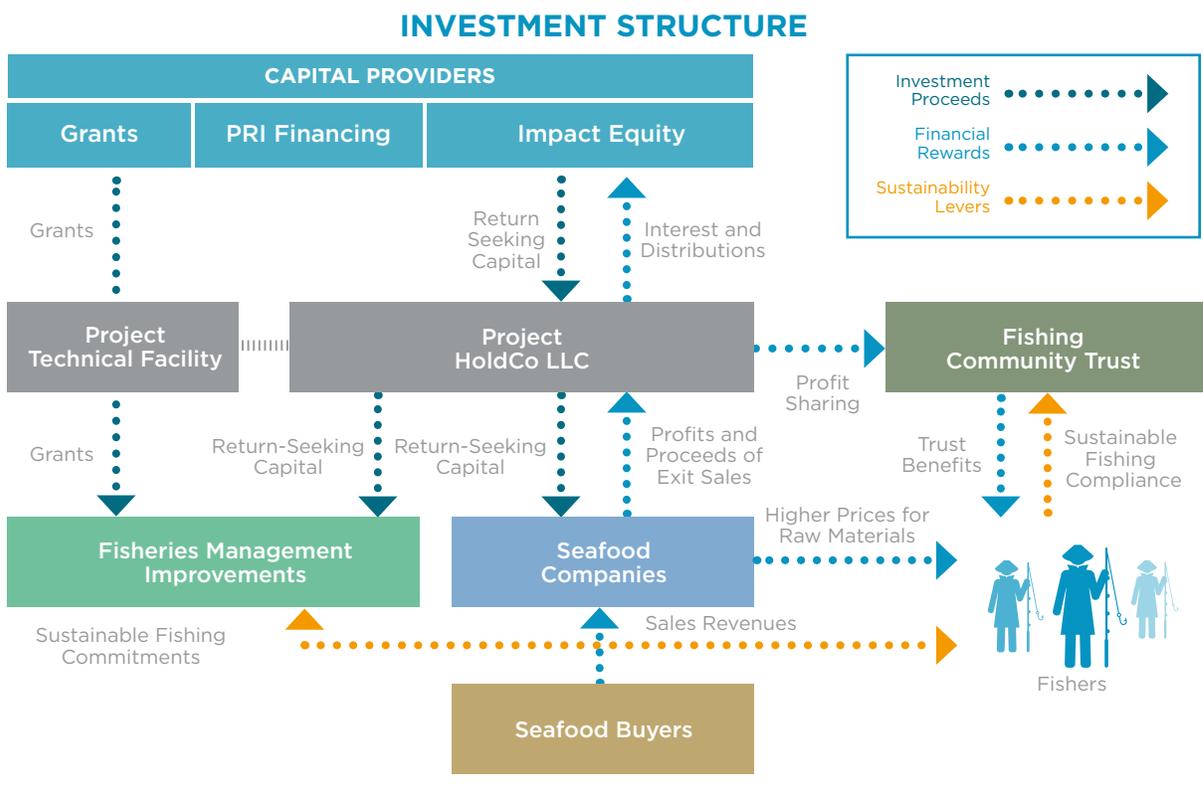


benefits program. Because the FCTs would be earning profits from a seafood business sourcing from multiple fishing communities, it would also serve to diversify the income sources to fishers, making them less vulnerable to localized weather disruptions, seasonal closures, and the like. The Fishing Community Trusts could be affiliate entities of existing or newly formed fishing community organizations, and should have strong democratic governance requirements to ensure fair

distributions to communities and their members over time. In fisheries where longer time horizons are required to generate profits as rewards to fishers, the FCTs could also be endowed with upfront funding by the investors or grantmakers supporting the strategies.

Figure 5 lays out the flow of funds and cash flows that are associated with the Small-Scale Fisheries strategies.

FIGURE 5: Small-Scale Fisheries Investment Structure





## AN OVERVIEW OF THE SMALL-SCALE FISHERIES INVESTMENT BLUEPRINTS

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**E**ncourage Capital developed three Investment Blueprints to demonstrate how the small-scale fisheries strategies could work to generate both financial and impact returns. Encourage engaged with its partners and advisors to develop and evaluate the challenges, opportunities, and risks associated with each Investment Blueprint, utilizing the 10-step evaluation and diligence process described above. Each Investment Blueprint takes into account factors such as local ecosystem complexity, regulatory challenges, management interventions tailored to the species incorporated, supply chain conditions, market factors, and detailed cost estimates to incorporate practical realities “on-the-ground” into each investment analysis and structure.

On the following page, Figure 6 provides a profile of the three small-scale Investment Blueprints in Chile, Brazil, and the Philippines.

The section that follows provides a detailed review of the Chilean small-scale fishery investment strategy, and Encourage Capital plans to disseminate the detailed Brazilian and Philippine small-scale Investment Blueprints in the fall of 2015. We hope that a broad range of fishery stakeholders—including entrepreneurs, investors, NGOs, multilateral institutions, philanthropies, the seafood industry, and other sustainable fisheries advocates—can make use of the strategies in achieving real change for people, with the goals of protecting and restoring marine ecosystems and helping to feed the world.

FIGURE 6: Small-Scale Fisheries Investment Blueprint Summaries

	THE MARISCOS STRATEGY	THE MANGUE STRATEGY	THE ISDA STRATEGY
Country	Chile	Brazil	The Philippines
Proposed Investment Amount <sup>15</sup>	\$7.0 million	\$15.0 million	\$11.7 million
Investment Term	5 Years	9 Years	10 Years
Fishery/Species Focus	Multispecies, benthic focus on razor clams, scallops, stone crab, king crab, nylon shrimp, abalone, and mussels	Mangrove crab	At least 20 species, including tuna, mahi mahi, snapper, trevally, mackerel, lobster, octopus, squid, crab, and sea urchin
Core Investments	<ul style="list-style-type: none"> <li>• Fishery management improvements</li> <li>• Seafood company</li> </ul>	<ul style="list-style-type: none"> <li>• Fishery management improvements</li> <li>• Seafood company</li> </ul>	<ul style="list-style-type: none"> <li>• Fishery management improvements</li> <li>• Seafood company</li> </ul>
Number of Fishing Communities Incorporated	7	98	40 initially, up to 80
Number of Fishers Engaged	550	1,300	19,000
Targeted Impact Returns: Protecting and Restoring Fish Stocks	<ul style="list-style-type: none"> <li>• Protect existing biomass from overfishing with potential upside increase of 10%</li> </ul>	<ul style="list-style-type: none"> <li>• Protect existing biomass from overfishing with potential upside increase of 10%</li> </ul>	<ul style="list-style-type: none"> <li>• Protect existing biomass from overfishing with potential upside increase of 20%</li> </ul>
Targeted Impact Returns: Supporting Fishing Livelihoods	<ul style="list-style-type: none"> <li>• Pay a premium of 25% to market prices for raw materials sourced, increasing aggregate fisher income by \$1.8 million<sup>16</sup> over the investment period</li> <li>• Establish and fund a Fishing Community Trust</li> <li>• Empower fishing communities as long-term commercial partners</li> </ul>	<ul style="list-style-type: none"> <li>• Pay a premium of 33% to market prices for raw materials sourced, increasing aggregate fisher income by \$1.2 million<sup>17</sup> over the investment period</li> <li>• Establish and fund a Fishing Community Trust</li> <li>• Empower fishing communities as long-term commercial partners</li> </ul>	<ul style="list-style-type: none"> <li>• Pay a premium of 15% to market prices for raw materials sourced, increasing aggregate fisher income by \$11.9 million<sup>18</sup> over the investment period</li> <li>• Establish and fund a Fishing Community Trust</li> <li>• Empower fishing communities as long-term commercial partners</li> </ul>

<sup>4</sup> In constant 2015 dollars

<sup>5</sup> In constant 2015 dollars

<sup>6</sup> In constant 2015 dollars

<sup>7</sup> Subject to further analysis

<sup>8</sup> The targeted financial returns assume modest cash yields and exit sales of seafood companies to strategic buyers with conservative EBITDA exit multiples relative to market benchmarks.

# **THE MARISCOS STRATEGY**

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**AN INVESTMENT BLUEPRINT  
FOR SMALL-SCALE FISHERIES  
IN CHILE**

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## THE MARISCOS STRATEGY: A SMALL-SCALE FISHERIES INVESTMENT IN CHILE

Encourage Capital has worked with support from Bloomberg Philanthropies and The Rockefeller Foundation to develop an impact investing strategy supporting the implementation of sustainable fishing improvements in a portfolio of small-scale, multispecies fisheries in Chile. The Mariscos Strategy is a hypothetical \$7.0 million impact investment to protect seven small-scale fisheries along the Chilean coastline.

The \$7.0 million would fund the implementation of fisheries management improvements across the fisheries, and be used to expand an existing consumer packaged goods company producing gourmet “heat-and-eat” meals for Latin American consumers. The Mariscos Strategy is focused on generating an 11.1% base-case equity return, while simultaneously protecting the multispecies stock biomass from current and future overfishing, enhancing almost 550 fisher livelihoods across seven fishing communities, and safeguarding the supply of over 5 million meals-to-market annually.

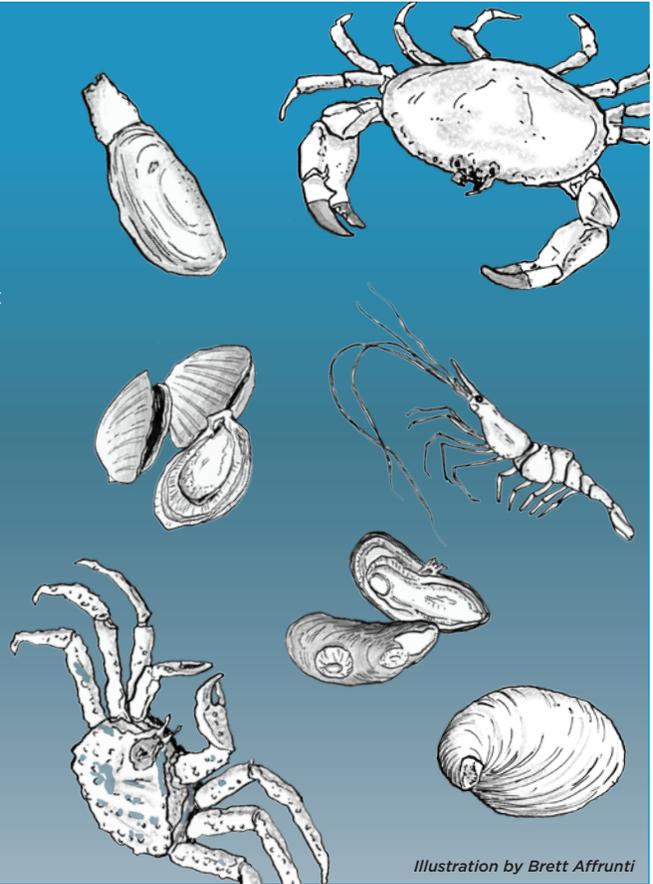


Illustration by Brett Affrunti

While Project Mariscos is based on analysis of actual fishing communities, fishing conditions, and commercial business operations to incorporate realistic assumptions of costs, returns, and risks affecting the potential outcomes of the project, Encourage Capital has synthesized its findings into a general case study that we hope can be used as a roadmap for fishery stakeholders interested in impact investing opportunities more broadly in the sustainable fisheries space. As such, most of the company and programmatic references herein use pseudonyms in place of the actual names of the organizations on which the analysis was based. Where used, such pseudonyms will be used consistently throughout the remainder of this text.

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The Mariscos Strategy proposes to implement robust fisheries management systems *before* overfishing and habitat destruction cause more severe stock depletion to occur.

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### THE MARISCOS STRATEGY

Chile's 6,435 km coastline constitutes one of the most biodiverse and productive nearshore marine environments in the world, accounting for 4% of the world's marine wild-capture fisheries landings.<sup>9</sup> Despite Chile's passing of one of the world's most progressive fisheries management laws in February 2013, many of the nation's stocks remain inadequately managed. The species group proposed for sourcing in The Mariscos Strategy incorporate a mix of stocks, including razor clams, mussels, scallops, king crab, stone crab, nylon shrimp, and abalone, each the predominant species in one of the seven caletas (or coves) incorporated into Mariscos's portfolio of small-scale fishing communities. Altogether, nearly 550 fishers with some 200 vessels harvest the aforementioned species, producing roughly 2,900 metric tons (mt) of seafood landings each year, with an aggregated estimated value of \$13.5 million in 2014.

The species vary in terms of their stock status and management systems, with four of the seven species lacking any stock assessment data, and three of the seven communities lacking access constraints to limit fishing effort. Only one of the seven species has a designated Management Committee, as required by law. As such, no science-based catch limits are in place for any of the species. Lacking critical elements of a robust management framework, the fisheries are vulnerable to overfishing. Indeed, all of The Mariscos Strategy portfolio species that are assessed, including the shrimp, king crab, and abalone, are currently fully exploited, while independent studies of the unassessed stocks, including the razor clams, scallops, stone crab, and mussels, suggest a general decline in catch per unit of fishing effort (CPUE), which itself is a clear sign of declining biomass volumes.<sup>10</sup>

The small-scale fishers who depend on the resource lack the infrastructure, access to capital, and commercial know-how required to effectively commercialize and grow their businesses to a viable scale. The fishers in all but a few of the over 400 caletas in Chile sell their products at the beachside, with no value addition, into a fragmented chain of intermediaries who take their product to market. These intermediaries often also lack access to cold-chain infrastructure, and have low standards regarding product handling, hygiene, and legality. The result is an often dramatic loss of product to spoilage, destroying value for both fisher and buyer, requiring increased production to compensate for the lost portion. Since buyers are limited, fishers have few options, so they must compete against one another on price. This, in turn, locks them into a weak market position and a low-margin, volume-driven production model.

The Mariscos Strategy therefore proposes to implement robust fisheries management systems *before* overfishing and habitat destruction cause more severe stock depletion to occur. The strategy proposes the investment of \$7.0 million in equity and grant funds into a combination of fisheries management improvements implemented across seven small-scale fisheries in Chile, as well as into a mission-aligned seafood company to improve the route-to-market for these products. In order to profile such a company, for the purposes of this Investment Blueprint, Mariscos therefore proposes to invest into the expansion of "GustoMar"<sup>11</sup> (or the "The Company"), a hypothetical consumer packaged goods company with a proven track record that produces "heat-and-eat" packaged meals for sale into Chilean grocery and institutional food-service channels.<sup>12</sup> Mariscos's innovative approach would incorporate the implementation

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<sup>9</sup> Food and Agriculture Organization of the United Nations, "The State of World Fisheries and Aquaculture," Rome 2014, ex/China.

<sup>10</sup> Costello, et al., "Status and Solutions for the World's Unassessed Fisheries," Science 338, 2013.

<sup>11</sup> "GustoMar" is a generic pseudonym used to ensure confidentiality.

<sup>12</sup> Consider all references to GustoMar throughout the remainder of this presentation as indicative of the type of business operations and historical performance that Mariscos would expect to find in a company of this size and focus.



of robust data collection technologies and systems, plus the use of financial incentives that reward sustainable fishing practices over time. The bundling of the fisheries management improvements with a company that mirrors the GustoMar investment profile would allow Mariscos to capture higher value for the products, generate financial returns, and reward fishers for maintaining sustainable fishing practices on an ongoing basis.

The Mariscos Strategy would aim to preserve current stock levels, with the potential for modest biomass increases in caletas facing localized depletion. The value created through the strategy's spoilage reduction and efficiency gains would be shared with fishers in the form of a 25% price premium to market ex-vessel raw material prices for participating supplier partners, with an expected aggregate increase of fisher revenues of approximately \$1.8 million over the five-year

investment horizon.<sup>13</sup> In addition, Mariscos offers greater resiliency to each participant caleta through a pre-capitalized Fishing Community Trust that could be drawn down to provide insurance in the case of business interruption due to bad weather or natural disasters. This fund would be recapitalized using the proceeds generated by the sale of a 20% equity share in the GustoMar business. Mariscos will also aim to reduce waste in the supply chain by 13.5%, and as a result, increase the number of meals to market by over 150,000 with no increase in landings. Mariscos has the potential to generate attractive financial returns, targeting an 11.1% levered IRR over a five-year horizon. Overall, Mariscos could provide a novel, replicable model for sustainable seafood delivery from small-scale fishers, while showing that sustainable management and responsible sourcing can be not only profitable but also a source of competitive advantage.

### IMPACT AND FINANCIAL RETURNS

- Safeguards seven species stock levels with the potential to increase biomass by 10%, depending on fishery conditions<sup>14</sup>
- Increases aggregate fisher revenues by \$1.8 million over five-year period<sup>15</sup>, and improves community resiliency through the allocation of a 20% equity share in GustoMar to participating communities
- Empowers fishers and fishing communities by strengthening fisher organizations and creating more direct market linkages
- Increases meals-to-market through 13.5% reduction in spoilage, delivering an additional 150,000 seafood meals to consumers annually
- Targets an 11.1% levered IRR over a five-year period

<sup>13</sup> In constant 2015 dollars

<sup>14</sup> A biomass increase is not built into the financial model.

<sup>15</sup> In constant 2015 dollars

## KEY VALUE DRIVERS

The Mariscos Strategy value proposition is based on the creation of a more vertically integrated supply chain, improving product quality and achieving greater efficiencies. Vertical integration allows Mariscos to secure seafood supplies to support

its growth strategy, capture higher margins, and generate value for investors that can be shared with fishers to reward them for sustainable fishing practices. The table below summarizes the key value drivers supporting Mariscos's investment thesis:

HIGHLIGHT	DETAILS
<b>Implements effective fisheries management improvements</b>	Mariscos can cost-effectively design and implement tailored fisheries management improvements for each portfolio caleta that capitalize on global best practices for managing nearshore fisheries, leverage new technologies to improve monitoring and catch accounting, and incentivize fishers to better steward their resources both in the water and post-harvest through enhanced market connectivity. The contemplated fisheries management framework would be aligned with and benchmarked to international standards.
<b>Leverages strong regulatory enabling conditions</b>	Chile's Territorial Use Rights Fisheries (TURF) laws provide some access limits in the portfolio fisheries and can be used as a foundation from which to implement additional fisheries management improvements.
<b>Uses innovations to increase fisher compliance</b>	The use of on-board data-capture technologies, dockside catch accounting, and other data systems, in combination with financial incentives to reward fishers for sustainable practices, can increase fisher compliance with fisheries management improvements.
<b>Establishes best-in-class partnerships</b>	Mariscos proposes that key technical and commercial partnerships should collaborate in the design and execution of the strategy, ideally including mission-aligned partners such as GustoMar and others, and to form strategic alliances with seven prototype caletas, each selected on the basis of their potentially high-value seafood products and commitment to fisheries management interventions.
<b>Leverages a strong commercial market position</b>	GustoMar currently has a 9% market share in core Chilean retail markets, with room to double this share over a five-year period through greater raw material sourcing, manufacturing, and marketing and sales capacity. The Company has unique nutritional, social, and environmental selling points associated with its brand, and provides the only fully-traceable seafood product offerings of artisanal origins in the domestic or regional market.
<b>Is supported by strong underlying demand fundamentals</b>	Growing Chilean demand for high-quality packaged seafood products has supported price growth of product lines averaging 8% annually. This trend is likely to continue, as a growing share of women in the Chilean workforce and longer hours worked by both genders drive increased demand for "heat-and-eat" meals. In addition, Chile leads all South American countries by a wide margin in terms of per capita spending on packaged foods, suggesting significant room for growth in regional countries as per capita incomes rise.
<b>Creates a positive investment climate</b>	Chile is an Investment Grade-rated country by all three major rating agencies, has one of the lowest country risk premiums in Latin America, and is considered one of the most attractive countries in which to invest in the region.

The Mariscos Strategy value proposition is based on the creation of a more vertically integrated supply chain, improving product quality and achieving greater efficiencies.



## PROFILE OF THE MARISCOS STRATEGY FISHERIES

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The Mariscos Strategy seeks to incorporate seven multispecies fisheries and fishing communities into a regional, sustainable seafood sourcing operation for the manufacture and delivery of packaged seafood products to domestic and international retailers and institutional food service operators. The species are believed to be under moderate fishing pressure, which make the fisheries vulnerable to overfishing as consumer demand continues to grow. Broadly speaking, Chile has a strong fisheries management regime, but does not actively manage all its nearshore benthic fisheries. Although fishers and vessels are typically registered, illegal fishing occurs with regularity, and only one species of seven in the Mariscos portfolio undergoes a stock assessment, with no maximum catch levels established.

The Mariscos Strategy seeks to more effectively limit illegal fishing activity within its portfolio communities by implementing fisheries management improvements that utilize the existing TURF agreements, a form of locally managed access limitations, and data collection technologies that aid in assessing stock health and fisher compliance with regulations.

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### The Mariscos Strategy seeks to more effectively limit illegal fishing activity within its portfolio communities

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#### CHILEAN SMALL-SCALE FISHERIES

Chile's 6,435 km coastline constitutes one of the most biodiverse and productive nearshore marine environments in the world, accounting for 4% of the world's fisheries catch.<sup>16, 17</sup> This productivity can be attributed in large part to the physical heterogeneity of the coastline, with at least five unique ecoregions, as well as unique oceanographic conditions including upwelling, nutrient inputs, freshwater influx, temperature regime, and bathymetry complexity.<sup>18</sup>

Greater than 50% of Chile's total landings, or nearly 5 million mt, are attributable to the small-scale, or artisanal" sector, defined by authorities as fishers operating vessels less than 18 meters in length, fishing within 5 nautical miles of the coastline, and operating independently from larger corporate fishing operations.<sup>19</sup>

This vibrant sector is generally organized around "caletas," the Spanish word for "cove," which are typically intergenerational landing sites used by one or more fishing communities. Caletas function much in the same way as cooperatives in other countries, such as Mexico, in which an individual fisher pays an annual fee and agrees to follow certain bylaws in order to enjoy the benefits of being part of the larger organization, including an allocation of quota that gives fishers the right to access the fishery, access to social services, and enhanced political leverage and market power.

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<sup>16</sup> Food and Agriculture Organization of the United Nations, "The State of World Fisheries and Aquaculture", Rome, 2014.

<sup>17</sup> This figure excludes China.

<sup>18</sup> Advanced Conservation Strategies, "A Coastal Marine Assessment of Chile," report prepared for the David and Lucile Packard Foundation, 2011.

<sup>19</sup> Food and Agriculture Organization of the United Nations, "The State of World Fisheries and Aquaculture," Rome, 2014.

The artisanal sector as a whole comprises roughly 72,000 fishers nationwide and more than 5,000 indirect jobs.<sup>20</sup> The gear used in each caleta varies, depending on the species being harvested, with finfish generally landed by gillnet, longline, or handline gears, and most bottom-dwelling (benthic) species (e.g., lobster, crab, and sea urchin) harvested using traps or manual extraction techniques.<sup>21</sup>

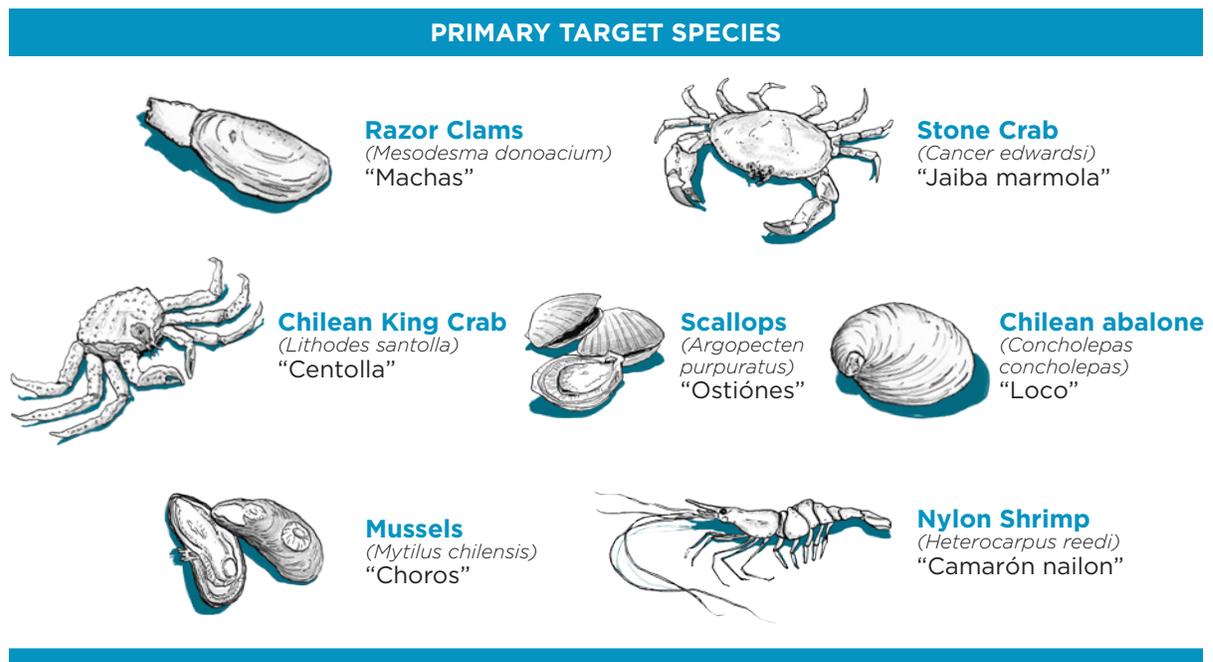
Of these artisanal landings, roughly 3% are composed of benthic species extracted from nearshore environments.<sup>22</sup> Although bivalves and crustaceans make up a small percentage of total landings, they are among the highest-value products available in Chile's waters. Given that these species exist almost exclusively within the 5 nautical mile band that is the domain of the artisans, their long-term viability will be driven to a large extent by the fishing practices and stewardship of artisanal fishers.

### THE MARISCOS STRATEGY PORTFOLIO

The species proposed for sourcing in The Mariscos Strategy represent a mix of bottom-dwelling, near-shore species. These species include razor clams,

mussels, scallops, king crab, stone crab, nylon shrimp, and loco (or Chilean abalone), each of which is depicted below with its scientific and local names:

FIGURE 1: Target Species of The Marisco Strategy



<sup>20</sup> Instituto Nacional de Estadísticas, "Primer Censo Nacional Pesquero Y Acuicultor Año 2008-2009", 2009.

<sup>21</sup> Instituto Nacional de Estadísticas de Chile, "Primer Censo Pesquero Y Acuicultor," Año Censal 2008-2009, 2009.

<sup>22</sup> J. Castilla, "Fisheries in Chile: Small Pelagics, Management, Rights, and Sea Zoning," *Bulletin of Marine Science* 86(2), 2010.



The Mariscos Strategy would incorporate seven prototype caletas (the caletas) within the first five years, spanning Regions IV, V, VII, VIII, X, and XIV. The map in Figure 2 highlights the locations of the

portfolio caletas and their primary species. Over time, Mariscos would seek to expand into other caletas should the model prove viable.

FIGURE 2: Location and Principal Species of the Caletas

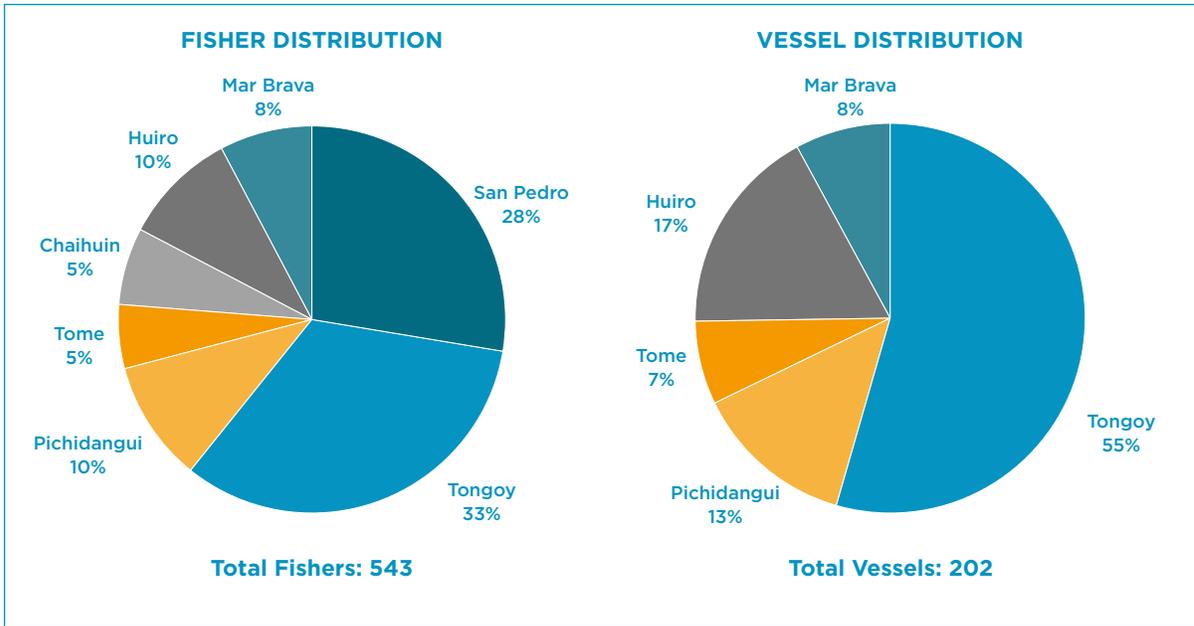


The seven prototype sites include approximately 200 vessels dedicated specifically to harvesting the target species, although many of the products are collected by hand from shallow water and thus have no associated vessels. Nearly all the fishers in the caletas are currently enrolled in formal fishing

associations. These associations exist to advocate for the fishers' interests in shaping regional and national fishing regulations, provide for the allocation of government-issued fishing rights, and oversee and enforce fishers' compliance with a range of fishing and commercialization bylaws.

Figure 3 shows the composition of fishers by caleta and the relative vessel numbers by caleta.

FIGURE 3: Total Number of Fishers and Vessels from Prototype Caletas

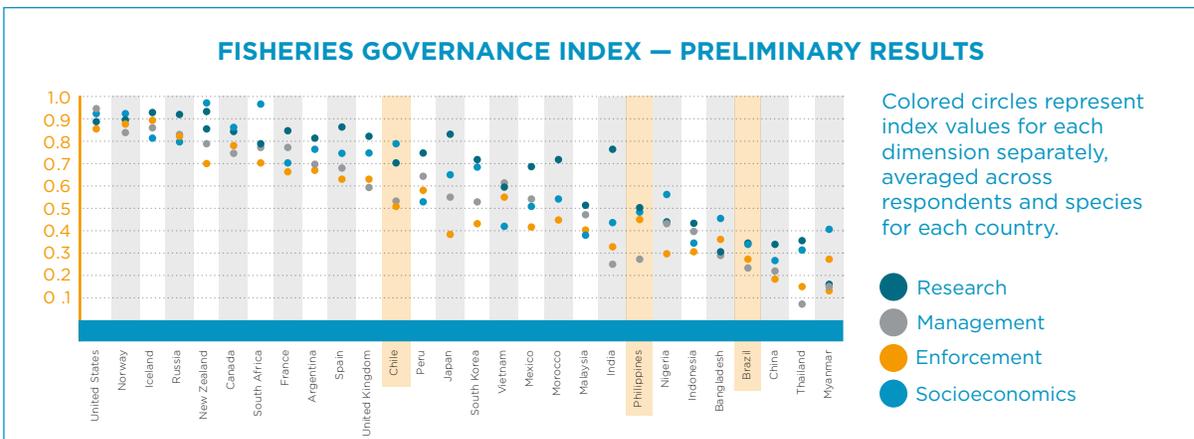


### CURRENT REGULATORY FRAMEWORK

Beginning in the 1990s, Chile started to utilize formal catch limits that established Total Allowable Catch levels, or TACs. These TACs were combined with an allocation of catch shares, or quota, to individual

fishing companies, fishers, and communities across many of the larger fisheries. Most international observers today consider Chile to maintain a strong management regime (see Figure 4).

FIGURE 4: Fisheries Governance Index



Notwithstanding Chile's progressive management framework, many specific management deficiencies exist, and many of the nation's stocks remain improperly assessed and/or managed. As of 2014, there were 38 official commercial stocks in Chile, 22 of which still lacked formal management plans. Of the stocks for which there were formal stock assessments and biological reference points established, eight were considered "fully exploited, eight "overexploited," and six "collapsed or exhausted." The remaining stocks had no formal stock assessments and were defined as open access.<sup>23</sup>

Management of benthic near-shore resources is, in many cases, conducted through the implementation of territorial user-rights management systems

(TURFs), referred to in Chile as Áreas de Manejo y Explotación de Recursos Bentónicos, which create a de facto exclusive-access right for certain groups of fishers. TURFs were established initially for the management of Chilean abalone, but have since been extended to other species. Although TURFs have been shown to meaningfully improve management and biomass levels in specific cases, they are often poorly implemented, and fishers tend to lack the technical understanding and data necessary to consistently manage their resources at sustainable extraction levels. Moreover, with rising domestic and international demand for many of these high-value products, short-term financial incentives are often at odds with long-term sustainable management.

### CONDITION OF NEARSHORE SPECIES

The portfolio caletas vary in terms of the stock status, management system in place, and market destinations (see Figure 5). Unfortunately, unlike many of the finfish for which there are now annual stock assessments conducted with established biological reference points to guide the establishment of total allowable catch (TAC) limits, the species in The Mariscos Strategy tend not to have comprehensive data available and therefore

must rely almost exclusively on local stewardship. As a result, significant deficiencies exist in management across all the caletas. These deficiencies leave the fisheries vulnerable to overfishing and illegal fishing activity. While comprehensive stock-level data on catch per unit effort does not exist for many of these species, studies suggest a general decline in CPUEs—a clear indicator of stock biomass declines.<sup>24</sup>

Figure 5: Nationwide Chilean Landings and Stock Status of Featured Species

SPECIES NAME (SPANISH)	LANDINGS 2014 (MT) <sup>25</sup>	STOCK STATUS <sup>26</sup>	MANAGEMENT SYSTEM	MANAGEMENT COMMITTEE ESTABLISHED (Y/N)
Razor Clams ( <i>Machas</i> )	2,741	No reference points set	TURF	No
Scallops ( <i>Ostiones</i> )	11,021	No reference points set	TURF	No
Stone Crab ( <i>Jaiba</i> )	3,500–4,000	No reference points set	None	No
Shrimp ( <i>Camarón</i> )	5,480	Fully exploited	None	Yes
King Crab ( <i>Centolla</i> )	5,500	Fully exploited	None	No
Mussels ( <i>Choros</i> )	3,800	No reference points set	TURF	No
Abalone ( <i>Loco</i> )	2,300	Fully exploited	TURF	No

<sup>23</sup> Sernapesca, "Anuario 2014," Ministeria de Economía Fomento Y Turismo, Gobierno de Chile, 2014.

<sup>24</sup> G. Vasquez-Prada, "Analyzing Fish Stocks Dynamics Using CPUE and PRCF: A New Approach for the Fishery Management," *Journal of Coastal Life Medicine* 2(1), 2014.

<sup>25</sup> Landings data reflect total landings for these species nationwide, not just landings in the portfolio caletas, which total 2,900 mt of the listed species.

<sup>26</sup> Chile's National Fisheries Service

The primary fisheries management improvements required in these fisheries include the use of data collection systems to support broader stock assessment efforts that can ultimately enable the setting of Total Allowable Catch limits for the species. In addition, authorities need to strengthen the enforcement of fishing access limitations, including

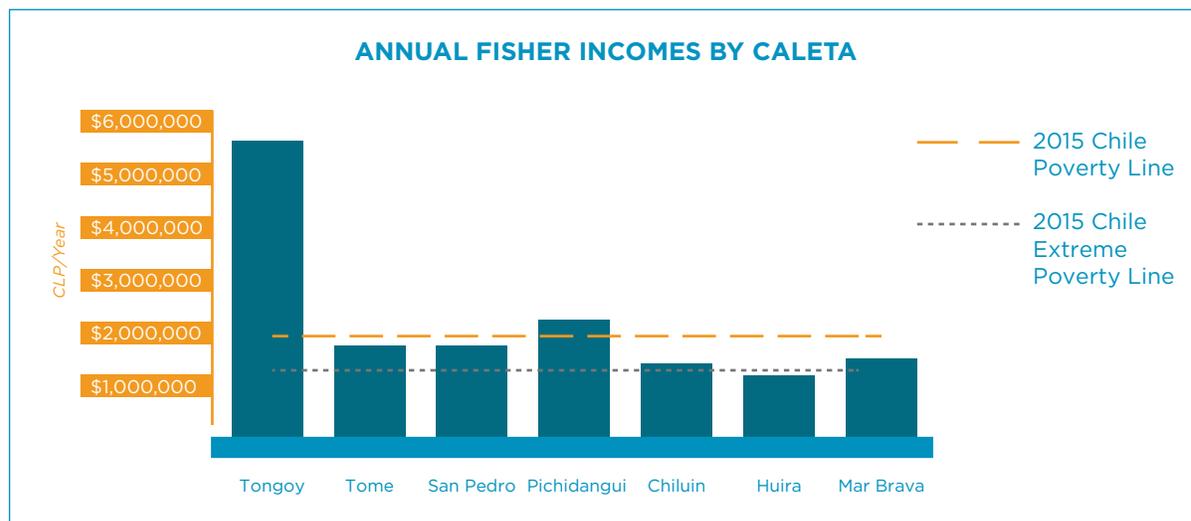
robust vessel registration, and the government certification of legal catch volumes. Finally, depending on the species, a variety of additional rules regarding seasonal closures and the establishment of no-take zones could be implemented to protect and restore the fisheries' biomass.

## SOCIO-ECONOMIC CONTEXT

The caletas that Mariscos proposes to incorporate into its portfolio are part of the most economically vulnerable segment of the fishing sector—the smallest-scale fishers dependent exclusively on nearshore benthic species harvested out of either TURF reserves or informal equivalents. Despite contributing over 50% of national landings, these artisanal fishers and their families tend to fall among the poorest segments of society largely because they

lack capital, infrastructure, and commercial know-how, diminishing their ability to capture a greater share of the final value of their products. Income levels vary largely by species, with finfish and crustacean fishers earning the most, and mollusk and algae harvesters making the least. Most artisanal fishers live well below the poverty line, as shown in Figure 6, with the seasonable variability of raw materials and lack of cold storage capacity leading to high income-volatility.<sup>27</sup>

FIGURE 6: Annual Fisher Income by Caleta Relative to Chilean Poverty Line and Extreme Poverty Line<sup>28, 29, 30</sup>



## THE CURRENT SUPPLY CHAIN

Despite landing a large and ever increasing share of Chile's seafood, particularly of its high-value products, the nation's artisanal fishers remain economically marginalized, with little or no downstream participation

in the value chain. This situation can be attributed in large part to underinvestment in modernization of the sector. This stands in stark contrast to Chile's industrial fishing and aquaculture sectors, which have become

<sup>27</sup> Note 1 million CLP = US \$1,420 at current exchange rates

<sup>28</sup> Instituto Nacional de Estadísticas de Chile, "Primer Censo Pesquero Y Acuicultor," Año Censal 2007-08, 2008.

<sup>29</sup> Ministerio de Desarrollo Social, "Encuesta Casen 2013: Situación de la Pobreza en Chile, 2014.

<sup>30</sup> Tongoy's socioeconomic status is stronger than that of many caletas, given its ability to produce high-value scallops that are in demand both in the capital of Santiago and internationally. In addition, the government has provided grant capital to Tongoy to construct preprocessing infrastructure and facilities, enabling it to transact direct sales to end customers and to capture higher value for its landed catch volumes.

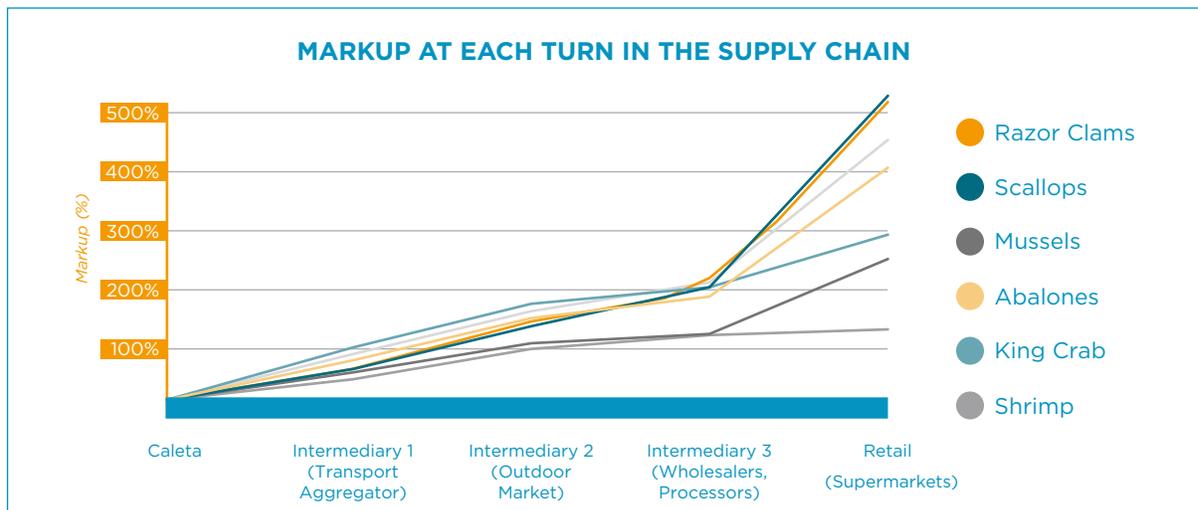
multi-billion dollar industries as a result of significant private and public investment. Instead, artisans tend to rely exclusively on small grants from regional governments and international philanthropies.

As a result, small-scale fishers suffer a marked lack of commercialization infrastructure, access to capital, and commercial know-how. In fact, in all but a few of the more than 400 caletas in Chile, fishers must sell their products at the beachside, with no value added, into a fragmented chain of intermediaries who take their product to market. These intermediaries themselves generally lack access to cold-chain infrastructure, and have low standards regarding product handling and hygiene. Moreover, the large number of fishers relative to intermediaries creates a monopsony market dynamic wherein fishers become price-takers, competing against one another on price, locking themselves into low-margin, volume-driven production models. This dynamic, together with high spoilage rates, in turn drives a positive feedback loop

in which fishers harvest more but make less, leading to stock depletion, lower catch per unit effort, and further margin compression.

To put this into context, a supply chain analysis of the products sold by the seven portfolio caletas reveals that the first intermediary in the supply chain sells the products at a 50% to 100% markup to the price they pay to fishers. These are the same unprocessed raw materials purchased from the fishers, with the markup intended to cover spoilage, transport costs, and a profit margin to the intermediary. This trend gets amplified at each turn in the supply chain (as seen in Figure 7) as the product makes its way to Santiago. By the time the product reaches the supermarket, again with little added value, the markup can be as high as 500%.<sup>31</sup> Ultimately, only a small percentage of these products ever reach export markets due to the diminished quality, opaque chain of custody, and lack of reliable volumes required to justify export operations.

FIGURE 7: Margin Increases at Each Turn in the Supply Chain



In addition to the supply chain issues facing artisanal products, many are barred from the necessary sustainability certifications demanded by many North American and European retailers. Although many of these fishers employ low-impact gear and tend to do a better job than their industrial counterparts of stewarding the resource—particularly for benthic stocks that can be managed at a caleta level—a certification for these fisheries cannot be achieved due either to

a lack of data regarding stock status or evidence to distinguish that the product was harvested by legal fishers and not mixed with illegal product.

As a consequence, artisanal fishermen are largely relegated to the role of “poor harvesters,” while demand for sustainably sourced seafood remains largely unmet.

<sup>31</sup> Based on Encourage Capital research on the portfolio caleta supply chains.

## THE MARISCOS IMPACT STRATEGY

### IMPACT INVESTMENT THESIS

The Mariscos Strategy's goal is to protect the current biomass of the caleta fisheries, with an upside opportunity to increase it by up to 10% over a five-year period, improving the livelihoods of approximately 550 fishers who depend on it.

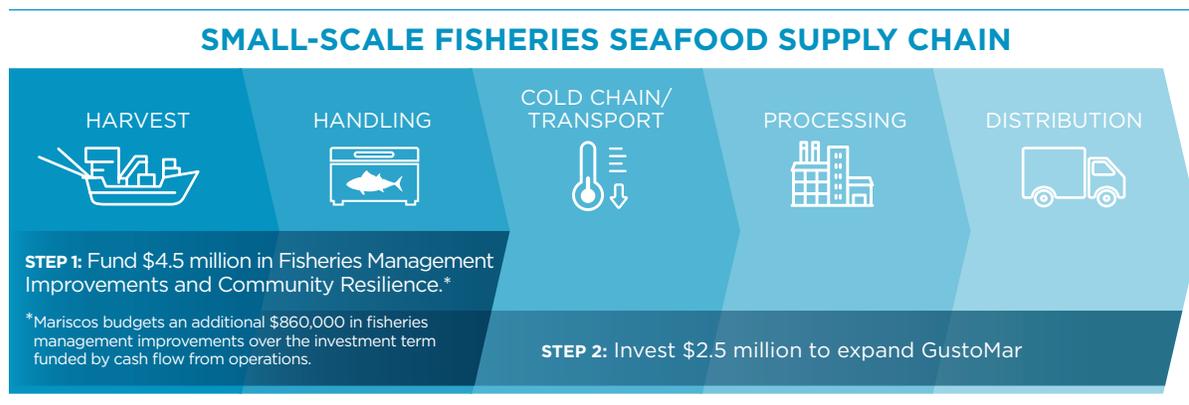
The strategy's investment thesis is premised on the opportunity to partner with seven fishing communities, bundle investments into fisheries management improvements with investments into a downstream food products company, capture higher value for the caletas products, and ultimately reward fishers for using sustainable fishing practices.

To accomplish these objectives, The Mariscos Strategy proposes the following bundled set of investments (see Figure 8):

**Step 1:** Invest \$4.5 million over five years in the design and implementation of robust caleta-level fisheries management improvements across the seven portfolio caletas.

**Step 2:** Invest \$2.5 million into the expansion of GustoMar, a packaged food products company that sells gourmet "heat-and-eat" meals both to retail outlets and through the institutional food channel. This would include the funding of new business operations to support purchasing relationships with each of the seven caletas, the construction of a preprocessing plant, the expansion of an existing manufacturing facility, the construction of a new manufacturing facility, and the funding of other operational expenses necessary to finance working capital and develop new international sales channels for the Company's products.

FIGURE 8: The Marisco Strategy's investments



By bundling the investments into fisheries management improvements with an investment in GustoMar, Mariscos would enable GustoMar to develop direct purchasing relationships with the caletas. GustoMar would expect to capture significantly higher margins through a reconfiguration of the supply chain, allowing the Company to offer premium prices to fishers in compliance with sustainability requirements, thereby serving to improve fisher compliance. Moreover, this connectivity to the fishers would afford greater control over both product quality and supply availability, creating a virtuous cycle of value generation.



### STEP 1: FISHERIES MANAGEMENT IMPROVEMENTS

The Mariscos Strategy proposes to implement fisheries management improvements in each of the seven portfolio caletas located across four regions in Chile. The fisheries management improvements outlined in this report are simplified to present the general set of actions necessary to improve the management of all species across the caletas, based on the shortcomings identified in the preliminary fishery analysis. Upon implementation, each caleta would require its own detailed preassessment and specific management plan tailored to its species, geography, and other identified needs. While the management improvements would be designed in alignment with internationally recognized best-in-class sustainability standards, they are not specifically aimed to achieve certification, but instead target specific social and environmental outcomes described herein.

The principal management intervention in the caletas would be the installation of a technology package, designed for and already tested in small-scale fishery settings. Tracking technology would record harvest location, composition, and gear-type, all of which would be captured passively and sent via Wi-Fi to a central receiver in a landing station at the port. Landings would then be weighed at the landing station, and a unique bar

code would be generated for each harvest batch that accompanies the product through the supply chain for traceability purposes. The data systems would be installed on all vessels targeting the species of interest for sourcing, and would feed a common database that provides information on (a) fleet movements in space and time, (b) catch and bycatch in weight by species, (c) landings by vessel and species, and (d) full traceability of products back to the vessel of origin. Most importantly, the system would capture landed and removed biomass for every fishing trip, thereby limiting illegal, unreported, and unregulated fishing.

By gathering this data across many different fishers and fisheries, the system would create a rich database of metrics essential for fisheries management efforts. Mariscos could then analyze the data to generate user-specific reports that empower fishers to better control their actions, allow commercial partners such as GustoMar to ensure that they are sourcing fresh and sustainably harvested raw materials, and provide valuable data to authorities to inform management efforts. These data would ultimately be used to evaluate the status of stocks, set total allowable catch limits, assess the environmental impact of fisheries, and work out mitigation strategies.

## THE FISHERIES MANAGEMENT PLAN

The table below outlines the core fisheries management activities associated with the portfolio caletas:

CORE FISHERIES MANAGEMENT COMPONENTS	ACTIVITIES	PROPOSED MANAGEMENT IMPROVEMENTS
Stakeholder Engagement	Government Engagement	<ul style="list-style-type: none"> <li>• Share all aggregated data by species with Sernapesca (fisheries authorities) to inform management efforts</li> <li>• Co-create product label with Sernapesca verifying the Company's product as legal and sustainable</li> <li>• Conduct workshops with Sernapesca authorities to help integrate Catch Documentation System (CDS) data into annual stock assessments</li> <li>• In year 5, begin workshops and training to transitioning CDS management to Sernapesca</li> </ul>
	Community Engagement	<ul style="list-style-type: none"> <li>• Provide training activities to improve adoption and utilization of the technology</li> <li>• Provide ongoing workshops for fishers to (a) improve handling and hygiene and (b) ensure full understanding of local fishery management plans</li> <li>• Prepare and publicly disseminate annual report on progress against target benchmarks with external audits in the 2nd and 5th years</li> </ul>
	Community Support	<ul style="list-style-type: none"> <li>• Invest in community vessel infrastructure and holding facilities to improve product quality and sanitary conditions for fishers</li> </ul>
Policy Rules and Tools	Exclusive Access Rights	<ul style="list-style-type: none"> <li>• Ensure that quota and TURF reserves—both de facto forms of exclusive access—are monitored and properly enforced through installation of Vessel Monitoring Systems (VMS) on all vessels</li> </ul>
	Fishery Management	<ul style="list-style-type: none"> <li>• Design and oversee implementation of caleta-specific fishery management plans outlining proper harvesting, landing, and catch-documentation practices, as well as key environmental considerations regarding ecosystem impacts, closed seasons, bycatch, discards, and bait use</li> <li>• Register all vessels in the participant caletas</li> <li>• Implement minimum size limits for each species based on minimum size at sexual maturity</li> </ul>
	Biological Monitoring and Assessment	<ul style="list-style-type: none"> <li>• Fund research projects on catch composition and discards</li> <li>• Fund research to map out sensitive ecosystems and spawning grounds</li> </ul>
	Stock Recovery	<ul style="list-style-type: none"> <li>• Ensure that all data is fed to fisheries management authorities to inform stock assessments and establishment of biological reference points</li> <li>• Derive annual reports on CPUE and total landings volume for dissemination to fishers, authorities, and commercial partners to monitor trends in stock biomass</li> </ul>
	No-take zones	<ul style="list-style-type: none"> <li>• Establish no-take zones of at least 10% of each TURF reserve to provide recovery areas for target species</li> </ul>

CORE FISHERIES MANAGEMENT COMPONENTS	ACTIVITIES	PROPOSED MANAGEMENT IMPROVEMENTS
Compliance	Catch Accounting	<ul style="list-style-type: none"> <li>• Design, implement, and operate Catch Documentation System (CDS)</li> <li>• Install weighing stations in caletas to ensure that landings comply with quota allocation and are properly accounted for in fishery management data</li> </ul>
	Product Traceability	<ul style="list-style-type: none"> <li>• Design and implement full traceability system from buying stations to final point of sale</li> </ul>
	Local Enforcement Systems	<ul style="list-style-type: none"> <li>• Sign contracts with the leadership of each of the seven caletas stipulating that in exchange for access to all technology and infrastructure (vessel equipment, ice machines, etc.), the caleta must comply with the guidelines of the fishery management plan</li> <li>• Work with caleta leadership to codify fishery improvement activities into the bylaws of each caleta and/or “Regimen Artesanal de Extracción” (RAE) through which quotas are allocated</li> </ul>

### SUSTAINABLE FISHING REWARDS PROGRAM

Fishers willing to commit to fisheries management improvements and serve as suppliers to GustoMar’s sourcing network would be eligible to participate in The Mariscos Strategy’s Sustainable Fishing Rewards Program (SFRP). Mariscos proposes to utilize the SFRP as an incentive to catalyze and sustain the implementation of sustainable artisanal fishing practices that support maintenance of nearshore stocks, bycatch reduction, habitat protection, and biodiversity.

The SFRP would offer economic rewards to fishers and fishing caletas in two ways: through the payment of higher prices per unit of catch and through a profit-sharing mechanism whereby fishing caletas are allocated an economic interest in GustoMar’s business, earning a share of GustoMar’s profits over time. (see Figure 9).

GustoMar expects to be able to pay 25% above prevailing beachside prices for products from the caletas. In addition, Mariscos would invest \$3.5 million to capitalize a new financial entity in each caleta called a Fishing Community Trust, or FCT.<sup>32</sup> The capitalization of the FCT is needed to create a longer term incentive to reward sustainable fishing

practices over time. Each FCT would be capitalized from the project outset with \$500,000 in grant funding from philanthropic sources and Chilean regional governments or development agencies, with a 20% annual vesting schedule for five years. Moreover, Mariscos would allocate 20% of GustoMar’s equity to caletas, with the proceeds upon sale of the company being divided evenly between the portfolio FCT’s, modeled to occur in the fifth year of the investment. The FCT would be structured as a community reserve fund or insurance pool, where funds could be drawn down by participant caletas to fund near-term revenue shortfalls and cover costs borne by the community as it adopts the transition to more sustainable fishing practices.\* In this way, the FCT both strengthens community resilience with committed funds up front to support short term needs in the community, as well as a share of longer term profits generated with the success of the caleta-Company collaboration.

The FCT would be structured as an adjunct financial entity attached to each of the portfolio caletas. The FCT would have the following governance and membership requirements:

<sup>32</sup> The concept and structure of the FCT is borrowed, in part, from the structures used by Fair Trade in distributing premiums earned on Fair Trade products to producing caletas.

\* The allocation and use of FCT funds will be subject to all rules and restrictions pertaining to the use and distribution of grant and government funding both within the local Chilean context as well as the domiciles from which the funds are sourced.

- a) The Fishing Community Trust (FCT) must be established as a public benefit trust, wholly owned and governed by each caleta association, subject to minimum conditions established through an FCT Charter document.
- b) FCT leadership must be elected annually by caleta members by simple majority in a democratic vote where one person equals one vote.
- c) FCT governance must include three members of the fishing caletas, plus one voting member from GustoMar, and two from The Mariscos Strategy management team.
- d) Any of FCT's external board members would have the right to veto any proposed modification to the FCT or the fisheries management improvements plan.
- e) Caletas' access to FCT funds must include agreement with and ongoing compliance with the adopted fisheries management improvements, which are to be updated and renewed annually.
- f) The FCT will have a vesting period of five years, whereby the caleta receives an incremental 20% share of the total funds each successive year, only after demonstrated compliance with the fisheries management improvements, until the fifth year when the initial endowment of funds

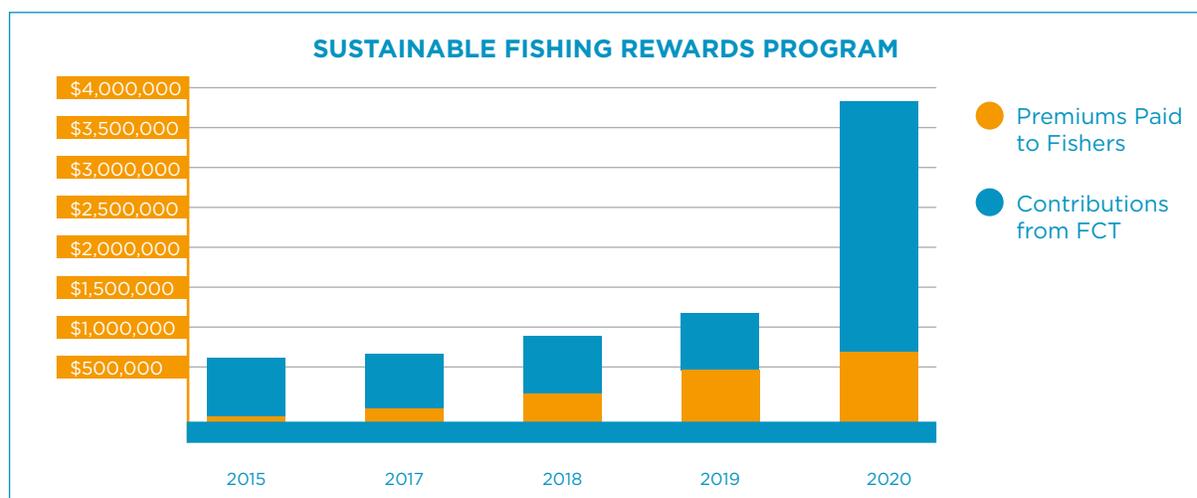
(see Transaction structure below) is fully vested and available to the community.

- g) FCT's board can determine how best to use the vested FCT funds subject to any constraints stipulated by the grant provider.<sup>33</sup> In addition to assisting communities in making a transition to more sustainable practices, the fund would also be well-suited to provide business-interruption insurance or other relief in the event of extended periods of inclement weather or natural disaster, depending on the needs of the individual community.

GustoMar would only source seafood from current members of the caletas, and then on the basis of individual and caletas' compliance with the current sustainability requirements as determined by local caletas' monitoring and annual third-party verification. Prices for specific volumes of landings would be paid for directly to fishers so long as the fisher's membership in the caletas remains intact. Proceeds from the 20% fisher ownership share in GustoMar generated at exit would be divided between the seven FCTs to recapitalize them.<sup>34</sup>

The Mariscos Strategy estimates the current value of the 2,905 mt landed annually by the seven portfolio caletas to be approximately \$13.5 million. Mariscos believes that it can generate sufficient additional

FIGURE 9: Profit Share Program Expansion (FCT and Premium)<sup>35</sup>



<sup>33</sup> The FCT would be capitalized initially with grant funds from philanthropic and regional government sources potentially constraining how the funds are used.

<sup>34</sup> If exit proceeds were sufficiently large or investors were willing to forgo a greater share of the equity, these funds could be used to endow a trust fund to pay for community or fishery improvements in perpetuity. This Fishery Management Fund mechanism is explored in the Industrial Fishery Blueprint.

<sup>35</sup> \$3.5 million up-front Contribution vests over 5 years @ 20% per year and is recapitalized upon exit through 20% equity share.

economic value each year across its operating footprint to pay out nearly \$1.8 million in premium to fishers over the first five years.<sup>35</sup> The value of the FCT in the 5th year could be as much as \$5.0 million in future value terms, and the 20% equity share could enable the FCT to grow further in value if the investment period were extended.

In addition, Mariscos proposes securing legal contracts with the leadership of each of the caletas stipulating that, in exchange for access to all loaned infrastructure (vessel equipment, ice machines, etc.) and access to the SFRP, the caletas must comply with the fisheries management improvements. Any caleta found in breach of the agreement could lose access to these valuable assets as well as to the SFRP. All valuable infrastructure in the

communities would be installed in such a way that it was secure but could be removed by truck in the case of sanction or other disruptions in the caletas. This structure of loaned or leased equipment with covenants is legally enforceable and would create a self-policing structure in which the caleta's leadership could use any of a wide variety of punitive measures to protect the broader interests of the caleta against individual fishers, including revocation of quota allocations, vessel licenses, or membership in the federation. This structure highlights the important interplay between market incentives and fisher compliance in a context in which sanctions on individual fishers by Mariscos by itself would be legally or politically infeasible.

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#### MANAGEMENT AND IMPLEMENTATION

The fisheries management improvements have been designed by experts in accordance with international best practices and certification frameworks, with a strong focus on traceability, data collection, enhanced market connectivity, and the special challenges of fisheries management in small-scale, data-poor fisheries. Mariscos would seek to engage similar experts to serve as the primary fisheries management implementation partner across the seven caletas, to ensure alignment with international fisheries management best practices and certification standards.

Finally, The Mariscos Strategy plans to utilize third-party verification and auditing of the fisheries management improvements at each fishing site it sources from, so as to create additional discipline and accountability in its sourcing policies and systems. The auditors would be asked to review annual reports provided by Mariscos, to conduct annual audits of fishing practices and management systems, and to perform surprise audits in each caleta.

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The Mariscos Strategy plans to utilize third-party verification and auditing of the fisheries management improvements at each fishing site it sources from, so as to create additional discipline and accountability in its sourcing policies and systems.

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<sup>35</sup> In real dollar terms, 2015 base year.

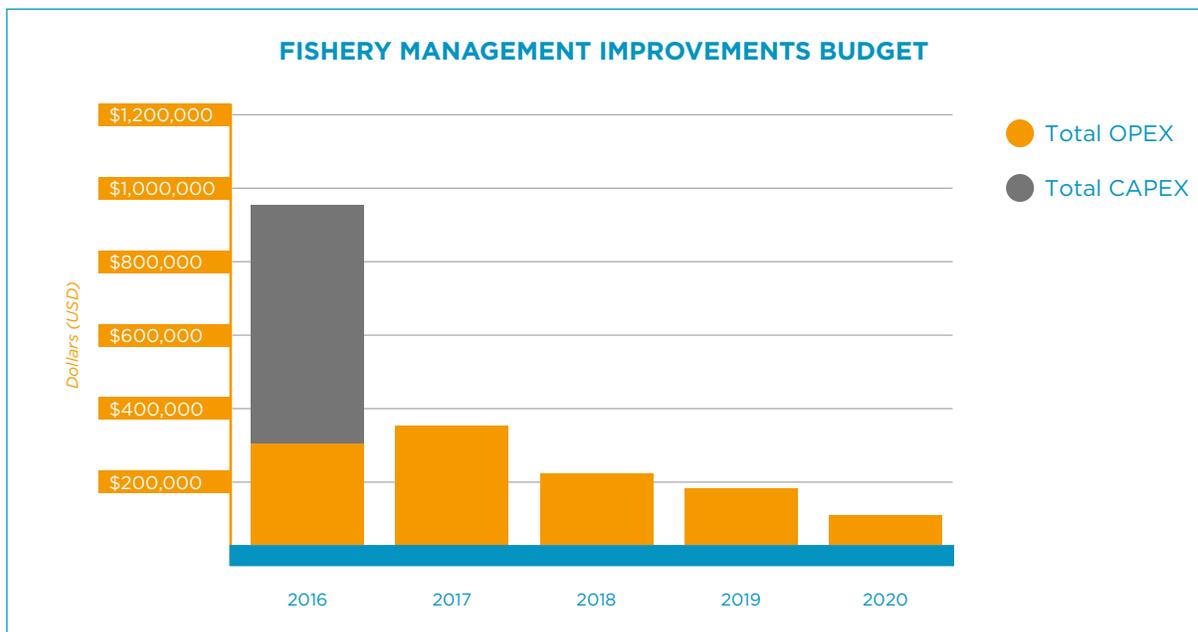


### FISHERIES MANAGEMENT IMPROVEMENTS BUDGET

The fisheries management improvements require a significant upfront investment, given that the strategy would be rolled out simultaneously across the seven caletas in year 1 (see Figure 10). This rollout schedule is important to facilitate an expansion of raw material sourcing beginning in year 1 of the project. Over time, the ongoing

fisheries management costs would gradually decrease as intensive stakeholder outreach diminishes, leaving only general oversight and maintenance of the vessel monitoring data, catch documentation (which would be transitioned to Sernapesca), reporting on FMI progress, external audits, and other day-to-day oversight.

FIGURE 10: Fisheries Management Improvements Annual Budget



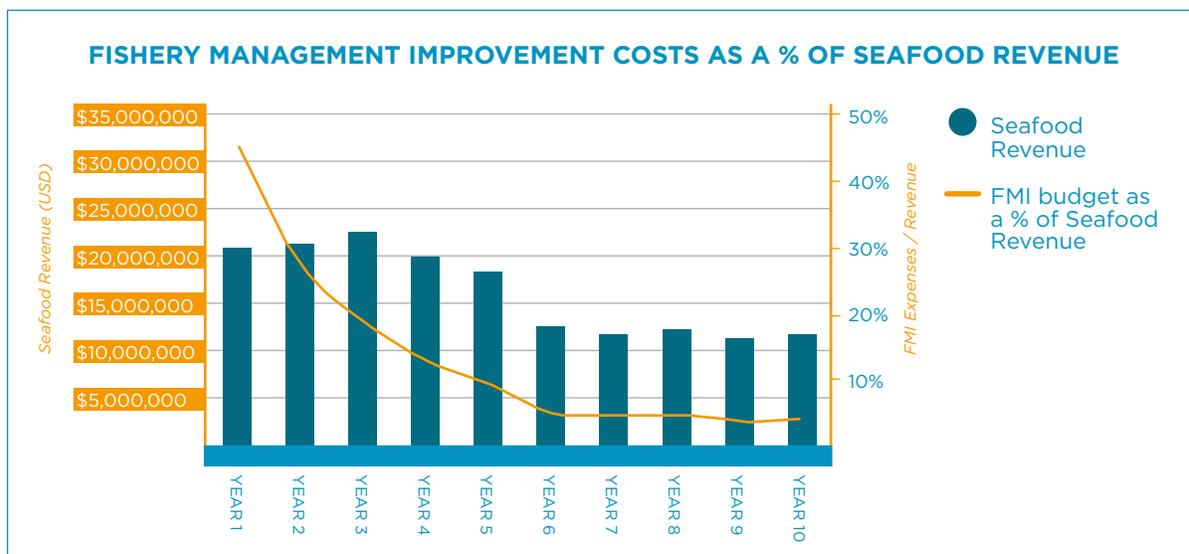
Major budget outlays associated with fishery management operating costs include:

- Workshops with Sernapesca to help them incorporate data into fishery management decisions
- Generation of annual reports tailored to fishers, GustoMar, and Sernapesca on fishery health and updates to the management plan
- Training sessions to transfer management of catch documentation systems (CDS) to Sernapesca by year 5
- Registration of all vessels
- External audits and stakeholder dissemination of findings
- Vessel monitoring systems on all vessels and data collection terminals within the caleta
- Electronic scales and IT systems for catch documentation
- Design, implementation, and constant monitoring of the catch documentation system (CDS)
- Traceability system from buying station to point of sale and integration with GustoMar logistics
- Ice machines and storage bins in each caleta to improve sanitary conditions for fishers and generate greater value per unit volume

Over time, the share of fishery management improvements would fall dramatically as a share of total seafood revenue, as shown in Figure 11:

Major capital expenses, all of which are incurred in the first year of the program, would include purchase and installation of the following:

FIGURE 11: Fishery Improvement Costs as a Share of Seafood Revenue



## TARGETED SOCIAL AND ENVIRONMENTAL IMPACTS

The table below sets forth the long-term social impact targets for the seven caletas The Mariscos Strategy would incorporate into its sourcing network:

### SOCIAL IMPACTS

<b>Increased Income Levels and Community Resilience</b>	<ul style="list-style-type: none"> <li>• 25% higher prices relative to current alternative market channels for nearly 550 fishers. The premiums paid out to fishers would approach \$1.8 million during the first five years of the project, paid out immediately as fishers supplied the GustoMar operations.<sup>37</sup></li> <li>• Increased community resilience by offering an initial FCT endowment of \$3.5 million with further capitalization in the form of a 20% equity interest in GustoMar that would be monetized upon exit in year 5. The cumulative FCT contribution from these sources totals \$5.0 million over the first five years of the project.<sup>38</sup> FCT funds could increase further in the event that the investment period was extended and additional profits were generated by the Company. The vested principal balance of the FCT could be drawn down by participant caletas as needed each year to fund community focused projects.</li> </ul>
<b>Food Security</b>	<ul style="list-style-type: none"> <li>• Through storage and handling improvements, GustoMar would target a reduction in spoilage across the supply chain from the current 15% to under 2%, which equates to approximately 200 mt in avoided spoilage over the five-year project forecast.</li> <li>• By reducing waste in the existing supply chain by the end of year 5, Mariscos would hope to deliver 150,000 additional meals-to-market each year to support local and global food security.</li> </ul>
<b>Time Horizon</b>	<p>If Mariscos were to extend its investment horizon to 10 years, the social impacts would likely be even greater.</p>

Because environmental conditions and conservation potential differ by species and region, The Mariscos Strategy's targeted impact returns would vary by species and caleta. The table below sets forth the primary environmental impact goals of the strategy:

### ENVIRONMENTAL IMPACTS

<b>Biomass Protection</b>	<ul style="list-style-type: none"> <li>• Maintain or gradually increase biomass in nearshore fisheries through improved management, no-take zones, and data-driven management plans</li> </ul>
<b>Habitat Protection</b>	<ul style="list-style-type: none"> <li>• Define no-take zones in TURFs constituting at least 10% of the total area, protecting nearly 16,000 hectares of community fishing grounds under robust management plans</li> <li>• Map fishing activity of artisanal fleets through vessel monitoring against occurrence of sensitive habitats, and seek to reduce incursions over time</li> </ul>
<b>Time Horizon</b>	<p>If Mariscos were to extend its investment horizon to 10 years, the environmental impacts would likely be even greater.</p>

<sup>37</sup> In real dollar terms, 2015 base year.

<sup>38</sup> In real dollar terms, 2015 base year.



## THE MARISCOS COMMERCIAL INVESTMENT THESIS

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### STEP 2: THE EXPANSION OF GUSTOMAR

The Mariscos Strategy proposes a \$2.5 million investment<sup>39</sup> into GustoMar to expand its sustainable seafood sourcing and distribution capacity by building supply-chain infrastructure, enabling it to source raw materials directly from seven fishing caletas, improve the quality of products sourced from its portfolio, expand its manufacturing capacity, and extend the marketing and distribution of artisanally sourced seafood products from Chile.

### VALUE PROPOSITION

The Mariscos Strategy capitalizes on the opportunity to create additional value for the landed catch than is currently generated in order to provide a source of cash flow to reward fishers for sustainable practices and to generate financial returns. The commercial investment thesis for The Mariscos Strategy is centered on (a) the reconfiguration of the existing, highly inefficient supply chain for artisanal seafood and (b) the development and sale of innovative, value-added, packaged food products to high-value customer segments both domestically and abroad.

Analysis of GustoMar's supply chain suggests that seafood buyers currently purchase raw materials at an approximately 200% markup to dockside prices earned by fishers in the caletas due to a reliance on intermediaries, each of which charges a markup to cover inefficient transportation costs and spoilage. By investing to create direct-sourcing channels to secure supplies, improve handling processes, upgrade supply chain infrastructure and logistics, and expand final product processing and packaging capacity, Mariscos can grow its business, improve quality and yield, and capture additional margin on its operations. This value creation would be generated before taking into consideration any final unit pricing and does not assume any increases in landings in the caletas, given that participant caletas are already assumed to be fully exploited.

By creating and capturing additional value for artisanally sourced seafood products, a company like GustoMar can provide economic rewards to fishers and fishing caletas and generate attractive financial returns.

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<sup>39</sup> This includes all uses of investment proceeds excluding FMI implementation, capitalization of the FCT, and transaction fees.

## COMPANY DESCRIPTION AND MISSION ALIGNMENT

Mariscos proposes that the commercial investment strategy identify a mission-aligned partner to ensure a shared set of sustainable sourcing standards. As such, Mariscos proposes an investment into GustoMar, an indicative company with a track record of success in the manufacture and sale of frozen “heat-and-eat” packaged meals. GustoMar’s brand emphasis is on higher-value, healthy, gourmet style food that is quick to prepare. Prepared products containing seafood, such as shrimp empanadas (baked pastry stuffed with shrimp) and scallops baked with grated parmesan cheese, have been GustoMar’s major differentiator from its competitors, most of whom do not offer seafood products. The Company also produces prepared food without seafood, including salads and sandwiches.

Mariscos would aim to invest into a company that has identified sustainability as an important part of its long-term business strategy, with interest in development of a line of products focused on high-value seafood entrees sourced from raw materials sustainably extracted by local artisanal fishers in

Chile’s coastal caletas. The Company’s mission would therefore incorporate the following tenets:

- Raw materials sourced from nature should be managed sustainably to protect and steward those natural resources for the long term
- Producers should be treated fairly in the value chain and have the opportunity to improve their livelihoods
- Sustainability and responsible-sourcing can be a key differentiator and source of competitive advantage in the marketplace

The Company markets a wide variety of products, including many of the same recipes sold in different formats, depending on the needs of the customer (frozen versus refrigerated or varying portion sizes.). Not all would need to contain seafood. Moreover, for the scale of operations proposed, GustoMar would need roughly 30 employees and an experienced management team and CEO.

FIGURE 12: Final Presentation of GustoMar’s Products



## GROWTH STRATEGY

Facilitated by Mariscos investment, GustoMar's goal would be to grow its sustainable sourcing network to encompass seven fishing caletas and approximately 550 fishers by 2020. This expansion would increase its sourcing to over 630 mt of raw material by 2020, growing its revenue from \$3.1 million to \$14.1 million, while targeting gross margins of 31% and EBITDA margins approaching 20% by the end of year 5. To realize this growth, The Mariscos Strategy proposes the investment of \$2.4 million into the expansion of GustoMar's business operations to integrate critical upstream elements of its current supply chain, as explained below.<sup>40</sup>

### Sourcing and Handling

The investment would expand GustoMar's sourcing portfolio to 630 mt by 2020, representing

approximately 21.8% of the portfolio caletas' total extraction volumes by 2020 (and a significantly higher percentage in many of the individual caletas), while providing direct and secure access to raw materials products. This large share of total production is intended to provide greater market leverage for both fishery management and quality improvements. Raw materials would be derived from the seven portfolio caletas producing seven high-value species: razor clams, scallops, stone crab, king crab, nylon shrimp, abalone, and mussels. In each of these caletas, GustoMar would implement seafood-handling training programs with fishers to improve product quality and hygiene. The expanded portfolio incorporating the seven caletas in four regions across Chile, are illustrated in Figure 13.<sup>41</sup>

FIGURE 13: GustoMar Sourcing Network Strategy Showing Locations of Seven Portfolio Caletas, Key Species, and Target Markets for Finished Goods



<sup>40</sup> This includes all uses of investment proceeds listed in the Transaction Summary section excluding FMI implementation, capitalization of the FCT, and transaction fees.

<sup>41</sup> For further details about The Marisco Strategy's strategy of enlisting new sustainable fishers and caletas into its sourcing network, refer to the "Sustainable Fishing Rewards Program" section above.

The sourcing contribution by species is outlined in Figure 14.

FIGURE 14: Sourcing Plan with Relative Contribution of Each Species to Total Volume

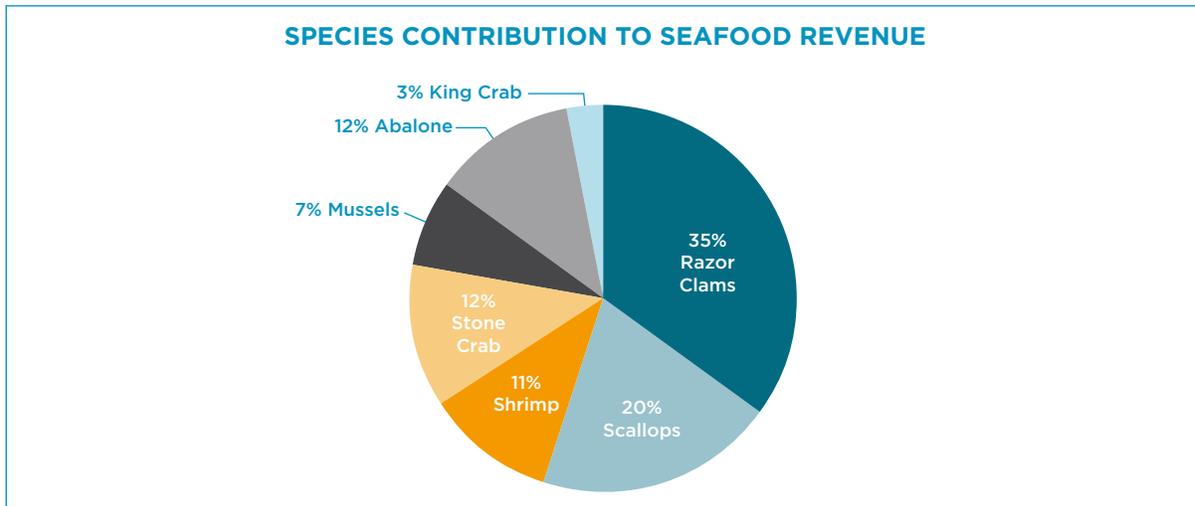
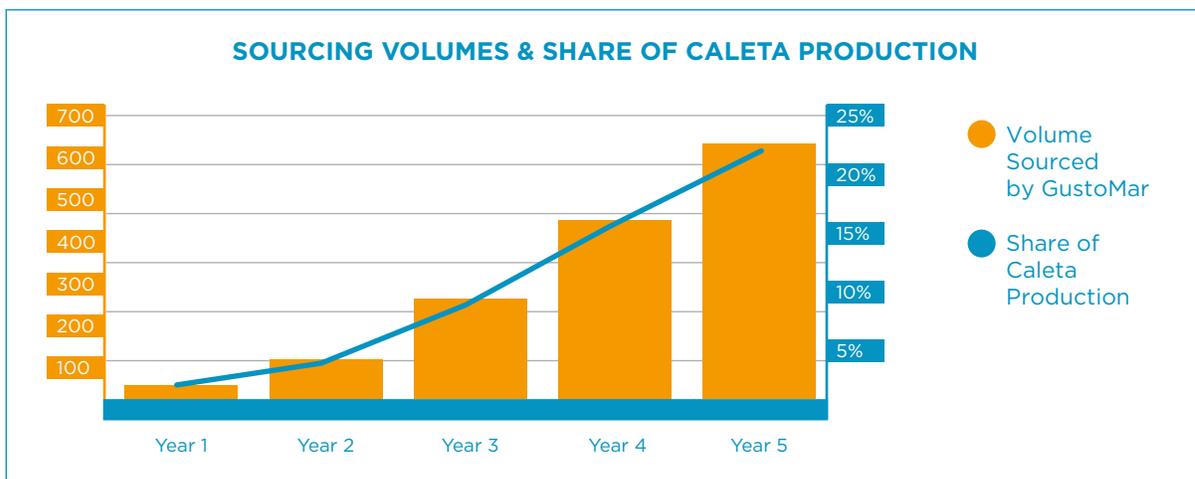


Figure 15 depicts the scale-up of sourcing and associated share of the production of the seven caletas.

FIGURE 15: Volume and Production Share from the Caletas Over the 5-Year Plan<sup>42</sup>



### Cold Chain and Logistics

Mariscos proposes to reconfigure the existing supply chain to enable direct sourcing from the portfolio caletas to the Company, bypassing the wholesale seafood terminal in Santiago, and providing uninterrupted cold chain access and chain of custody from the beachside to the manufacturing plant.

### Processing and Packaging

Mariscos would plan to upgrade GustoMar's existing manufacturing plant and construct a new, larger facility in Santiago to increase annual seafood raw material processing capacity to over 600 mt by Year 5. The investment would also support the construction of a new preprocessing plant that would allow the Company to buy seafood products directly from fishers without relying on processing intermediaries as they currently do.

<sup>42</sup> This constitutes a weighted average share of raw materials sourced, which underrepresents the extent of market leverage in the caletas due to the large production volume to sourcing in caleta Tongoy—1100 mt and only 4% by year five, respectively.



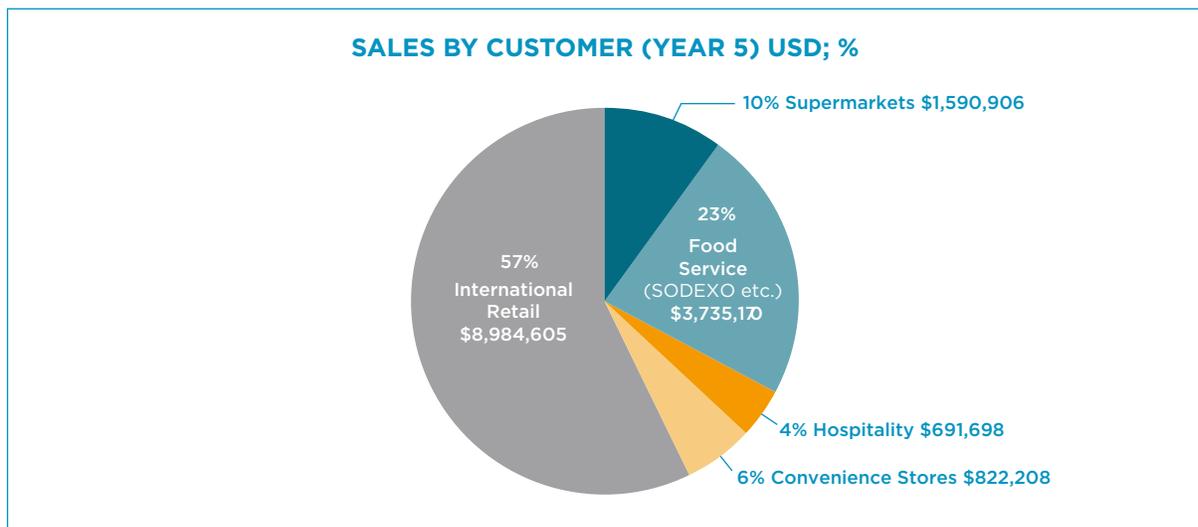
### Distribution

GustoMar has developed a brand identity in the Chilean retail markets based on health and quality. Its marketing strategy going forward would be focused on a combination of Chilean store-point expansion and international distribution. GustoMar’s goals would first include expanded market access and distribution to achieve an increase in total volume of seafood finished goods from 7 mt in 2014 to over 1,000 mt by Year 5.<sup>43</sup> Moreover, the investment would establish a working capital line to support 90-day receivables accounts (typical in grocery retailing customer

accounts) and support volume sales increases to new store locations with existing customer bases.

Given the relatively small size of the Chilean market, with a national population of only 17.6 million, the international expansion strategy is key to GustoMar’s growth. GustoMar would plan to initiate product distribution and sales in four additional countries over the next four years, using its relationship with a major retail conglomerate as an entry point into the retail grocery markets of Mexico, Brazil, Colombia and Peru (see Figure 16).

FIGURE 16: Sales by Customer Segment Year 5



<sup>43</sup> Because finished goods have fillers added to volume, processing “yield” is greater than 1; therefore, the total volume of finished goods at -1,000 mt is greater than the 634 mt in raw material inputs.

While Chile will continue to be GustoMar's home base, the Company has ambition to expand to other larger Latin American countries where significant growth opportunities exist. It would seek to expand to four other Latin American countries beginning with Brazil and Mexico in 2016, followed by Colombia and Peru by 2017. The financial model

assumes an investment of \$1.5 million to expand into these four countries over the next 5 years.

The table below compares the income level and number of people who fall within the wealthiest 20% in each of these countries, which illustrates that there is significant market potential for GustoMar's high-value products in the regional market.

COUNTRY	INHABITANTS	MOST AFFLUENT QUINTILE	INCOME PER CAPITA FOR TOP QUINTILE
Chile	17.8 million	3.6 million	\$41,325
Brazil	206.1 million	41.2 million	\$32,555
Mexico	125.4 million	25.1 million	\$27,676
Peru	31.0 million	6.2 million	\$16,396
Colombia	47.8 million	9.6 million	\$22,875

Source: World Bank, 2014.

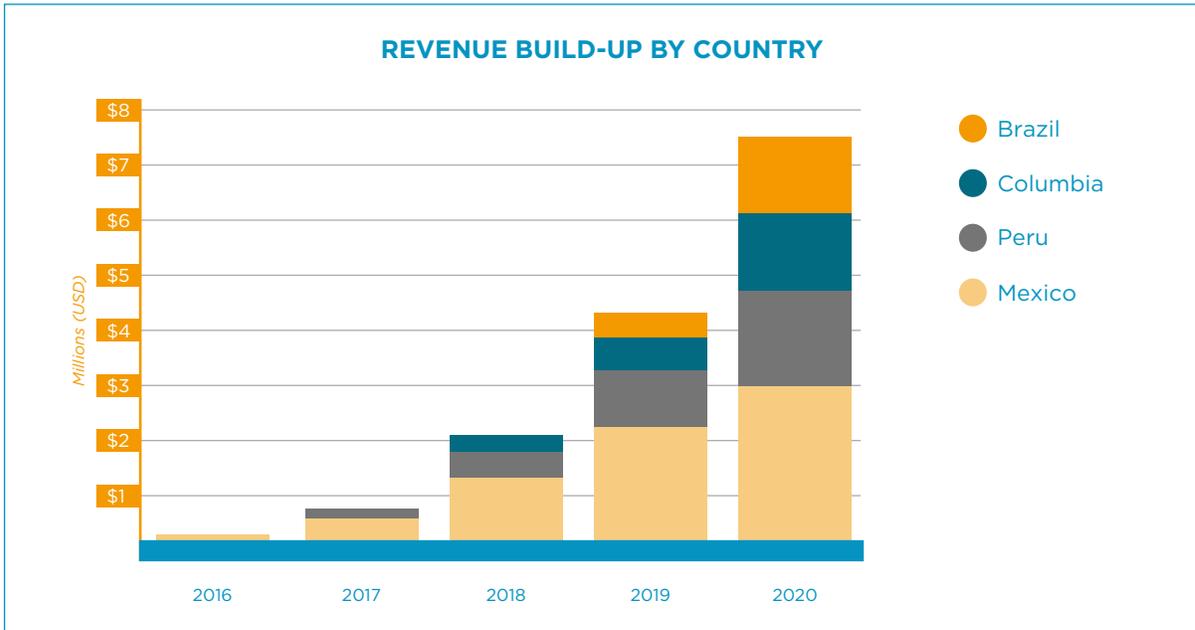
Each of the above countries boasts a population much larger than that of Chile. Moreover, in each of these countries there is a trend of increasing urbanization driving growth in supermarket outlets.<sup>44</sup> Capitalizing on this trend and its existing retail experience in Chile, the Company will first target the supermarket segment. In particular, the

company hopes to build on existing relationships with Chilean retailers such as Cencosud, which also own supermarkets in Brazil, Colombia and Peru. A list of potential anchor clients, all of whom offer either sustainable or premium seafood offerings, is identified in the table to the right.

COUNTRY	TARGET RETAIL CHAINS
Mexico	Wal-Mart, Commercial Mexicana, Costco, Bodega Aurrera
Brazil	Wal-Mart, Cencosud, Pão de Açúcar, Carrefour, Angeloni
Colombia	Cencosud, Makro, Almacenes Éxito
Peru	Cencosud, Vivanda, Tottus, Plaza Vea

<sup>44</sup> Food and Agriculture Organization of the United Nations, "State of the World's Fisheries 2014", Annual Report, Rome, 2014.

FIGURE 17: Sales Growth by Country as a Result of International Expansion Plan

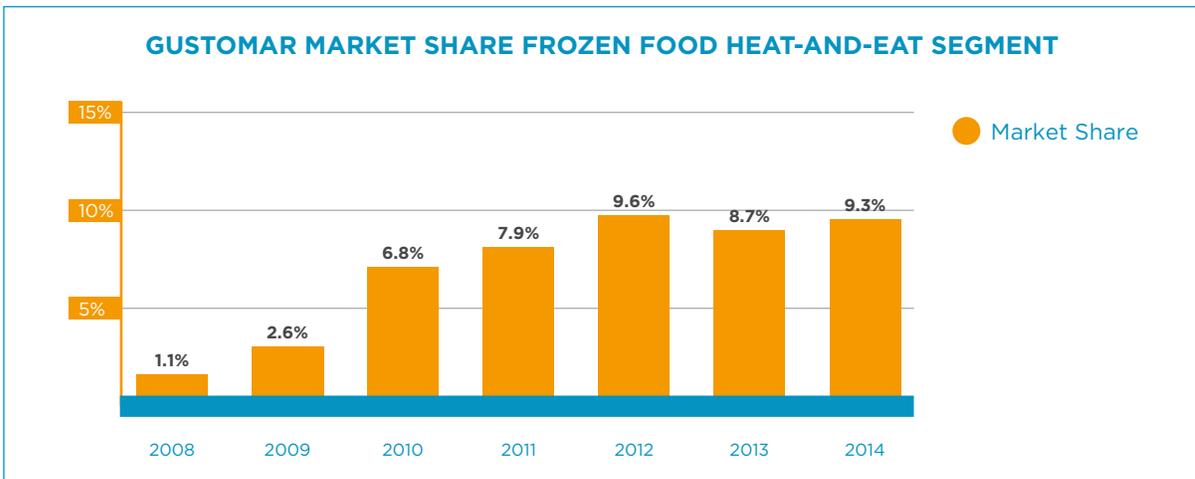


### HISTORICAL PERFORMANCE

The Company's historical performance is compelling, having grown sales in each year since its founding, attaining a 9% market share within the refrigerated, frozen and salad prepared food segments of the Chilean retail market, as shown

in Figure 18. Nevertheless, overall profitability has remained low as the Company has struggled to fund its working capital needs while having its margins squeezed by high debt-service costs.

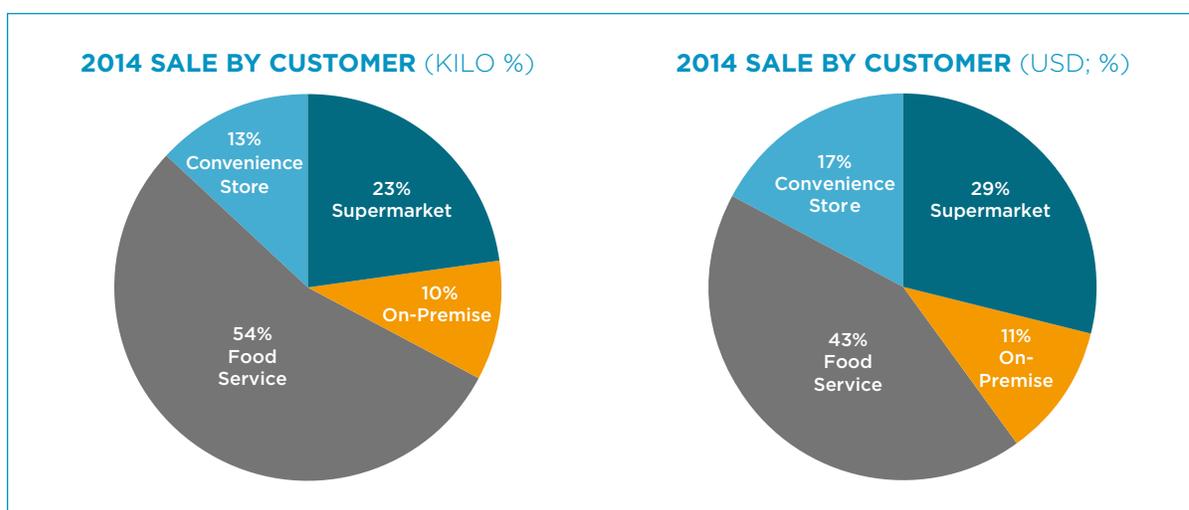
FIGURE 18: GustoMar Historical Market Share



GustoMar's products are currently sold through several key distribution channels in Chile, including supermarkets (leading chains such as Jumbo, Santa Isabel, Tottus), convenience stores (OK Market, Shell, etc.), hospitality businesses (hotels, restaurants, and cafes), and institutional food services companies (Sodexo). Companies that provide institutional food services are mainly facilities management companies that serve segments such as the mining, education, prison, and other industries.

Although supermarkets only comprise 23% of GustoMar's sales volume in 2014, this sector also pays the highest price on a per kilo basis, resulting in a 29% contribution to the Company's total revenue, as the analyses in Figure 19 demonstrate. GustoMar distributes its products to nearly all the leading supermarket chains in Chile.

FIGURE 19: Sales by Market Segment in Kilos and Dollars of Revenue



Currently, products with seafood as an ingredient comprise under 10% of GustoMar's unit sales but deliver 14% of total revenue, given the higher price point on many of its prepared seafood dishes. One of the main reasons that seafood sales do not currently represent a larger portion of GustoMar's business is the unreliable supply of key ingredients,

such as razor clams, conger eel, and scallops. Between October 2014 and February 2015, for example, razor clams were out of stock because of supply shortages. Moreover, the company lacks processing capacity for seafood raw materials, leaving it reliant on intermediaries who often fail to deliver quality, traceable product.

## MARKET TRENDS

Mariscos expects GustoMar's sales to continue to benefit from the general socioeconomic trends in Chile in addition to the Chilean consumers' shift in food preferences toward healthier, responsibly sourced products. Due to the positive economic development and outlook in Chile, Chileans are enjoying higher standards of living that are continuing to improve. With the growth in the economy, a growing percentage of women are entering the Chilean workforce, and both men and women are working longer hours. Moreover, Chileans are delaying parenthood and remaining single longer, with the number of single households rising to 14% in 2013.<sup>45</sup> These factors all contribute to rising disposable income and less time available to prepare meals from scratch, leading to a greater ability and willingness to pay more for higher-quality, more convenient food options. At the same time, there is increasing consciousness among Chilean consumers, particularly the younger generations, to support values-aligned companies.

In terms of dietary preferences, Chileans consume only 12.9 kg of seafood on an annual per capita basis, versus global average consumption of over 17 kg per capita.<sup>46</sup> This is only one-sixth of Chilean meat consumption. However, fish and seafood per capita sales in Chile rose by 3.9% in 2013 at a higher rate than the 3.7% observed in overall food sales in the country.<sup>47</sup> Many attribute the low seafood consumption in Chile to the historically poor quality of seafood products as a result of improper handling in harvest and distribution.

Of all the fish and seafood landed in Chile for human consumption, 57% is currently converted into frozen products, 33% are sold fresh and chilled, and 10% are processed into cured and preserved products. Sales in frozen fish and seafood increased dramatically by 22% annually, rising from U.S. \$5.2 million in 2008 to \$19.8 million in 2013. Sales in fresh seafood amounted to \$650 million in 2013.<sup>48</sup>

Chile currently enjoys \$513 of consumption per capita of packaged food, surpassing the rest of the countries in South America. Within the ready-to-serve meals market, frozen food is growing more rapidly than refrigerated food and salads (10.1% vs. 5.5% and 5.5% in 2014). Processed refrigerated food and processed frozen products amount to 5.9 and 3.6 kg per capita, respectively.<sup>49</sup>

The retail supermarket segment would be the most important growth segment for GustoMar. Chile has one of the most sophisticated retail industries in the world, on par with the United States. In Chile, the three biggest supermarket chains—Walmart Chile, Cencosud (which owns supermarket brands Jumbo and Santa Isabel), and SMU (which owns supermarket chains Unimarc, Bigger, and convenience store OK Market—constitute a combined 80% of total market share of supermarket food sales.<sup>50</sup> Figure 20 shows the historical and projected growth of the prepared food segment in the Chilean market.

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Chile has one of the most sophisticated retail industries in the world, on par with the United States.

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<sup>45</sup> Euromonitor International, "Downsizing Globally: The Impact of Changing Household Structure on Global Consumer Markets," April Strategy Briefing, 2013.

<sup>46</sup> Food and Agriculture Organization of the United Nations, "The State of World Fisheries and Aquaculture," Rome, 2014.

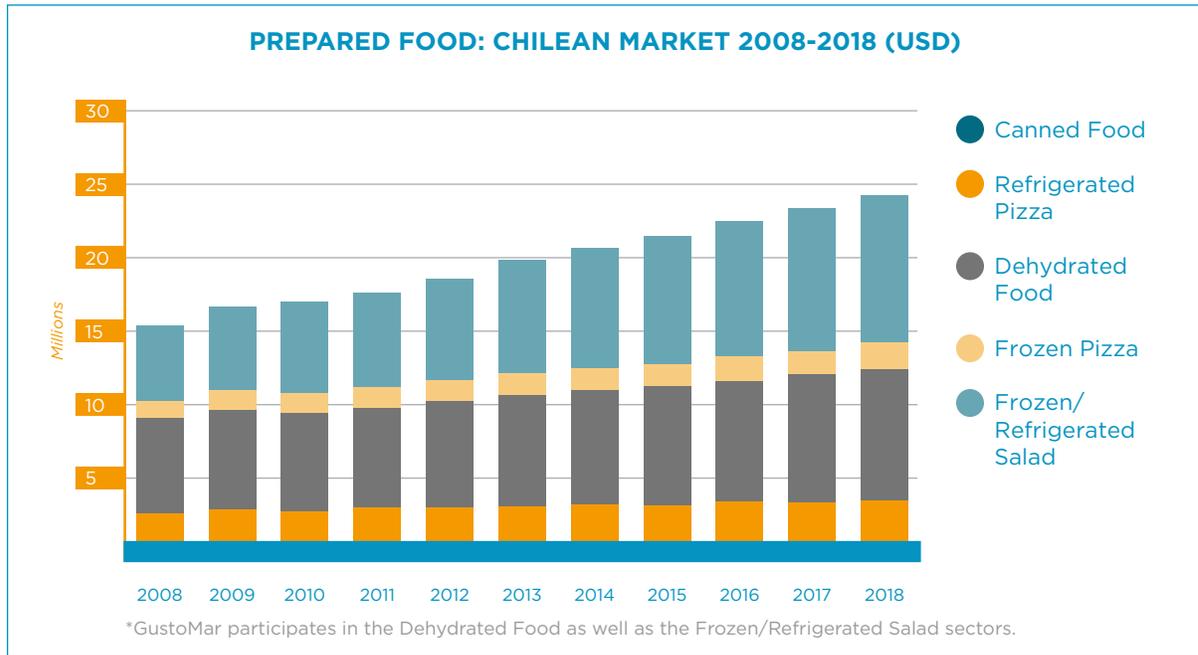
<sup>47</sup> Euromonitor International, "Downsizing Globally: The Impact of Changing Household Structure on Global Consumer Markets," April Strategy Briefing, 2013.

<sup>48</sup> Euromonitor International, "Frozen Processed Food in Chile," March Country Report, 2015.

<sup>49</sup> USDA Foreign Agricultural Service, "Chile's Food Processing Sector," Global Agricultural Information Network Report, 2013.

<sup>50</sup> Feller Rate Clasificadora de Riesgo, "Chile salio de compras," Salio De Compras", Estudio Final, 2013.

FIGURE 20: Growth (both Historical and Projected) of Key Prepared-Foods Product Families in the Chilean Market in Which GustoMar Participates in the Two Categories Shaded Green



**COMPETITION**

Within the sustainable prepared seafood category, GustoMar is currently the only player in the market. One packaged food company has seafood products similar to GustoMar’s in the retail and food service segments but without the emphasis on quality, sustainability, or wellness. Three other competitors

currently offer packaged food products that could compete with GustoMar’s, including sustainably harvested frozen vegetables and fruits, and frozen seafood products such as salmon and breaded fish sticks. All three are well-funded companies backed by larger parent entities.

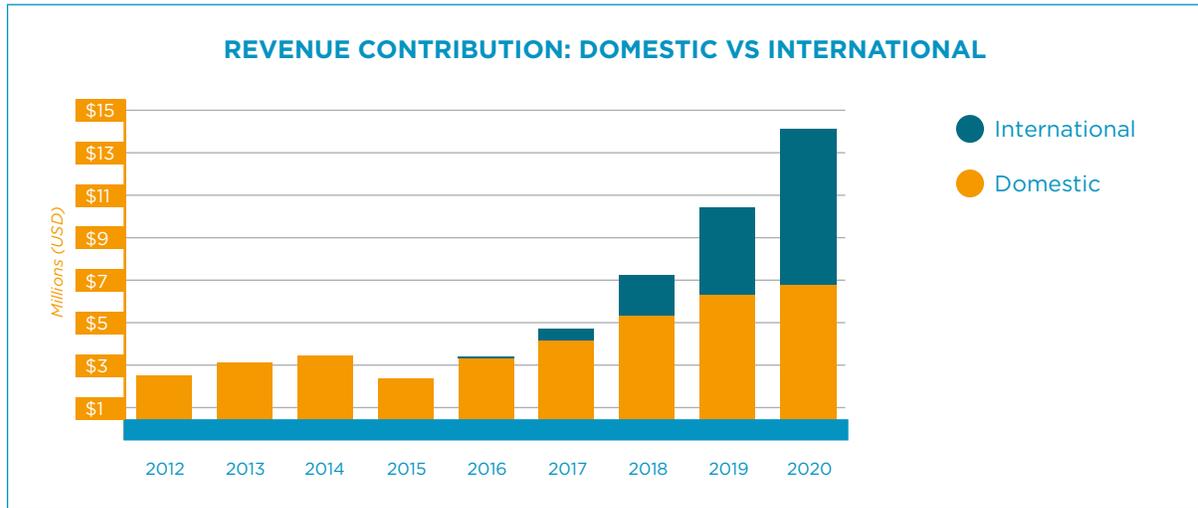
Within the sustainable prepared seafood category, GustoMar is currently the only player in the market.

## THE MARISCOS STRATEGY FINANCIAL ASSUMPTIONS & DRIVERS

### REVENUE MODEL AND PRICING

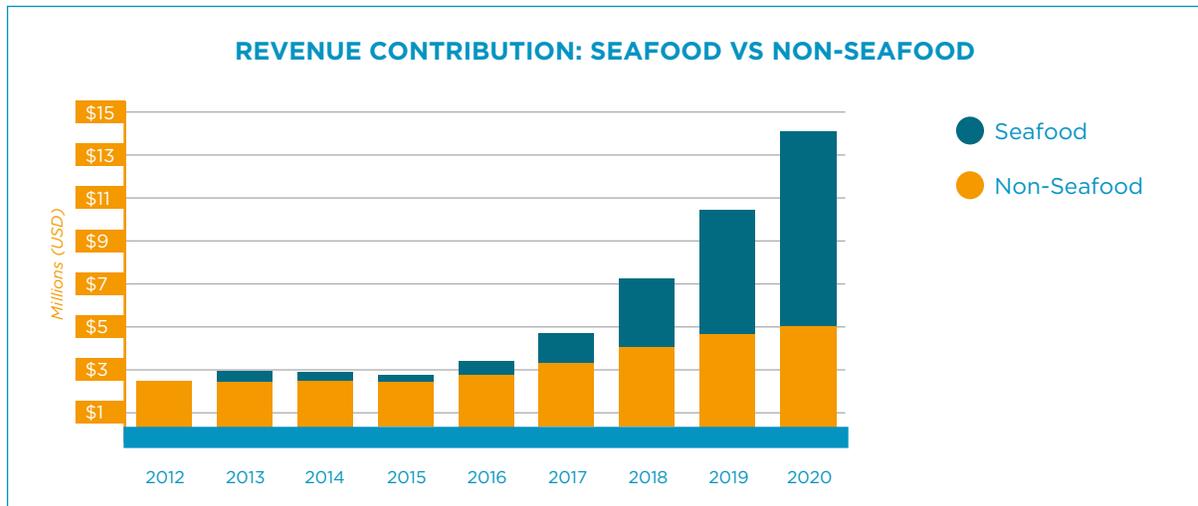
With the injection of fresh capital, GustoMar would expect to grow domestic sales at a CAGR of 16.8% during the first five years, reaching \$6.6 million by 2020, and to grow international sales from zero to \$7.5 million by 2020 (Figure 21).

FIGURE 21: GustoMar Revenue Projections Through International Expansion Plan



Consistent with the Company's strategic shift toward local, responsibly sourced seafood products, existing nonseafood product revenue is expected to level off, with seafood products driving future top-line growth (Figure 22).

FIGURE 22: GustoMar Revenue Projections in Key Segments



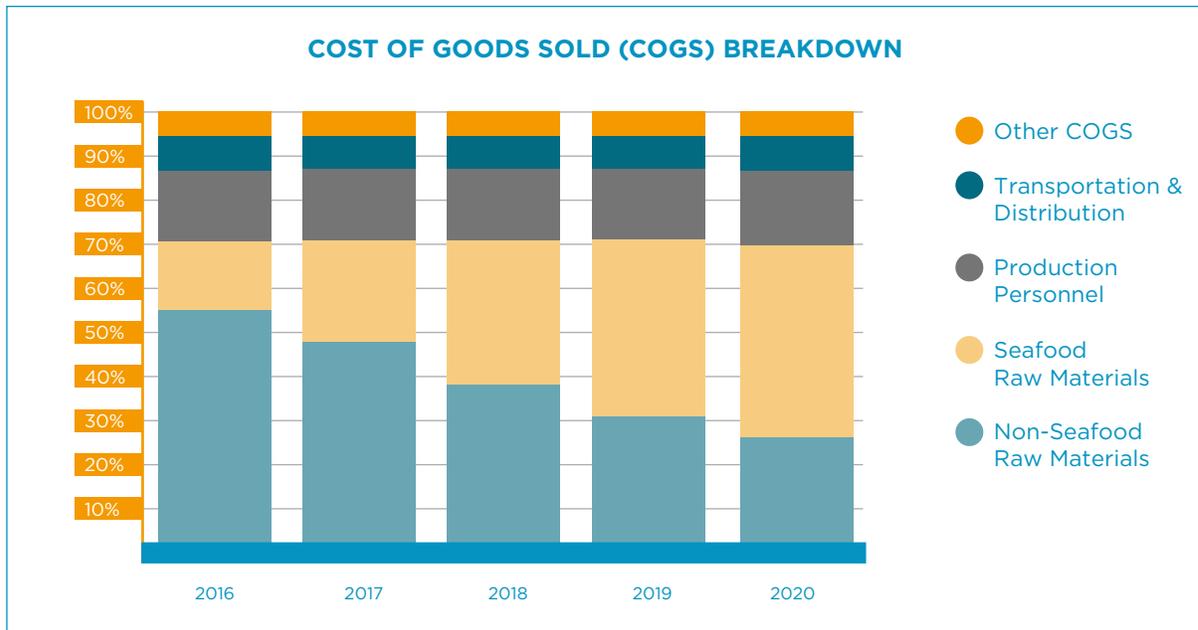


### COST STRUCTURE

GustoMar's cost of goods sold (COGS) would be driven primarily by its nonseafood raw material costs in the early years, but increasingly by seafood raw materials as the sourcing plan

develops. Transportation, processing personnel, other production costs (including utilities), remain a relatively constant but small contributor to the overall cost structure (Figure 23).

FIGURE 23: Breakdown of COGS by Expense Category



GustoMar's Selling, General, and Administrative Expenses (SG&A) costs early on would be dominated by operational expenses associated with its overseas expansion, business development, and fisheries improvement activities. Over time,

these "start-up" related costs will fall, and general administrative overhead including personnel payroll and benefits should become assume the dominant share of SG&A (Figure 24).

FIGURE 24: Breakdown of SG&A by Expense Category

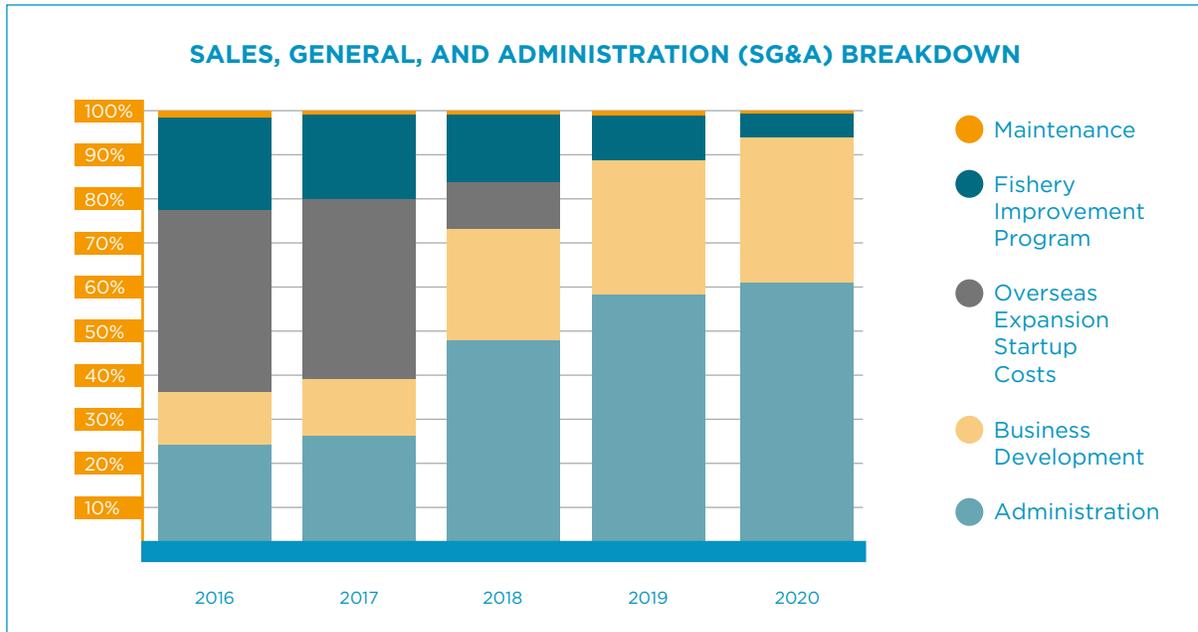
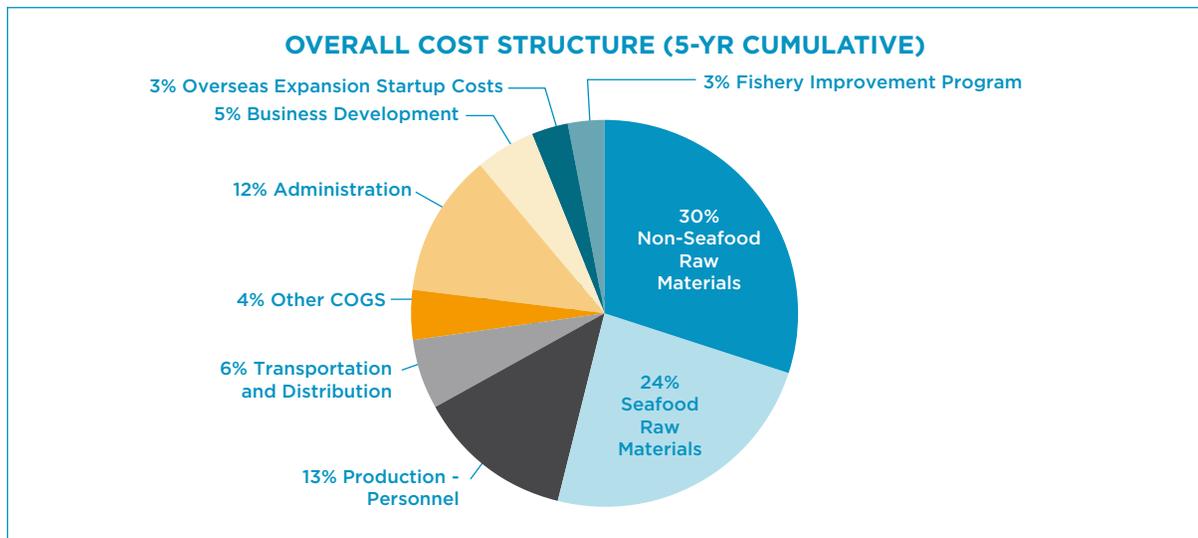


Figure 25 reflects the overall cost structure of GustoMar's operations. Raw material costs would

comprise a large share of the business, in line with costs at other food processing and distribution businesses.

FIGURE 25: GustoMar Cost Structure (5-Year Average)



## THE MARISCOS STRATEGY TRANSACTION STRUCTURE

### SOURCES AND USES OF FUNDS

The Mariscos Strategy proposes a \$7.0 million investment consisting of a \$3.5 million equity investment paired with a total of \$3.5 million of grant proceeds.

TOTAL SOURCES		CAPITALIZATION
Sponsor Equity	\$3,467,273	50%
Total Debt	\$ -	0%
Foundation PRI	\$ -	0%
Foundation Grant	\$1,750,000	25%
Government Grant	\$1,750,000	25%
<b>Total Sources</b>	<b>\$6,967,273</b>	<b>100%</b>

The following table summarizes the uses of funds for Project Mariscos:

TOTAL USES	
Cash	\$100,000
Pre-Processing Plant	\$467,630
Upgrade Existing Processing Assets	\$37,037
New Processing Facility	\$592,593
FMI Initial Implementation	\$962,626
Overseas Expansion	\$600,000
Debt Payoff	\$607,387
Fishing Community Trust	\$3,500,000
Transaction Fees	\$100,000
<b>Total Uses</b>	<b>\$6,967,273</b>

### OWNERSHIP STRUCTURE AND GOVERNANCE

The CEO and Founder currently owns 100% of the Company. After the proposed transaction, the new investors would own 71% with management owning the remaining 29%. Mariscos investors would then allocate a 20% equity share for fishers.

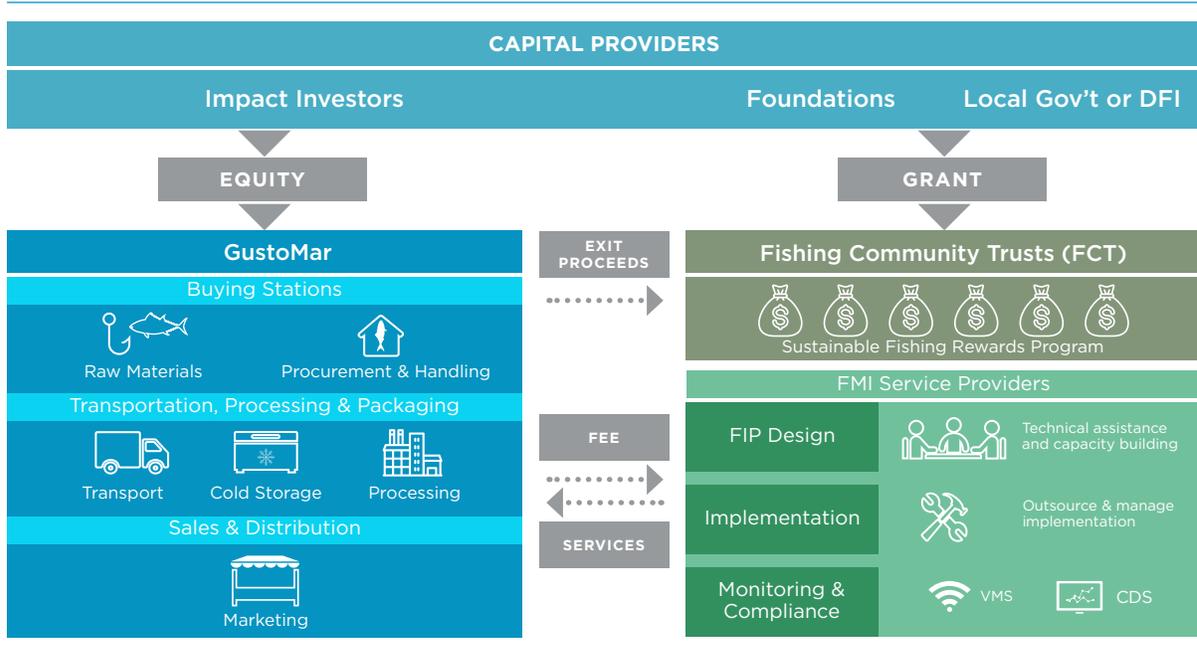
#### OWNERSHIP STRUCTURE

Investors	51%
FCT Allocation <sup>51</sup>	20%
Management	29%
<b>Total</b>	<b>100%</b>

The most efficient system for foreign investors and foundations to invest into The Merluza Strategy would be through an entity incorporated in the United States. This company would become the parent company and majority shareholder of GustoMar. Mariscos proposes that the GustoMar board have six total seats, with the primary investor group controlling three, management controlling two, and one caleta leader, rotating annually across the seven fishing caletas. Decisions would be made by simple majority.

<sup>51</sup> This equity interest is controlled by Mariscos Investors; however, proceeds at sales will be distributed to the FCT.

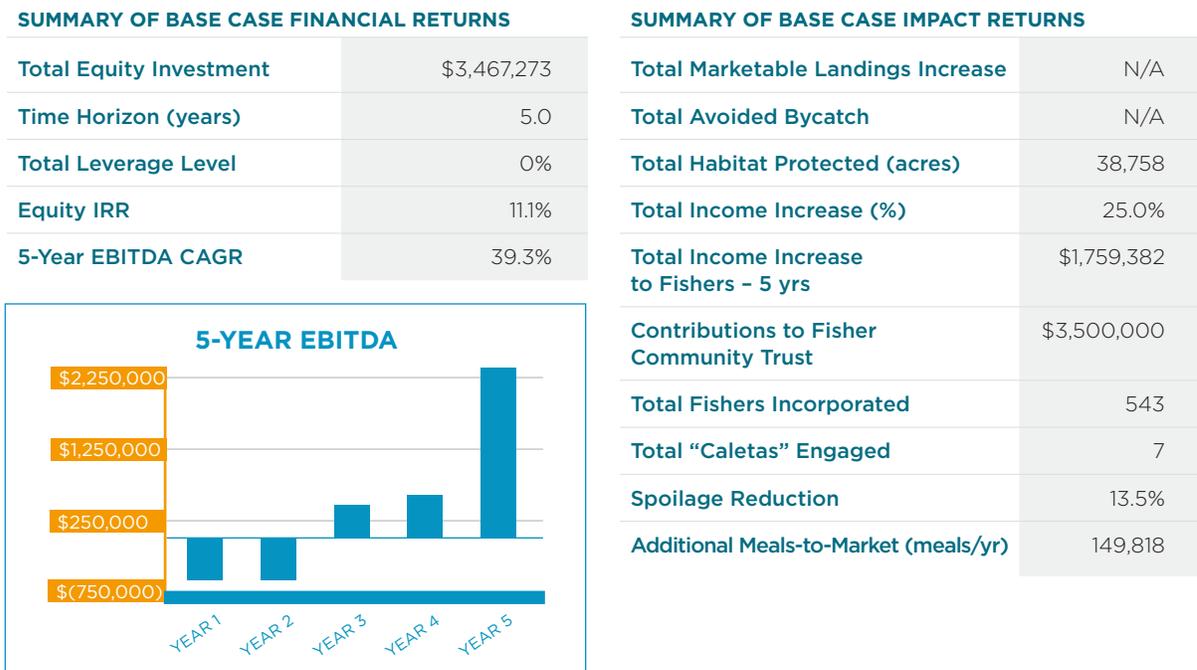
FIGURE 26: Capital Providers



**SUMMARY OF RETURNS**

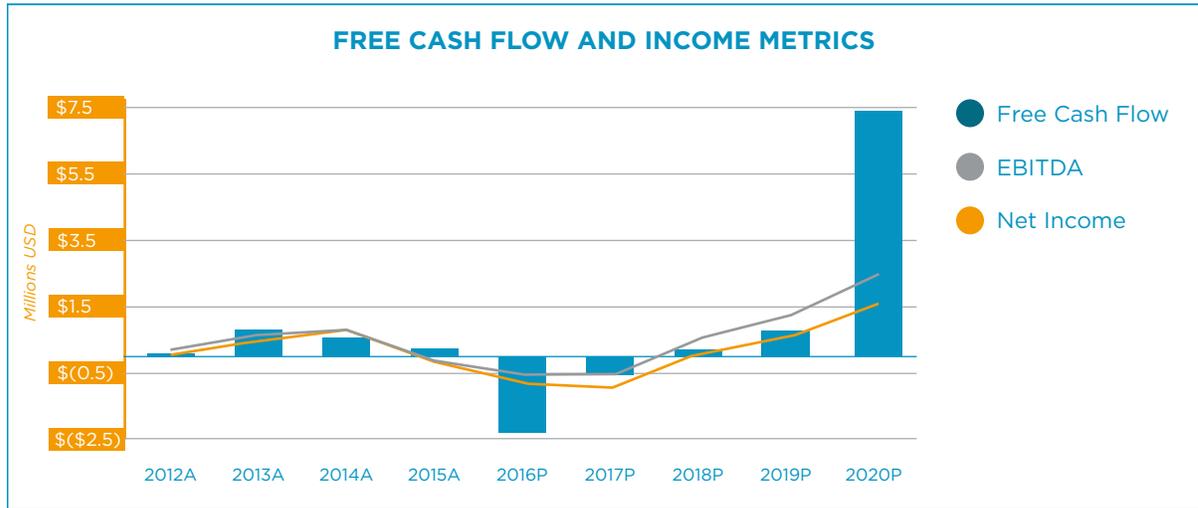
Figure 27 shows a summary of the base case Mariscos impact and financial returns.<sup>52</sup>

FIGURE 27: Base Case Impact and Financial Returns



<sup>52</sup> "Contributions to Fishing Community Trust"—includes the \$3.5m FCT capitalization, vested over 5 years, and 20% company equity allocated to FCT, all in real dollar terms (2015 USD); "Caleta Livelihood Diversification"—real value (2015 USD) of FCT capitalization vested over 5 years, and 20% company equity allocated to FCT paid out in year 5, and the % that this represents of the total ex-vessel value of all landings within GustoMar's operating footprint over the 5-year period, represented in real terms (2015 USD); "Additional Meals to Market"—incremental meals produced due to spoilage reductions, assuming 200 g per serving.

FIGURE 28: Growth in Free Cash Flow and Income\*



\* Free cash flow in 2020 includes the anticipated proceeds from the disposition of equity; anticipated free cash flow from ongoing operations in 2020 is \$1,589,150, while the estimated share from the exit of the investment is \$5,861,388.

### SENSITIVITY ANALYSIS

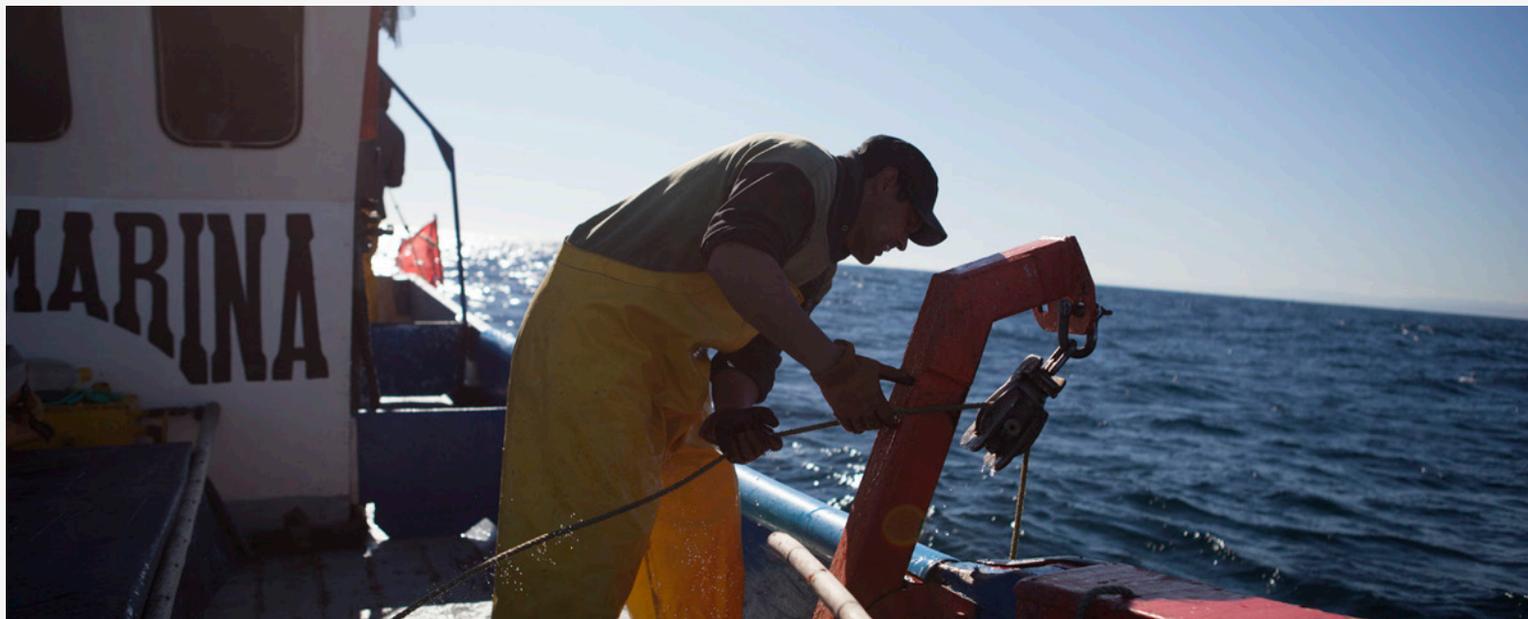
Several key inputs will have a particularly pronounced effect on the financial return of the project. As such, the model has been forecast under multiple scenarios, flexing the following key variables:

**Annual Changes in Sales Prices:** As with any processing and distribution business, the cash flows of the Company are sensitive to changes in the sales price of the finished goods. The sales prices used in the model are based on thorough diligence of the market segments into which GustoMar intends to sell. The base-case scenario assumes that current market prices grow 2% faster than core inflation of 4%, or 6% per year. The downside scenario assumes that prices only increase at domestic inflation rates of 4%, while the upside scenario assumes 7% annual increases. The IRR falls to 7.9% in the downside case, while increasing to 16.8% in the upside case.

**Working Capital:** Managing working capital is a particular challenge when sourcing from artisanal fishers, given the need to pay cash at the time of raw material purchase with significant delay before payment by the customers. Moreover, the volatility in seafood supply relative to the need to fulfill

constant supply agreements with buyers requires holding significant inventory. Both scenarios create significant working capital demands. In GustoMar's case, inventory has less of an impact on the IRR of the project. In the base case, the model assumes 60 receivable days; 90 days is assumed in the downside scenario, and 30 days in the upside scenario. In the downside scenario the project IRR falls to 8.0% while in the upside scenario the IRR increases to 13.4%.

**Transportation Costs as Percentage of Sales:** Given the wide geographic distribution of the caletas, transportation costs—even when outsourced to an efficient provider—can be a significant component of the Company's cost structure. The base case assumes transport costs of 6% of sales, in line with what other seafood businesses in Chile pay for transport of raw materials but significantly higher than GustoMar's current spend on transportation. Transport costs of 8% of sales are assumed in the downside and 4% in the upside. In the downside scenario the project IRR falls to 6.6% while in the upside scenario the IRR increases to 14.8%.



**EBITDA Exit Multiple:** In year 5, the company is assumed sold at a multiple times EBITDA. This multiple is a function of the upside that the company might offer to a potential buyer. The model assumes a 5.0x multiple in the base case, a 7.0x multiple in the upside case, and a 3.0x multiple in the downside. In the downside scenario the project IRR falls to 0.0% while in the upside scenario the IRR increases to 19.0%. Precedent exit multiples in the Chilean seafood industry have tended to vary between 6.0x-9.0x, so even the upside scenario presented here may be conservative.

**Foreign Exchange:** Foreign exchange rates also have the potential to impact returns, given that the model assumes dollar-denominated investment. A stronger dollar in the short run means greater purchasing power in Chile, while a gradual strengthening of the currency could improve the return significantly as pesos are converted back into dollars to repay investors upon exit of the company. So as not to overemphasize the impact of foreign exchange in the model, the base case assumes a CLP/USD (Chilean peso vs. U.S. dollar) exchange rate of 675, a downside of 725, and an upside of 625. In the downside scenario the project IRR falls to 5.5% while in the upside scenario the IRR increases to 16.2%.

	SCENARIOS			IRR IMPACT	
	Base Case	Downside	Upside	Downside	Upside
<b>Sales Price Increase (%/yr)</b>	6.0%	4.0%	7.0%	7.9%	16.8%
<b>Working Capital (Receivable Days)</b>	60	90	30	8.0%	13.4%
<b>Transportation (%/Sales)</b>	6.0%	8.0%	4.0%	6.6%	14.8%
<b>EBITDA Multiple</b>	5.0x	3.0x	7.0x	0.0%	19.0%
<b>F/X Rate (CLP/USD)</b>	675	725	625	5.5%	16.2%

## KEY MARISCOS STRATEGY RISKS AND MITIGANTS

The Mariscos Strategy presents a range of potential risks that require mitigation or incorporation into the investment and valuation analysis, as follows:

RISK	DESCRIPTION	MITIGANTS
<b>Key Risks Impacting Fishery Improvement Programs</b>		
Reliance on operating partners to work with caletas to implement fishery improvement efforts	GustoMar cannot control the fisheries management implementation process, and partners could fail to execute on implementation. Any operating partner could cease to exist, and there are limited choices for substitute providers.	The contemplated operating partner is already working with GustoMar, and the two groups' mission and interests are aligned. In addition, Mariscos can cultivate alternative suppliers of fishery implementation and management.
Fish stock biomass declines, despite efforts to work with caletas to utilize sustainable practices and maintain healthy levels	Community rather than stock-scale fisheries management improvements may fail to protect the spawning stock as a whole, leading to declining productivity despite sound local management efforts.	The species incorporated into Mariscos are primarily benthic, nonmigratory species that have been shown to be successfully managed at smaller scales, such as through TURF reserves.
Leakage due to continued illegal fishing and overfishing by others	Fish protected and not caught by fishers involved with the caletas could be illegally or irresponsibly caught by other fishers or industrial fleets.	Mariscos would seek to leverage local management improvements to improve national scale monitoring and enforcement by Sernapesca. Moreover, Mariscos would engage closely with Sernapesca from an early stage to improve enforcement in the portfolio caletas.
<b>Key Risks Impacting Raw Material Sourcing Volume</b>		
Limited or uncertain raw material volume from caletas as GustoMar ramps up its sales	Climatic conditions (e.g., El Niño) may cause biomass availability to vary, resulting in inadequate supply for GustoMar.	GustoMar produces multiple seafood (and nonseafood) products in order to diversify its revenue. Since the Company sources different species from different caletas, it is unlikely that all species would be affected in any one year.
Environmental/climate risks from earthquakes or volcanic eruption	Earthquakes and volcanic eruptions, to which Chile is prone, may potentially disrupt inland transport and logistics in getting the raw materials to GustoMar's processing plant in Santiago.	Same as above. Moreover, Chile is one of the most efficient countries in South America, and the government is overall quite well-prepared in terms of coping and recovering (clearing roads, etc.) from natural disasters.

RISK	DESCRIPTION	MITIGANTS
<b>Key Risks Impacting Raw Material Costs</b>		
Existing intermediaries offering caletas higher prices	Competitors wanting to compete with GustoMar may offer higher prices to the caletas.	By working closely with the caletas through its partners and procurement staff, GustoMar would pay a better price to the caletas. In addition, the caletas would have an ongoing financial interest in GustoMar's business through the FCT, which align and incentivize them to support GustoMar's operations.
<b>Key Risks Impacting Revenue</b>		
Customer concentration	GustoMar currently has 7 clients. In 2013, the Company lost an important contract with one of its clients, resulting in a loss of 35% of revenue.	The Company recognizes this weakness. With funds from this new round of financing, the Company would work to strengthen its sales and marketing efforts to diversify its client base. As it expands to other Latin American markets, its customer base would also expand.
International Expansions	GustoMar's business plan is reliant on international expansion, which may prove more costly or slower to ramp up than projected.	GustoMar has already completed extensive due diligence of the international markets, and has access to large-scale customers through its existing customer network and relationships.
Existing competitors undercutting by price or new entrants crowding the market	GustoMar's products are more expensive than most of its competitors'. There is also interest from other companies in entering the prepared seafood segment.	GustoMar positions itself as offering gourmet food products, which it believes is supported by growing customer demand. This is demonstrated by GustoMar's continuous growth in market share in the retail sector. GustoMar would continue to develop new innovative food products not offered by other competitors. Finally, as the company grows it would be expected to achieve significant economies of scale that should reduce its cost structure.
Still small but growing market for sustainable products in Latin America	As GustoMar tries to focus on growing sales of its sustainable seafood, customer demand or willingness to pay a premium for sustainable seafood may not be sufficient to support the growth strategy.	One of GustoMar's strengths is that it produces great-tasting, unique, gourmet products that others currently do not offer. Even without the sustainability message, consumers are expected to continue to favor and purchase its products. Moreover, responsible sourcing from artisanal producers provides a unique selling point that seems to resonate with consumers.



RISK	DESCRIPTION	MITIGANTS
<b>Key Risks Impacting Business Execution</b>		
Trying to grow too quickly, resulting in an unsuccessful overseas expansion	In addition to losing invested capital associated with these overseas ventures, it could also divert GustoMar's management time from the core business in Chile.	GustoMar should only initiate entrance to other geographic markets once its Chilean business is on track. Moreover, this expansion should be phased in over the next five years.
Management's ability to focus on growing the business while managing other noncommercial issues	Not uncommon to small growing companies, GustoMar management has had to dedicate energy to resolving issues such as hiring/ firing personnel and buying out former investors who did not take to the sustainability/responsible-sourcing story. One of its suppliers also committed fraud, resulting in GustoMar's losing money.	The addition of the COO role in 2014 has been an important addition for the management team, allowing the CEO to focus more on the commercial side of the business. A capital infusion would also allow GustoMar to hire a finance and administrative manager and several other key positions, all of which should provide capacity to address a range of management issues.
<b>Key Risks Impacting General Macroeconomic Environment</b>		
Inflation and currency risks	<p>The Chilean peso has weakened against the U.S. dollar considerably in the last 18 months. At 689 pesos to USD \$1, it is currently approximately 31% below the 5-year average of 523 pesos per USD \$1.</p> <p>Inflation and currency fluctuations in Chile are closely linked to the price of copper, Chile's most important export.</p>	<p>The base-case model scenario assumes the current weak foreign exchange rate will continue through 2020. This is a conservative view that assumes copper prices will not rebound in the next 5 years.</p> <p>The base case also assumes a reasonable core inflation rate of 4% (Chile's trailing 5-year average).</p>

## APPENDIX

### OPERATIONAL AND FINANCIAL PROJECTIONS

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
# of Fishing Communities	7	7	7	7	7
# of Fishers	543	543	543	543	543
# of Vessels	202	202	202	202	202
<b>SALES VOLUME (mt)</b>					
Live Weight Equivalent	56	118	262	453	634
Finished Product	88	183	404	706	1,016
<b>REVENUE</b>					
Export Sales	\$37,543	\$582,790	\$1,948,938	\$4,217,712	\$7,522,672
Domestic Sales	\$3,024,294	\$3,849,485	\$5,104,833	\$6,087,311	\$6,584,178
<b>Total</b>	<b>\$3,061,837</b>	<b>\$4,432,275</b>	<b>\$7,053,771</b>	<b>\$10,305,023</b>	<b>\$14,106,850</b>
<i>YoY Growth in Sales</i>		44.8%	59.1%	46.1%	36.9%
<b>OPERATING EXPENSES</b>					
<b>Cost of Good Sold</b>					
Non-Seafood Raw Materials	\$1,214,930	\$1,518,663	\$1,898,328	\$2,183,078	\$2,401,385
Seafood Raw Materials	\$351,484	\$769,512	\$1,756,545	\$3,092,209	\$4,310,226
Production - Personnel	\$367,420	\$531,873	\$846,453	\$1,236,603	\$1,692,822
Transportation and Distribution	\$183,710	\$257,072	\$395,011	\$556,471	\$733,556
Other COGS	\$122,473	\$177,291	\$282,151	\$412,201	\$564,274
<b>Total COGS</b>	<b>\$1,933,834</b>	<b>\$2,820,047</b>	<b>\$4,501,325</b>	<b>\$6,511,889</b>	<b>\$8,404,433</b>
<b>SG&amp;A</b>					
Administration	\$306,184	\$425,498	\$648,947	\$906,842	\$1,184,975
Business Development	\$168,401	\$234,911	\$359,742	\$504,946	\$663,022
Overseas Expansion Startup Costs	\$600,000	\$750,000	\$150,000	\$ -	\$ -
Fishery Improvement Program	\$302,626	\$355,150	\$218,561	\$176,453	\$107,650
Maintenance	\$16,969	\$16,117	\$15,307	\$14,538	\$13,808
<b>Total COGS</b>	<b>\$1,071,027</b>	<b>\$1,340,060</b>	<b>\$728,303</b>	<b>\$681,399</b>	<b>\$770,671</b>
<b>EBITDA</b>	<b>\$(572,361)</b>	<b>\$(603,811)</b>	<b>\$482,726</b>	<b>\$1,221,681</b>	<b>\$2,435,131</b>
<i>EBITDA Margin</i>	<i>-19%</i>	<i>-14%</i>	<i>7%</i>	<i>12%</i>	<i>17%</i>
<b>CASH EXPENDITURES</b>					
Pre-processing Facility	\$467,630	\$ -	\$ -	\$ -	\$ -
Processing Facility	\$592,593	\$ -	\$ -	\$ -	\$ -
Upgrades to Existing Processing Facility	\$37,037	\$ -	\$ -	\$ -	\$ -
Buying Stations	\$660,000	\$ -	\$ -	\$ -	\$ -
Fishery Improvement Materials and Equipment	\$485,000	\$ -	\$ -	\$ -	\$ -
Fishery Improvement Infrastructure	\$175,000	\$ -	\$ -	\$ -	\$ -
<b>Total CAPEX</b>	<b>\$2,417,259</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>

# **THE MANGUE STRATEGY**

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**AN INVESTMENT BLUEPRINT  
FOR SMALL-SCALE FISHERIES  
IN BRAZIL**

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## THE MANGUE STRATEGY

Encourage Capital has worked with support from Bloomberg Philanthropies and The Rockefeller Foundation to develop an impact investing strategy supporting the implementation of sustainable management and extraction practices in a small-scale fishery in Brazil. The Manguê Strategy (Manguê) is a hypothetical \$15 million impact investment to protect the mangrove crab (*Ucides cordatus*) fishery in the Brazilian state of Pará.

This \$15 million investment would fund the implementation of critical management improvements across the fishery, and be used to launch a crab export business with a network of buying stations and a modern processing facility designed to meet both domestic and international food safety standards. The Manguê Strategy has the potential to generate a 12.0% levered equity return while protecting the mangrove crab stock biomass from current and future overfishing, enhancing up to 1,300 fisher livelihoods across 10 extractive reserves (RESEXs), and providing an additional 2.4 million seafood meals to market annually by Year 9. Additionally, the strategy would support the sustainable management of up to 300,000 hectares of critical coastal mangrove forest within the Amazon Delta, protecting and capturing the economic and ecosystem services of this delicate ecosystem.

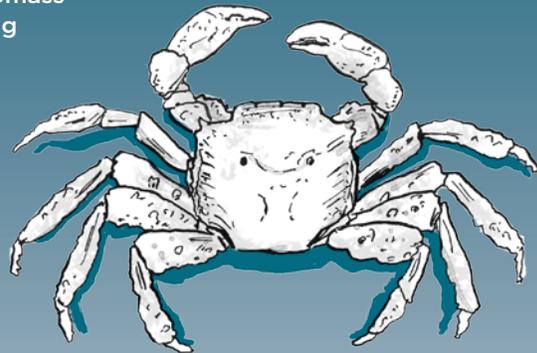


Illustration by Brett Affrunti

Note: While the Manguê Strategy is based on analysis of actual communities, fisheries, and commercial business opportunities, Encourage Capital has synthesized these findings into a single investment strategy to be used as a roadmap for stakeholders interested in sustainable, small-scale fisheries impact investing. As such, some of the commercial and programmatic entities referenced herein are hypothetical and have been assigned fictitious names. Wherever this is the case, the hypothetical entities will be clearly identified.



## THE MANGUE STRATEGY

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The sustainable harvest of mangrove crabs is of both environmental and social importance and is the basis of the Manguê Strategy (“Manguê” or “the Strategy”). Mangrove crabs are comparable to other mass-market crab species in terms of taste and texture, and can be processed into a variety of marketable seafood products. The crabs are found exclusively in dense forest ecosystems known as mangrove forests or “mangroves”, which grow in tropical and subtropical coastal zones around the world. Brazilian mangroves, many of which are located in expansive protected areas along the coast, are among the most biodiverse ecosystems on Earth and provide critical spawning grounds and nurseries for many commercial and non-commercial marine species. Mangrove crabs are considered a keystone species in this ecosystem due to their role in shaping the physical, chemical, and biological conditions.

The Manguê Strategy outlines an impact investing strategy across a large swath of the coastline in the state of Pará, spanning some 300,000 hectares and encompassing nearly 30% of Brazil’s total mangrove forest habitat (see Figure 1). The state’s mangrove forests produce roughly 50% of the total mangrove crab landed nationally. Straddling the heart of the Amazon Basin, Pará consists of some of the most species-rich habitats on Earth, but is also facing intense pressure from destructive land-use activities including mining, aquaculture, and deforestation, making it the subject of much national and international environmental concern.

FIGURE 1: Map of Pará State, Brazil



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Manguê outlines an impact investing strategy across a large swath of the coastline in the state of Pará, spanning some 300,000 hectares and encompassing nearly 30% of Brazil’s total mangrove forest habitat.

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Photo credit Tarciso Leão

The mangrove crab fishery spans a series of coastal extractive reserves, referred to as “RESEXs,” which exclude non-community members from fishing the crab resource while allowing virtually unlimited extraction by community members living within the reserve area. This system regulates the fishery to a degree, but leaves the prospect of overfishing largely unresolved.

While data collection efforts have been lacking, research suggests that an estimated 2,000 full-time crabbers landed approximately 80% of the average 5,000 metric tons (mt) of total crab harvests in the years leading up to 2004. The last government assessment of landings was conducted in 2007, and showed only 3,000 mt of crab harvested from the fishery.<sup>1</sup> The reason for this decline in landings is unclear, but could be related to improved economic growth in the region from 2005 to 2007, drawing fishers into alternative economic activities. Crabbing has traditionally been seen as a profession of last resort due to the difficult working conditions and low pay, so activity levels in this fishery tend to be inversely related to the strength of the Brazilian labor market. As of 2014, landings in Pará were estimated to have increased once again to at least 5,000 mt, representing an aggregate value of approximately \$5.3 million.

This rising rate of extraction, coupled with a weakening Brazilian economy, poor access limitations that technically allow any of the 150,000 community members across the 10 RESEXs to harvest crab, and growing demand for crab products domestically and internationally, threatens to dramatically increase fishing effort. Such overfishing, in turn, could drive significant crab-stock declines, with ramifications for the broader ecosystem, given the keystone role of the species. Neighboring states and select micro-regions within the reserve have already experienced this phenomenon.<sup>2</sup> Moreover, with the recent economic downturn in Brazil, there is increasing pressure being put on officials in Pará to allow the conversion of mangrove forests to shrimp aquaculture in an attempt to generate alternative livelihood opportunities, further threatening the mangrove crab fishery.

As such, the Mangrove Strategy would attempt to implement robust management systems and provide an economic case for conservation *before* overfishing, habitat destruction, and stock depletion occur. To do so, the Strategy proposes the investment of \$15 million in equity, program-related investments, and grant funding to launch CEB,<sup>3</sup> a mangrove crab processing and distribution business, combined with robust fishery

<sup>1</sup> ARR Araujo, “Fishery Statistics and Commercialization of the Mangrove Crab *Ucides Cordatus* (L.) in Braganca, Pará, Brazil,” Center for Tropical Marine Ecology, 2006. Current (2014) estimates are based on consultant estimates derived from biological parameters and primary research undertaken by local universities.

<sup>2</sup> Based on conversations with local academics and conservation organizations operating in the region.

<sup>3</sup> CEB stands for “Crab Export Business,” the name chosen for the hypothetical Brazil-based company to be established in the state of Pará.

management improvement measures implemented across 10 RESEXs in the state of Pará. Sourcing solely from community fishers adhering to strict sustainable management guidelines, CEB aims to be the first Brazilian mangrove crab processor licensed to sell crabmeat products across state lines and to export to international markets. The Mangue Strategy's innovative approach would incorporate the use of (a) investment capital to catalyze government policy reforms, (b) robust data collection technologies and systems, and (c) financial incentives that reward sustainable fishing practices over time. Bundling fishery management improvements with a commercial enterprise would enable the Mangue Strategy to capture higher value for the crab products, create a more efficient and responsible commercialization channel, and reward fishers for maintaining sustainable fishing practices on an ongoing basis.

The Mangue Strategy aims to preserve current stock levels, with a modest upside potential of 10% increased in biomass due to reduced fishing pressure.<sup>4</sup> The strategy aims to increase aggregate fisher incomes by 33%, offer greater resilience for fishing communities through profit-sharing mechanisms, and empower fishers through community organization and enhanced market power. The Mangue Strategy also has the potential to dramatically reduce spoilage in the supply chain while increasing the number of meals to market by up to 59% by the project's final year. In addition, the Mangue Strategy hopes to reduce the conversion of critical mangrove forest habitats to aquaculture or other uses by giving them additional economic value. Finally, the base case projections suggest that the Mangue Strategy has the potential to generate compelling financial returns, targeting a 12.0% levered equity return, with diversified cash flows stemming from both domestic and international markets, over a nine-year horizon.

#### IMPACT AND FINANCIAL RETURNS

- Safeguards mangrove crab stock levels across 10 RESEX sites with the potential to increase biomass by 10%, depending on current fishery conditions
- Increases aggregate fisher incomes by 33%, and improves community resilience through profit-sharing programs
- Empowers fishers and fishing communities by extending formal recognition to newly organized crabbing associations that provide political, legal, and professional representation, improving access to banking, credit, and government pension and health benefits
- Increases meals-to-market by 59% through spoilage reductions, delivering an additional 2.4 million meals to consumers annually
- Promotes the protection of more than 300,000 hectares of mangrove forest from encroaching threats of development, mining, and shrimp farming by providing a sustainable and profitable means of sustainable production
- Targets a 12.0% levered equity return over a nine-year period

The Mangue Strategy aims to preserve current stock levels, with a modest upside potential of 10% increased in biomass and biodiversity gains due to reduced fishing pressure.

<sup>4</sup> While The Mangue Strategy believes that the potential exists for stock recovery, the business model and project economics both assume that the fishery is maintained at current biomass levels.

## KEY VALUE DRIVERS

The impact and financial returns listed above are underpinned by the following set of key value drivers:

VALUE DRIVERS	DESCRIPTION
<b>Catalyzes government policy reforms</b>	The Mangue Strategy and its operating partners would negotiate with fisheries authorities to establish specific management policies, including science-based catch limits, increased enforcement and prosecution of illegal activity, and the imposition of rules to restrict the sale of illegally harvested crab.
<b>Uses innovations to increase fisher compliance</b>	The use of catch accounting and other data systems, in combination with financial market incentives to reward fishers for sustainable practices, can increase fisher compliance with fishery management improvements.
<b>Establishes best-in-class partnerships</b>	The Strategy would require close collaboration with complementary operating partners, particularly conservation NGOs and academic institutions, in the design and implementation of the fishery management improvements. Moreover, the Strategy will seek to create a collaborative stakeholder engagement process, aiming to cultivate buy-in from fishers and their communities to promote sustainable fishing practices.
<b>Engages experienced commercial management</b>	The Strategy would be overseen by an experienced, mission-aligned commercial management team to launch CEB and oversee its engagement with various operating partners. The proposed team has a three-year track record of success in seafood sourcing, processing, and distribution from emerging markets, and over 15 years working as retail buyers and advisors in the sustainable seafood arena.
<b>Capitalizes on growth and margin expansion opportunities</b>	The Mangue Strategy captures greater value from the current catch volumes by reducing spoilage from 50% to 5%, increasing the volume of marketable final product by up to 59%, and achieving 20% to 50% higher prices than current market channels through sales to new high-value markets.
<b>Leverages a strong commercial market position</b>	CEB can market its product with a set of unique social and environmental selling points to the proposed management team's existing network of global clients. CEB's product would be the first sustainable, artisanal seafood product from Brazil meeting international food safety standards.
<b>Supported by strong underlying seafood market fundamentals</b>	Global demand for traceable, responsibly sourced, quality crab meat is growing due to extensive fraud and illegal sourcing of product in recent years. Same-store crab-product sales are increasing in the U.S. at a compound annual rate of 8.5% since 2012.

We believe this set of value drivers will increase the probability of the Mangue Strategy's success.



## PROFILE OF THE MANGUE STRATEGY FISHERIES

**B**razil contains the second largest area of mangrove habitat in the world, with more than one million hectares found along its more than 7,000 km of coastline. No extraction or human interference is allowed inside the protected areas designated by IBAMA (the Brazilian environmental agency), except for in specially designated zones that are open to artisanal extraction using traditional, low-impact methods. These zones are defined as National Reserves for the Extraction of Natural Resources, or RESEXs by their Portuguese acronym. These RESEX zones are intended to serve as “territorial spaces destined for the self-sustained exploration and conservation of renewable natural resources by user populations”.<sup>5</sup> RESEXs are established only upon request by local populations who participate in the design and implementation of a co-management plan (between the community and the government) in exchange for exclusive access rights to particular resources.<sup>6</sup> Inside these zones, industrial operators are not permitted, nor are fishers from outside of the designated communities.

The Manguê Strategy selected the state of Pará primarily because its large number of small-scale fishers and high volume of crab production offer compelling commercial and impact potential. Pará’s mangrove forests, located at the mouth of the Amazon Basin, constitute the second longest contiguous stretch of mangrove habitat in the world, covering 3,000 km of coastline and approximately 30% of Brazil’s total mangrove habitat. This area is of critical ecological importance, and NGOs and academia are active in the region, offering strong partnership opportunities for the Manguê Strategy’s design and implementation.

In Pará State, the Manguê Strategy has identified 10 designated RESEX zones in which local community members are permitted to harvest specified marine resources, and in which the mangrove crab accounts for almost 50% of all extracted resource products by value. In these zones, only male crabs are caught due to the larger claws and higher meat content. The Manguê Strategy anticipates incorporating all 10 RESEXs into its sourcing program, which encompass a total area of 302,809 hectares (approximately 1,200 square miles), as shown in Figure 2.

<sup>5 & 6</sup> U. Saint-Paul. “Interrelations among Mangrove, the Local Economy, and Social Sustainability: a Review from a Case Study in Northern Brazil”. Environment and Livelihoods in Tropical Coastal Zones. CABI. 2006.

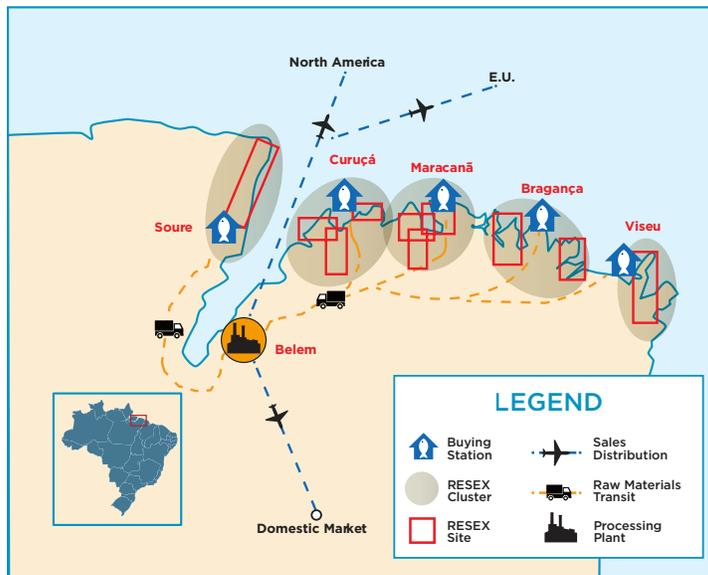


FIGURE 2: The Mangue Strategy RESEX Areas

RESEX AREA	SURFACE AREA (HECTARES)	MAIN MUNICIPALITY
Gurupi Piriá	74,082	Viseu
Marinha de Caeté Taperaçú	42,489	Bragança
Mãe Grande de Curuçá	36,678	Curuçá
Maracanã	30,179	Maracanã
Soure	29,578	Soure
Marinha de Tracuateua	27,864	Quatipurú
Marinha Mestre Lucindo	26,465	Marudá
Marinha Mocapajuba	21,028	São Caetano de Odivelas
Marinha Cuinarana	11,036	Cuinarana
São João da Ponta	3,409	São João da Ponta
<b>TOTAL</b>	<b>302,809</b>	

The 10 RESEX zones can be broadly grouped into five extraction “clusters,” each with its own buying station as a regional hub, as illustrated in Figure 3.

FIGURE 3: Regional Extraction Clusters, Sourcing Hubs, and Logistics Strategy for the Mangue Strategy in Pará, Brazil





### CURRENT REGULATORY FRAMEWORK

The RESEX areas effectively serve as TURFs, or Territorial Use Rights for Fisheries areas, which prevent outsiders to the fishing communities from entering the fishing grounds and harvesting the crab. This basic access limitation offers a foundation for development of further fishery management improvements, and makes the RESEXs attractive candidates for the Strategy.

The mangrove crab fisheries in Brazil have historically been regulated through both federal and state laws outlining permissible catch zones, extraction methods, seasonal closures, and minimum size limits. Unfortunately, these laws are seldom enforced, given the fragmented nature of the mangrove crab fisheries in Pará and the lack of monitoring and enforcement capacity of local fisheries authorities. In the absence of public resources for implementation and enforcement, the Mangue Strategy hopes to improve the implementation of fishery management measures by introducing community-based accountability structures and gradually aligning fisher economic incentives with mangrove crab stock health. This co-management approach is a foundational tenet of the RESEX model, but to date has

been poorly implemented in the mangrove crab fisheries due to a lack of organization among crabbers and the large extent of the RESEX areas.<sup>7</sup>

Bycatch and illegal landings of undersized or female crabs are not major problems for this fishery. However, the seasonal fishing closures, spanning six weeks in total during the months of January through March, are not enforced, as evidenced by the availability of fresh crabs and crabmeat in the market during the ban period.

Although the resource is not currently believed to be overexploited, growing harvest pressures due to the economic downturn in Brazil and rising demand for crabmeat domestically and internationally are cause for concern. Given these factors, The Mangue Strategy would seek to catalyze and secure certain regulatory reforms, particularly to: (i) establish a system of crabber licensing formalizing the profession, (ii) create a cap on total allowable harvest, and (iii) increase enforcement resources to reduce illegal harvest and commercialization. Achieving these goals would go a long way toward protecting and even increasing current mangrove crab biomass levels.

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Mangue's approach is aimed at catalyzing government policy reforms to strengthen access limitations and increase enforcement, to eliminate fishing during the ban period, to introduce a full-catch reporting and documentation scheme, and to implement a traceability system to ensure that crabs are extracted in a sustainable way.

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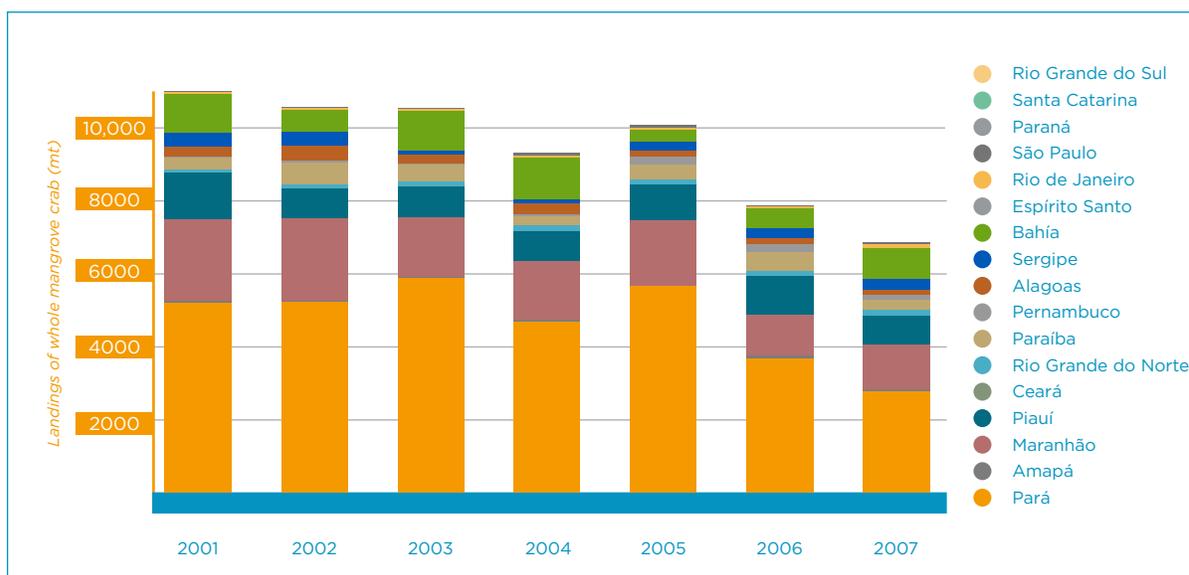
<sup>7</sup> U. Saint-Paul. "Interrelations among Mangrove, the Local Economy, and Social Sustainability: a Review from a Case Study in Northern Brazil". Environment and Livelihoods in Tropical Coastal Zones. CABI, 2006.

## CONDITION OF MANGROVE CRABS IN BRAZIL

The Brazilian environmental agency, IBAMA, recorded annual landings by state and species until 2007 but has since suspended any mangrove crab data collection in the Pará region. Based on the limited historical information, annual landings in Pará oscillated from between 4,600 mt and 5,800 mt per year in the early 2000s, but decreased to less than 3,000 mt in 2006 and 2007.<sup>8</sup> (See Figure 4.) Given the lack of scientific

data for the fishery, experts cannot currently determine whether the decrease was the start of a persistent reduction in crab catches or the result of reduced effort in the fishery during that period. Current unofficial estimates suggest that landings have since rebounded to nearly 5,000 mt, likely as a result of the recent economic downturn in Brazil and a resulting increase in fishing effort as crabbers return to the fishery.

FIGURE 4: Official Brazilian Government Landings Statistics for Mangrove Crab, 2001–2007



## SOCIOECONOMIC CONTEXT

Upwards of 150 communities across the 10 associated municipal districts of Pará are within or bordering a RESEX, with 150,000 community members granted access to the extractive reserves. Of these, an estimated 120,000 people depend in some way upon the RESEX resources to earn a living, with approximately 75,000 relying on the harvest, processing, transport, or sale of mangrove crab for either all or a significant portion of their livelihood, which often combines subsistence with commercial activities.<sup>9</sup>

While there are full-time crabbers who take pride in what they do, many individuals use crabbing as a safety net for short-term poverty alleviation when

other employment options disappear or become less economically viable. The fishery operates as such because of the lack of barriers to entry, the reduced need for specialized skills, and the absence of requirements for any up-front capital investment. The consequent influx of part-time and opportunistic crabbers can lead to turf conflicts, and during periods of increased fishing effort, oversupply can drive down prices. This is especially challenging for those full-time crabbers who rely on the resource for 100% of their income. A day of crabbing consists of an average of eight hours spent manually extracting the live crabs from their burrows. While fast-working crabbers under the best conditions can earn up to \$20 per day net

<sup>8</sup> Instituto Brasileiro de Meio Ambiente (IBAMA), "Estatística da Pesca: Brasil," Ministério do Meio Ambiente, Brazil, 2007.

<sup>9</sup> Ulrich St. Paul and, Horacio Schneider, "Mangrove Dynamics and Management in Northern Brazil", Springer Science and Business Media, 2010.



Photo credit Tarciso Leão



Photo credit José Pinto

of costs, their productivity levels are restricted by variations in tides, weather, and seasons, as well as the number of days per week that they are able to go out. As a result, average daily earnings for full-time crabbers range from \$3 to \$4 per day over the course of a year.<sup>10</sup>

The state of Pará is located in the second poorest region of Brazil, behind the northeastern states, with 36% of the population considered “poor” (living on less than \$130 per month) and 13% categorized as “extremely poor” (living on less than \$65 per month). Among the rural population utilizing the RESEX resources, these numbers are even more

pronounced, with between 50% and 80% of this population falling below the poverty line, depending on the region.<sup>11</sup> Crab fishers are among the most disenfranchised members of these communities, as they are unlicensed individuals operating almost entirely within the informal economy, and are afforded no professional or political representation in the form of associations or cooperatives common among other types of fishers. Because their profession is not legally recognized as such, they also lack access to government social security benefits, health coverage, minimum wages, and access to credit and the banking system.

### THE CURRENT SUPPLY CHAIN

Collectors generally harvest mangrove crabs by either pulling them out of their burrows by hand or with a hooked stick, and tie the animals together in bunches of 10-20 live individuals. From this point, the crabs enter a fragmented and inefficient supply chain in which the product changes hands multiple times between intermediaries before it is ever consumed.

Crab fishers typically sell their catch immediately following harvest to reduce the risk of spoilage, and thus are at the mercy of price fluctuations, weather events, and any other external forces that may affect

their yields. In some cases, crabbers sell live crabs to primary traders, who then mark up and sell fresh crab to restaurants or other consumers. Throughout this process, crabs are traditionally transported while tied together without padding or adequate humidity. This has been shown to lead to mortality losses of 50% on average, as crabs are dehydrated and become aggressive when tied together.<sup>12</sup> Crabbers also sell crabs in local open-air markets or directly to “pickers”, artisanal processors who manually extract meat from between 150 and 300 crabs per day, often in their homes.<sup>13</sup> Processing the crab by hand

<sup>10</sup> Capistrano, et al., “Crab gatherers perceive concrete changes in life history traits of *Ucides cordatus*, but overestimate their past and current catches”, *Ethnobiology and Conservation* 1 (7), 2012.

<sup>11</sup> Instituto Brasileiro de Geografia e Estatística (IBGE), “2010 Population Census,” 2011.

<sup>12</sup> Daniel Viana, “Brazil Coastal Fisheries Fellowship Report,” Rare International Service Program, Final Report, 2013.

<sup>13</sup> Fernandes, et al., “Productive Chain of the Mangrove Crab in the Town of Braganca, in the Northern Brazilian State of Pará,” *Journal of Coastal Research*, April 2014.



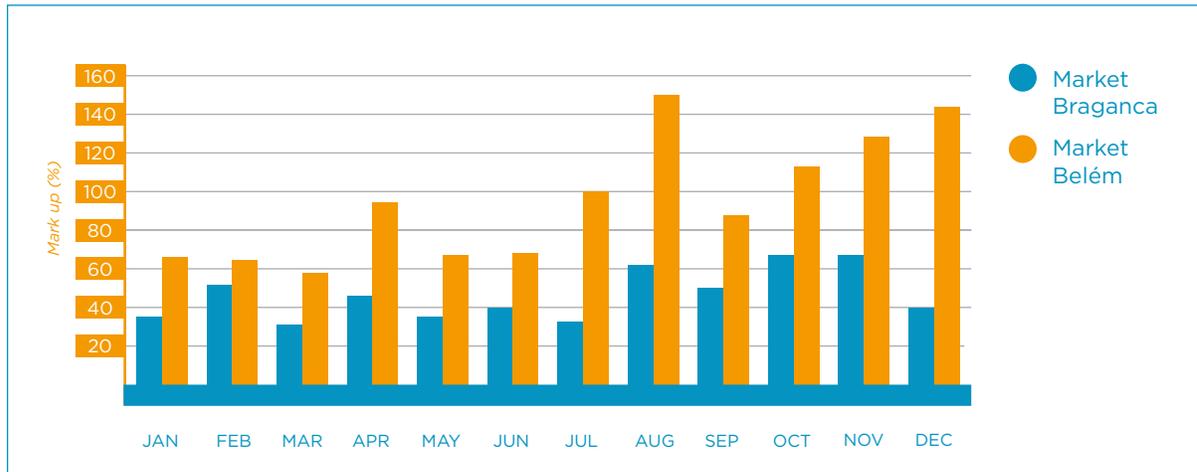
Photo credit Cristiano Burmester

is a painstaking, time-intensive, and highly inefficient process. Once pickers have removed the meat, secondary traders buy it and sell it to local restaurants or, in some cases, to larger regional markets.

At each turn in the supply chain the product price is marked up as each intermediary must carve out a profit, regardless of added value.

All of this markup occurs downstream from artisanal crabbers, who see none of the estimated 32%-150% markups that have occurred by the end of the live crab supply chain.<sup>14</sup> Figure 5 shows total supply chain markups for live crab in two major mangrove crab harvesting hubs, tracked throughout the year.

FIGURE 5: Estimated Markup of Mangrove Crab Prices



<sup>14</sup> Fernandes, et al., "Productive Chain of the Mangrove Crab in the Town of Braganca, in the Northern Brazilian State of Pará," *Journal of Coastal Research*, April 2014.

A supply chain analysis of the processed crabmeat commercialization chain in the crab markets of Braganca and Belem shows an even higher average markup in the processed meat market. The distribution of markup throughout the year at each stage in the supply chain is shown in Figure 6.

The sale of live crab takes place as quickly as possible due to high mortality rates and little to no access to cold storage. Crabbers must sell their catch directly to intermediaries and traders at whatever

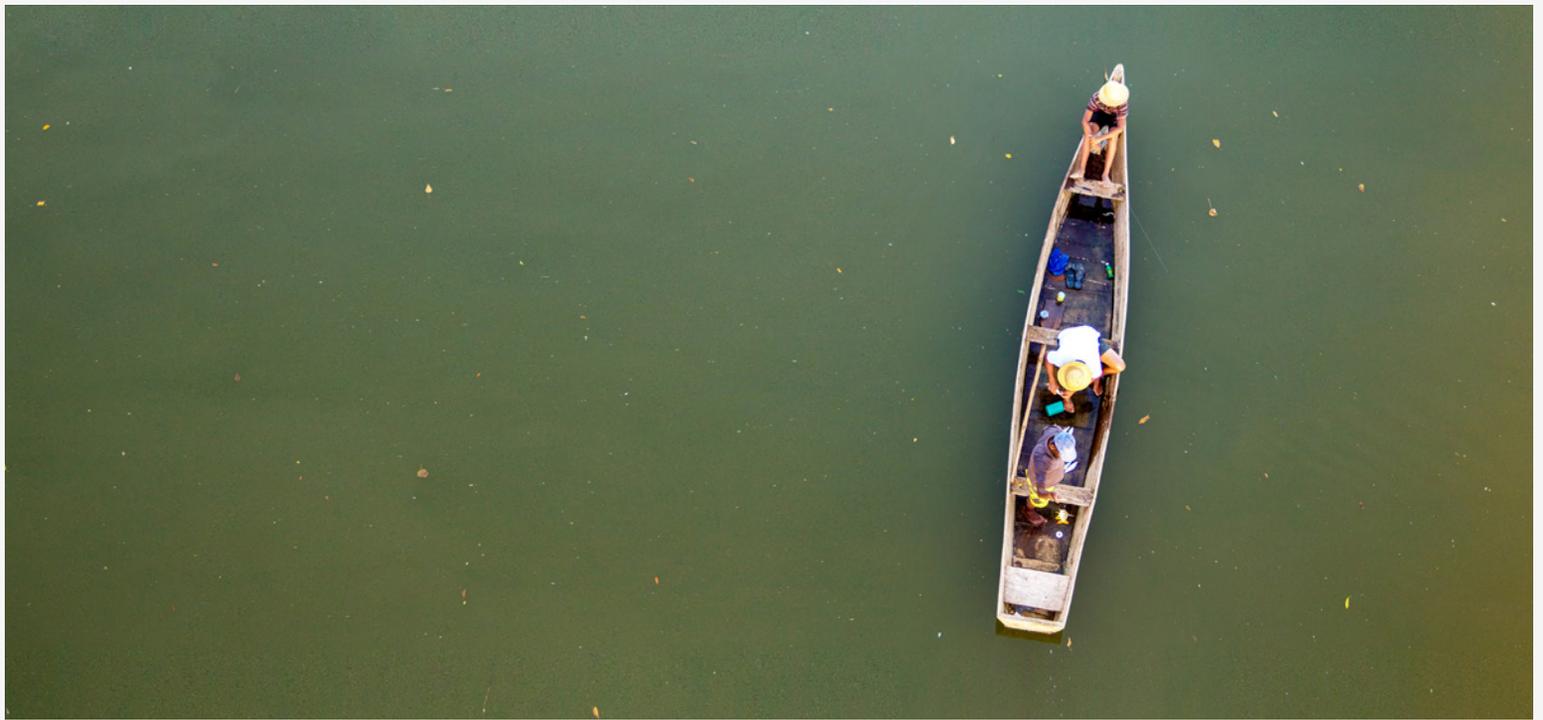
price they can get, leaving them highly vulnerable both to changes in yield due to weather events and profits due to price fluctuations. This vulnerability also largely excludes crabbers from the higher profit margins enjoyed by those further down the supply chain. Markups of live crab have been documented to be as high as 150%.<sup>15</sup> Because of the fragmented supply chain and lack of processing and transport infrastructure, crabbers have no access to higher-value markets and currently see no material benefit to engaging in sustainable fishing practices.

FIGURE 6: Total and Individual Markup (%) in the Pulp Crabmeat Commercialization Chain on the Braganca and Belém Markets, 2003

	TOTAL MARKUP (%)	MIDDLEMAN MARKUP (%)	WHOLESALE MARKUP (%)	RETAILER MARKUP (%)
January	149	27	29	52
February	160	23	31	60
March	143	21	25	60
April	124	7	33	58
May	127	6	58	35
June	211	37	64	38
July	110	6	38	43
August	154	25	33	52
September	156	15	45	52
October	204	15	59	66
November	212	16	50	79
December	216	12	57	79

Because of the fragmented supply chain and lack of processing and transport infrastructure, crabbers have no access to higher-value markets and currently see no material benefit to engaging in sustainable fishing practices.

<sup>15</sup> ARR Araujo, "Fishery Statistics and Commercialization of the Mangrove Crab *Ucides Cordatus* (L.) in Braganca, Pará, Brazil," Center for Tropical Marine Ecology, 2006.



## THE MANGUE IMPACT STRATEGY

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### IMPACT INVESTMENT THESIS

The Mangué Strategy's impact thesis is premised on the opportunity to bundle investments into robust fishery management improvements with investments in crab processing and distribution to create the economic incentives necessary to finance ongoing fishery management improvements and reward fishers for complying with them. As such, the Mangué Strategy proposes three key steps:

**Step 1:** Engage with fisheries authorities and communities to secure specific fishery management policy reforms.

**Step 2:** Invest an initial \$3.5 million into the design and implementation of fishery management improvements and the capitalization of Fishing Community Trusts in each of the ten RESEX zones.

**Step 3:** Invest \$11.5 million into a new Crab Export Business (CEB), funding the construction of 10 buying stations for sourcing raw materials, a state-of-the-art processing facility, and development of new marketing and sales channels for Brazilian mangrove crab. (See "The Mangué Strategy Commercial Investment Thesis" section below for a full description of CEB's strategy and value proposition.)

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<sup>16</sup> This covers fishery management improvements costs for the first three years of the Strategy prior to CEB generating revenue.



## SMALL-SCALE FISHERIES SEAFOOD SUPPLY CHAIN



### STEP 1: SECURE GOVERNMENT COMMITMENTS

The Mangue Strategy would first seek to establish specific management commitments from Brazilian fisheries authorities at either the state or federal level. In order to protect mangrove crab biomass and mangrove forests, there must be effective access and total allowable catch limitations in place in the fishery. While the RESEX serves as an important cornerstone to access limitations by prohibiting non-community members from fishing the resource, the unlimited access afforded to community members without a total allowable catch limit leaves the fishery and ecosystem vulnerable to increasing numbers of community members entering the fishery. The Mangue Strategy would thus work with fishery authorities and the crabber association to codify a series of regulations including to (i) establish a system of fisher licensing, (ii) create a

cap on total allowable harvest, and (iii) increase enforcement resources to reduce illegal harvest and commercialization. All of these measures would serve to facilitate and empower the creation of crabbing associations of legal harvesters.

The passage of these measures is believed to be feasible given their direct alignment with and reinforcement of the ultimate objectives of the RESEX management approach, wherein communities “co-manage” natural resources with limited government support, mostly in the form of codified harvest rules and enforcement. Moreover, the recent disbanding of the Ministry of Fisheries in Brazil is widely seen as positive step, and should help catalyze renewed government effort to improve fishery management, and particularly “win-win” opportunities such as this one.

## STEP 2: FISHERIES MANAGEMENT IMPROVEMENTS

The Mangue Strategy's plan contemplates implementation of fishery management improvements in 10 RESEX zones in the state of Pará.

### THE FISHERIES MANAGEMENT PLAN

The proposed fishery management improvements incorporate design criteria that are aligned with international sustainability standards and best practices. In addition to the anticipated government commitments highlighted in blue, the table below outlines the fishery improvement measures

associated with the portfolio sites and funded by the Mangue Strategy. The Mangue Strategy would seek to have most of these measures in place by Year 4 when commercial operations would begin.

CORE FISHERIES MANAGEMENT COMPONENTS	ACTIVITIES	PROPOSED MANAGEMENT IMPROVEMENTS
Stakeholder Engagement	Government Engagement	<ul style="list-style-type: none"> <li>Engage with fisheries authorities to secure policy reform commitments and resources</li> </ul>
	Community Engagement	<ul style="list-style-type: none"> <li>Hold convenings with fishers to educate them on sustainable harvest methods, closed seasons, catch documentation, size limits, and other critical sustainability measures</li> </ul>
	Community Support	<ul style="list-style-type: none"> <li>Assist fishers in organizing into producer associations to enhance their political and market power, while also making it easier for CEB to coordinate fishery management and sourcing activities</li> </ul>
Policy Rules and Tools	Exclusive Access Rights	<ul style="list-style-type: none"> <li>Establish crabber registration and licensing system with a cap placed on the number of permitted harvesters<sup>17</sup></li> <li>Establish science-based catch limits in accordance with estimates of maximum sustainable yield that can be refined as additional data is collected over time</li> <li>Improve monitoring and enforcement of illegal harvest and commercialization</li> </ul>
	Biological Monitoring and Assessment	<ul style="list-style-type: none"> <li>Conduct stock assessment based on four-year time series of capture data and catch per unit effort (CPUE)</li> </ul>
	Fisheries Management	<ul style="list-style-type: none"> <li>Work with local operating partner(s) to design and oversee implementation of RESEX-specific fishery management plans outlining proper harvesting, landing, and catch-documentation practices, as well as other key environmental considerations</li> </ul>
Compliance	Catch Accounting	<ul style="list-style-type: none"> <li>Create database for systematically storing all landings data recorded by CEB at buying stations to inform fishery management efforts, and particularly harvest limits</li> </ul>
	Product Traceability	<ul style="list-style-type: none"> <li>Implement RFID tagging program to provide full traceability from the buying stations to market</li> </ul>
	Local Enforcement Systems	<ul style="list-style-type: none"> <li>Sign contracts with the leadership of each of the crabbing associations stipulating that in exchange for access to the CEB commercialization channel and Sustainable Fishing Rewards Program (described below), all the association members must comply with the guidelines of the fishery management plan</li> </ul>

<sup>17</sup> Given that the fishery is not currently overexploited, the total allowable catch would not necessarily decrease; rather, this regulation would seek to prevent harvest in excess of MSY by future entrants into the fishery and to allow for adaptive management based on stock conditions.

The Mangue Strategy proposes to utilize third-party auditing of its fishery management improvement implementation to create additional discipline and accountability in its sourcing policies and systems. The auditors would be asked to

review reports provided by CEB and the local implementation partner, to conduct formal reviews of fishing practices and management systems, and to perform surprise annual audits.

#### SUSTAINABLE FISHING REWARDS PROGRAM

Fishers willing to commit to Mangue's fishery management improvements and serve as suppliers to CEB's sourcing network (see "Commercial Investment Thesis" section) would be eligible to participate in the Mangue Strategy's Sustainable Fishing Rewards Program (SFRP). The Mangue Strategy proposes to employ the SFRP as a financial incentive to catalyze and maintain the implementation of sustainable artisanal fishing practices to support habitat protection, stock preservation, and regulatory compliance across the 10 RESEX zones.

The SFRP would offer economic rewards to fishers and fishing communities in two ways: (a) through the payment of higher prices per unit of catch (referred to as "price premiums"), and (b) via a profit-sharing mechanism whereby fishing communities are allocated an economic interest in CEB's business, gaining access to a share of the proceeds from the Company's sale at exit (see Figure 7).

#### Raw Material Price Premiums

CEB expects to be able to pay fishers prices that are over 30% higher than current local market prices for live, whole crab raw material, as a result of a combination of improved supply chain efficiencies and resulting decreases in spoilage rates of up to 90%, and of higher-margin sales to export markets for finished goods.

#### The Fishing Community Trust

In addition, The Mangue Strategy will invest \$2.5 million to capitalize 10 newly created financial entities called "Fishing Community Trusts" (or FCTs), with one FCT for each RESEX.<sup>18</sup> The FCT would serve as an adjunct entity to newly formed

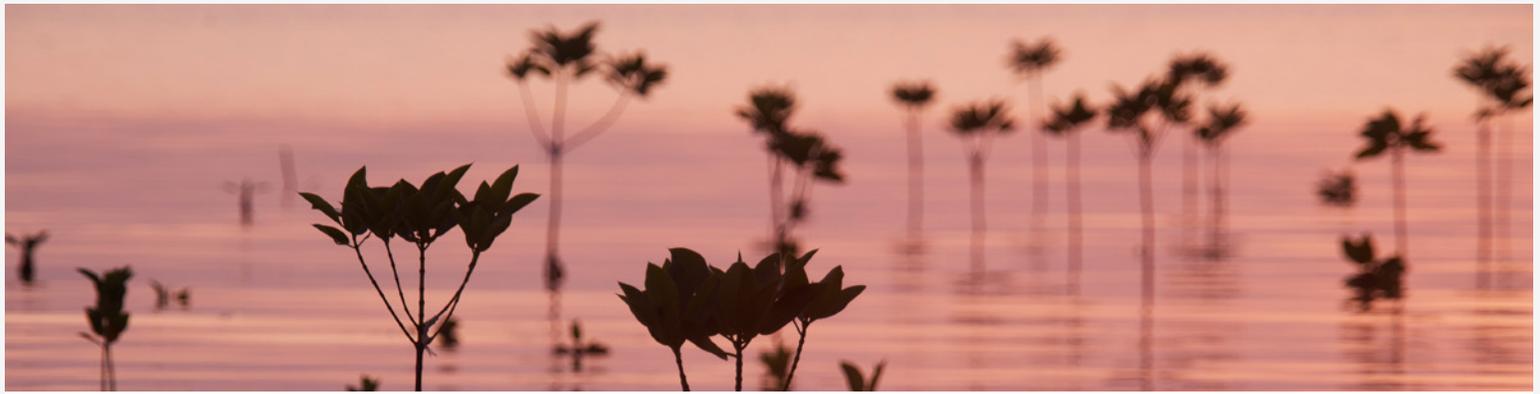
crab fishing associations in each RESEX, which CEB and the management implementation partner will help establish, creating an additional incentive to reward sustainable fishing practices beyond the up-front premium. The Mangue Strategy proposes that the FCT be structured as a community reserve fund or insurance pool, where funds could be drawn down to help participant communities cover revenue shortfalls as a result of inclement weather, changes in tides, or other environmental phenomena that curtail harvest.<sup>19</sup>

Each FCT would be capitalized at the project outset with \$250,000 in grant funding from a combination of philanthropic sources and Brazilian state or federal governments or development agencies, with 25% of funds becoming available each year. The goal of the FCT in years 1 through 4 would be to provide incentives to the communities to participate in Mangue's fishery improvement efforts prior to CEB being able to pay out premiums for raw materials. Given that the FCT would be exhausted by Year 5, The Mangue Strategy would allocate 20% of the proceeds from the sale of CEB to recapitalize the portfolio FCTs in the ninth year of the investment.<sup>20</sup> In the intervening years, the premiums would be used as the primary financial incentive to reward compliance. In this way, the FCT both incentivizes participation from the Strategy's outset with committed funds up front, while also providing a share of longer-term profits generated through the success of the crabbing association-CEB collaboration. This approach avoids the challenge of sharing profits with thousands of crabbers independently, while still providing tangible benefits for participation to them and their communities.

<sup>18</sup> The concept and structure of the FCT is borrowed, in part, from the structures used by Fair Trade in distributing premiums earned on Fair Trade products to producing communities. Visit [annualreport.fairtrade.org/en/](http://annualreport.fairtrade.org/en/) for a description of Fair Trade's successful use of this mechanism.

<sup>19</sup> The allocation and use of FCT funds will be subject to all rules and restrictions pertaining to the use and distribution of grant and government funding both within the local Brazilian context as well as the domiciles from which the funds are sourced.

<sup>20</sup> If exit proceeds were sufficiently large or investors were willing to forgo a greater equity share, these funds could be used to endow a trust fund to pay for community or fishery improvements in perpetuity. This Fishery Management Fund mechanism is explored in the Merluza Strategy Blueprint.



The FCT would have the following governance and membership requirements:

- a. The Fishing Community Trust (FCT) should be established as a public benefit trust, wholly owned and governed by each RESEX crab-fisher association, subject to minimum conditions established through an FCT charter document.
- b. FCT leadership must be elected annually by its members by simple majority in a democratic vote.
- c. FCT's governance would include rotating board members, one representing each of the crabber associations in the ten RESEX regions and selected by the crabbers in that region. Each member would have one vote. The Mangue Strategy would have three voting members selected from among its operating partners.
- d. Fund distribution decisions would be on the basis of a simple majority vote, while proposed modifications to the FCT charter would require a two-thirds supermajority from the board with at least two votes from Mangue Strategy members.
- e. The board would be responsible for determining to what use to put the funds each year, subject to the constraint that they be directed toward communities in full compliance with the Mangue Strategy fishery improvement plans and fall within the usage restrictions of the grant provider.<sup>21</sup>
- f. Member obligations must include agreement to and compliance with the adopted fishery management improvement plan, to be updated and renewed annually.

- g. The FCT will have a vesting period of four years, whereby the association receives an incremental 25% share of the total funds each year, but only after demonstrated compliance with the fishery management improvements. At the end of the project, the FCT would be recapitalized with the proceeds from the 20% equity share in CEB, dependent upon continued compliance throughout the life of the project.

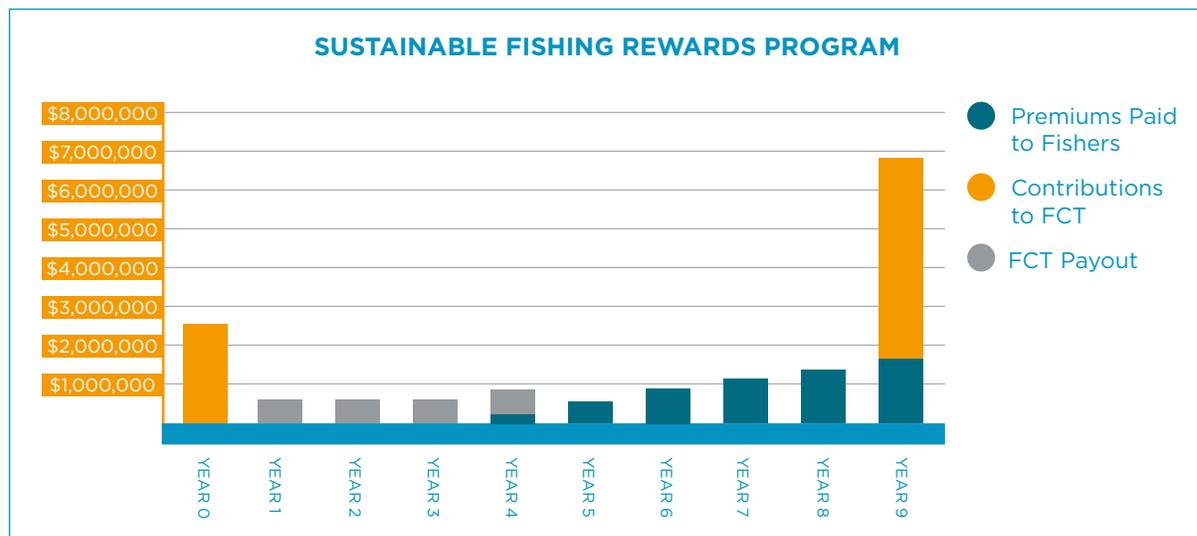
CEB would only source raw material from current members of the FCTs in each fishing association on the basis of individual and community compliance with the fishery management improvements as determined by local community monitoring and annual third-party verification. Prices for specific volumes of landings will be paid directly to fishers so long as their membership in the association and compliance with the terms of the FCT remain intact. Proceeds generated by the FCT's 20% economic interest in CEB's business operations generated at exit would be split among the FCTs in order to recapitalize them.

The Mangue Strategy estimates the current value of the estimated 5,000 mt landed annually across the 10 RESEXs to total approximately \$5.3 million. The Mangue Strategy estimates that sufficient additional economic value can be generated each year across its operating footprint to pay out an average of \$1 million in annual price premiums during the six years following the inception of raw material sourcing in Year 4, reaching \$1.7 million annually by 2024. The value of the FCT equity stake is projected to reach \$5.7 million in future value terms under base case assumptions, with further upside growth potential if the investment period were to be extended.

<sup>21</sup> The FCT would be capitalized initially with grant funds from philanthropic and regional government sources, potentially constraining how the funds are used.

The Mangué Strategy believes that it can generate sufficient additional economic value each year across its operating footprint to pay out an average of \$1 million in annual price premiums during the six years following the start of sourcing operations in 2019, reaching \$1.7 million annually by 2024.

FIGURE 7: Sustainable Fishing Rewards Program (FCT and Premiums)<sup>22</sup>



In addition, the Mangué Strategy proposes securing legal contracts with the leadership of each of the associations stipulating that, in exchange for continued legal status and access to the benefits provided by the crab fisher associations and affiliated FCTs (such as premium prices, CEB equity, and political recognition as legal harvesters), the members must comply with the fishery management improvements.

Any association or individual found to be in breach of the agreement could lose access to these valuable benefits as well as to the SFRP. This use of enforceable covenants and incentives would create a self-policing structure in which the association's leadership would be able to use a range of punitive measures to protect the broader interests of the association against the harmful actions of individual fishers, including revocation of both fishing rights (subject to legal approval) and membership in the

federation. This structure highlights the important interplay between market incentives and fisher compliance in a context in which sanctions on individual fishers by the Mangué Strategy by itself may be legally or politically infeasible.

### Management and Implementation

The Mangué Strategy would seek to establish partnerships with locally active NGOs, preferably with existing knowledge of mangrove crab fisheries in Brazil, to serve as implementation partners. The partnership would incorporate a services agreement offering a fee payment for delivery of specific fishery management activities, including organization of fishers and establishment of the proposed Fisheries Community Trust and Sustainable Fisheries Rewards Program, implementation of catch accounting systems, support for the proposed fisher licensing program, and coordination of the third-party audits required as part of the program.

<sup>22</sup> \$2.5 million up-front contribution vests over four years, and is recapitalized upon exit through a 20% equity share.



#### FISHERIES MANAGEMENT IMPROVEMENTS BUDGET

The Mangue Strategy anticipates implementation of the fishery management improvements across

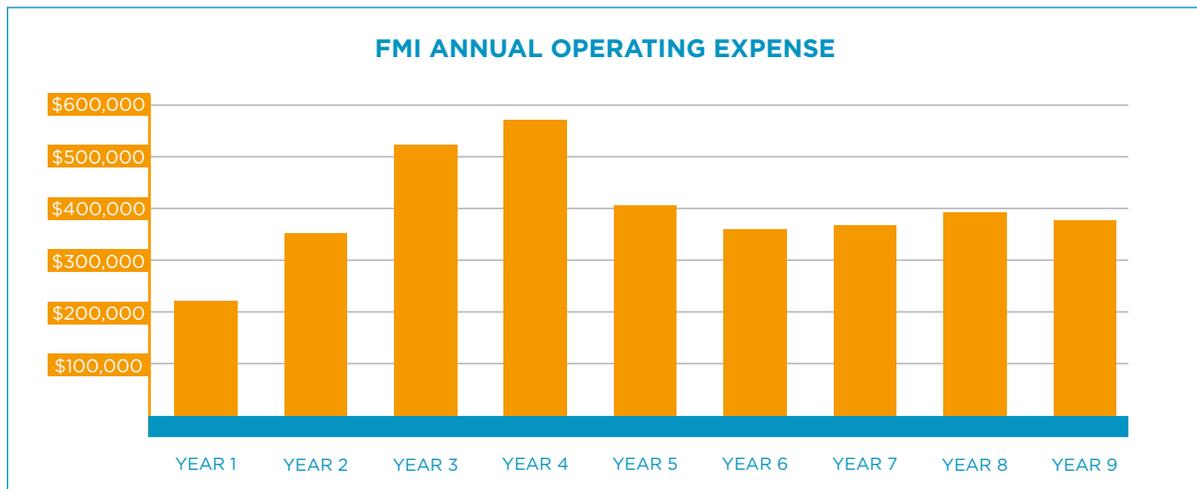
the 10 RESEXs and 98 communities over a nine-year time frame, as shown in Figure 8.

#### TARGETED SOCIAL AND ENVIRONMENTAL IMPACTS

The Mangue Strategy targets several specific medium- and long-term social and environmental outcomes, including (a) maintenance of current stock levels or modest stock increases, (b) increased

income levels for fishers, (c) increased economic resilience for fishers, and (d) protection of the mangrove forest ecosystem from which the crabs are extracted.

FIGURE 8: Fisheries Management Improvements Expenses<sup>23</sup>



<sup>23</sup> "Operating Expenses" excluding expenditures on fixed assets (CAPEX).

<sup>24</sup> "Fishery Management Improvements" including CAPEX.

The table below sets forth the long-term impact return targets for the 98 communities and associated fisheries that TMS would incorporate into its sourcing network.

#### TARGETED IMPACT RETURNS

<b>Protect and Restore Fish Stocks</b>	<ul style="list-style-type: none"> <li>• Preserve current estimated biomass throughout the nine-year investment horizon and beyond</li> <li>• Deliver up to a 10% increase in biomass by Year 7</li> </ul>
<b>Support Fisher Livelihoods</b>	<ul style="list-style-type: none"> <li>• Generate 33% higher revenues relative to non-CEB market channels for participating fishers, or an estimated \$1.7 million in additional annual value by 2024<sup>25</sup></li> <li>• Increase community resilience through 20% profit-sharing interest in the CEB business, equivalent to \$5.4 million over the nine year project and \$4,320 per fisher in CEB supplier network<sup>26</sup></li> <li>• Empower fishers through registration and licensing, formal government recognition and associated social benefits, organization and formalization of the sector, and access to formal banking channels.</li> </ul>
<b>Feed More People</b>	<ul style="list-style-type: none"> <li>• Eliminate 90% of post-harvest losses</li> <li>• Target the delivery of an additional 2.4 million sustainably produced meals to local, regional, and global seafood markets</li> </ul>
<b>Co-Benefits</b>	<ul style="list-style-type: none"> <li>• Help protect up to 300,000 hectares of mangrove forest habitats from conversion to aquaculture or other land-uses by improving the economic viability of standing mangrove forests</li> </ul>

<sup>25</sup> Equivalent to \$1.15 million in real (2015) terms.

<sup>26</sup> Equivalent to \$3.66 million and \$2,908 per fisher in real (2015) terms. Assuming fishers-incorporated is held constant.



## THE MANGUE COMMERCIAL INVESTMENT THESIS

### STEP 3: LAUNCH AND GROW CEB

Step 3 of the Mangu Strategy's impact investment thesis proposes to fund an investment into a new processor and exporter of mangrove crab products, CEB. This company, launched alongside Steps 1 and 2, will create a commercial platform capable of adding value to the mangrove crab products and generating a 12% financial return to investors. The Mangu Strategy proposes an investment of \$11.5 million to establish the supply chain infrastructure necessary to source sustainably-caught mangrove crab from the Mangu Strategy's portfolio communities, add value to the product, and ultimately sell it into higher-value markets.

### SMALL-SCALE FISHERIES SEAFOOD SUPPLY CHAIN



### VALUE PROPOSITION

In accordance with the other small-scale blueprints, the Mangu Strategy capitalizes on the opportunity to create additional value from products in order to reward fishers for sustainable practices while generating compelling financial returns for investors. Mangu's commercial investment thesis centers on a) the dramatic reduction of spoilage, reducing product volumes lost between first sale and retail by up to 90% (from 50% spoilage down to 5%); and b) the development of an export and high-value domestic-market oriented supply chain for artisanal seafood that can achieve significantly higher prices than the current local market.



The Mangue Strategy estimates the current value of the 5,000 mt of catch from the 10 regions from which it plans to source to be approximately \$5.3 million, of which 65% would be included in the Mangue Strategy during the first nine years. Improvements to the quality of the current landings volumes could generate up to 33% more value

for the products, implying an aggregate potential gain in value of approximately \$1.7 million annually across the 10 RESEX regions by Year 9. This value creation is independent of any value that might be generated through stock restoration and higher landings volumes.

#### COMPANY DESCRIPTION AND MISSION ALIGNMENT

The Mangue Strategy would invest in the launch of a newly created company based in the Brazilian state of Pará established as the first processing and export business in the country to exclusively deliver sustainably-sourced mangrove crab products, including both crabmeat and live fresh crabs to domestic and international customers. CEB would require that its suppliers employ sustainable fishing

practices and would offer financial incentives to engage and reward its suppliers. CEB would serve both customers throughout Brazil, particularly in the northeast where there is already a tradition of mangrove crab consumption and in other large Brazilian cities with high levels of tourism, as well as in Europe, North America, and Asia Pacific.

#### LAUNCH AND GROWTH STRATEGY

CEB would be a greenfield business venture with no operating history. The founders of CEB would ideally have extensive experience setting up and operating similar sustainable seafood processing companies in other developing countries, and would support a gradual buildup of CEB's operations while working to lay the groundwork for fishery management improvements with local implementation partners. The company would obtain all necessary permits to build and operate the processing facility in the first few years and would expect to source raw materials from the Mangue Strategy portfolio communities and generate initial revenue in Year 4. If successful, the business is projected to

achieve a 45% gross margin and 24% EBITDA (earnings before interest, tax, depreciation, and amortization) margin by Year 9 in the base case, with total revenue and EBITDA of \$15.5 million and \$3.8 million, respectively.

#### Sourcing and Handling

CEB would develop a sourcing portfolio covering 65% of the current fishery in combination with efficient sourcing logistics aimed at purchasing 3,200 mt of raw material by Year 9. The sourcing portfolio would seek to incorporate approximately 98 communities within the 10 RESEX zones in Pará where mangrove crab is currently being harvested.

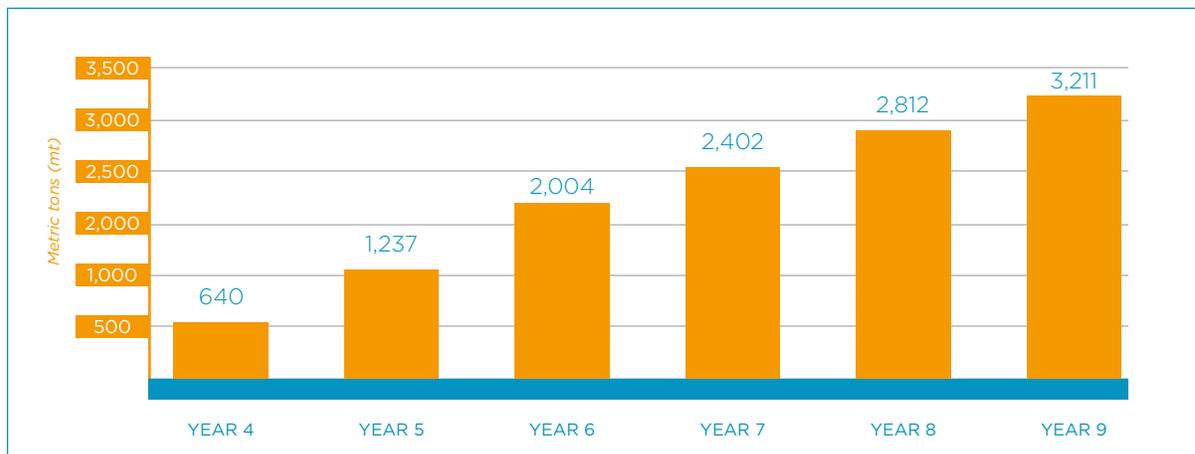


Photo credit: CMBlo/APA Delta do Parnaíba

Total volume of raw materials sourced by CEB is expected to grow from 640 mt in Year 4, its first revenue-generating year, to 3,200 mt by Year 9 (see Figure 9).

Investment proceeds would be used to provide fishers and fishing communities with crab transport boxes that allow crabs to be transported and stored in a chilled and aqueous environment so as to preserve freshness and reduce post-harvest mortality and spoilage.

FIGURE 9: Total Estimated Sourced Volume of Raw Materials (mt)



### Cold Chain and Logistics

To support the sourcing network, the Mangue Strategy would fund CEB with \$500,000 to construct a cold chain “backbone” to support all 10 sustainable fishing regions across the Pará RESEX zones, including the construction of 10 new buying stations, one in each RESEX. The buying stations would serve both as collection and consolidation points for raw materials to be transported to CEB’s processing facility, as well as centers for outreach and commercial interaction with fishery stakeholders. In the buying stations, seafood raw materials would be procured from FCT members, inspected against quality parameters and sustainability requirements, labeled with identity tags that serve as the core of the traceability program, and prepared for loading and transport to the processing facility. The buying stations would be equipped with

a crab storage room with air conditioning and regular hydration so that crabs can be kept in good condition for a maximum of 30 hours before loading and shipping to the processing plant.

CEB would also acquire 10 small collection trucks (one for each buying station) that would transport the raw materials from the buying stations to the processing plant. These trucks would be insulated and chilled to an inside temperature of 20 Celsius (69 Fahrenheit) to keep the crabs in good condition.

### Processing

The Mangue Strategy proposes investing \$6.7 million in the construction of a new, modern, and mechanized product manufacturing facility with a capacity of 4,000 mt of crab raw materials. Currently, all mangrove crab processing in Brazil, such as removing crabmeat from fresh crabs, is done by hand, and no machinery exists to

process mangrove crab. However, machinery to process other crab species, such as swimming crab, does exist and is being used widely in other parts of the world. Chile, Canada, and the U.S. are the countries with the most experience in crab processing technology, so it is CEB's intention to contract specialists in these countries to create machinery specifically for use in processing the mangrove crab.

The processing facilities would be constructed to meet international food hygiene and safety standards to avoid contamination and extend product life, utilize quality packing and packaging materials to extend product life and maintain quality, and pay factory workers at least the minimum official wage but with bonuses for achieving higher processing yields.<sup>27</sup> No mangrove crab processors currently operating in Pará are allowed to export processed crab products outside

the state. This is due to historical noncompliance with national food safety laws, which has led to food safety problems in the market in the past. The CEB processing plant would be in compliance with international food safety and hygiene standards and intends to receive all the necessary permits and approvals to export high-quality crab products to Brazilian cities outside Pará and internationally.

The facility would also be equipped with advanced IT and data processing systems to support traceability throughout its various operations. The facility, with a total capacity of 4,000 mt, would allow CEB to process up 1,056 mt of crab products from the raw materials sourced by 2024 and allow for further growth in the following years. The final products would be composed of approximately 244 mt of raw frozen whole crab, 244 mt of cooked frozen whole crab, and 568 mt of frozen cooked crabmeat products, as shown in Figure 10.

FIGURE 10: Crab Product Forms and Markets

PRODUCT FORM	PRODUCT TYPES	DETAILS/REMARKS
Whole Crab	<ul style="list-style-type: none"> <li>• Raw Frozen</li> <li>• Cooked Frozen</li> </ul>	<ul style="list-style-type: none"> <li>• Product mainly for Asian markets</li> <li>• Product mainly for Asian markets</li> </ul>
Crabmeat	<ul style="list-style-type: none"> <li>• Cooked Frozen Claw Meat</li> <li>• Cooked Frozen Leg Meat</li> <li>• Cooked Frozen Body Meat</li> </ul>	<ul style="list-style-type: none"> <li>• Potentially also for canned products</li> <li>• Potentially also for canned products</li> <li>• Potentially also for canned products</li> </ul>

### Distribution

CEB would work to build market access and distribution to support total volume of finished crab products sold of 1,056 mt by Year 9. Its marketing strategy would focus on the development of higher-value products such as cooked claw meat, and the cultivation of CEB brands with buyer recognition for sustainability, quality, and food safety. CEB would seek to secure client accounts in Europe, North America, and Asia Pacific.

From a marketing perspective, CEB would leverage and tap into its proposed management team's existing marketing network and experience in

the international seafood markets. CEB would invest considerable time and capital to develop its brand identity in the international markets. CEB's marketing strategy would focus on linking major buyers and seafood businesses to its artisanal sourcing networks in Brazil. CEB would attempt to create deep linkages between buyers and suppliers such that the buyers become invested in CEB's sustainability standards across its sourcing networks. Customers would be provided with a range of promotional materials to position the products at the point of final sale, increasing customer awareness of sustainability values and objectives and creating a stronger customer constituency over time.

<sup>27</sup> Existing processing facilities pay their workers a monthly salary of RS 480 (\$163), inclusive of all employer taxes, insurance, pension, and other social benefits.

FIGURE 11: Primary Crab Export Markets

MARKET TYPE	EXPORT TARGET GEOGRAPHIES		
	EUROPE	NORTH AMERICA	ASIA PACIFIC
Sustainably harvested crab	France U.K. Netherlands Belgium	U.S. Canada	Hong Kong Singapore
Any crab	Spain Italy		China Korea

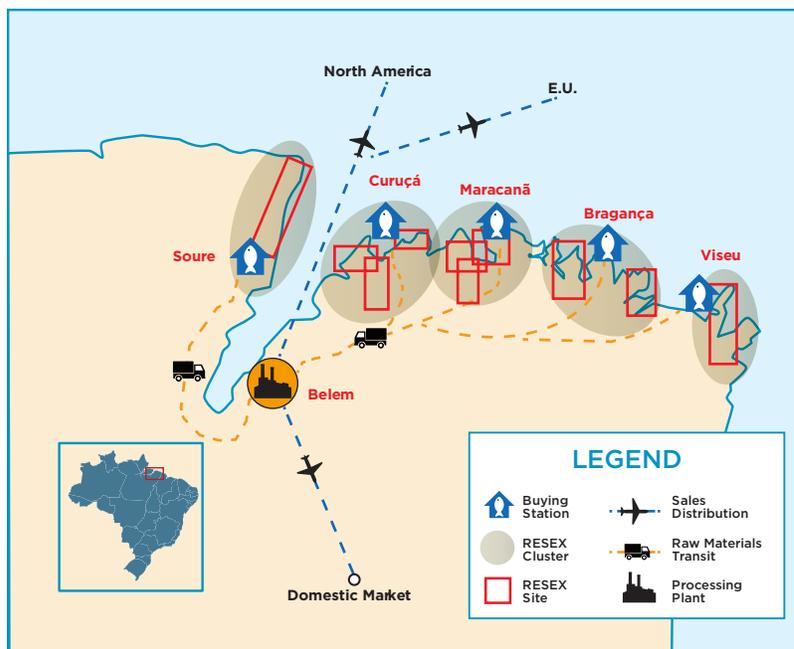
CEB’s crab products would be marketed both internationally and domestically in both retail and food service channels. CEB would segment its target international markets into two groups: one with demand for sustainably harvested crab, and one with demand for crab of any kind (see Figure 11).

For domestic markets, the sales and distribution strategy would focus on retail and food service markets that are interested in good quality, reliability, and consistent supply. The marketing strategy would primarily focus on the classical and traditional crab

markets in the northeast of Brazil, with the cities of Salvador da Bahia, Natal, Recife, Fortaleza, and Belem as the main centers and key target markets.

CEB would also work toward the development of Fair Trade or other comparable certifications for small-scale fishers in the CEB sourcing network. Appropriate certification would further support, frame, and promote the value of seafood products from small-scale fisheries on world markets, notably in North America and Europe.

Regional Extraction Clusters, Sourcing Hubs, and Route-to-Market Strategy for the Mangue Strategy in Pará



### MANAGEMENT TEAM AND TRACK RECORD

CEB would be founded by seasoned seafood company executives bringing invaluable operational experience in the sustainable seafood sector to the Mangue Strategy. The ideal founders would have extensive experience in the marine and seafood sectors, with a wide range of technical and commercial skillsets and relationships.

CEB would be headquartered in the Brazilian state of Pará. It would be led by a local manager who would be responsible for running the contemplated processing facility to be based in that state. By 2024, CEB would expect to employ nearly 160 people, predominantly local community members, for its buying and supply chain logistics and crab processing facility.

### DOMESTIC MARKET TRENDS

The Mangue Strategy expects CEB to benefit from favorable trends in Brazil's current seafood market. While the value of the Brazilian Real has fallen considerably at the time of this writing, Brazil still boasts a large middle class that is already driving growth in the domestic seafood market. Between 2003 and 2009, Brazil's middle class grew by an estimated 35 million people.<sup>28</sup> As is often the case, this demographic shift entails a change in diet as middle class consumers move away from grains and toward

more meat and protein. Furthermore, the Brazilian government has declared an aim to boost domestic seafood consumption in the coming years to a target of 14 kilograms per capita. While per capita seafood consumption across Brazil remains lower than the world average (9 kilos per capita versus 17 kilos per capita in 2011), this is up from only 6 kilos per capita in Brazil in 2006.<sup>29</sup> The clear trend here has been an ongoing increase in seafood demand driven by a confluence of demographic and government factors.

### COMPETITION

The Mangue Strategy foresees domestic competition from other local mangrove crab

processors, as well as international competition from producers of other crab species.

### DOMESTIC COMPETITION

There is currently no industrial-scale processing plant for mangrove crab in Brazil. The existing small-scale family producers can sell products in their home states, but cannot legally commercialize their products either in other states or internationally due to food safety requirements. The current processing companies rely on local labor to pick the crabmeat manually, with no companies having made investments into more efficient means of processing crabmeat with specialized machinery and technologies. There

are roughly five more government-sponsored micro-facilities expected to become operational sometime in the short to medium term, but the Mangue Strategy does not expect them to have either modern machinery for processing or the ability to export products outside their home state. All existing crab manufacturing and commercial companies involved in Brazil focus their business on the local markets, predominantly those in the northeast of Brazil, where there is existing consumer demand for crab and crabmeat products.

<sup>28 & 29</sup> E. Tallaksen and, T. Seaman, "Intrafish Seafood Report: Brazil," Intrafish Media AS, Norway, 2013.

FIGURE 12: International Competition

SPECIES GROUP	GENUS	MAIN PRODUCER COUNTRIES	PREDOMINANT TYPE OF PRODUCTS		
			CRABMEAT	LEGS & CLAWS	WHOLE CRAB
<b>Snow Crabs</b> <b>King Crabs</b>	Chionoecetes Lithodidea	China, Japan, Russia, Norway, U.S., Chile	●	●	
<b>Mud Crabs</b>	Scylla	SE Asia, China, India			●
<b>Brown Crabs</b>	Cancer	Europe, North America, Japan	●		●
<b>Swimming Crabs</b>	Portunus	SE Asia, China, India	●		●
<b>Mangrove Crabs</b>	Ucides	Brazil	●		●

**INTERNATIONAL COMPETITION**

In terms of international markets for crab and crab-meat products, the Mangue Strategy will compete with producer countries and companies that are active in crab processing and trade of similar products. Figure 12 summarizes this international competition, with the most directly competitive species, producing countries, and product types highlighted in gold.

The Mangue Strategy is most likely to compete with swimming crabs in the crabmeat market, and with swimming crabs and mud crabs in the whole

crab market, which are both very similar to mangrove crab in taste and texture. Snow/king crab and brown crab generally grow in colder waters and have slightly different physical characteristics. (See images in Figure 13.)

As such, The Mangue Strategy expects that South-east Asia, China, and India would be its primary international competitors. To compete effectively with these low-cost countries, the Mangue Strategy recognizes the need to run a highly mechanized and streamlined processing operation.

FIGURE 13: Competitor Crab Species

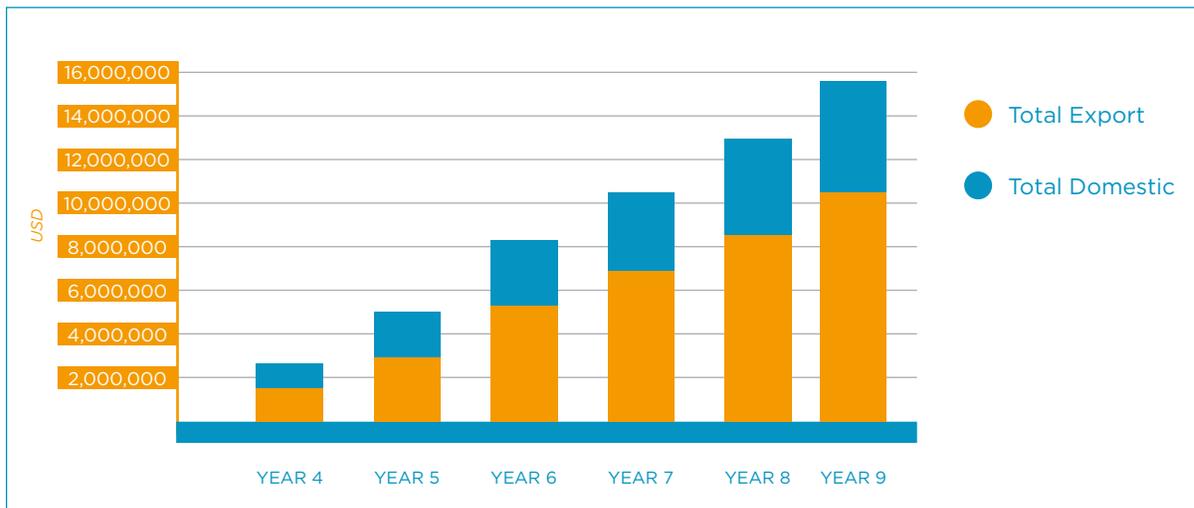


## THE MANGUE STRATEGY FINANCIAL ASSUMPTIONS AND DRIVERS

### REVENUE MODEL

The Mangué Strategy revenue, generated through CEB product sales, is projected to grow from \$2.5 million in its first year of sales in Year 4 to \$15.5 million by Year 9 (see Figure 14). International sales are projected to generate nearly \$10.6 million, or 68% of total revenue, with domestic sales comprising the remaining \$4.9 million (see Figure 15).

FIGURE 14: CEB Sales by Destination (USD)



The crabmeat products, composed of cooked leg, claw, and body meat, will constitute a majority of the revenue for both the international and the domestic segments. These higher-value products

are expected to account for up to \$13.2 million, or 85%, of the company's total revenue by 2024, with cooked and raw whole crab comprising the remainder (see Figure 16).

FIGURE 15: CEB Domestic Sales by Product Type (USD)

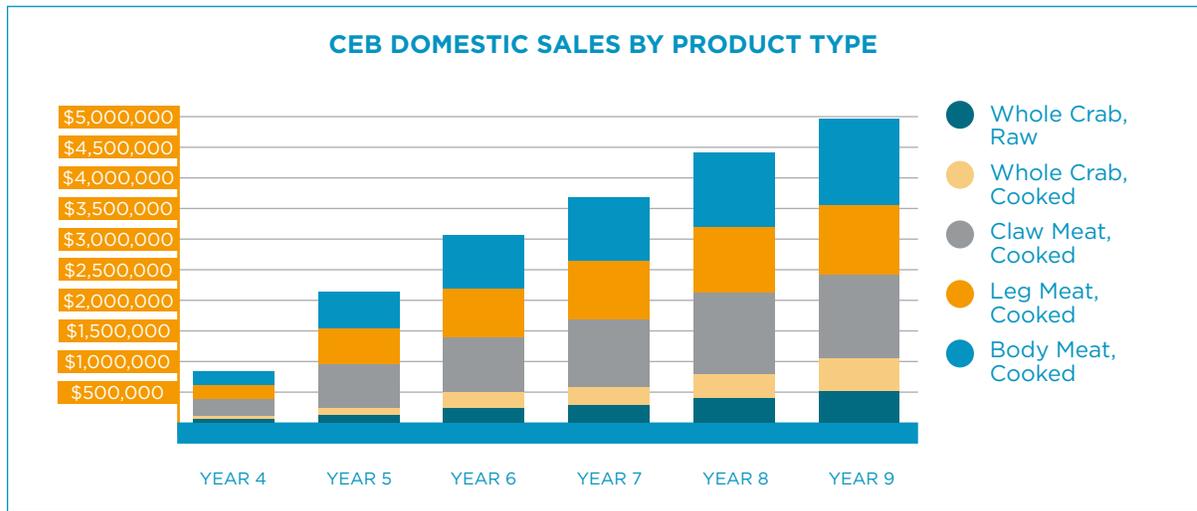
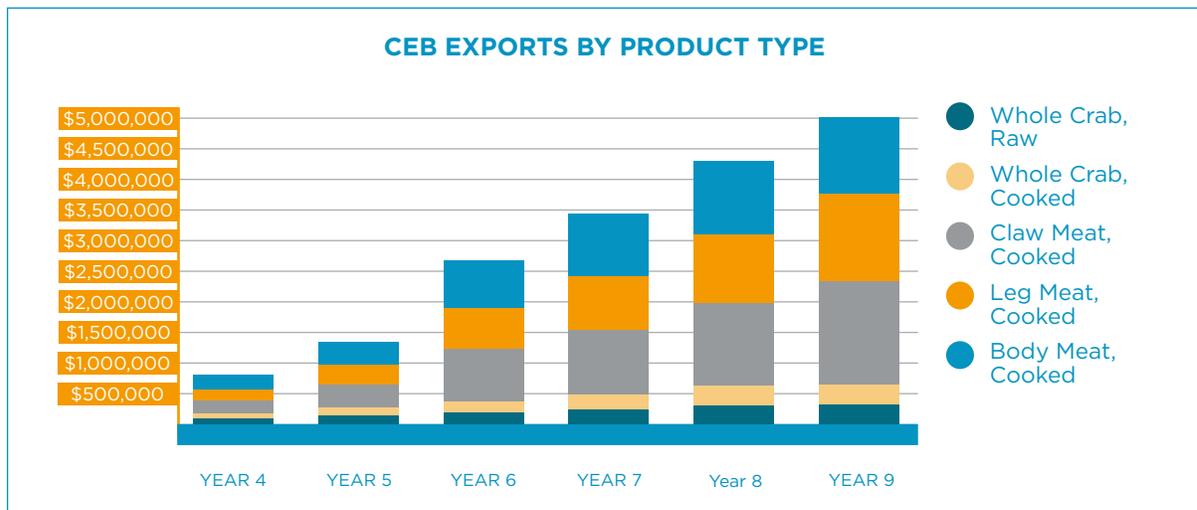


FIGURE 16: CEB Exports by Product Type (USD)



The most important revenue drivers for TMS are therefore the amount of raw material it can source to produce crabmeat (which in turn is dependent

on the processing plant's being able to run smoothly) and the export price it can receive for its crabmeat products.

## PRODUCT PRICING

In our analysis, we have assumed an annual 4.5% price increase in U.S. Dollar terms on products to be exported internationally as well as on those destined for the domestic market. As the international demand market for mangrove crab is currently untested, CEB has not assumed any premium in its export price even though it would

be marketed as a sustainably harvested product. To be able to compete with swimming and mud crabs, the two closest competitive products, the Strategy is conservatively assuming that CEB's export price will be on the lower end of the export price range of swimming crabs from the Southeast Asian region (see Figure 17).

FIGURE 17: International Crab Price Reference Points

PRODUCT TYPE	PRODUCT TYPES	CRAB SPECIES/ ORIGIN	PRICE BENCHMARK FOB (\$/KG NET)	CEB PROJECTED PRICE (\$/KG NET)
<b>Whole Crab</b>	Raw Frozen	Swimming Crab/ SE Asia	\$3.5-5.50	\$3.65
	Cooked Frozen	Swimming Crab/ SE Asia	\$3.5-5.50	\$3.70
<b>Crabmeat</b>	Cooked Frozen Claw Meat	Swimming Crab/ SE Asia	\$22.0-26.0	\$21.50
	Cooked Frozen Leg Meat	Swimming Crab/ SE Asia	\$15.0-22.00	\$16.15
	Cooked Frozen Body Meat	Swimming Crab/ SE Asia	\$15.0-22.00	\$16.15

(FOB = Free on Board price)

CEB's domestic prices are also estimated to be similar to current local market prices as set by the existing processors (see Figure 18).

FIGURE 18: Domestic Crab Price Reference Points

PRODUCT TYPE	PRODUCT TYPES	CRAB SPECIES/ ORIGIN	PRICE BENCHMARK FOB (\$/KG NET)	CEB PROJECTED PRICE (\$/KG NET)
<b>Whole Crab</b>	Raw Frozen	Mangrove Crab/ Brazil	\$2.00-2.50	\$2.85
	Cooked Frozen	Mangrove Crab/ Brazil	\$2.00-2.50	\$2.90
<b>Crabmeat</b>	Cooked Frozen Claw Meat	Mangrove Crab/ Brazil	\$16.60	\$14.30
	Cooked Frozen Leg Meat	Mangrove Crab/ Brazil	\$13.30	\$11.70
	Cooked Frozen Body Meat	Mangrove Crab/ Brazil	\$13.30	\$11.70

(ExWorks = price of product ex-works or ex-factory in Brazil)

## COST STRUCTURE

CEB's cost of goods sold (COGS) constitute 59% of the overall operational costs of the Mangu Strategy

by Year 9 (see Figure 19), and of COGS, crab raw materials comprise 80% (see Figure 20).

FIGURE 19: CEB Projected Operating Cost Allocation

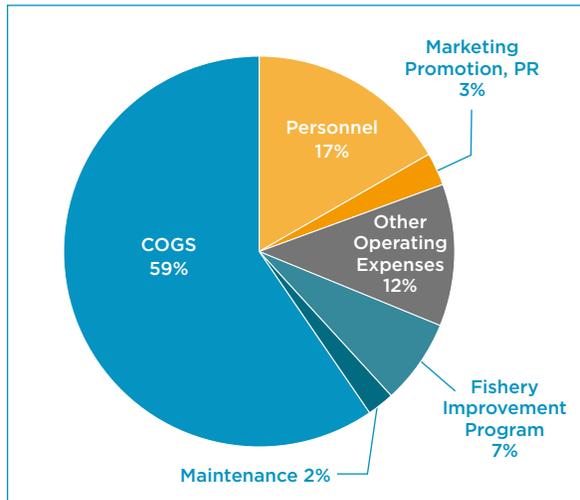
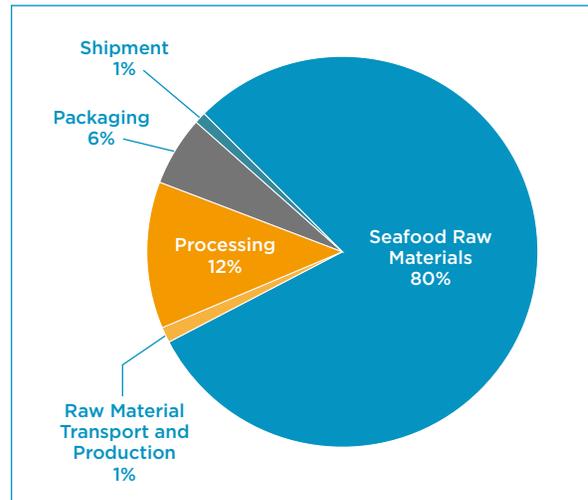


FIGURE 20: CEB Projected Cost of Goods Sold Breakout

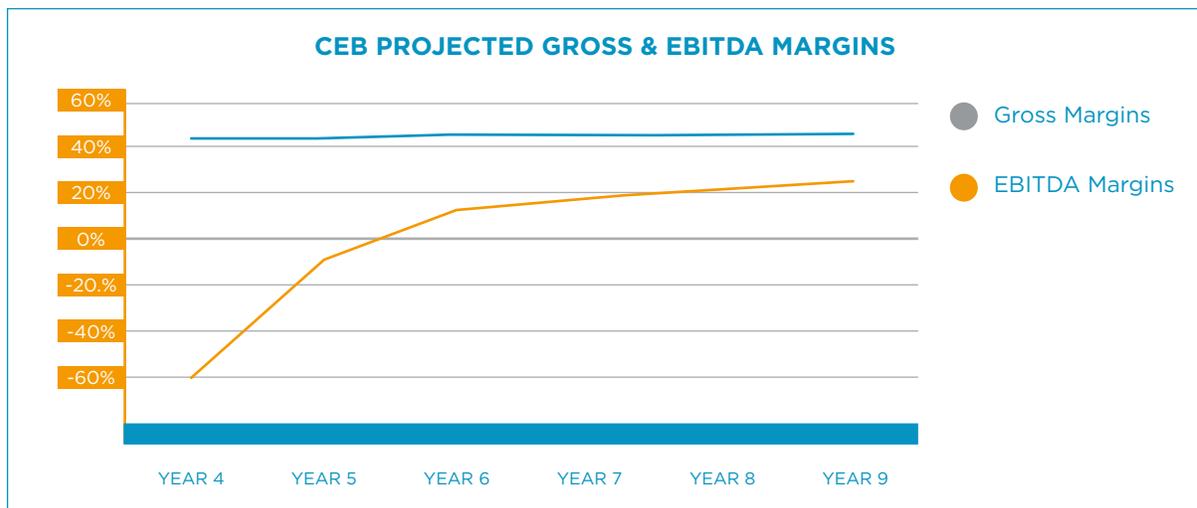


## GROSS PROFIT AND EBITDA MARGINS

CEB is projected to generate a gross profit margin of 45.4% by Year 9, and is expected to become profitable on an EBITDA (earnings before interest, tax, depreciation & amortization) basis by Year 6,

the third year after initial sales, with a targeted EBITDA margin of above 12.1% in that year (see Figure 21). EBITDA margins would ultimately reach 25% by Year 9.

FIGURE 21: CEB Projected Gross and EBITDA Margins





## TRANSACTION STRUCTURE

### SOURCES AND USES OF FUNDS

The Manguê Strategy proposes a \$15.0 million initial greenfield investment, including a Series A investment of \$8.5 million in sponsor equity, \$4 million in Program Related Investment (PRI), and \$2.5 million in grants. In addition to the capital investment, the project will eventually seek credit guarantees from development finance institutions with a strategic focus on the Amazon region or coastal resources, such as USAID’s Development Credit Authority, Inter-American Development Bank, or OPIC. These guarantee agreements encourage private lenders to extend financing to underserved borrowers in new sectors and regions. The table below summarizes the proposed uses of funds and the capital structure of the deal:

#### USES OF INVESTMENT PROCEEDS

Cash	\$4,980,000
Buying Stations - CAPEX	500,000
Processing Facility - CAPEX	5,800,000
Fisher Community Trust	2,500,000
FMI Implementation	1,000,000
Financing Fees	40,000
Legal Fees	150,000
Travel Fees and Expenses	30,000
<b>Total</b>	<b>\$15,000,000</b>

#### SOURCES OF INVESTMENT PROCEEDS

Foundation Grant	\$1,250,000
Government Grant	1,250,000
Revolver (BNDES - Subsidized)	-
Foundation PRI	4,000,000
Sponsor Equity	8,500,000
<b>Total</b>	<b>\$15,000,000</b>

The Manguê Strategy's capital investments are split between (a) fishery improvements and community development activities and (b) the commercial infrastructure and operations.

The commercial investment would fund the project and company development, which in the first 18 months will include the preconstruction modeling, planning, licensing, and design work, followed by construction of the central processing facility and 10 regional buying stations. Due to the long lead-times required for establishing new businesses and developing projects in Brazil, particularly where foreign investment is involved, the anticipated facility commercial operation date (COD) is not until Year 2. However, fishery improvement development and implementation will kick off immediately, and be funded in parallel with the commercial activities, so that the social infrastructure is sufficiently organized by the time production begins.

Following COD, the project would seek to secure a revolving credit facility to finance the significant and highly variable working capital needs of a business of this nature, but this would be added to the capital structure in Year 3 (ideally as part of a loan guarantee package).

While the Manguê Strategy carries substantial development risk during the first 18 months, the favorable impact profile of this business, together with a proven, viable route-to-market strategy and seasoned management team, requires an impact oriented equity investor with long-time horizons (10 to 12 years) and a willingness to take on outsized risk if a commercial return can be attained, together with a significant and scalable environmental and social impact. The share of sponsor equity is assumed to be about 57% of the total capital contributed.

It is expected that access to commercial lines of credit are not realistic until the business is fully operational, and even then will require strong credit guarantees until the business is able to establish a

five-year track record and achieve a stable credit profile. However, assuming that credit enhancement is achieved, a revolving credit facility of \$1 million should be secured to ensure coverage of working capital requirements, which will be especially important during the early years. BNDES, the Brazilian Development Bank, offers subsidized credit facilities, at a discount of up to 500 basis points (bps) to the SELIC rate targeted by the Bank of Brazil (analogous to the Fed Funds Rate in the U.S., currently at approximately 14.0%).

Though no commercial debt will be sought in the development of the business, there is an important opportunity to leverage Program Related Investment as a source of low-cost capital focused purely on social and environmental impact. Specifically, this \$4 million tranche would be used to pay for the fishery management improvements and social engagement activities, which by themselves are not a source of financial return. This is critical during the development phase, as equity would be cost prohibitive for such early stage noncommercial investments, yet this is a critical step in ensuring the long-term impact returns sought by the Manguê Strategy. By serving as low-cost debt with a patient time horizon, PRI would enable the project to develop its impact-oriented activities and pay back the PRI loan, with interest, out of the commercial earnings once CEB is fully running. The PRI investment would constitute approximately 30% of the investment capital, and while terms will depend on the funder and specific deal structure, the current model assumes the entire principal to be repaid at the end of a ten-year term, with an annual interest rate of 2.5%.

Because CEB will not be sufficiently profitable to capitalize the FCT with its own earnings until well into the project, the Manguê Strategy would initially capitalize the FCT with \$2.5 million in grant funds. Grant funds are ideally suited for this purpose given that the FCT would be used to incentivize and promote primarily conservation rather than commercial outcomes.

## OWNERSHIP STRUCTURE AND GOVERNANCE

Under Brazilian law, the most efficient structure for private equity foreign investments is to establish a Brazilian-domiciled investment shell company under the “limitada” structure, which would then make investments into local activities. The sponsor equity under the Mangue Strategy would own 65% of the equity and control four of six board seats, with two seats to management, which will own 15% of the equity. The Fishing Community Trust would be allocated 20% of the equity and would hold one board-observer seat, which would rotate every two years among leaders of that entity.

CEB would also manage the fisheries management activities, and would engage an advisory committee made up of academic experts, industry leaders, policy experts, crabbers, and key buyers. The advisory committee would exercise no formal governance over the commercial business, but would provide a diversity of stakeholder views to the proposed fishery management activities, lending credibility to the process and ensuring effective integrated resource management.

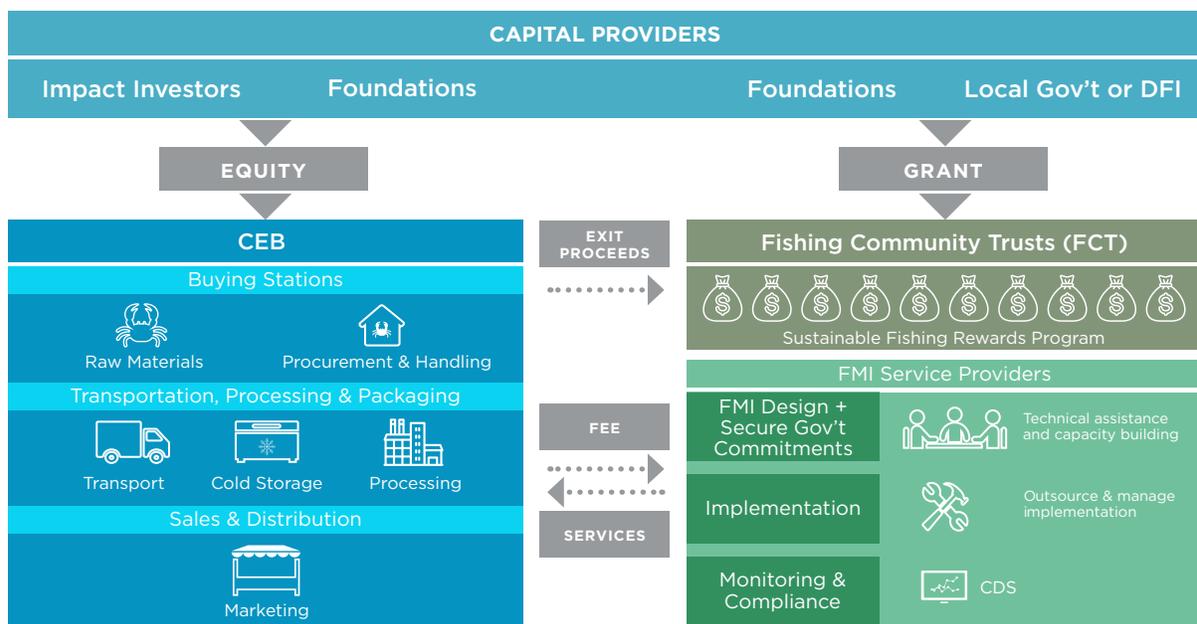




Photo credit: Agência Pará

### SUMMARY OF EXIT AND RETURNS

To be conservative, CEB is assumed to be sold at a 6x multiple of EBITDA to a strategic buyer in Year 9. CEB would provide an attractive opportunity to strategic buyers to lock in additional supply of high-quality crab meat, particularly as demand for responsibly and sustainably sourced seafood increases.

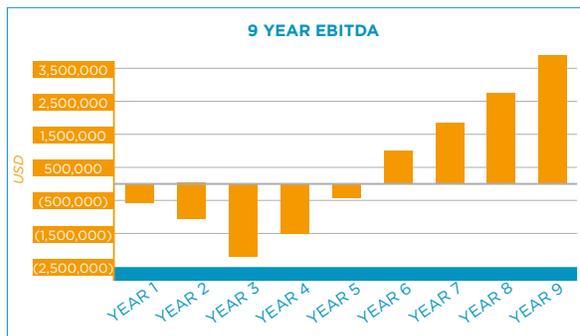
The following table shows a summary of the most relevant financial, social, and environmental impact metrics of Project Manguê:

#### SUMMARY OF BASE CASE FINANCIAL RETURNS

Total Sponsor Equity Investment	\$8,500,000
Time Horizon (years)	9.0
Total Leverage Level	26.7%
Equity IRR	12.3%
9-Year EBITDA CAGR	26.0%

#### SUMMARY OF BASE CASE IMPACT RETURNS

Total Marketable Landings Increase (MT)	5,538
Total Avoided Bycatch	N/A
Total Habitat Protected (hectares)	195,294
Total Income Increase (%)	33.2%
Total Income Increase to Fishers - 9 yrs	\$4,394,889
Contributions to Fisher Community Trust	\$2,500,000
Total Fishers Incorporated	1,260
Total Extractive Reserves (RESEX) Engaged	10
Total Communities Engaged	98
Spoilage Reduction (whole fishery)	58.5%
Additional Meals-to-Market (run-rate meals/yr)	2,376,563



## SENSITIVITY ANALYSIS

Several key inputs have a particularly pronounced effect on the financial return of the project. As such, the model has been forecasted under multiple scenarios, flexing the following key variables:

**Annual Changes in Sales Prices:** The cash flows of CEB are highly sensitive to the changes in sales price of the finished goods, and as these prices change over time, the IRR is impacted markedly. The base case scenario assumes 4.5% growth in export market prices, and 4.5% price inflation in domestic markets in U.S. Dollar terms, and the corresponding levered IRR is 12.3%. The management case assumes zero inflation, leaving the project with a levered IRR of 2.3%. In the downside case, prices deflate 1% annually upon the start of product sales, yielding a -4.7 % IRR.

**Cost of Raw Materials:** is to be expected in any processing and distribution business, changes in cost of raw materials have a significant impact on revenues and returns. The raw materials costs

in the model are based on current prices and thorough diligence on the costs of crabmeat harvest in Brazil. The base case assumes 4.5% raw materials cost inflation. In the management case, raw material prices remain constant, which brings the IRR up to 22.1%. In the downside case, however, assumed 5.5% cost inflation drives the IRR down to 8.5%.

**Capex Investments:** Because of the structure of the strategy and the upfront costs associated with launching CEB and the associated processing facility asset, Capex investments constitute a significant portion of the costs of this strategy. Whether these costs are higher or lower than expected naturally affects the IRR. In the base case, a total of \$7.4 million in expenditures is assumed. In the management case, Capex is assumed to be 13% lower, at \$6.5 million, which increases IRR by 1.6% to 13.9%. In the downside case, Capex investment costs are 8.7% above management case projections at \$8.1 million, decreasing levered IRR to 11.1%.

BASE CASE LEVERED IRR		12.3%			
SENSITIVITY ANALYSIS	SCENARIOS			IRR IMPACT	
	Base	Downside	Management	Downside	Management
Annual Changes in Sales Price	4.5%	(1.0)%	0.0%	(4.7)%	2.3%
Raw Material Cost Inflation	4.5%	5.5%	0.0%	8.5%	22.1%
Capital Expenditures (million USD)	\$7.4m	\$8.1m	\$6.5m	11.1%	13.9%

The model has been forecasted under multiple scenarios, flexing the following key variables: Annual Changes in Sales Prices, Cost of Raw Materials, and Capex Investments.

## KEY RISKS AND MITIGANTS

The Manguê Strategy presents a range of potential risks that require mitigation or incorporation into the investment and valuation analysis, as follows:

RISK	DESCRIPTION	MITIGANTS
<b>Key Risks Impacting Fishery Management Improvements</b>		
Reliance on securing government commitments for fishery management improvement success	Prior to investing in commercial operations, the Manguê Strategy would need to secure specific commitments from Brazilian fisheries authorities to (a) establish a system of fisher licensing and registration, (b) increase enforcement resources to reduce illegal fishing, (c) create a cap on total allowable harvest, and (d) prohibit the sale of illegally harvested crab.	The recent disbanding of the Ministry of Fisheries is widely seen as positive step for improving the regulation of the sector. The Strategy assumes that through a combination of this renewed focus on improving fishery management in the country, combined with deliberate efforts from local NGOs and the community to advocate for the project, it will be possible to secure these commitments from the government. If this is not possible, the Strategy may need to be attempted elsewhere.
Challenge in identifying and working with the local fishery management improvement partner	It would be CEB's goal to partner with a trustworthy NGO based in Pará that would act as the local fishery management improvement implementation partner, but this local partner has yet to be identified.	CEB's commercial operations would not begin until Year 4, affording ample time for the Company to identify the partner, establish relationships with fishing communities, and begin incorporating them into CEB's sourcing portfolio.
Reliance on fishery management improvement partners	CEB cannot control the fisheries management implementation process, and partners could fail to execute on implementation.	A variety of potential fishery management improvement implementation partners currently operate in the region, allowing the Manguê Strategy to choose the most closely aligned and effective one from among this network.
Crab stock declines, despite efforts to utilize sustainable practices and maintain healthy levels	Community fishery management improvements may fail to protect the stock, or the stocks may be under more pressure than initially accounted for.	The Manguê Strategy will look to other domestic crab fisheries in order to diversify against biological risk, and will work to secure government commitments and work with local and international fisheries experts to gather and employ best-in-class science to inform fishery management efforts.

RISK	DESCRIPTION	MITIGANTS
<b>Key Risks Affecting Raw Material Sourcing Volume and Costs</b>		
Uncertain supply of labor	The Mangue Strategy may find that if and when the Brazilian economy improves, fewer residents want to partake in the unpleasant job of crabbing. This form of employment to-date comes without government benefits and has some negative stigma associated with it. Also, many young workers are moving to the growing cities nearby to find work.	The strategy prioritizes professionalizing the crabbing business and empowering crabbers by facilitating the formation of more cohesive associations of crabbers. Paying higher wages and price premiums may also make the job more attractive.
Localized environmental risks	In the Amazon region, there is risk of pollutants entering the mangrove ecosystem due to local stresses on the landscape, such as mining and timber operations.	The Mangue Strategy anticipates a strengthened political presence as a result of community-building measures in the Strategy. This increased agency may lead to a stronger ability to resist mining and timber operations' encroaching on the area.
Climate risk	There is a possibility of declining catch volumes due to climate change or associated adverse weather events.	The Mangue Strategy will look to other domestic crab fisheries in order to diversify against potential regional effects of climate change and related weather events.
Threats to mangroves/ habitat destruction	Large-scale deforestation is common in the Amazon region, and mangrove forests can be clear-cut or used for other purposes, like aquaculture.	By professionalizing and making more profitable the sustainable extraction of mangrove crab, the Mangue Strategy provides a development model for generating potentially significant economic value from intact mangrove that may deter deforestation.
<b>Key Risks Affecting Revenue</b>		
Demand for mangrove crab in the international market is largely untested	The Brazilian mangrove crab is currently only consumed domestically, particularly in northeast Brazil. CEB will be offering mangrove crab as a new seafood product in the international export market.	There is already demand in the international markets that CEB will be targeting, albeit for different crab species. Mangrove crab has a similar taste and texture profile to other mass market crabs, like swimming crab and mud crab. With CEB's marketing efforts around the high quality and sustainability of its products, CEB should eventually be able to fetch a premium over other competing crab products.  In addition, CEB plans to price its products at the same level as swimming crab, which it sees as its closest competing product and already has demand internationally.

RISK	DESCRIPTION	MITIGANTS
Uncertainty around actual volumes of mangrove crab landings and raw material availability	The Brazilian government stopped tracking landings by species and state in 2008. Total raw material available for sourcing by CEB is based on landings data collected through 2007 and local academic information, both of which may be unreliable and inconsistent.	The CEB business plan assumes that the company would ultimately source a maximum amount of 4,000 mt of mangrove crab per year as the fishery management improvement program expands, which falls below estimates of the total extent of the resource across the 10 RESEX zones.
High cost-structure compared to other crab-producing countries	Brazil is one of the most expensive countries in South America in which to do business. The Mangue Strategy anticipates higher labor costs than in swimming crab and mud crab exporting regions, like Southeast Asia, China, and India.	CEB anticipates that having a mechanized and streamlined manufacturing process will make it competitive on cost. Moreover, with CEB's marketing efforts around the high quality and sustainability of its products, CEB should eventually be able to fetch a premium over other competing crab products.
Lack of barriers to entry in the market	Because the market is currently unoccupied by a company of CEB's size, in theory another company could attempt to match the scale of CEB and attempt to undercut prices.	The Mangue Strategy prioritizes the development of unique relationships with the RESEX communities and offers FCT benefits that other companies would be hard-pressed to match. The local communities also stand to gain significant political capital by participating in CEB's supply chain and being organized into more formalized fishing communities.
Commodity price risk	Crabmeat is a commodity, and mangrove crabmeat is similar enough to its mass-market equivalents that it can also be subject to global price swings.	CEB will pursue branding opportunities and attempt to differentiate the product in order to insulate it against price swings.

#### Key Risks Affecting Business Execution

Startup and implementation risk	Because CEB is a greenfield venture, there are risks associated with the lack of precedent for initiating business in Brazil.	In the early stages of CEB's business, lots of attention is paid to developing relationships with local entities. Also, the Mangue Strategy would ensure that a network of consultants and a management team with local expertise and experience will mitigate startup risk.
Scaling/growth risk	The anticipated rapid growth of CEB presents some uncertainty, as it would in any quickly expanding business.	An experienced management team would mitigate this risk.

RISK	DESCRIPTION	MITIGANTS
Operational execution risk	Because of poor infrastructure in Pará and the high number of communities, there is significant business execution risk.	The Mangue Strategy tries to address this risk by using buying stations to consolidate pressures on infrastructure and streamline the transport network. This model has been proven in similar ventures in other nations with challenging infrastructure, like the Philippines.
Processing technology specifically for mangrove crab does not yet exist	There are existing crab processing facilities and requisite technology for other crab species but not yet for mangrove crab. CEB will most likely be the first business in the world to adapt existing industrial crab processing technologies to use on mangrove crab.	CEB intends to contract specialists and engineering firms in Chile, Canada, and the U.S. that operate in the spaces of crabmeat processing, crabmeat manufacturing machinery, and plant design. CEB has conservatively allocated almost three years to create and test its processing operations before officially starting commercial manufacturing in Year 4.

#### Key Risks Affecting General Business Environment

Bureaucracy, corruption, and fraud	Despite its economic progress in the last decade, Brazil is still known for its troublesome bureaucracy, especially when dealing with the government, and continues to have pockets of corruption. CEB and the fishery management improvement implementation would have to work with a number of government agencies and local authorities to obtain the necessary support, buy-in, and permits in order to operate and export domestically and internationally. Fraud by local partners and employees is also possible in Brazil.	Given the challenges of working in Brazil, conservative project timelines have been assumed. Moreover, the proposed CEB management team has extensive experience managing seafood businesses in other emerging economies from which valuable lessons can be drawn and applied in the Brazilian context.
Inflation and currency risks	The Brazilian economy has weakened since 2011 and its currency has been volatile. In the last five years, the Brazilian Real has fallen against the U.S. dollar. While this could make Brazilian exports more attractive, it has also resulted in high inflation in the country. Average inflation in local currency terms was between 5 and 6% per year for the last three years. 2015 inflation is expected to hit 9%, largely driven by the weakening currency. <sup>30</sup>	The Mangue Strategy has attempted to make reasonably conservative assumptions in the financial modeling around these parameters, plus a mix of domestic and export markets for the product acts as a hedge against currency and inflation fluctuations. In U.S. Dollar terms, the Mangue Strategy has assumed 4.5% annual inflation, which is reasonable based on local currency inflation of 4%–6% over the past decade.

<sup>21</sup> Instituto Brasileiro de Geografia e Estatística (IBGE), Inflation Statistics 1980–2015, September, 2015.

## APPENDIX

### THE MANGUE STRATEGY FINANCIAL PROJECTIONS

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9
# of Fishing Communities	-	49	74	98	98	98	98	98	98
# of Fishers	-	-	-	267	485	775	921	1,115	1,260
# of Vessels	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>SALES VOLUME (mt)</b>									
Live Weight Equivalent	-	-	-	640	1,237	2,004	2,402	2,812	3,211
Finished Product	-	-	-	223	406	650	772	934	1,056
<b>REVENUES</b>									
Export Sales	-	-	-	\$1,613,584	\$2,677,511	\$5,326,478	\$6,873,632	\$8,571,205	\$10,628,024
Domestic Sales	-	-	-	834,667	2,122,465	3,039,755	3,652,790	4,380,515	4,925,401
<b>Total</b>	-	-	-	<b>\$2,448,251</b>	<b>\$4,799,976</b>	<b>\$8,366,232</b>	<b>\$10,526,422</b>	<b>\$12,951,720</b>	<b>\$15,553,425</b>
<i>YoY Growth in Sales</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>96.1%</i>	<i>74.3%</i>	<i>25.8%</i>	<i>23.0%</i>	<i>20.1%</i>
<b>OPERATING EXPENSES</b>									
<b>Cost of Goods Sold</b>									
Raw Materials	-	-	-	(1,080,515)	(2,184,332)	(3,696,941)	(4,631,502)	(5,666,001)	(6,759,864)
Process & Packaging	-	-	-	-	(260,548)	(495,861)	(829,359)	(1,029,456)	(1,301,058)
Distribution	-	-	-	-	(31,988)	(61,309)	(103,692)	(129,994)	(161,309)
<b>Total COGS</b>	-	-	-	<b>(\$1,080,515)</b>	<b>(\$2,476,868)</b>	<b>(\$4,254,112)</b>	<b>(\$5,564,553)</b>	<b>(\$6,825,451)</b>	<b>(\$8,222,231)</b>
<i>% Sales</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>44.1%</i>	<i>51.6%</i>	<i>50.8%</i>	<i>52.9%</i>	<i>52.7%</i>	<i>52.9%</i>
SG&A	(552,502)	(1,011,485)	(2,218,687)	(2,555,205)	(2,473,396)	(2,722,688)	(2,898,453)	(3,073,759)	(3,180,483)
<b>EBITDA</b>	<b>(552,502)</b>	<b>(1,011,485)</b>	<b>(2,218,687)</b>	<b>(1,480,006)</b>	<b>(414,922)</b>	<b>1,013,553</b>	<b>1,837,017</b>	<b>2,749,593</b>	<b>(3,884,320)</b>
<i>EBITDA Margin</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>(60.5%)</i>	<i>(8.6%)</i>	<i>12.1%</i>	<i>17.5%</i>	<i>21.2%</i>	<i>25.0%</i>
<b>CAPITAL EXPENDITURES</b>									
New Processing Plant	-	\$89,700	\$6,550,860	\$24,150	\$45,540	\$3,450	\$3,450	-	-
New Buying Stations	-	-	513,388	-	17,197	17,971	18,870	19,625	20,508
Materials and Equipment	-	-	-	-	17,197	17,971	18,870	19,625	20,508
FIP CAPEX	-	-	-	-	-	-	-	-	-
<b>Total CAPEX</b>	-	<b>\$89,700</b>	<b>\$7,064,248</b>	<b>\$24,150</b>	<b>\$79,935</b>	<b>\$39,392</b>	<b>\$41,010</b>	<b>\$39,250</b>	<b>\$41,016</b>

# **THE ISDA STRATEGY**

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**AN INVESTMENT BLUEPRINT  
FOR SMALL-SCALE FISHERIES  
IN THE PHILIPPINES**

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## THE ISDA STRATEGY

Encourage Capital has worked with support from Bloomberg Philanthropies and The Rockefeller Foundation to develop an impact investing strategy supporting the implementation of sustainable fishing practices in a portfolio of small-scale fisheries in the Philippines. The Isda Strategy<sup>1</sup> is a hypothetical \$11.7 million impact investment to protect and restore small-scale fisheries spanning 80 communities across the Philippine archipelago and at least 20 species.



*Yellowfin Tuna*



*Albacore Tuna*



*Skipjack Tuna*



*Mackrel*



*Trevally*



*Mahi Mahi*



*Snapper*



*Sardine*



*Round Scad*



*Flying Fish*



*Yellowtail Fusillier*



*Needlefish*



*Rainbow Runner*



*Cutlass Fish*



*Moon Fish*



*Rusty Jobfish*



*Narrow-Barred Spanish Mackrel*



*Sea Urchin*



*Cuttlefish*



*Squid*



*Octopus*



*Blue Swimming Crab*



*Spiny Lobster*



*Slipper Lobster*

The \$11.7 million would fund the implementation of fisheries management improvements across both pelagic and nearshore fisheries, and be used to expand a seafood processing and distribution company producing premium seafood products, sourced from small-scale fishers, for both domestic and export markets. The Isda Strategy has the potential to generate a 20.7% base case equity return, while simultaneously protecting the multispecies stock biomass from current and future overfishing, enhancing the livelihoods of up to 19,000 fishers<sup>2</sup> across 80 fishing communities,<sup>3</sup> and safeguarding the supply of 6.7 million meals-to-market annually.<sup>4</sup>

<sup>1</sup> "Isda" is the Philippine word for *fish*.

<sup>2</sup> Assuming 2 fishers per vessel in nearshore fishing communities and 3 fishers per vessel in pelagic fishing communities.

<sup>3</sup> Comprising 60 pelagic and 20 nearshore sourcing communities.

<sup>4</sup> Assuming run-rate of 1,332 mt of finished goods sold per year from year 5 onward and 200 g portion sizes.

While Project Isda is based on analysis of actual fishing communities, fishing conditions, and commercial business operations to incorporate realistic assumptions of costs, returns, and risks affecting the potential outcomes of the project, Encourage Capital has synthesized its findings into a general case study that we hope can be used as roadmap for fishery stakeholders interested in impact investing opportunities more broadly in the sustainable fisheries arena. As such, the company and programmatic references herein use pseudonyms in place of the actual names of the organizations on which the analysis was based. Where used, such pseudonyms will be identified clearly throughout the remainder of this text.



## THE ISDA STRATEGY

The Philippines comprises over 7,100 islands, encompassing an estimated 23,000 km of coral reef habitat supporting more than 3,200 fish species and 10,000 invertebrate species, supporting the region's designation as a global biodiversity hotspot.<sup>5</sup> Fishing generates approximately 2.3 million metric tons (mt) of catch per year, making the Philippines the 11th largest producer of seafood in the world. Despite the importance of its fisheries for both food production and tourism, it ranks 21st among the top 28 fish-producing nations in terms of fisheries management and governance, due to limited research capacity, lack of effective access limitations, and improving but still inadequate enforcement of existing regulations.<sup>6</sup> The species group proposed for inclusion in the Isda Strategy incorporates a mix of at least 20 species, including tuna, mahi mahi, snapper, trevally, mackerel, lobster, octopus, squid, crab, and sea urchin, landed across 80 fishing communities<sup>7</sup> throughout the Philippines.<sup>8</sup>

While the tuna and mahi mahi species (referred to herein as “the pelagic species”) are managed by regional bodies and considered to be in good health, the nearshore species are virtually unregulated due to budgetary constraints and limited implementation capacity by regulatory authorities. No stock assessments or science-based catch limits are in place for many of these nearshore species or communities. Lacking critical elements of a robust management framework, nearly all these nearshore fisheries have been subjected to decades of overfishing and habitat destruction. Although data that tracks landings shows increases in national landings over time, catch per unit of effort (CPUE), a primary indicator of fishery distress, has plummeted from 30 to 45 kg per fisher per trip to 3 kg per fisher per trip over the last 30 years.<sup>9</sup> The Isda Strategy, therefore, proposes to implement robust fisheries management systems to prevent further depletion, create fishery data-collection systems to enable adaptive management improvements, and ultimately restore nearshore species and ecosystems. Similar management measures, particularly around vessel monitoring and catch documentation, would be implemented for the tuna and mahi mahi fisheries as well to backstop and improve national and regional management efforts.

<sup>5</sup> Food and Agriculture Organization of the United Nations, “Country Profile: Philippines,” [fao.org](http://fao.org), 2014.

<sup>6</sup> “Oceans Prosperity Roadmap: Fisheries and Beyond,” Synthesis Report, [oceanprosperityroadmap.org](http://oceanprosperityroadmap.org), 2015.

<sup>7</sup> In this blueprint, “community” refers to a *barangay*, the Philippine term for a village, and the smallest administrative division in the Philippines.

<sup>8</sup> This list of species is indicative (not exhaustive) and based on preliminary assessment of raw material supply in target communities and market demand.

<sup>9</sup> Western and Central Pacific Fisheries Commission, 2015.

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The Isda Strategy's innovative approach would incorporate the implementation of robust data collection technologies, as well as the use of financial incentives that reward sustainable fishing practices over time.

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The Isda Strategy proposes the investment of \$11.7 million in equity and grant capital into a combination of fisheries management improvements and TambaCo<sup>10</sup> (also referred to herein as “the Company”), an illustrative processing and distribution business producing premium seafood products for both domestic and international markets. The Isda Strategy's innovative approach would incorporate the implementation of robust data collection technologies, as well as the use of financial incentives that reward sustainable fishing practices over time. The bundling of the fisheries

management improvements with the TambaCo investment would allow the Isda Strategy to capture higher value for the products, and would generate financial returns that could be used to reward fishers for maintaining sustainable fishing practices and to pay for ongoing fishery management improvement activities. The Isda Strategy hopes to provide a novel, replicable model for sustainable seafood delivery from small-scale (also referred to as “artisanal”) fishers, while showing that sustainable management and responsible sourcing can be not only profitable but a source of competitive advantage as well.

The base case impact and financial returns are summarized below:

---

#### Impact and Financial Returns

- Safeguards stock levels of at least 20 species, including both pelagic and nearshore, with the potential to increase biomass by 20%, depending on fishery conditions<sup>11</sup>
  - Increases aggregate fisher revenue through a 15% premium paid per unit of raw material sourced by the Company, equivalent to a total of \$11.9 million<sup>12</sup> of additional income over the 10-year investment period
  - Avoids the harvest of an estimated 5,500 mt of bycatch, including shark and billfish, through the use of selective handline fishing gear<sup>13</sup>
  - Increases community-designated “no-take zones” in each community TURF-reserve of at least 20% of the total area, totaling over 1,000 hectares
  - Increases coral cover by 15% across the TURF-reserve area, totaling 150 hectares of additional cover
  - Improves participant community resilience through the capitalization of a \$3 million Fishing Community Trust, vested over 10 years, and recapitalized with 10% of the proceeds generated by the sale of TambaCo, worth an estimated \$2.9 million<sup>14</sup> in the base case
  - Increases meals-to-market through a 13% reduction in spoilage<sup>15</sup> in the supply chain, delivering an additional 800,000 meals-to-market annually<sup>16</sup>
  - Has the potential to generate a 20.7% unlevered equity return over a 10-year investment period
- 

<sup>10</sup> Based on “tambakol,” the Philippine word for *yellowfin tuna*.

<sup>11</sup> A biomass increase is not built into the model.

<sup>12</sup> In constant 2015 dollars.

<sup>13</sup> Assuming 2% bycatch in the artisanal handline fleet relative to approximately 30% in the industrial longline fleet applied to the total raw material sourced from this fishery by TambaCo over the 10-year investment period.

<sup>14</sup> In constant 2015 dollars.

<sup>15</sup> Assuming TambaCo maintains spoilage rates of 2% or less versus an estimated 15% in the prevailing supply chain.

<sup>16</sup> Assuming a run-rate of 2,776 tons of raw material sourced by TC, a 45% processing yield, and 200 g portion sizes.

## KEY VALUE DRIVERS

The Isda Strategy value proposition is based on the creation of a more vertically integrated supply chain to improve product quality and distributions. Vertical integration allows the Isda Strategy to secure seafood supplies to support its growth strategy, capture higher margins, and generate

value for investors that can be shared with fishers to reward sustainable fishing practices and pay for ongoing fishery management improvements. The table below summarizes the key value drivers supporting The Isda Strategy investment thesis:

HIGHLIGHT	DETAILS
<b>Implements effective fisheries management improvements</b>	The Isda Strategy presents an opportunity to leverage novel technologies and partnerships to deliver fishery management improvements more effectively, at greater scale, and lower cost. The contemplated improvements are aligned with international certifications and best practices.
<b>Leverages regulatory enabling conditions</b>	The Philippines' fisheries management framework permits the use of Territorial Use Rights for Fishing (TURFs) that can be used to create access limitations in the nearshore portfolio fisheries and a foundation upon which to implement additional fisheries management reform.
<b>Uses innovations to increase fisher compliance</b>	The use of on-board vessel monitoring systems, dockside catch accounting, and other low-cost data collections systems, in combination with financial incentives to reward fishers for sustainable practices, should increase fisher compliance with fisheries management improvements.
<b>Establishes best-in-class partnerships</b>	The Isda Strategy seeks to leverage the capacity and know-how of complementary operating partners, including TambaCo, NGOs, academic institutions, and seafood industry experts, to offer the strongest possible leadership and execution of the overall strategy. In addition to these formal operating partners, the Strategy would actively engage regulators, retailers, food service companies, and other actors aligned in the goal of bringing sustainable seafood to market in ways that benefit fishers and their communities and that ensure the preservation of marine ecosystems.
<b>Leverages a strong commercial market position</b>	The strategy expects to leverage TambaCo's existing tuna platform to support a logistics network onto which the sourcing of nearshore species could be added. These additional products could be sold into an established global network of clients already in place for the tuna, building on the unique social and environmental selling points associated with the TC brand.
<b>Is supported by strong, underlying seafood demand fundamentals</b>	Demand for responsibly and sustainably sourced seafood is growing globally, <sup>17</sup> with most major retailers in the United States and Europe committing to sustainable wild-caught seafood sourcing. <sup>18</sup> This has translated to price increases of 8% annually for key TambaCo product lines. <sup>19</sup>
<b>Capitalizes on a positive investment climate</b>	The Philippines has a steadily improving sovereign credit rating from all three major rating agencies, and was upgraded to investment grade by S&P in 2014, making it one of the most attractive countries in which to invest in the region. <sup>20</sup>

<sup>17</sup> Marine Stewardship Council, "MSC Consumer Survey 2014," [www.msc.org](http://www.msc.org), November, 2014.

<sup>18</sup> "Progress Toward Sustainable Seafood - By the Numbers," 2015 edition, California Environmental Associates.

<sup>19</sup> Deloitte, "Seafood & Sustainability: Influences on the Buying Behavior of Seafood Purchasers," Royal Greenland/Deloitte Sustainability, 2015.

<sup>20</sup> [www.gov.ph/report/credit-ratings](http://www.gov.ph/report/credit-ratings).



## PROFILE OF THE FISHERIES

The Isda Strategy seeks to incorporate up to 80 fishing communities into a regional, sustainable seafood sourcing operation for the delivery of high-value products to local, regional, and international buyers. All of the pelagic stocks incorporated into the strategy are considered to be in good health, and are caught by highly selective “hand-line” gear that limits bycatch to less than 2% of landed volumes versus up to 40% in the industrial longline fishery.<sup>21,22</sup> The remainder are nearshore species that are believed to be depleted at the stock level due to overfishing driven by population growth, the use of destructive gear, and coastal development that affects near-shore marine ecosystems. The fisheries management regime in the Philippines is weak, primarily due to its lack of effective access limitations. Although registration of fishers is technically required and recent efforts have been made to register fishers and vessels, virtually anyone can enter the fishing grounds. The Isda Strategy, then, seeks to remedy overfishing within its portfolio communities by implementing fishery management improvements that utilize both “Territorial Use Rights for Fishing” (TURF), a form of locally managed exclusive access, and data collection technologies that aid in assessing stock health and fisher compliance with fishing regulations.

### PHILIPPINE SMALL-SCALE FISHERIES

The Philippines is located in Southeast Asia and made up of over 7,100 islands situated in the western Pacific Ocean. Located at the apex of the Coral Triangle and encompassing most of the Sulu-Celebes Sea Large Marine Ecosystem, the waters of the Philippines are a hotspot of marine biodiversity<sup>23</sup> spanning over 2 million square kilometers of ocean fisheries<sup>24</sup> and 22,500 square miles of coral reef habitat.<sup>25</sup> Approximately 12% of Philippine waters consist of continental shelf zones, hosting biodiverse coral reefs, mangrove, and algal ecosystems.<sup>26</sup> There are an estimated 464 species of corals, 190 species of seaweed, 42 species of mangroves,<sup>27</sup> 16 species of seagrasses, 3,200 species of fish,<sup>28</sup> and at least 10,000 species of invertebrates,<sup>29</sup> many of which are endemic to the Philippines.<sup>30</sup> In 2013, the nation reported 2.3 million mt of total marine fish capture, ranking second after Indonesia in the Southeast Asia region and 11th worldwide.<sup>31</sup>

<sup>21</sup> Kelleher, K., “Discards in the world’s marine fisheries: An Update” FAO Fish, FAO Technical Paper 470, Rome, 2005.

<sup>22</sup> SPC, “Bycatch and discards in the Western Pacific tuna fisheries: a review of SPC data holdings and literature,” SPC, Standing Comm., 1993.

<sup>23</sup> Pauly, et al., “Philippine Marine Fisheries Catches: A Bottom-up Reconstruction 1950 to 2010,” Research Report, UBC Fisheries Center, 2014.

<sup>24</sup> Pauly, et al., “Philippine Marine Fisheries Catches: A Bottom-up Reconstruction 1950 to 2010,” Research Report, UBC Fisheries Center, 2014.

<sup>25</sup> Burke, et al., “Reefs at Risk Revisited,” World Resources Institute, Washington, DC, 2011.

<sup>26</sup> Pauly, et al., “Philippine Marine Fisheries Catches: A Bottom-up Reconstruction 1950 to 2010,” Research Report, UBC Fisheries Center, 2014.

<sup>27</sup> Burke, et al., “Reefs at Risk Revisited,” World Resources Institute, Washington, DC, 2011.

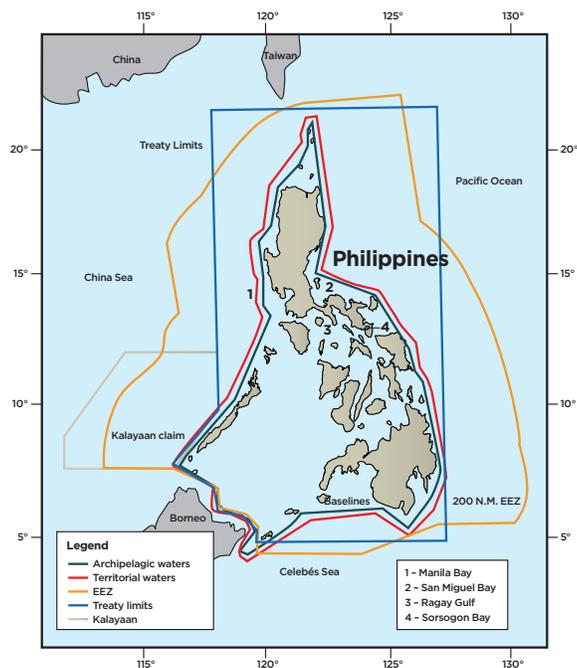
<sup>28</sup> Pauly, et al., “Philippine Marine Fisheries Catches: A Bottom-up Reconstruction 1950 to 2010,” Research Report, UBC Fisheries Center, 2014.

<sup>29</sup> Pauly, et al., “Philippine Marine Fisheries Catches: A Bottom-up Reconstruction 1950 to 2010,” Research Report, UBC Fisheries Center, 2014.

<sup>30</sup> Carpenter and Springer, “The center of the center of marine shore fish biodiversity: The Philippine Islands,” *Environmental Biology of Fishes* 72, 2005.

<sup>31</sup> Pauly, et al., “Philippine Marine Fisheries Catches: A Bottom-up Reconstruction 1950 to 2010,” Research Report, UBC Fisheries Center, 2014.

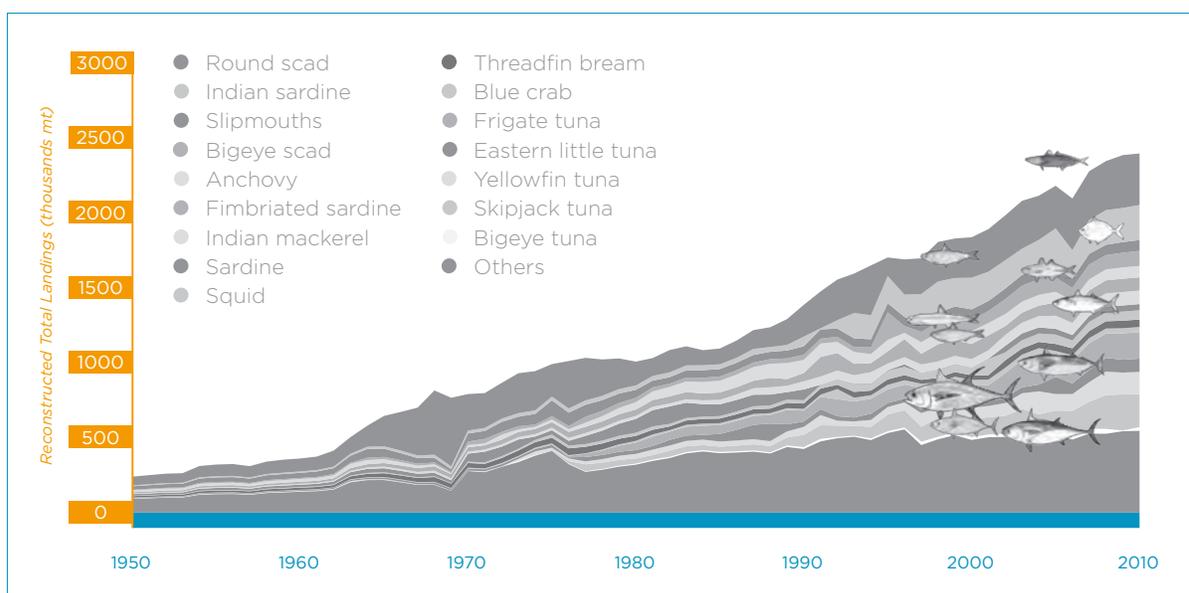
PHILIPPINE FISHING JURISDICTION AND TERRITORY<sup>32</sup>



The species landed in greatest abundance by small-scale fishers include frigate tuna, big-eyed scad, roundscad, Indiang scad, Indian sardine, Indian mackerel, anchovies, yellowfin tuna, squid, and slipmouth, with the top 10 species comprising 49.6% of landed volumes in 2013.<sup>33</sup> (See Figure 1.) Small-scale fishers generally use low-intensity gear,

such as gill nets, fish corrals, spears, hook and line, fish pots, handlines, and squid jigs, while trawls and seines are prohibited within municipal waters. The Philippines government estimates the value of the small-scale catch to be approximately \$1.8 billion, which is likely overestimated in line with its overestimates of total landings.

FIGURE 1: Philippine Marine Catch Composition, 1950-2010



<sup>32</sup> Bureau of Fisheries and Aquatic Resources, "Philippine Fisheries Profile 2013," Department of Agriculture of the Philippines, 2013.

<sup>33</sup> Bureau of Fisheries and Aquatic Resources, "Philippine Fisheries Profile 2013," Department of Agriculture of the Philippines, 2013.



Photo Credit SSG Advisors<sup>34</sup>

Between 460,000 and 1.3 million small-scale fishers<sup>35</sup> operate over 470,000 vessels<sup>36</sup> in coastal waters, only 38% of which are motorized.<sup>37</sup> They reside throughout the nearly 1,000 coastal

municipalities across the country. Small-scale vessels are defined as being less than 3 gross tons in weight and are afforded exclusive access to fish within 15 km of the coastline.

PHILIPPINE ADMINISTRATIVE REGIONS



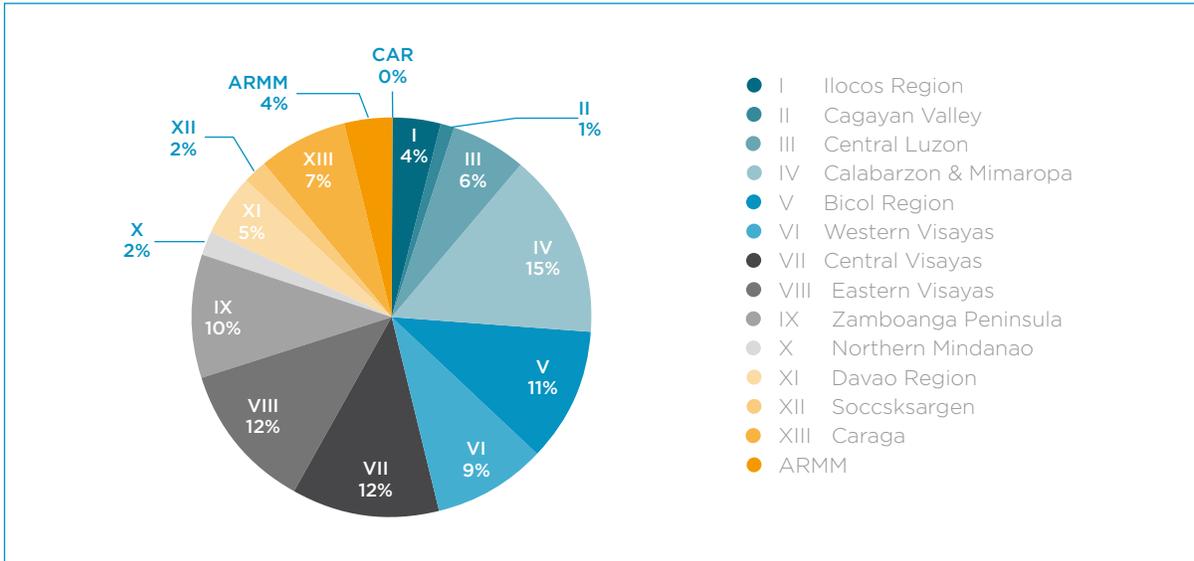
<sup>34</sup> <http://ssg-advisors.com/project/ecosystems-improved-for-sustainable-fisheries-ecofish>.

<sup>35</sup> Pauly, et al., "Philippine Marine Fisheries Catches: A Bottom-up Reconstruction 1950 to 2010," Research Report, UBC Fisheries Center, 2014. Note that the Bureau of Fisheries and Aquatic Resources cites an estimated 1.3 million fishers based on the 2002 Census of Fisheries conducted by the government. Estimates use a coastal population growth model to calculate total fishers. BFAR further estimates approximately 119,000 commercial fishers operate some 6,400 vessels across the country.

<sup>36</sup> Bureau of Fisheries and Aquatic Resources, "Philippine Fisheries Profile 2013," Department of Agriculture of the Philippines, 2013.

<sup>37</sup> Bureau of Fisheries and Aquatic Resources, "Philippine Fisheries Profile 2013," Department of Agriculture of the Philippines, 2013.

CONCENTRATION OF SMALL-SCALE FISHERS BY REGION

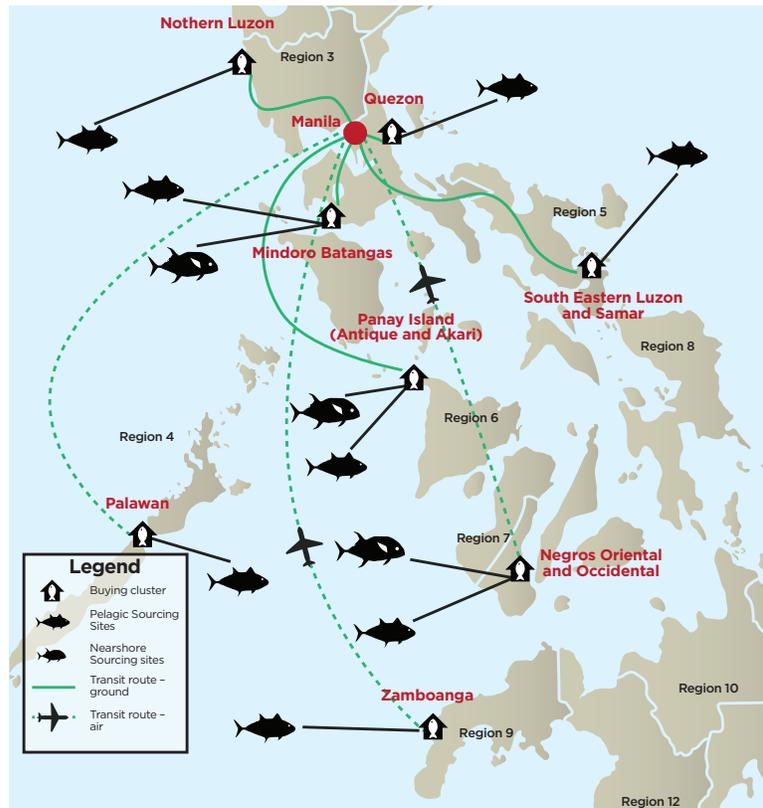


THE ISDA STRATEGY PORTFOLIO

The Isda Strategy proposes the incorporation of 80 coastal communities into its fishery improvement and raw material procurement portfolio.

Figure 2 highlights the locations of the 80 initial communities currently contemplated for inclusion in the Isda Strategy’s seafood sourcing strategy.

FIGURE 2: Isda Strategy Portfolio Communities and Supply Chain

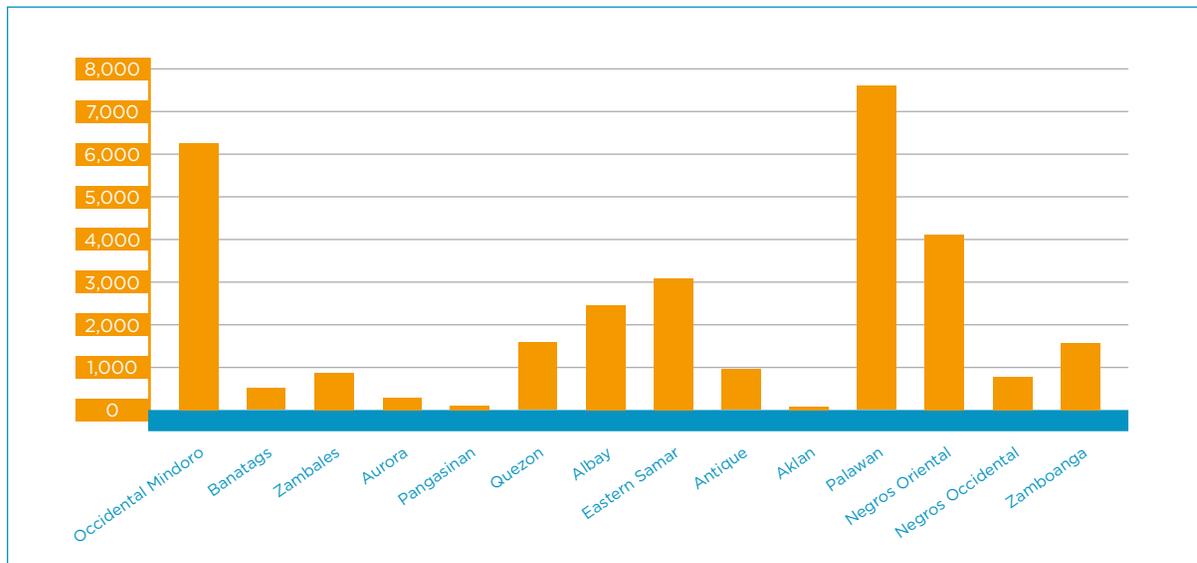


LGUs control the waters within 15 km of the shoreline, giving registered and licensed small-scale fishers from those municipalities exclusive right to fish within this zone.

The 80 communities, spanning 14 provinces, are home to over 30,000 artisanal fishers operating approximately 7,500 vessels (see Figure 3). The fishers are loosely organized into approximately 150 “casas,” or informal fishing associations, which often own or finance the vessels used to fish, provide important fishing supplies such as bait and fuel, and act as brokers to sell the landed catch.

Isda’s fishers are currently landing approximately 8,300 mt of commercially viable species annually,<sup>38</sup> which represent approximately 2% of total small-scale catch nationwide,<sup>39</sup> if total national catch volumes are to be believed. An illustrative assemblage of species proposed for TambaCo sourcing are presented in Figure 4 (see next page).

FIGURE 3: Number of Fishers by Province<sup>40</sup>



### CURRENT REGULATORY FRAMEWORK

Small-scale fisheries operate under the jurisdiction of Local Government Units (LGUs), the bodies governing at the municipal level across the country. Under the Local Government Code and the National Fisheries Code,

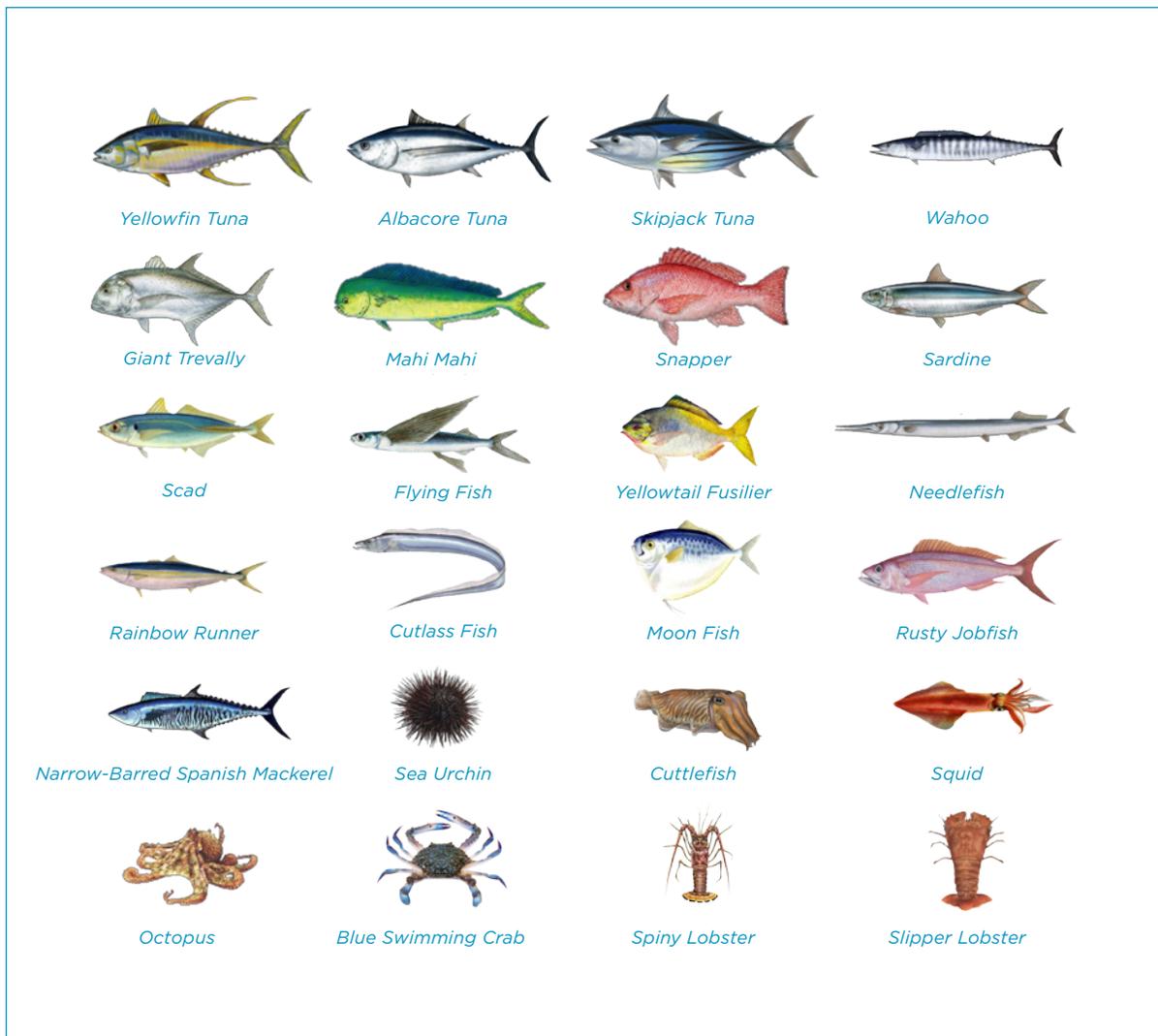
LGUs control the waters within 15 km of the shoreline, giving registered and licensed small-scale fishers from those municipalities exclusive right to fish within this zone.

<sup>38</sup> Based on interviews with fishing communities conducted by Blueyou Consulting.

<sup>39</sup> Bureau of Fisheries and Aquatic Resources, “Philippine Fisheries Profile 2013,” Department of Agriculture of the Philippines, 2013.

<sup>40</sup> Based on interviews with fishing communities conducted by Blueyou Consulting.

FIGURE 4: Target Commercial Species of The Isda Strategy<sup>41</sup>



<sup>41</sup> This list is indicative (not exhaustive) and based on preliminary assessment of raw material supply in target communities, market demand, and conservation status.

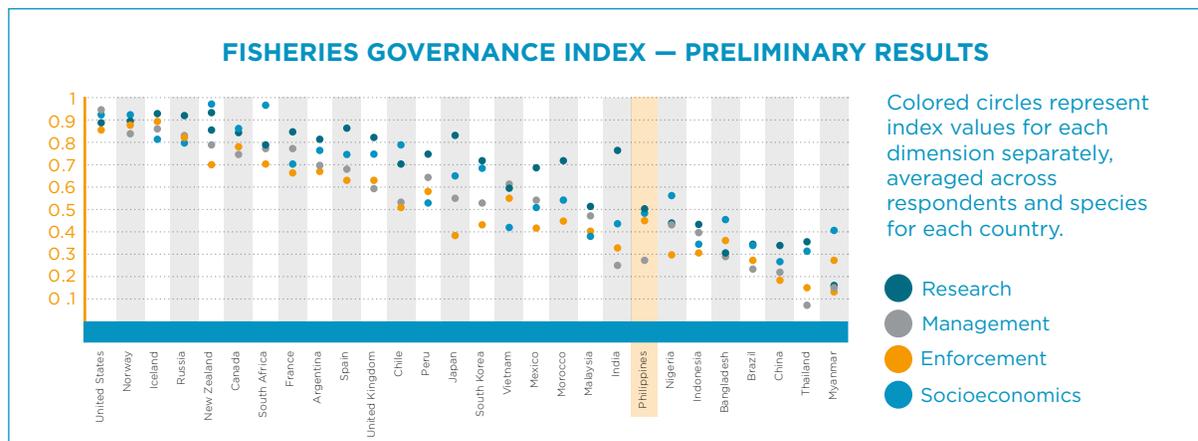


Since the 1990s, there has been a strong and coincident movement toward the establishment of locally managed Marine Protected Areas (MPAs), sometimes called “no-take zones.” To date, there are over 1,600 MPAs scattered across the country, although there is a wide disparity in their size and effectiveness of implementation. The government has more recently undertaken ambitious national programs around fisher and vessel registration, and has targeted the construction of Community Fish Landing Centers in more than 700 municipalities by 2016. In addition, budgetary resources for fisheries management have increased

sevenfold since the Aquino administration took office in 2008, focused primarily on enforcement activities, although with little funding trickling down to the municipal or LGU level.<sup>42</sup>

Notwithstanding some movement in the right direction, the Philippines ranks 21st out of the top 28 on the Fisheries Governance Index out of fish-producing countries that deliver 80% of global seafood supply (see Figure 5). The Philippines scores low on the index for research, management, and enforcement capacity relative to other developing country peers such as Vietnam and Mexico.<sup>43</sup>

FIGURE 5: Performance of the Philippines in the Fisheries Governance Index<sup>44</sup>



Because the tuna and mahi mahi are highly migratory species, their stock status and health is monitored by a range of organizations, including the Western and Central Pacific Fisheries Commission and the International Union for Conservation of Nature (IUCN). None of the three species is considered to be overfished or overexploited. The primary challenge in each

of these fisheries is the harvest of unwanted bycatch, including bigeye tuna, listed as vulnerable by the IUCN, as well as marlins, billfish, sharks, and juvenile tunas, by industrial purse seine vessels and longline fishers. While improvements to management of the industrial tuna fleet have significantly reduced the catch of iconic species such as dolphins and sea turtles, harvesting

<sup>42</sup> Food and Agriculture Organization of the United Nations, “Country Profile: Philippines,” fao.org, 2014.

<sup>43</sup> Food and Agriculture Organization of the United Nations, “The State of World Fisheries and Aquaculture,” Rome, 2014.

<sup>44</sup> Source: “Oceans Prosperity Roadmap: Fisheries and Beyond,” Synthesis Report, oceanprosperityroadmap.org, 2015.

of other ecologically important species and of juveniles of the target species remains a significant issue. The industrial sector is not incorporated into the Isda Strategy, which instead proposes

stock management and commercialization improvements in only the artisanal single-hook hand-line fisheries for tuna and mahi mahi.

### CONDITION OF NEARSHORE SPECIES

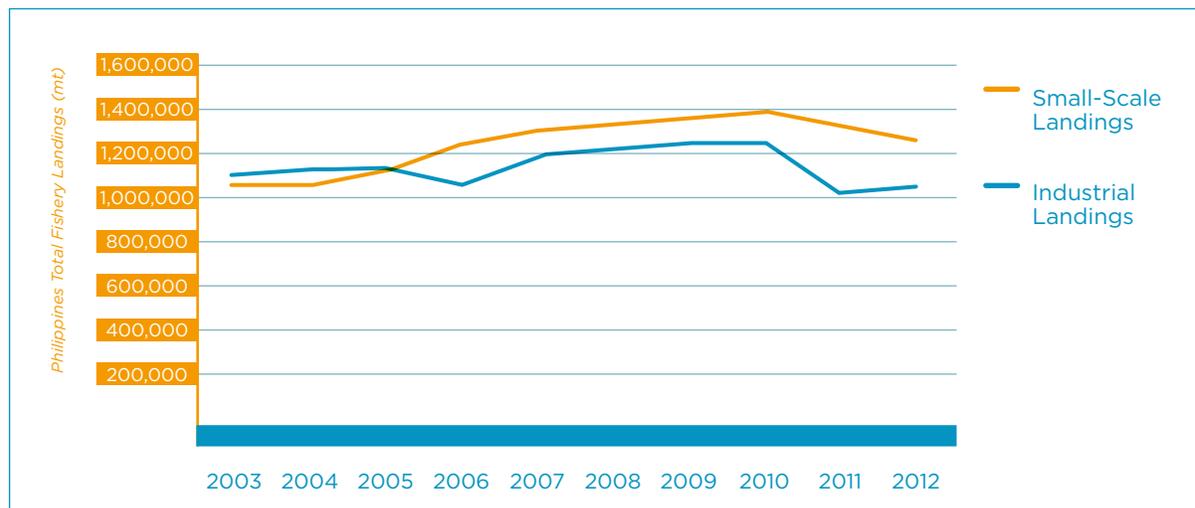
Nearshore fisheries in the Philippines are broadly considered to be overexploited and depleted; however, because catch histories have not been accurately recorded at the municipal level, it is difficult to establish the exact condition of most stocks. Experts and fishers alike believe that municipal waters are particularly overfished, at a rate estimated to be 30% higher than maximum sustainable yields can support.<sup>45</sup>

Philippine government statistics show a gradual decline in small-scale landings between 2010 and 2014 (see Figure 6), which actually masks the true extent of depletion, better evidenced by the dramatic fall in CPUE. Stated differently, dramatically more effort is now required to deliver landings comparable to past levels. Over

the last several decades, fish catch has declined from an average catch of between 40 and 25 kg per trip per municipal fisher in the 1970s to an average catch of 3 kg per trip per municipal fisher (see Figure 7 next page).<sup>46</sup>

The Philippine government reports that the small-scale fisheries sector landed approximately 1.1 million mt, or 54% of the total government reported marine catch in 2013,<sup>47</sup> while recently published data from Pauly 2014 suggest that the small-scale catch share is likely much lower, approximately 23% of total landed volumes, or only 530,000 mt (see Figure 8 next page). Moreover, daily catch rates have shown steady declines across the country, down 68%–76% since the 1950s, even as the country's total catch volume grew by 28%–38% over the same period.

FIGURE 6: Government Reported Fishery Landings (mt)<sup>48</sup>



<sup>45</sup> Green, et al., "Philippine Fisheries in Crisis: A Framework for Management. Coastal Resource Management," Project of the Department of Environment and Natural Resources, Cebu City, 2003.

<sup>46</sup> Green, et al., "Philippine Fisheries in Crisis: A Framework for Management. Coastal Resource Management," Project of the Department of Environment and Natural Resources, Cebu City, 2003.

<sup>47</sup> Bureau of Fisheries and Aquatic Resources, "Philippine Fisheries Profile 2013," Department of Agriculture of the Philippines, 2013. Note that many experts believe that the government reported statistics may be extremely inaccurate due to the lack of any meaningful comprehensive fisheries data collection system, and argue that the real catch volumes are unknown. Municipal catch volumes are, for example, estimated using the same fixed ratio for the relationship between small-scale and industrial catches in place since the late 1960s.

<sup>48</sup> Bureau of Fisheries and Aquatic Resources, "Philippine Fisheries Profile 2013," Department of Agriculture of the Philippines, 2013.



FIGURE 7: Catch Per Unit Effort For Municipal Small Pelagic Fisheries<sup>49</sup>

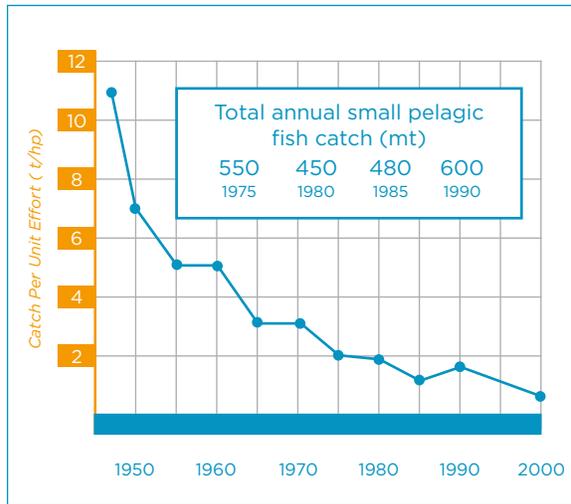
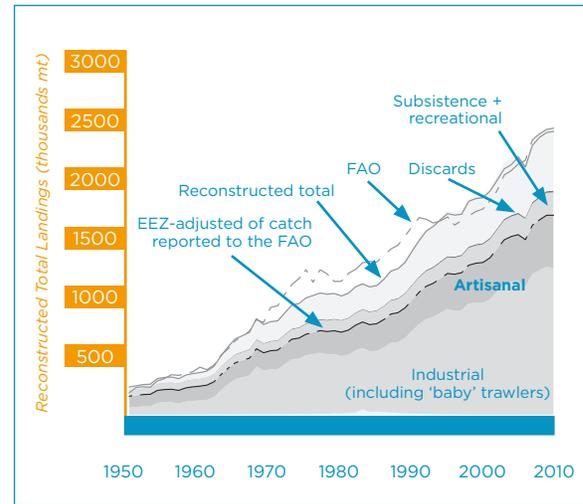


FIGURE 8: Philippine Marine Fisheries Catches, 1950–2010<sup>50</sup>



Discards are not believed to be an issue in the Philippines, where researchers estimate discards made up just 0.1% of the national catch in 2005.<sup>51</sup> Most bycatch is simply used for fish-meal production or consumed by the fishers, often after dried-processing.

The reasons for the current state of depletion in small-scale fisheries are numerous. Overfishing is pervasive across the stocks for which any data is available,<sup>52</sup> resulting in economic losses conservatively estimated at over \$200 million<sup>53</sup> per year.<sup>54</sup> In addition, population growth and general economic distress are exerting increasing pressure on nearshore fisheries, especially when combined

with a lack of effective access limitations. If average fish consumption continues growing in line with population, domestic demand for fish will reach 3.2 million mt by 2020.<sup>55</sup> Finally, habitat destruction caused by pollutants and sedimentation from land-based activities, plus mangrove and coral reef decay, further stress stocks and, in turn, make coastal communities more vulnerable to storms. In fact, two-thirds of Philippine reefs are rated in the “high” or “very high” threat categories by the World Resource Institute’s rating system,<sup>56</sup> and broader surveys of the reef systems corroborate this assessment, estimating only 1%–4% of reefs in the Philippines to be in excellent condition.

<sup>49</sup> “Philippine Coastal Management Guidebook Series No. 1: Coastal Management Orientation and Overview,” Coastal Resource Management Project, DENR, USAID, 2001.

<sup>50</sup> Pauly, et al., “Philippine Marine Fisheries Catches: A Bottom-up Reconstruction 1950 to 2010,” Research Report, UBC Fisheries Center, 2014.

<sup>51</sup> Pauly, et al., “Philippine Marine Fisheries Catches: A Bottom-up Reconstruction 1950 to 2010,” Research Report, UBC Fisheries Center, 2014.

<sup>52</sup> Green, et al., “Philippine Fisheries in Crisis: A Framework for Management. Coastal Resource Management,” Project of the Department of Environment and Natural Resources, Cebu City, 2003.

<sup>53</sup> In constant 2015 dollars.

<sup>54</sup> Green, et al., “Philippine Fisheries in Crisis: A Framework for Management. Coastal Resource Management,” Project of the Department of Environment and Natural Resources, Cebu City, 2003.

<sup>55</sup> Green, et al., “Philippine Fisheries in Crisis: A Framework for Management. Coastal Resource Management,” Project of the Department of Environment and Natural Resources, Cebu City, 2003.

<sup>56</sup> Burke, et al., “Reefs at Risk Revisited,” World Resources Institute, Washington, DC2011.



### SOCIOECONOMIC CONTEXT

The combined population of the 80 communities across 14 provinces totals over 3 million people, with a median per capita income of 72,000 Philippine Pesos (equivalent to roughly \$1,500).<sup>57</sup> Fishers have the highest level of poverty incidence of any sector, at 41.4%, versus the national average of 26.5%.<sup>58</sup> A typical fisher might go out on the water for two to three days at a time, landing only 3–6 kg of fish and earning as little as \$2 dollars per day for the effort.<sup>59</sup>

Millions of Filipinos depend on the health and productivity of coastal and marine environments

for their livelihoods and food security, where seafood accounts for more than 56% of the total animal protein consumed in the country. Officials estimate that Philippine citizens consume between 30 and 60 g per day of seafood,<sup>60</sup> significantly higher than the global average of 17 g per day.<sup>61</sup> Coastal communities in the Philippines are likely even more dependent on marine resources for their protein intake, making the decline in nearshore stocks an issue of both ecology and food security.

### THE CURRENT SUPPLY CHAIN

Philippine seafood supply chains are highly complex and yet remarkably centralized. With the 5th longest coastline of any nation in the world, the Philippines has been forced to create centralized hubs for aggregating its seafood supply to facilitate more efficient export. Navotas Fishing Port Complex (NFPC), for example, provides a hub for the industrial fishing sector, with a breakwater, landing quay, and many market halls that serve to consolidate raw materials. Unfortunately, few of the benefits of this facility or others like it are available to the artisanal fishing sector. The supply chain serving small-scale fishers in the Philippines is markedly undercapitalized and fragmented.

Lacking in basic market infrastructure, most fishing communities have little or no access to ice, cold storage, or even refrigeration. Fishers typically sell their catch to beachside or dockside brokers, who in turn distribute products through local networks to larger neighboring towns and cities. Given the perishability of the product and the remote nature of many of the small-scale fisheries, fishers are generally “price takers” with little market power or ability to capture fair value for their products. These dynamics result in a large amount of waste in the supply chain, with as much as 20%–50% of the catch spoiling before reaching consumers.

<sup>57</sup> Philippine Statistics Authority, “Family Income and Expenditure Statistics 2012,” Republic of the Philippines, 2012.

<sup>58</sup> National Statistics Coordination Board, “Poverty Statistics for Basic Sectors,” 2009.

<sup>59</sup> This does not apply to artisanal yellowfin tuna fishers.

<sup>60</sup> Pauly, et al., “Philippine Marine Fisheries Catches: A Bottom-up Reconstruction 1950 to 2010,” Research Report, UBC Fisheries Center, 2014.

<sup>61</sup> Food and Agriculture Organization of the United Nations, “The State of World Fisheries and Aquaculture,” Rome, 2014.

## THE IMPACT STRATEGY

### IMPACT INVESTMENT THESIS

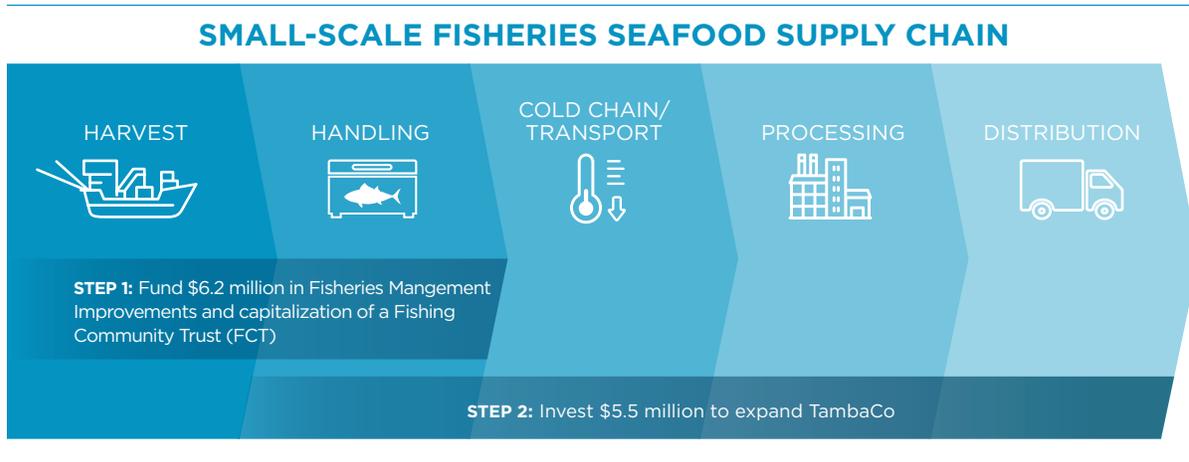
The Isda Strategy's overarching impact objective is to protect the existing stock biomass of the portfolio communities from further distress, with an upside opportunity to increase it by up to 20% over a 10-year period, thereby improving both the livelihoods of the fishers who depend on it and the food security of their communities. Moreover, in the nearshore fisheries, Isda has the potential to protect up to 1,000 hectares of coastal nearshore habitat as no-take zones across a network of TURF-reserves, and to increase coral cover by up to 150 hectares. To accomplish these objectives, the Isda Strategy proposes the following bundled set of investments (see Figure 9):

**Step 1:** Invest \$6.2 million into the design and implementation of robust fishery management improvements across the 80 portfolio communities and the capitalization of a single Fishing Community Trust to be shared across the sourcing regions. The first-year cost of these fishery management improvements would be \$3.2 million, and total roughly \$19.4 million over the ten year strategy.<sup>62</sup>

**Step 2:** Invest \$5.5 million up front, into the expansion of TambaCo, a premium seafood processing and distribution business selling products to the domestic and export markets. The expansion would include:

- Building a network of buying stations to serve as procurement and fishery improvement hubs.
- Upgrading existing processing plants and constructing new facilities to allow processing of larger volumes of yellowfin tuna in addition to the wide variety of nearshore species.
- Funding a broad marketing program to strengthen the Company's sales channels among local and international buyers.

FIGURE 9: The Isda Strategy Investments



<sup>62</sup> This includes fishery management improvement related operating and capital costs over the ten-year project duration.



By bundling the investments into fisheries management improvements and TambaCo, the Isda Strategy would enable TambaCo to develop direct purchasing relationships with the fishing communities. TambaCo would expect to capture significantly higher margins through a shortening of the supply chain, allowing the

Company to offer financial rewards to fishers in compliance with sustainability requirements, thus serving to improve fisher compliance. Moreover, this connectivity to the fishers would afford greater control over product quality and supply availability, creating a virtuous cycle of value generation.

### **STEP 1: FISHERIES MANAGEMENT IMPROVEMENTS**

The Isda Strategy proposes to expand the fishery improvement efforts of TambaCo and its partners to a total of 80 pelagic communities by the end of Year 5. By the end of the first year, the portfolio would consist of 35 communities predominantly landing the pelagic species (including yellowfin tuna, albacore, and mahi mahi), and five communities predominantly landing the nearshore species (including finfish, crustaceans, cephalopods, and echinoderms). As the logistics network reaches breakeven on the basis of its core yellowfin tuna offerings, the Isda Strategy could expand the sourcing portfolio to include increasing numbers of nearshore species and fishing communities.

The fisheries management improvements outlined in this report are simplified to present the general set of actions necessary to improve the management of the portfolio species and fisheries. The Isda Strategy would seek to refine specific management plans tailored to each community and species. While the management improvements would be designed in alignment with internationally recognized best-in-class sustainability standards, they are not specifically aimed to achieve certification, but instead target the specific social and environmental outcomes described herein. As a result, no sustainability premium is assumed on TambaCo sales.

The principal management interventions in the nearshore communities would be the implementation of TURF-reserve management frameworks, combined with the installation of a technology package, designed for and already tested in small-scale fishery settings. This package would include vessel tracking technology to record harvest location, composition, and gear type, all of which would be captured passively and sent via Wi-Fi to a central receiver in a landing station at the port. Landings would then be weighed at the landing station, and a unique bar code would be generated for each harvest batch to accompany the product through the supply chain for traceability purposes. The data systems would be installed on all vessels targeting the species of interest for sourcing, and would feed a common database to provide information on fleet movements in space and time, catch and bycatch by weight by species, landings by vessel and species, and full traceability of products back

to the vessel of origin. Most important, the system would capture landed and removed biomass for every fishing trip, thereby limiting illegal, unreported, and unregulated (IUU) fishing.

By gathering these data across many different fishers and fisheries, the system would create a rich database of metrics essential for adaptive fisheries management. The Isda Strategy could then analyze the data to generate user-specific reports that empower fishers to better control their actions, allow commercial partners such as TambaCo to ensure that they are sourcing fresh and sustainably harvested raw materials, and provide valuable data to authorities to inform management efforts. This data would ultimately be used to evaluate the status of stocks, set total allowable catch limits, assess the environmental impact of fisheries and work out mitigation strategies.

### THE FISHERIES MANAGEMENT PLAN

While each fishing community incorporated into the Isda Strategy's network of suppliers will require a tailored fisheries management plan, the strategy creates management improvements that are aligned with international sustainability standards and best practices. Given the profile of the sites and species in the contemplated portfolio of supplier communities, the Isda Strategy

proposes two improvement program models. One is suited to the pelagic, fishing communities, while the second model is better suited to the nearshore multispecies fishing communities. The table below summarizes the core fishery improvement activities associated with the portfolio sites:

CORE FISHERIES MANAGEMENT COMPONENTS	ACTIVITIES	FISHERY MANAGEMENT PLANS	
		PELAGIC FISHERIES AND COMMUNITIES	NEARSHORE FISHERIES AND COMMUNITIES
Stakeholder Engagement	Government Engagement	<ul style="list-style-type: none"> <li>Ensure that all data is fed to fisheries management authorities to inform stock assessments and establish biological reference points</li> </ul>	<ul style="list-style-type: none"> <li>Engage local legislative council and Fishery and Aquatic Resource Councils to approve new local fishery ordinances</li> <li>Ensure that all data is fed to fisheries management authorities to inform stock assessments and establishment of biological reference points</li> </ul>

CORE FISHERIES MANAGEMENT COMPONENTS	ACTIVITIES	PELAGIC FISHERIES AND COMMUNITIES	NEARSHORE FISHERIES AND COMMUNITIES
Stakeholder Engagement	Community Engagement	<ul style="list-style-type: none"> <li>• Provide training activities to improve adoption and utilization of technology package</li> <li>• Provide ongoing workshops for fishers to ensure full understanding of fishery management plans</li> <li>• Prepare and publicly disseminate annual report on progress against target management benchmarks</li> </ul>	<ul style="list-style-type: none"> <li>• Recruit and train community fellows</li> <li>• Establish Community Council</li> <li>• Hold convenings with fishers for sustainability education</li> <li>• Establish process for decision-making around local fishery management efforts</li> </ul>
	Community Support	<ul style="list-style-type: none"> <li>• Conduct social marketing to engage the broader community to support sustainability and stewardship</li> <li>• Establish Fishing Community Trust to provide rewards for compliance</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct social marketing to engage the broader community to support sustainability and stewardship</li> <li>• Establish Fishing Community Trust to provide rewards for compliance</li> </ul>
Policy Rules and Tools	Exclusive Access Rights	<ul style="list-style-type: none"> <li>• Register all vessels supplying TambaCo</li> </ul>	<ul style="list-style-type: none"> <li>• Define exclusive access geographic boundaries, and formalize TURF network</li> <li>• Register all vessels in the participant communities</li> </ul>
	Fishery Management	<ul style="list-style-type: none"> <li>• Establish fishing rules and codify in community management plan (gear, size limits, seasonal closures, maximum effort, size limits, etc.) to backstop regional management efforts</li> </ul>	<ul style="list-style-type: none"> <li>• Design and oversee implementation of community-specific fishery management plans outlining proper harvesting, landing, and catch-documentation practices, as well as key environmental considerations regarding ecosystem impacts, closed seasons, bycatch, discards, and bait use</li> </ul>
		<ul style="list-style-type: none"> <li>• Install vessel monitoring systems on all vessels from which TambaCo intends to source</li> <li>• Utilize third-party verification and auditing of the fisheries management improvements to create additional discipline and accountability in its sourcing policies and systems</li> </ul>	<ul style="list-style-type: none"> <li>• Install vessel monitoring systems on all vessels in portfolio communities</li> <li>• Utilize third-party verification and auditing of the fisheries management improvements to create additional discipline and accountability in its sourcing policies and systems</li> </ul>
Biological Monitoring and Assessment	<ul style="list-style-type: none"> <li>• Fund annual stock assessments, transitioning this effort to fisheries authorities by year 5</li> </ul>	<ul style="list-style-type: none"> <li>• Fund annual stock assessments, transitioning this effort to fisheries authorities by year 5</li> <li>• Conduct annual review of nearshore species and their stock and subpopulation status to avoid sourcing of at-risk species/populations</li> </ul>	

CORE FISHERIES MANAGEMENT COMPONENTS	ACTIVITIES	PELAGIC FISHERIES AND COMMUNITIES	NEARSHORE FISHERIES AND COMMUNITIES
Stakeholder Engagement	Fish Recovery Zones	<ul style="list-style-type: none"> <li>• N/A</li> </ul>	<ul style="list-style-type: none"> <li>• Define no-take zones in each community not to be less than 20% of the TURF area</li> </ul>
Reduce Fishing Effort	Stock Recovery	<ul style="list-style-type: none"> <li>• N/A</li> </ul>	<ul style="list-style-type: none"> <li>• Derive annual reports on CPUE and total landings volume for dissemination to fishers, authorities, and commercial partners to monitor trends in stock biomass and allow for adaptive management of community fisheries</li> </ul>
Compliance	Catch Accounting	<ul style="list-style-type: none"> <li>• Register all vessels providing raw materials to TambaCo</li> <li>• Install electronic weighing stations and platform for catch documentation system</li> <li>• Create database to collect and organize all fishery data gathered by vessel monitoring and catch documentation systems</li> </ul>	<ul style="list-style-type: none"> <li>• Register all vessels in portfolio communities</li> <li>• Install electronic weighing stations and platform for catch documentation</li> <li>• Create database to collect and organize all fishery data gathered by vessel monitoring and catch documentation systems</li> </ul>
	Product Traceability	<ul style="list-style-type: none"> <li>• Implement radio-frequency identification (RFID) tagging program</li> </ul>	<ul style="list-style-type: none"> <li>• Implement RFID tagging program</li> </ul>
	Local Enforcement Systems	<ul style="list-style-type: none"> <li>• N/A</li> </ul>	<ul style="list-style-type: none"> <li>• Secure commitments from local police</li> <li>• Organize and support “Bantay Dagat,” the community ocean guard system</li> </ul>

### SUSTAINABLE FISHING REWARDS PROGRAM

Fishers willing to commit to fisheries management improvements and serve as suppliers to TambaCo’s sourcing network would be eligible to participate in the Isda Strategy’s Sustainable Fishing Rewards Program (SFRP). The Strategy proposes to utilize the SFRP as an incentive to catalyze and sustain the implementation of sustainable fishing practices.

The SFRP would offer economic rewards to fishers and fishing communities in two ways: through the payment of higher prices per unit of catch (referred to as “premiums”) and through a profit-sharing mechanism whereby fishing communities are allocated an economic interest in TambaCo’s business that would be monetized upon sale of the Company<sup>63</sup>. (See Figure 10.)

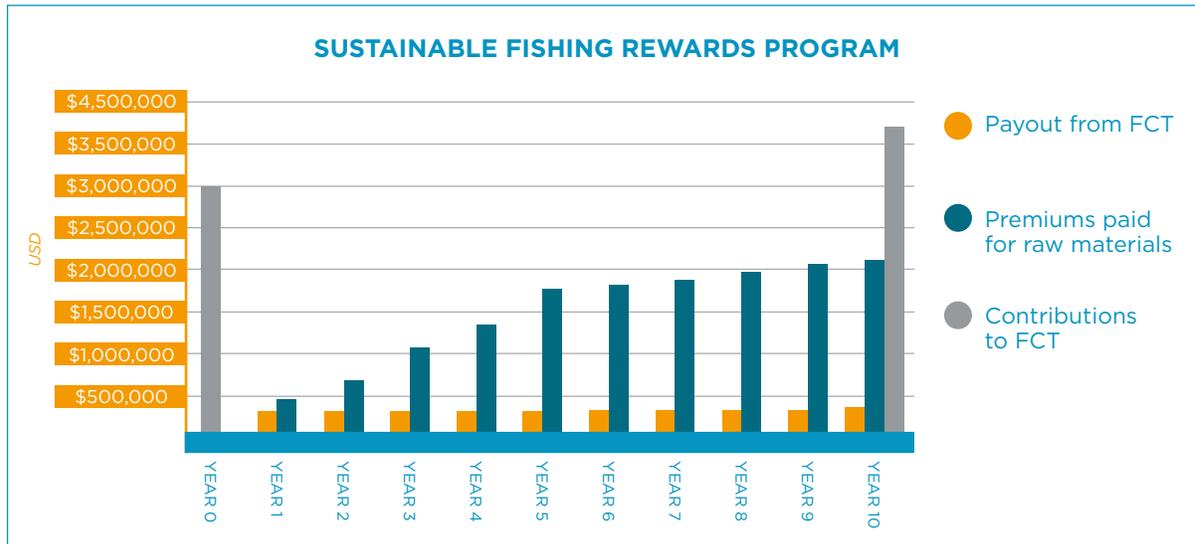
### Raw Material Premium

TambaCo would only source seafood from current members of the portfolio communities and FCT (see the next section), and on the basis of individual and community compliance with the current sustainability requirements as determined by local community monitoring and annual third-party verification. Prices for specific volumes of landings would be paid directly to fishers so long as their membership in the FCT remains secure. TambaCo expects to be able to pay 15% above prevailing beachside prices for raw materials from the communities. Over the 10-year investment period, a total of \$11.9 million<sup>64</sup> is expected to be paid out in premiums to participant fishers in present-value terms.

<sup>63</sup> No annual profit-sharing is assumed in the model prior to sale of the Company as profits will need to be reinvested back into fishery improvement and commercial activities..

<sup>64</sup> In constant 2015 dollars.

FIGURE 10: Sustainable Fishing Rewards Program



### Fishing Community Trust

In addition, the Isda Strategy would invest \$3 million<sup>65</sup> to capitalize a new financial entity, called a Fishing Community Trust, or FCT.<sup>66</sup> The FCT would follow a 10% annual vesting schedule, with proceeds distributed to support activities that improve fishing community resilience for those participating in the Isda Strategy. This fund would be ideally suited to provide business-interruption insurance or other relief in the event of extended periods of inclement weather or natural disasters for portfolio communities and their fishers. The Philippines is the country with the highest incidence rate for tropical storms, so the availability of these funds should provide a strong incentive for compliance. Moreover, the Isda Strategy would allocate 10% of the proceeds from its sale of TambaCo to recapitalize the FCT upon sale of the Company.

The FCT would have the following governance and membership requirements:

1. The FCT must be established as a trust fund, wholly owned by an independent party selected by the Isda Strategy investors.

2. FCT's governance would include rotating board members, one representing each of the eight buying cluster regions and selected from among the fishers in that region. Each member would have one vote. The Isda Strategy would have three voting members selected from among its operating partners.
3. Fund distribution decisions would be made based on a simple majority vote, while proposed modifications to the FCT charter would require a two-thirds supermajority from the board with at least two votes from Isda Strategy members. The board would be responsible for determining to what use to put the funds each year, subject to the constraint that they be directed toward communities in full compliance with the Isda Strategy fishery improvement plans and fall within the usage restrictions of the grant provider.<sup>67</sup>

<sup>65</sup> This is Included in the \$6.2 million allocated toward fishery management improvement activities.

<sup>66</sup> The concept and structure of the FCT is borrowed, in part, from the structures used by Fair Trade in distributing premiums earned on Fair Trade products to producing communities.

<sup>67</sup> The FCT would initially be capitalized with grant funds and thus subject to certain constraints.



### MANAGEMENT AND IMPLEMENTATION

The fisheries management improvements will be designed by experts in accordance with international best-practices and certification frameworks, with a strong focus on traceability, data collection, enhanced market connectivity, and the special challenges of fisheries management in small-scale fisheries context. The Isda Strategy would seek to establish a dedicated implementation partnership with an operating partner or another organization with strong community relationships and engagement experience in small-scale fisheries.

Finally, the Strategy plans to utilize third-party verification and auditing of the fisheries management improvements at each fishing site from which it sources to create additional discipline and accountability in its sourcing policies and systems. The auditors would be asked to review annual reports provided by Isda Strategy staff or operating partners, to conduct formal annual reviews of fishing practices and management systems, and to perform surprise audits in each community.

### FISHERIES MANAGEMENT IMPROVEMENTS BUDGET

The 10-year fishery management improvement budget is outlined in Figure 11. For the purposes of the blueprint, all fishery management improvement costs are borne by Project Isda investors, although in reality opportunities may exist for cost-sharing with operating partners. As shown, the fisheries management improvement costs are concentrated in the first five years, given the aggressive community rollout from TambaCo's

30 current communities to 80 by the end of year 5. This rollout schedule is important to facilitate an expansion of raw material sourcing beginning in the project's first year. Over time, the fisheries management improvement costs would gradually decrease as the need for fixed-asset purchases and installations (CAPEX) fall, leaving only the ongoing operating expenses (OPEX).

FIGURE 11: Fisheries Management Improvement Budget

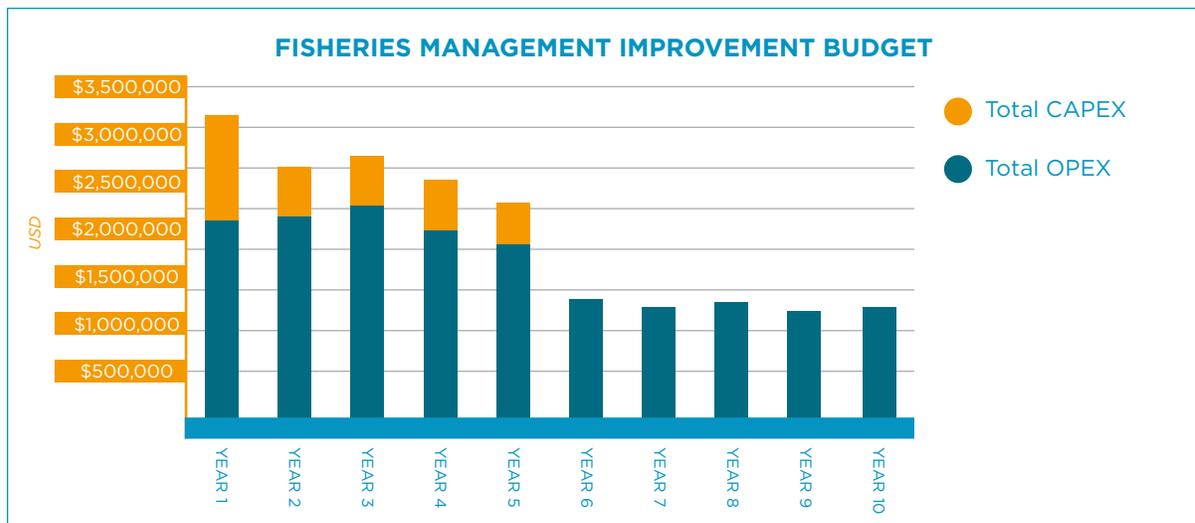
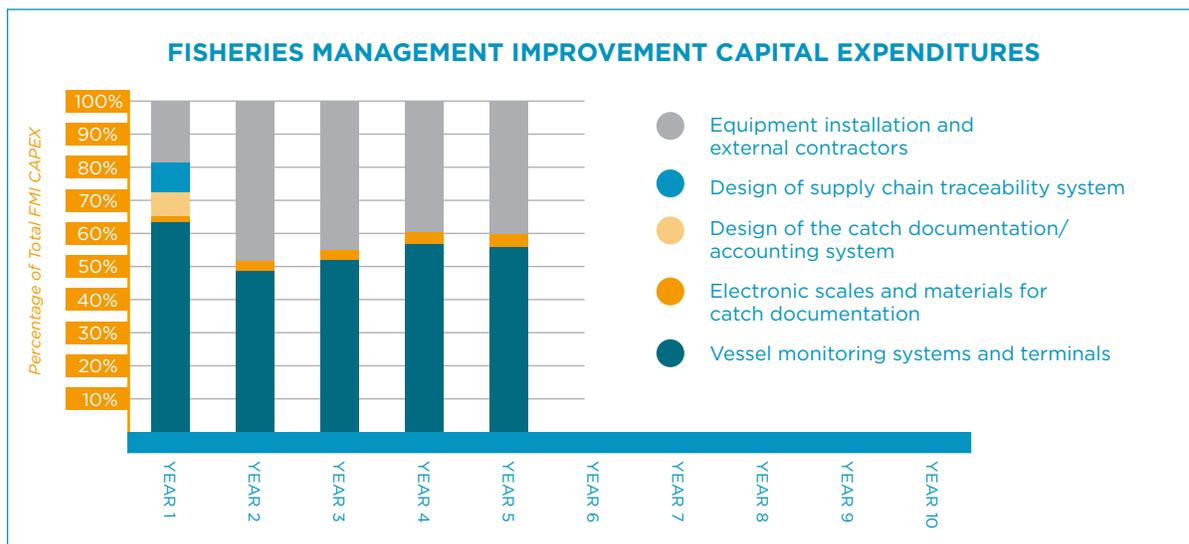


FIGURE 12: Fisheries Management Improvement Capital Expenditures



Capital expenditures on fishery management related fixed assets, as outlined in Figure 12, occur only in the first five years during the rollout to new communities. These costs include the purchase and installations of the following:

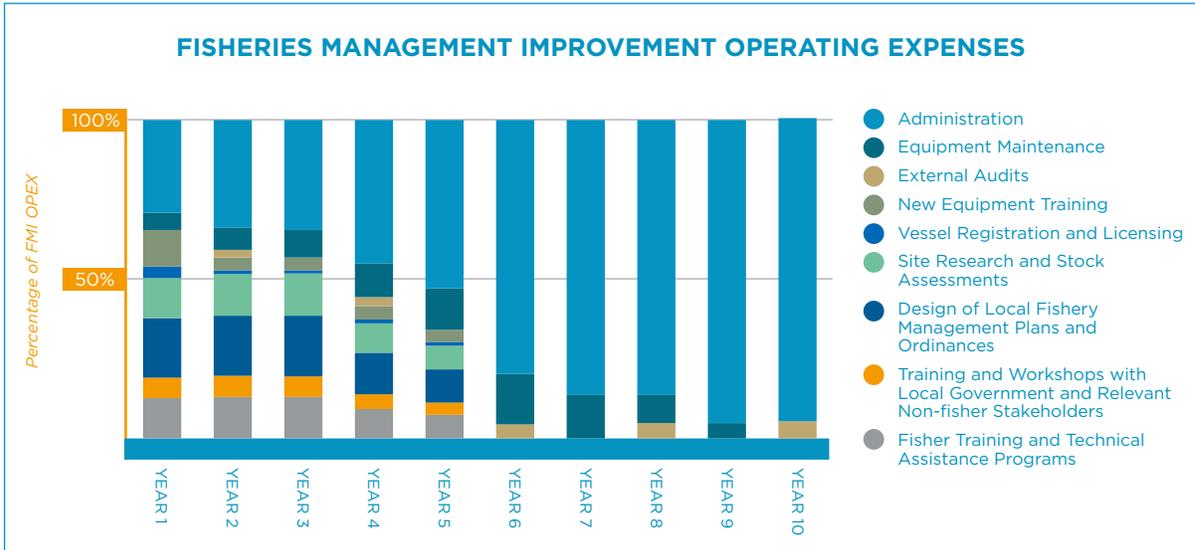
- Vessel monitoring systems on 6,500 vessels and data collection terminals in 80 communities
- Design and implementation of a robust catch documentation/accounting system
- Design of an IT platform for providing full traceability from buying station to point of sale and integration with TambaCo's logistics
- Electronic scales and materials for conducting catch documentation at each buying station

Major budget outlays associated with ongoing fishery management improvement activities are outlined in Figure 13, and include:

- Administration costs of the operating partner<sup>68</sup>
- Workshops with the LGUs to help incorporate data into fishery management decisions
- Generation of annual reports tailored to fishers, TambaCo, and the LGUs on fishery health and updates to the management plans
- Registration of all vessels in the portfolio communities
- Management of the traceability system from buying station to point of sale and integration with TambaCo logistics
- External audits every two years and stakeholder dissemination of findings
- Fishery management-related equipment training workshops with fishers
- Fishery management-related equipment maintenance

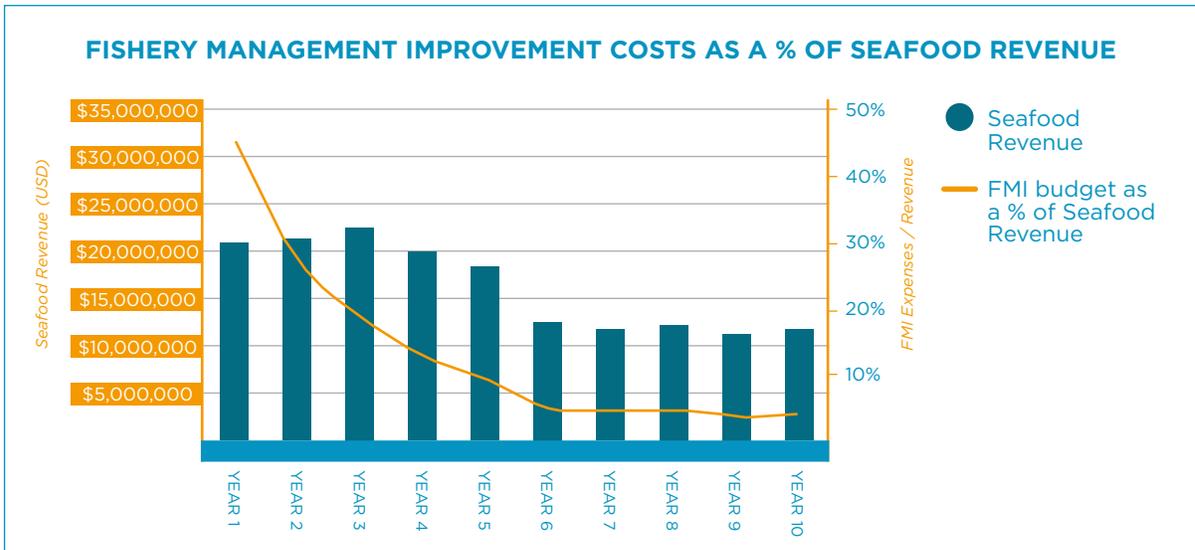
<sup>68</sup> The Isda Strategy assumes a team of 18 employees needed by year 5, including two international and 16 local staff, to ensure sound design, implementation, and progress reporting for the fishery management improvements across the 80 communities. Depending on the operating partner(s) selected, the salaries and headcount may vary.

FIGURE 13: Fisheries Management Improvement Operating Expenses



Over time, the share of fishery management improvements would fall dramatically as a share of total seafood revenue, as shown in Figure 14:

FIGURE 14: Fishery Improvement Costs as a Share of Seafood Revenue



## TARGETED SOCIAL AND ENVIRONMENTAL IMPACTS

The table below sets forth the long-term social impact targets for the portfolio communities

that the Isda Strategy would incorporate into its sourcing network:

ALL SPECIES/COMMUNITIES	
<b>Increased Income Levels and Income Resilience</b>	<ul style="list-style-type: none"> <li>• 15% higher prices relative to current alternative market channels for 19,000 fishers. The premiums paid out to fishers would amount to \$11.9 million over the investment period.<sup>69</sup></li> <li>• Increased fisher community resilience by offering an initial FCT endowment of \$3 million with further capitalization in the form of a 10% equity interest in TambaCo that would be monetized upon exit in year 10. The present value of these FCT contribution would be approximately \$5.8 million.<sup>70</sup></li> </ul>
<b>Food Security</b>	<ul style="list-style-type: none"> <li>• TambaCo is targeting less than 2% spoilage in the supply chain. Assuming that spoilage rates of the current supply chain are at least 15%, this amounts to nearly 3,000 mt of waste avoided by TambaCo over the investment period.</li> <li>• By reducing waste in the existing supply chain, the Isda Strategy hopes to deliver 800,000 additional meals-to-market annually to support local and global food security.</li> </ul>
<b>Time Horizon</b>	<ul style="list-style-type: none"> <li>• The Isda Strategy seeks to realize all impact goals within the first 10 years.</li> </ul>

Because environmental conditions and conservation potentially differ by species and region, Isda's targeted impact returns will vary by species and

community. The table below sets forth the primary environmental impact goals of the strategy:

PELAGIC FISHERIES	
<b>Biomass Restoration</b>	N/A <sup>71</sup>
<b>Bycatch Reduction</b>	Avoiding the harvest of an estimated 5,500 mt of bycatch, including shark and billfish through the use of highly selective single-hook hand-line fishing gear <sup>72</sup>
<b>Habitat Protection</b>	N/A
<b>Time Horizon</b>	Immediate impact for every landed ton
NEARSHORE FISHERIES AND SPECIES	
<b>Biomass Restoration</b>	<ul style="list-style-type: none"> <li>• Protect current biomass, with upside potential of 20% stock restoration</li> </ul>
<b>Bycatch Reduction</b>	N/A
<b>Habitat Protection</b>	<ul style="list-style-type: none"> <li>• Increase community-designated "no-take zones" in all community TURF reserves of at least 20% of the total area, totaling over 1,000 hectares across the 20 nearshore community fisheries</li> <li>• Increase coral cover by 15% across TURF reserve area, totaling 150 ha of additional coral cover</li> </ul>
<b>Time Horizon</b>	10 years

<sup>69</sup> In real dollar terms, 2015 base year.

<sup>70</sup> In constant 2015 dollars.

<sup>71</sup> Because these fisheries include a large industrial component, and feature highly-migratory species, it is difficult to ensure the protection of stock biomass through the management improvements of Isda alone.

<sup>72</sup> Assuming 2% bycatch in the artisanal handline fleet relative to approximately 30% in the industrial longline fleet applied to the total raw material sourced from this fishery by TambaCo over the 10-year investment period.



## THE COMMERCIAL INVESTMENT THESIS

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### STEP 2: THE EXPANSION OF TAMBACO

The Isda Strategy proposes a \$5.5 million investment into TambaCo, an illustrative seafood processing and distribution company. The investment would fund the expansion of the Company's sourcing portfolio, upgrade and expand its processing and cold chain logistics, and extend the marketing and distribution of sustainably sourced artisanal seafood products from the Philippines.

### VALUE PROPOSITION

The commercial investment thesis for Project Isda is centered on building a robust logistics network to source, process, and distribute high-value raw materials, particularly yellowfin tuna, from across the Philippines primarily destined for export. Once the core infrastructure is in place, TambaCo will be in a position to add incremental volumes of lower-value nearshore species for sale in the metro, regional, or export markets with sufficient contribution margin to supplement profitability and impact artisanal fishing communities participating in its supply chain network. Nearshore species are expected to strengthen TambaCo's business by diversifying its product line, eventually adding incremental profitability through economies of scale. TambaCo would focus on communities proximally located to its pelagic supply chain network to enable their participation, even though the profit margins associated with the nearshore species would be lower than those for the tuna product lines.

The Isda Strategy capitalizes on the opportunity to create additional value for the landed catch by (a) improving product quality through changes to handling and cold chain transport, (b) reconfiguring the existing, highly inefficient supply chain for artisanal seafood, and (c) developing high-value customer sales channels both domestically and abroad. By investing to create direct sourcing channels to secure high-quality supplies, as well as to expand final product processing and packaging capacity, the Isda Strategy can grow TambaCo's business, improve quality and yield, and capture additional margin on its operations. This value creation is generated before taking into consideration any final unit pricing and does not assume any increases in landings in the communities. By creating and capturing higher value for artisanally sourced seafood products, the Isda Strategy can provide economic rewards to fishers and fishing communities and generate attractive financial returns



### GROWTH STRATEGY

TambaCo's goal would be to expand its sustainable sourcing network to encompass 80 fishing communities, 150 fishing operators (leaders of large groups of fishers), some 6,500 fishing vessels, and approximately 19,000 fishers by 2020. TambaCo would expect the expanded sourcing network to increase its supply of raw materials

fivefold, tripling revenue while targeting a 25% gross margin and 17% EBITDA margin.

To realize this growth, The Isda Strategy proposes to invest \$5.5 million into the expansion of TambaCo's business operations to implement the following four strategies, all of which are tied to value creation across the supply chain:

## SMALL-SCALE FISHERIES SEAFOOD SUPPLY CHAIN



### Sourcing and Handling

The Isda Strategy proposes to expand TambaCo's sourcing portfolio from approximately 500 mt in 2014 to 2,800 mt by 2020, constituting approximately 33% of the portfolio communities' total extraction volumes, and providing direct and secure access to raw materials. This large share of total production is intended to provide greater market leverage for fishery management and quality improvements. Raw materials would be derived from the portfolio communities producing highly migratory pelagic species such as yellowfin

tuna, albacore tuna, frigate tuna, skipjack tuna, and mahi mahi, as well as nearshore species including snapper, grouper, parrotfish, mud crab, lobster, octopus, and squid. In each of these communities, TambaCo would implement seafood handling training programs with fishers to improve product quality and hygiene.

TambaCo's growth strategy would incorporate 80 different landing sites and municipalities in 14 provinces around the Philippines, as illustrated in the map on the following page (Figure 15).<sup>73</sup>

<sup>73</sup> For further details about Project Isda's strategy of enlisting new sustainable fishers and communities into its sourcing network, see the section above titled "Sustainable Fishing Rewards Program."



TambaCo's goal would be to expand its sustainable sourcing network to encompass 80 fishing communities, 150 fishing operators (leaders of large groups of fishers), some 6,500 fishing vessels, and approximately 19,000 fishers by 2020.

FIGURE 15: Project Isda Supply Chain

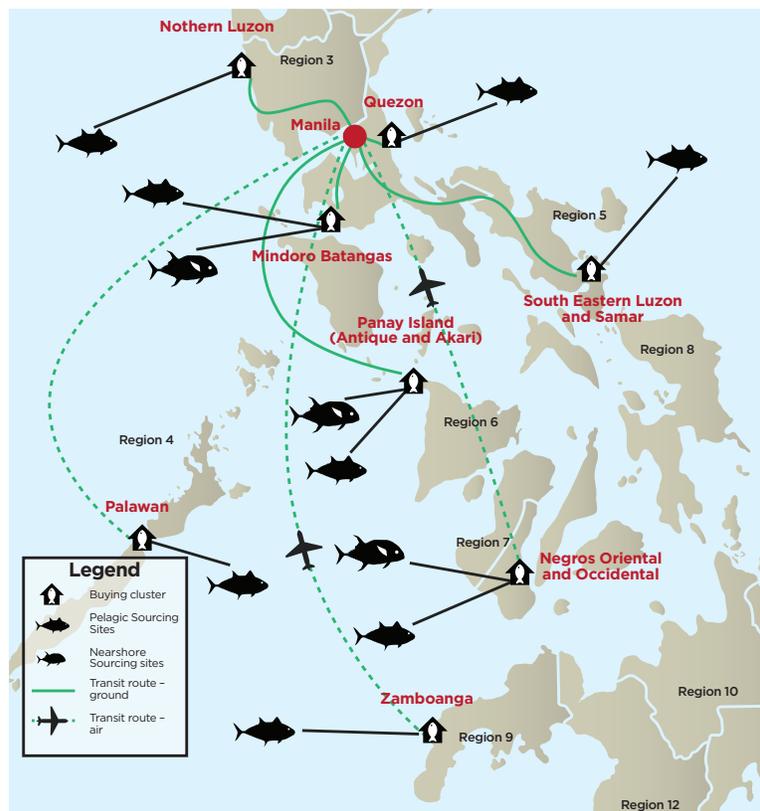
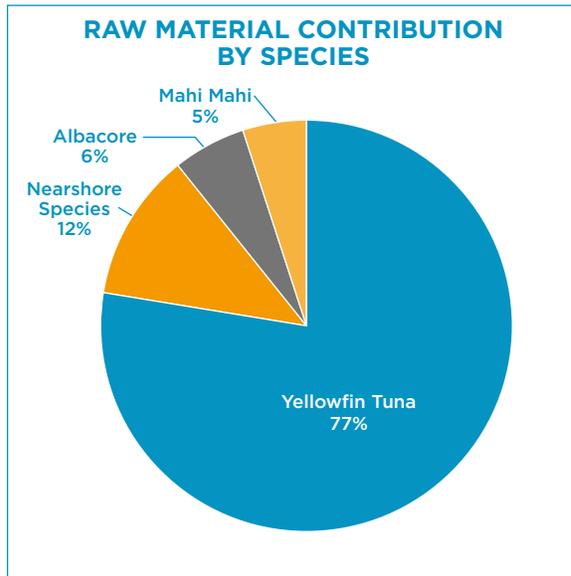


Figure 16: Raw Material Volume Sourced by Species



The nearshore fisheries to be incorporated are not expected to generate significant volumes of raw materials in the early years, given their current levels of depletion and the fishing constraints likely to be imposed by the fisheries management improvements. Over the next five years, TambaCo would expect its product mix to consist primarily of pelagic species shown in Figure 16.

The raw materials would be sourced across eight geographic clusters, as shown in Figure 17, incorporating all 80 portfolio of communities.

Figure 17: Sourcing Plan with Relative Contribution by Region

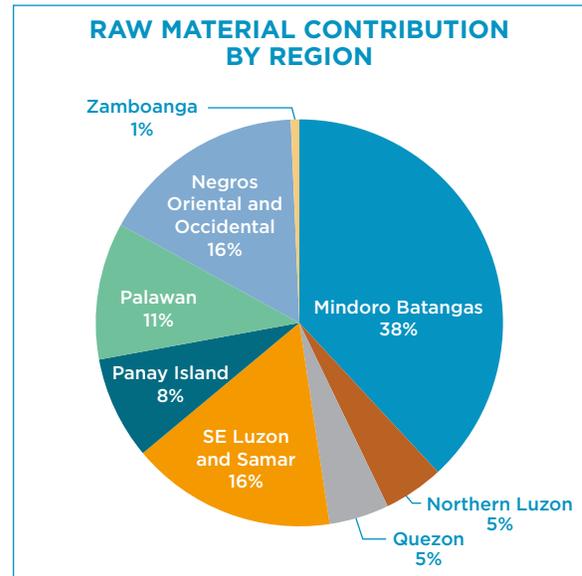
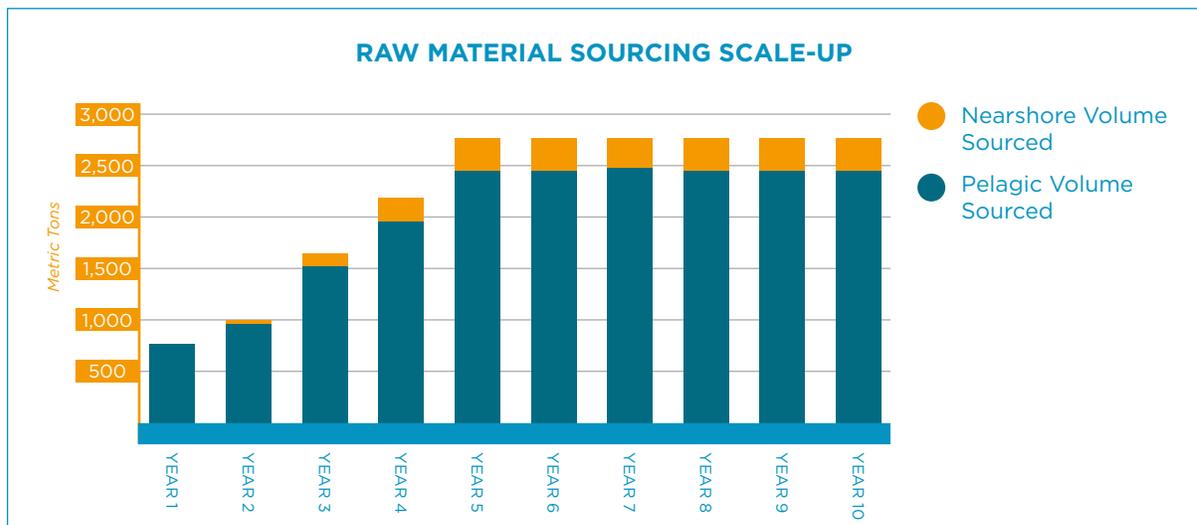


Figure 18 illustrates the scale-up of raw material sourcing, highlighting the volume contributions from pelagic versus nearshore species.

#### Cold Chain and Logistics

The Isda Strategy would enable TambaCo to extend a cold chain “backbone” logistics network to support the eight core geographic clusters of product sourcing. To support the expanded sourcing network, TambaCo would expect to construct 11 new buying stations, more than doubling its buying station facilities from current levels. The buying stations would serve as collection and consolidation

FIGURE 18: Raw Material Sourcing Scale-Up



points for raw materials to be transported to the processing facilities in Manila, as well as centers for fishery management improvement outreach and commercial interaction with fishery stakeholders. In the buying stations, seafood raw materials would be procured from fishery stakeholders, inspected against quality parameters and sustainability requirements, labeled with RFID tags that serve as the core of the traceability program, and be prepared

for loading and transport to Manila. TambaCo would acquire and manage a portion of the trucking fleet required for transport, and would lease or contract services for the remainder.

The buying stations would be located in consolidated geographic clusters supporting five land-based transport routes and three air-based ones. The table below summarizes the eight sourcing clusters:

**SUMMARY OF SOURCING CLUSTERS**

CLUSTER	TRANSPORT TYPE	TRANSPORT NOTES
<b>Mindoro Batangas</b>	Truck	Good road conditions, moderate flooding risk; some ferry transit required with storm closures
<b>Northern Luzon</b>	Truck	Good road conditions, some flooding risk; no ferry transit required
<b>Quezon</b>	Truck	Good road conditions; no ferry transit required
<b>South Eastern Luzon and Samar</b>	Truck	Moderate road conditions, with some problems anticipated in Samar; ferry transit required with storm closures
<b>Panay Island (Antique and Aklan)</b>	Truck	Good road conditions; some ferry transit required with storm closures
<b>Palawan</b>	Air	Puerto Princesa Airport Hub has no chilling station
<b>Negros Oriental and Occidental</b>	Air	Dumaguete/Bacolod Airport Hub has no chilling station
<b>Zamboanga</b>	Air	Zamboanga City Airport Hub has no chilling station

As TambaCo is able to add additional fishing communities to its sourcing network over time, its operations should benefit from economies of scale, wherein truck and air logistics achieve lower costs per unit of product with higher, more regular shipment volumes from the fishing communities.

#### Processing and Packaging

The Isda Strategy would plan to upgrade two existing manufacturing facilities and construct a new, larger facility to increase annual raw material processing capacity from 1,300 mt to 4,300 mt by early 2018 and to enable production of frozen product lines. The existing processing facilities would be used until they reach maximum annual capacity of 450–500 mt of final product

throughput sometime in the next two years; however, the existing facilities are limited in terms of access and space, while the restricted processing capability has prevented TambaCo from offering frozen tuna products.<sup>74</sup> The Isda Strategy thus proposes investment of \$4.5 million to construct a new processing facility in one of the PEZA (Philippines Export Zone Authority) Special Economic Zones<sup>75</sup> close to Manila. The new facility would be designed and installed as an energy and cost-efficient plant equipped with advanced IT and data processing systems to support traceability throughout its supply chain. Food safety and freezing functionality would allow for the processing of a variety of seafood products into desired product forms

<sup>74</sup> Frozen products serve as an important inventory buffer that allows TC to buy tuna raw materials from suppliers on a more consistent and broader range of quality.

<sup>75</sup> PEZA Special Economic Zones can be viewed as industrial parks where businesses will receive benefits such as tax breaks, simplified export procedures, and professional infrastructure all provided by the government.

and packaging types. The new facility would have a processing capacity of up to 3,000 mt of raw materials, allowing TambaCo to produce nearly

900 mt of fresh and chilled, 430 mt of frozen, and 25 mt of live product, as described below.

#### SUMMARY OF TAMBACO PRODUCT FORMS

SPECIES TYPE	PRODUCT FORM	PRODUCT TYPE
<b>Crustacean (Crab, Lobsters)</b>	Live Frozen	Freshly Packed Whole/Claws/Tails
<b>Cephalopods (Octopus, Squid)</b>	Fresh and Chilled Frozen	G&G <sup>76</sup> G&G <sup>76</sup> /Tubes/Rings
<b>Tuna</b>	Fresh and Chilled Frozen	G&G/H&G <sup>76</sup> Loins (Natural and CO) Loin, Steaks (Natural and CO)
<b>Other Finfish</b>	Fresh and Chilled Frozen	G&G <sup>76</sup> Filletts Filletts

#### Distribution

TambaCo would develop a strong brand identity among sustainability-minded international buyers and would seek to expand brand recognition of its products among local and regional buyers. TambaCo's goal would be to create sales channels supporting total volume of products growing from 185 mt in 2014 to 1,325 mt by 2020 by securing new client accounts in the U.S., Canada, and EU markets. In addition, TambaCo would launch and market the "Responsible Seafood Basket," a new marketing concept for locally and responsibly caught seafood, to the domestic and nearby Asian export markets such as Hong Kong and Singapore.

TambaCo would invest considerable time and capital in developing its brand identity in the international markets, so that they incorporate unique selling points, including sustainability, traceability, quality, process integrity, food safety, support of fisher livelihoods, and reliability.

TambaCo's marketing approach would attempt to create deep linkages between buyers and

suppliers such that the buyers become invested in TambaCo's sustainability standards and fisheries management improvements across its sourcing networks. Clients would be provided with a range of promotional materials to position the products at the point of final sale, which TambaCo believes will increase customer awareness of sustainability values and objectives and build a stronger customer constituency over time.

Yellowfin tuna, albacore tuna, and mahi mahi products would continue to be marketed by TambaCo on a worldwide basis in several product forms differentiated by size of portion, specific cut, and fresh versus frozen options.

As C and D grade tuna production increases, TambaCo would seek to deepen its local sales channels, targeting primarily food service where premium quality and sustainable/responsible branding are less important. Despite the lower product quality, these products generally yield relatively high margins because of the limited freight costs associated.

<sup>76</sup> GG: gilled & gutted; H&G: heads and guts removed; CO: treated with carbon monoxide. The application of CO is illegal for most export markets, with the exception of the U.S. and countries in the Middle East, Africa, Russia, and South America. CO binds with the myoglobin to form a very stable protein in the tuna tissue, called Carboxymyoglobin, which appears deep-red. Such tuna is therefore "artificially" colored but also highly stable, unlike natural tuna, whose color deteriorates after four or five days.

Nearshore species would be marketed under a newly developed branding program called the “Responsible Seafood Basket.” TambaCo would offer the Responsible Seafood Basket as a way to enable incorporation of fisheries earlier in the cycle of fisheries management improvement implementation, before they have been in place long enough to comply with traditional sustainability standards. The fisheries management improvements will still be subject to high standards of sustainability, but, given the level of expected depletion, will allow for a longer period

of rebuilding and restoration to take place while still permitting a limited volume of seafood to be sold in the marketplace to support fisher livelihoods. TambaCo would seek to develop customer interest in the Responsible Seafood Basket, targeting new buyers in the Manila market consisting primarily of high-end hotels and restaurants as well as in regional hubs abroad.

The tables below summarize the targeted market segments for each of the primary product lines TambaCo would expect to offer.

#### TARGET CUSTOMER SEGMENTS\*

PRODUCTS/PROGRAM	INTERNATIONAL EXPORT	REGIONAL EXPORT	DOMESTIC MARKETS
<b>Tuna and mahi mahi products</b>	Retail Food Service	Food Service Retail	Food Service Retail
<b>Responsible Seafood Basket</b>		Food Service	Food Service Retail Wholesale

\* Market segments highlighted in blue are the primary market targets.

#### TARGET CUSTOMER GEOGRAPHIES

PRODUCTS/PROGRAM	EUROPE	NORTH AMERICA	ASIA PACIFIC
<b>Tuna and mahi mahi products</b>	Switzerland France U.K. Netherlands Italy Scandinavia	U.S. Canada	Hong Kong Australia Singapore Bangkok Shanghai Macao
<b>Responsible Seafood Basket</b>			Manila Hong Kong Singapore Shanghai

The Isda Strategy would work with TambaCo toward the development of Fair Trade certification for small-scale fishers in the TambaCo sourcing network. Fair Trade certification would further support and help frame and promote the value of seafood products from small-scale fisheries on world markets, notably in North America and Europe. Achievement of the aforementioned sales goals would enable TambaCo to become one of the leading producers of fresh, chilled, and frozen yellowfin tuna products in the Philippines,

while at the same time supporting and sourcing from sustainably managed, small-scale fisheries.

#### Market Trends

TambaCo would expect to benefit from favorable demand trends for sustainable seafood in its target markets. Restaurants, wholesalers, and retailers around the world are increasingly committing to sustainable and responsible sourcing policies.<sup>77</sup> Of the top 38 North American and European retailers, those representing more

<sup>77</sup> A. Garrett, A. Brown, “Yellowfin tuna: A global and UK supply chain analysis,” *Seafish Economics*, March, 2009.

<sup>78</sup> Progress toward Sustainable Seafood – By the Numbers, 2015 edition, California Environmental Associates.

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The U.S. supermarket Safeway has announced that all fresh and frozen seafood will be either responsibly sourced, or on a “time-bound path” to be so, by the end of 2015.

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than 80% of sales have some level of commitment to sustainable seafood, either through an NGO partnership or a Marine Stewardship Council (MSC) chain of custody certification.<sup>78</sup> The U.S. supermarket Safeway has announced that all fresh and frozen seafood will be either responsibly sourced, or on a “time-bound path” to be so, by the end of 2015. Meanwhile, the seafood-purchasing giant Sysco has also committed to sourcing 100% of its “top 10” wild-caught seafood species from sources that are MSC-certified, engaged in MSC assessment, or engaged in a Fishery Improvement Project. These industry leaders are responding to growing consumer awareness of and demand for sustainable and responsibly sourced seafood.<sup>79</sup> Although demand for sustainable seafood has remained largely confined to the U.S. and Europe, Japan—the largest importer of fresh and frozen tuna—is considered a next logical target for cultivating sustainable seafood demand.<sup>80</sup>

Moreover, combating IUU (illegal, unreported, and unregulated) fishing—a major focus of The Isda Strategy’s fishery management improvement efforts—has gained increasing attention of late from policymakers in both the U.S. and Europe. The European Commission’s anti-IUU card system, which imposes warnings (yellow cards) and trade bans (red cards) on trading partners, appears to be catalyzing significant attention to fisheries management.<sup>81</sup> Similar policy changes are likely afoot in the U.S. following the release of an action plan in March 2015 by the Presidential Task Force on Illegal, Unreported, and Unregulated (IUU) Fishing and Seafood Fraud, co-chaired by the

Departments of Commerce and State. The action plan proposes the incorporation of at least six of TambaCo’s target species into a comprehensive traceability program.<sup>82</sup>

### Competition

TambaCo would face two main groups of competitors. The first group includes General Santos processors and exporters that tend to be larger enterprises producing final products in fresh, chilled, and frozen form. Some also have tuna canning operations. General Santos, in the Mindanao province in southern Philippines, is the country’s “tuna hub” due to its large-scale industrial fish port and landing site. The origin and legality of the catch landed in General Santos is often questionable, with a majority of landings from illegal hand-lining fleets venturing into Indonesian and Malaysian waters and landing of yellowfin tuna by industrial, pelagic long-liners from Taiwan and other nations.

The second group of competitors includes Metro Manila processors and exporters that tend to be small operators, often situated in private residential areas around the Manila international airport (for ease of export by air) where they operate basic, often “backyard style,” processing and packing facilities for yellowfin tuna. Their procurement and final sales volume are smaller than those from the city of General Santos (see below). These companies are usually privately operated, family-owned businesses and typically lack the ability to process frozen tuna, thus they deal almost exclusively with fresh and chilled products.

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<sup>79</sup> Marine Stewardship Council, “MSC Consumer Survey 2014,” [www.msc.org](http://www.msc.org), November, 2014.

<sup>80</sup> Progress toward Sustainable Seafood – By the Numbers, 2015 edition, California Environmental Associates.

<sup>81</sup> Progress toward Sustainable Seafood – By the Numbers, 2015 edition, California Environmental Associates.

<sup>82</sup> [www.nmfs.noaa.gov/ia/iuu/taskforce.html](http://www.nmfs.noaa.gov/ia/iuu/taskforce.html).

An overview of the two types of competitors is provided below.<sup>83</sup>

PARAMETER	TAMBACO COMPETITOR PROFILE	
	GENERAL SANTOS COMPANIES	METRO MANILA COMPANIES
Type of Business	Large corporate enterprises	Smaller family-owned operators
Product Forms	Fresh & hilled/frozen	Fresh & chilled
Number of Companies	6-8	12-15
Average Volume of Raw Materials	1,500-2,000 mt	50-400 mt
Type of Raw Material (Fishing Method)	Hand-line and pelagic longline	Hand-line mainly
Average Volume Final Products	750-1,500 mt	25-200 mt
Average Sales Value per kg Net Final Product	12 USD	16 USD
Average Turnover YFT Products/Year	9-20 million USD	0.4-3.5 million USD
Other Business Activities	Usually only yellowfin tuna	Other fish/seafood species

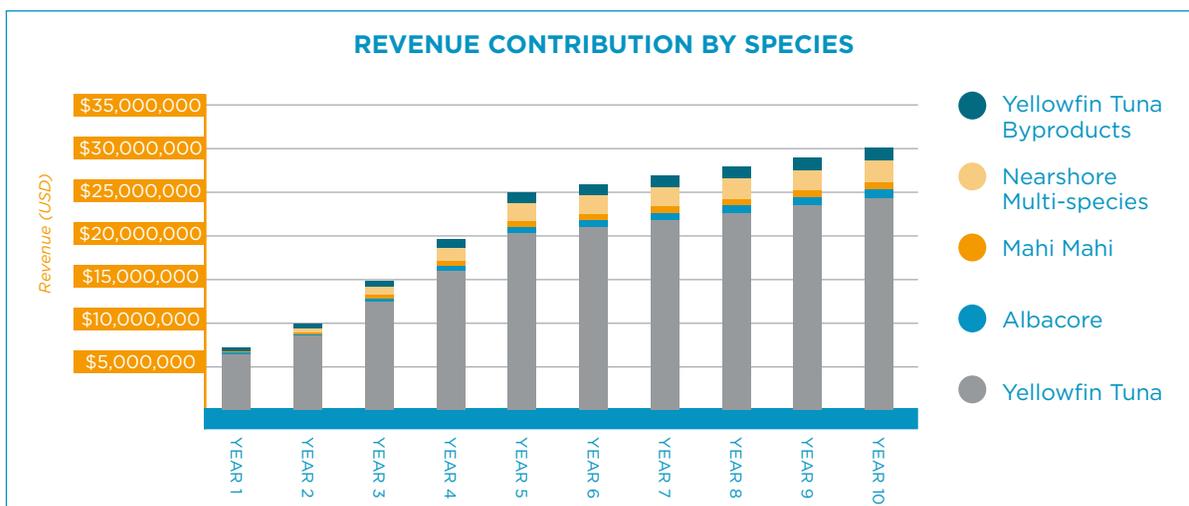
<sup>83</sup> TC 2015 Business Plan as prepared by management.

## FINANCIAL ASSUMPTIONS AND DRIVERS

### REVENUE MODEL AND PRICING

The export of yellowfin tuna will continue to comprise a majority of the TambaCo's revenue in the future, with increasing sales of the Responsible Seafood Basket over time. The addition of the Responsible Seafood Basket will allow TambaCo to begin to diversify its revenue with a much wider product range over the next five years. In the base case, TambaCo's revenue is expected to grow from \$7.1 million to \$30.1 million over the 10-year investment period, driven primarily by increasing sales volumes of yellowfin tuna (see Figure 19).

Figure 19: TambaCo Sales by Species



Within the yellowfin tuna segment, A-grade, B-grade, and C-grade products are projected to comprise 30%, 20%, and 40% of total sales, respectively, by the year 2024, with an increasing share of C-grade over time (see Figure 20). D-grade yellowfin tuna and processing byproducts are projected to remain a small proportion of the overall sales picture, because they fit less squarely with TambaCo's premium-quality brand identity.

Figure 20: Proportion of Yellowfin Tuna Sales by Quality Grade

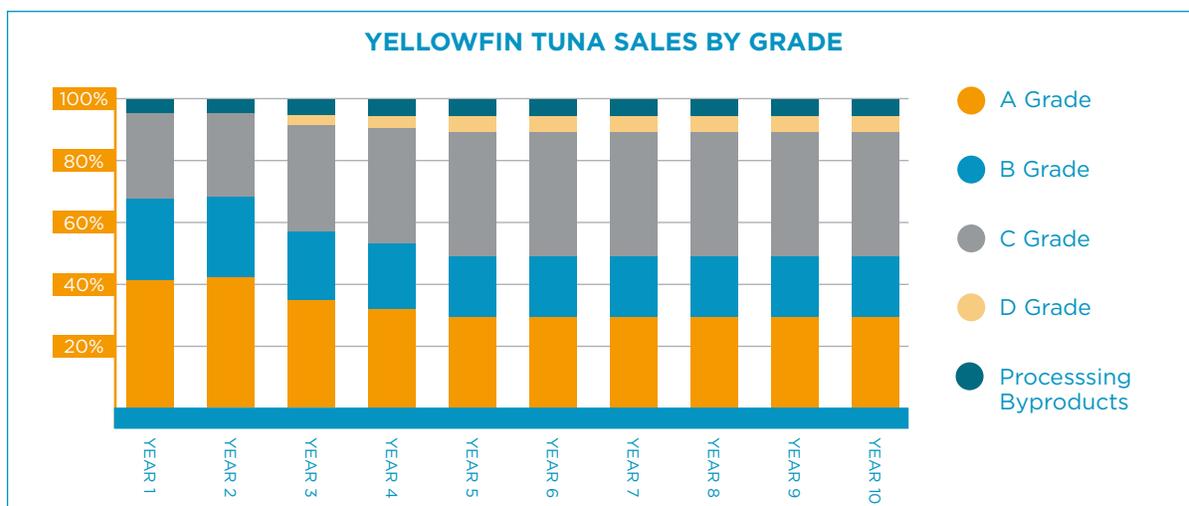


Figure 21: Breakdown of COGS by Expense Category

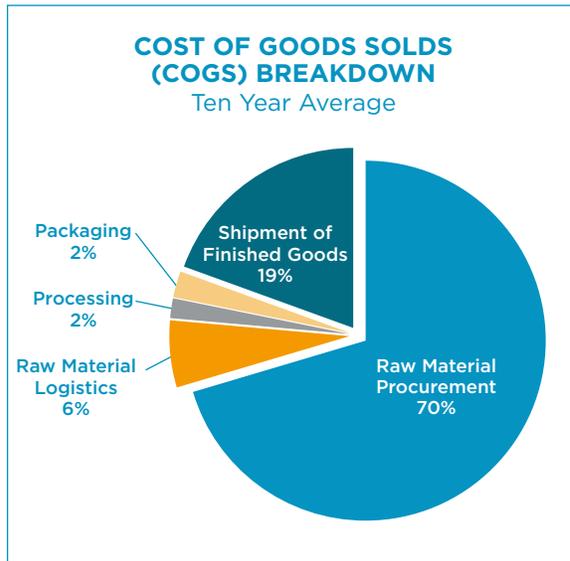
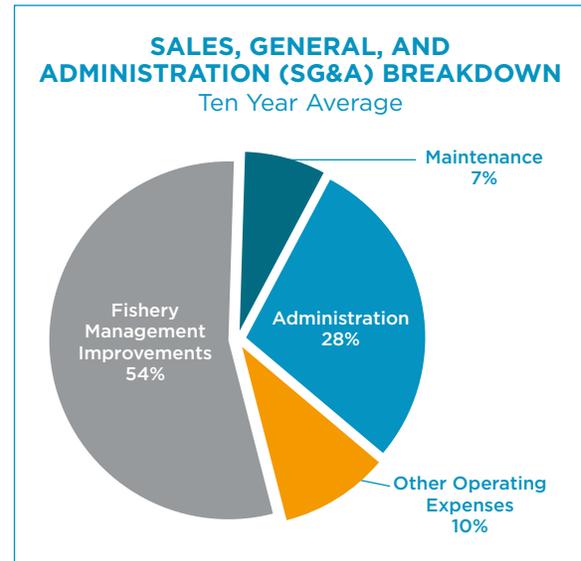


Figure 22: Breakdown of SG&A by Expense Category



### COST STRUCTURE

TambaCo’s cost of goods sold (COGS) expense categories are projected to remain relatively constant over the 10-year investment period, with raw material procurement costs constituting far and away the biggest driver (see Figure 21). The high cost of raw materials reflects, in part, the commitment of TambaCo to pay fishers higher prices for higher-quality products. Shipping costs for finished goods remain the second largest component of COGS throughout the investment period, although the contribution of this expense category falls as frozen tuna products are introduced, allowing for lower-cost transport alternatives. Over time, TambaCo would expect to achieve increasing economies of scale in processing, packaging, and logistics accomplished through higher throughput on a fixed-asset base.

TambaCo’s Selling, General, and Administration Expenses (SG&A) are driven by three primary expense categories: administrative costs (i.e., payroll and benefits for its employees), fisheries management improvement expenses, and maintenance on fixed assets (see Figure 22). Fishery-improvement-related expenses will primarily be paid out as service fees to TambaCo’s operating partners. All other expense categories grow in similar proportions with the expansion of the business, and come to comprise nearly half of SG&A in years 6 through 10.

Figure 23: Overall TambaCo Cost Structure

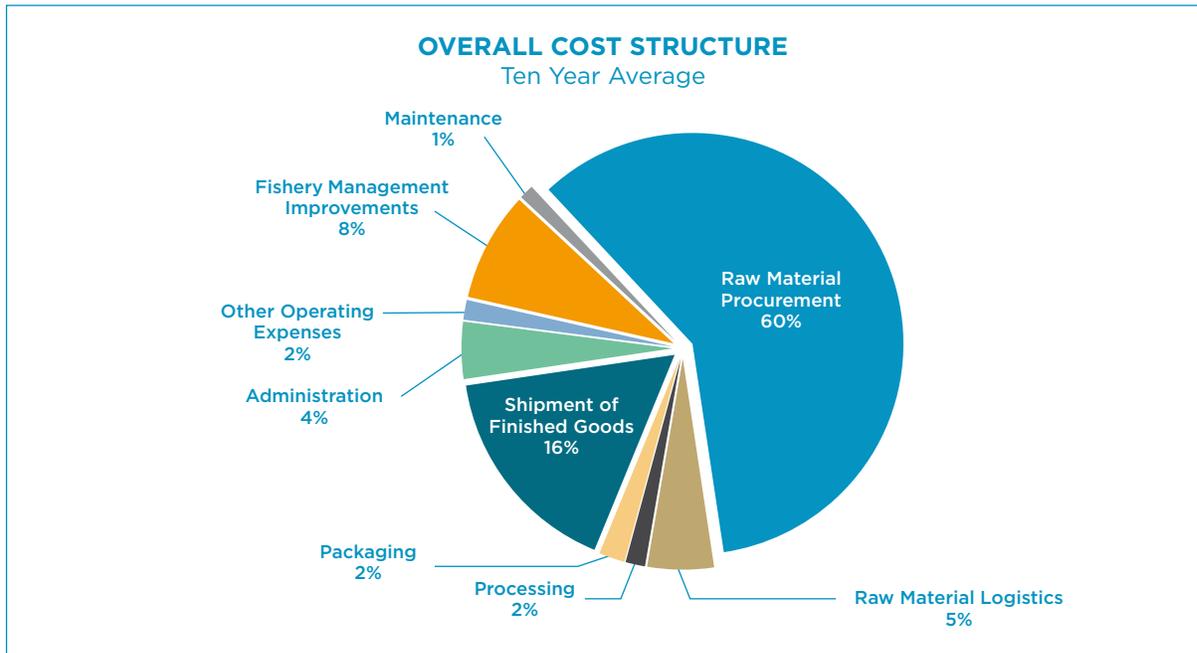


Figure 23 reflects the overall cost structure of TambaCo's operations over the investment period. TambaCo's costs of production are between 15% and 25% higher than its domestic competitors as a result of the additional costs associated with fishery improvements, responsible sourcing, improved handling, and supply-chain traceability.

The higher cost structure requires TambaCo to maintain a premium value position in the export markets, particularly for yellowfin tuna. While its position today is strong and strengthening, the Company will need to continue to find ways to expand its margins.

## TRANSACTION STRUCTURE

### SOURCES AND USES OF FUNDS

The Isda Strategy base case assumes an \$11.7 million investment consisting exclusively of impact equity and philanthropic grant funding, as follows:

#### SOURCES OF INVESTMENT PROCEEDS

Sponsor Equity	\$8,678,851
Total Commercial Debt	-
Foundation Program-Related Investment	-
Foundation Grant	\$3,000,000
Government Grant	-
<b>Total</b>	<b>\$11,678,851</b>

The grant funds would be managed as an independent Fishing Community Trust (FCT), and would have no impact on the financial performance of TambaCo or the Strategy. The base case does not assume any Program Related Investment (PRI) to demonstrate the maximum financial capacity of the strategy; however, a tranche of PRI funding would ideally be used to support the high up-front fishery management improvement costs.

The following table summarizes the uses of investment proceeds for the Isda Strategy:

#### USES OF INVESTMENT PROCEEDS

Existing Processing Facility Upgrades	\$85,000
New Processing Facility	\$4,500,000
Initial Buying Stations	\$683,171
Initial Fishery Management Improvement Fixed Assets (CAPEX)	\$1,114,975
Initial Fishery Management Improvement Operating Expenses (OPEX)	\$2,080,706
Transaction Fees	\$50,000
Legal Fees	\$150,000
Travel Fees and Expenses	\$15,000
Precapitalization of FCT	\$3,000,000
<b>Total</b>	<b>\$11,678,851</b>

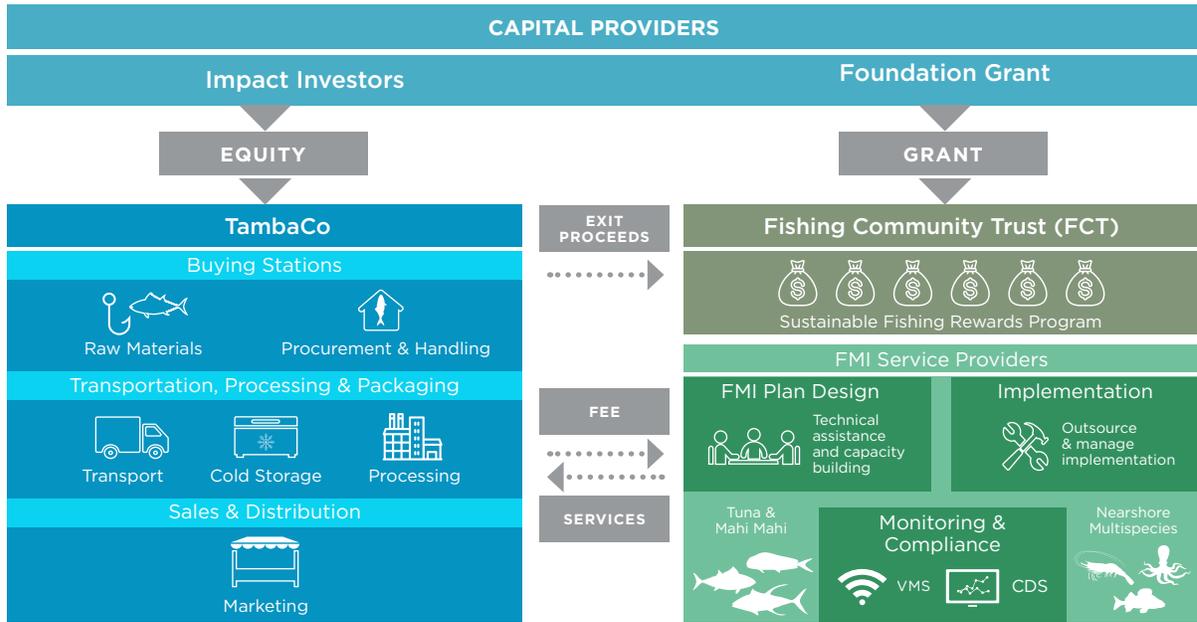
### OWNERSHIP STRUCTURE AND GOVERNANCE

TambaCo is fully owned by a single foreign entity. After the proposed transaction, the Isda Strategy investors would own 79% of the Company, with the existing shareholder owning 21%. Isda Strategy investors would then allocate a 10% equity share to fishers to eventually recapitalize the Fishing Community Trust at exit.

<b>Isda Strategy Investor Ownership %</b>	<b>79.3%</b>
<i>Investor Ownership %</i>	<i>69.3%</i>
<i>FCT Ownership %</i>	<i>10.0%</i>
<b>Previous Investor Ownership %</b>	<b>20.7%</b>

The most efficient structure for foreign investors and foundations to invest into the Isda Strategy would be through a shell company incorporated in the United States. This company would become the parent company and majority shareholder of TambaCo. Figure 24 illustrates a simplified transaction structure, highlighting capital sources and flows.

Figure 24: Summary of Capital Providers and Flows



### SUMMARY OF RETURNS

The following table summarizes the base case impact and financial returns of the Isda Strategy:

#### SUMMARY OF BASE CASE FINANCIAL RETURNS

Total Equity Investment	\$8,678,851
Time Horizon (years)	10.0
Total Leverage Level	0.0%
Equity IRR	20.7%
10-Yr EBITDA Compound Annual Growth Rate	18.0%

#### SUMMARY OF BASE CASE IMPACT RETURNS

Total Marketable Landings Increase	n/a
Total Avoided Bycatch (%)	28%
Total Avoided Bycatch (mt)	5,526
Total Habitat Protected (ha)	1,000
Premium Paid to Fishers (%)	15.0%
Total Income Increase to Fishers (USD)	\$11,874,099
Contributions to Fishing Community Trust (USD)	\$5,754,504
Total Fishers Incorporated	19,000
Total Communities Engaged	80
Spoilage Reduction	13.0%
Additional Meals-to-market - Run-rate (meals/yr)	812,005
Additional Meals-to-market - Cumulative Years 1-10	6,512,585

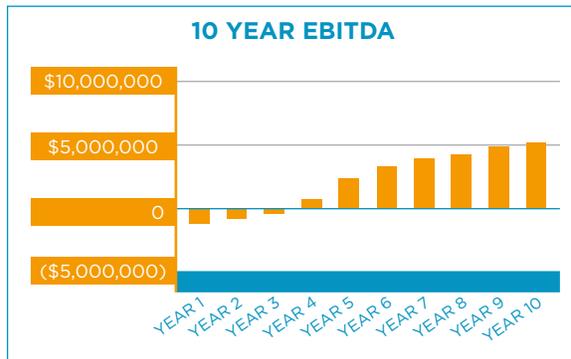
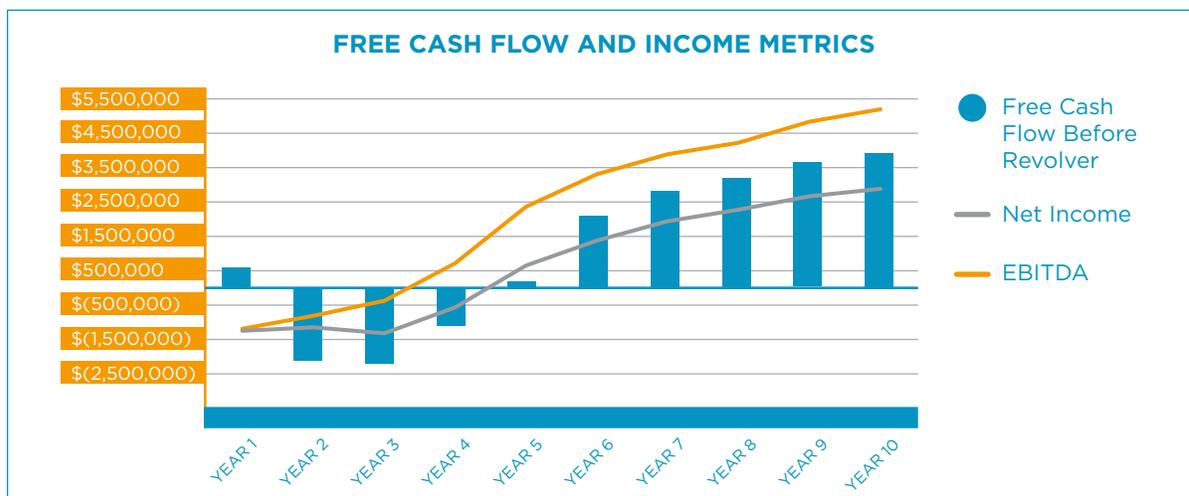


Figure 25 depicts free cash flow and income metrics over the 10-year strategy. A line of credit would be used to finance working capital needs and cash flow shortfalls in years 1-3.

Figure 25: Free Cash Flow and Income Metrics



### SENSITIVITY ANALYSIS

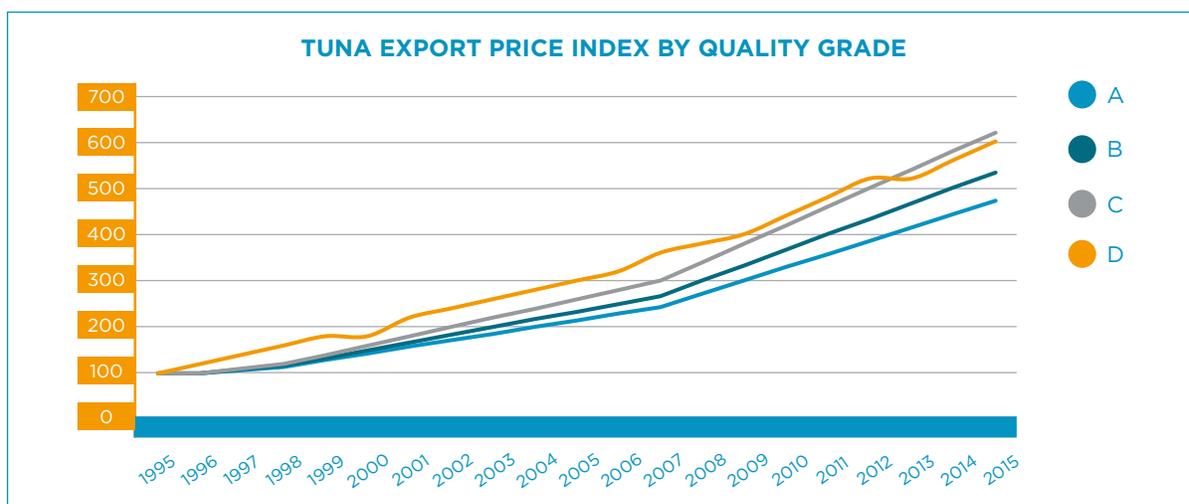
Several key assumptions have a particularly pronounced effect on the estimated financial return of the Isda Strategy. As such, the model has been forecast under multiple cases that flex the following key variables:

**Annual Changes in Sales Prices:** As with any commodity-driven business, the cash flows of TambaCo are particularly sensitive to changes in the sales price of finished goods relative to raw material costs. In particular, given the dominance of yellowfin tuna in the TambaCo product mix, the Isda Strategy financial return

will depend significantly on the demand and pricing dynamics for that tuna on the international market. Promisingly, as the price index in Figure 26 illustrates, export prices for yellowfin tuna from the Philippines have been rising steadily and consistently for the last 20 years. In fact, prices for A-, B-, and C-grade tuna—TambaCo’s most significant import offerings by volume and value—have been growing at a compound annual rate of 7%, 8%, and 9%, respectively, for 20 years.

The Isda Strategy base case projects an annual 3.8% increase in sales prices for all product lines,

Figure 26: Tuna Export Price Index



including yellowfin tuna. Based on historical price trends in both yellowfin tuna and seafood more broadly, the annual price increases incorporated into the Isda Strategy base case are likely conservative. Moreover, the base case assumes that sales prices will grow at the same rate as raw material prices. The downside case assumes that sales prices only increase by 2.8%, while the upside case assumes price inflation of 4.8% per year. The IRR falls to 6.8% in the downside case, but increases to 28.6% in the upside case. Similarly, when sensitizing around raw material costs, and holding sales price growth constant at 4.8%, a 1% increase in raw material prices decreases the IRR to 13.0%, but a 1% decrease in raw materials increases the IRR to 25.6%.

**Premium Paid to Fishers:** Aligning economic incentives between fishers and TambaCo is a core premise of the Isda Strategy investment thesis. As such, the strategy proposes to pay a premium to fishers on top of the prevailing market price for raw materials. The base case sets that premium at 15%, although the downside scenario assumes a 25% premium and the upside case a 5% premium. In the downside scenario, the project IRR falls to 10.3%, but in the upside scenario the IRR increases to 26.9%.

**Raw Material Throughput:** Despite its focus on premium offerings and sustainability, TambaCo is still fundamentally a seafood processing and distribution business and thus fundamentally depends on throughput to drive profitability. Once the fixed-asset base is established, each unit of additional throughput should contribute directly to growing the profitability of the business. In the base case, the model assumes that those raw material volumes that are sourced never exceed 2,776 mt, implying a maximum processing plant utilization rate of 65%. The base case is again intentionally conservative given the uncertainty around raw material availability and the capacity of the new plant to efficiently process as many as 20 different species. In the downside case, TambaCo sources 25% less raw material each year versus the base case, achieving a maximum processing facility utilization rate of 48%, and the upside case assumes 25% greater volumes and a max plant utilization rate of 81%. In

the downside case, the project IRR falls to 10.6% but in the upside case the IRR increases to 26.9%.

**Number of Nearshore Communities:** The number and type of communities incorporated into the TambaCo sourcing portfolio is another key driver of the financial return, due in large part to the costs associated with establishing additional buying stations and expanding fishery management improvement activities. The sourcing volumes in the model are based on site visits to actual communities; however, little or no data exists on the historical landings by community, meaning it is difficult to project how many communities must be incorporated into the strategy to reach TambaCo's projected throughput schedule. Moreover, the two community types have different contribution margins because of the relatively higher raw material volumes and lower fishery management improvement costs associated with the pelagic-species fishing communities. Given the potentially greater additional conservation value of incorporating the nearshore multispecies fishery communities, they are considered important to incorporate; however, this comes at a cost to investors. The base case assumes the Isda Strategy will incorporate 20 nearshore multispecies fishing communities and 60 pelagic-species fishing communities to meet its sourcing requirements. In the downside case, the strategy incorporates 25 nearshore multispecies fishing communities and 70 pelagic species fishing communities, versus the upside case that incorporates 15 nearshore multispecies fishing communities and 50 pelagic-species fishing communities. In the downside case, the IRR falls to 13.2% but in the upside case the IRR increases to 23.7%.

**EBITDA Exit Multiple:** In year 10, TambaCo is assumed to be sold at a multiple of EBITDA, the proceeds of which are used to repay investors and recapitalize the FCT. This multiple is a function of the upside that a company might offer to a potential buyer. The model assumes a 6x EBITDA multiple in the base case, a 3x multiple in the downside case, and a 9x multiple in the upside case. These multiples are based on comparable transactions in the seafood arena. In the downside case, the project IRR falls to 15.4% but in the upside case it increases to 24.6%.

**Communities Per Buying Station:** Given the wide geographic distribution of the portfolio communities, TambaCo will need to create buying station outposts across the Philippines from which to procure raw materials. The ability to cluster communities around fewer buying stations is a critical component of the raw material procurement strategy. The base case assumes that only one station will be needed per five additional communities based on TambaCo's historical precedent of six communities per station. The model assumes three communities per buying station in the downside case and seven communities per buying station in the upside case. In the downside case the project IRR falls to 15.7% but in the upside case the IRR increases to 22.8%.

**Working Capital:** Managing working capital is a particular challenge when sourcing from artisanal

fishers, given the need to pay cash at the time of raw material purchase, and to potentially endure significant delays before receiving payment from customers. Moreover, the volatility in seafood supply relative to the need to fulfill constant supply agreements with buyers requires holding significant inventory. Both cases create substantial working capital demands. In TambaCo's case, inventory has less of an impact on the IRR of the project, given that most of its product is fresh, chilled, or even live and cannot be held as inventory. In the base case, the model assumes 45 accounts receivable days and 15 accounts payable days. The downside case assumes 90 accounts receivable days and only 1 accounts payable day, while 30 receivable days and 30 payable days are assumed in the upside case. In the downside case, the project IRR falls to 16.9% although in the upside case the IRR increases to 21.9%.

SENSITIVITY ANALYSIS	SCENARIOS			IRR		IRR IMPACT	
	Base	Downside	Upside	Downside	Upside	Downside	Upside
Sales Price Increase ( $\Delta\%/yr$ )	3.8%	2.8%	4.8%	6.8%	28.6%	-13.9%	7.9%
Price Premium (%)	15%	25%	5%	10.3%	26.9%	-10.4%	6.2%
Max Raw Material Purchased (mt; $\Delta\%/yr$ )	2776	1839 (-25%)	3065 (+25%)	10.6%	26.9%	-10.1%	6.2%
Raw Material Costs Increase ( $\Delta\%/yr$ )	3.8%	4.8%	2.8%	13.0%	25.6%	-7.7%	4.9%
Communities Incorporated (Nearshore; Pelagic)	20; 60	25; 70	15; 50	13.2%	23.7%	-7.5%	3.0%
EBITDA Exit Multiple	6x	3x	9x	15.4%	24.6%	-5.3%	3.9%
Communities Per Buying Station	5	3	7	15.7%	22.8%	-5.0%	2.1%
Working Capital (Receivable Days; Payable Days)	45; 15	90; 1	30; 30	16.9%	21.9%	-3.8%	1.2%

## KEY RISKS AND MITIGANTS

Key risks that can affect the TambaCo business and the Project Isda investment can be categorized into the following five main areas: raw material sourcing volume, raw material cost, revenue, fishery improvement plan, and general business environment.

RISK	DESCRIPTION	MITIGANTS
<b>Key Risks Affecting Raw Material Sourcing Volume</b>		
Limited fishery raw material availability in the Philippines	Fishery raw material availability in the Philippines is limited and fluctuations can be high and unpredictable, given the lack of systematic data collection.	TambaCo intends to source from up to 80 fishery sites spread over 14 provinces in the country to diversify its sourcing risk. Being able to process frozen products will also allow the Company to “store up” in times of high fish landings.
Environmental/climate risks from earthquakes, volcanic eruption, and (regular) typhoon storms	The Philippines is prone to earthquakes and volcanic eruptions, and is the country with the highest incidence rate for tropical storms. Such extreme weather events can lead to regular disruption of fishery raw material supplies, can impose safety-at-sea risks for the fishers, and can disrupt inland transport and logistics.	(Same as above.) All the collection and buying stations will be equipped with ice storage to extend the time during which fish stays fresh, especially when transport delays are likely to occur due to adverse weather conditions.
Competing General Santos companies moving into TambaCo yellowfin tuna fishery sites	Since October 2014, some of the larger tuna companies from General Santos have been moving into the small-scale fishery landing sites where TambaCo has been established. <sup>84</sup>	TambaCo would pay fishers 15% more for raw materials, compared to their competitors. TambaCo would also focus on community outreach to educate artisanal fishers about the long-term socioeconomic and ecological benefits of working with and selling to TambaCo. Moreover, as TambaCo established itself as a reliable buyer—both in terms of buying meaningful volumes of raw material and investing in vessel improvements and technical assistance—it would be able to build long-term buying relationships with the fishers.
<b>Key Risks Affecting Raw Material Costs</b>		
High tuna raw material prices in the Philippines	Tuna from the Philippines tends to be more expensive than that from other Asian countries, such as Indonesia, Vietnam, Sri Lanka, and the Maldives.	TambaCo would construct a solid “marketing story” as to why a premium is warranted for sustainable and responsible seafood. It will be critical to focus on higher-end customers, especially in export markets, who are less price sensitive and more committed to seafood sustainability.

<sup>84</sup> According to information from tuna fishery industry insiders, the General Santos companies have been struggling to obtain raw materials for their processing operations due to enhanced enforcement by Indonesian authorities combatting illegal fishing by the Philippines tuna industry in Indonesian waters.

RISK	DESCRIPTION	MITIGANTS
<b>Key Risks Affecting Raw Material Costs</b>		
Uncertain/Fluctuating raw material sourcing cost	Due to uncertainties regarding raw material availability, as discussed above, the price that TambaCo needs to pay to fishers can at times be high and/or unpredictable.	While this is not an area that TambaCo can easily mitigate against, the model downside cases associated with higher ex-vessel prices (and increases in those prices over time) reveal positive IRRs in all but extreme cases. Moreover, the diverse species portfolio and modular processing capacity do accommodate species and product substitution.
<b>Key Risks Affecting Sales</b>		
Tuna prices	TambaCo revenue relies heavily on yellowfin tuna prices.	As previously discussed, tuna prices have been increasing at a CAGR of 7%-10%, depending on the grade over the last 20 years. If this trend ceases, revenue from other products, such as the Responsible Seafood Basket, could help buffer volatility in yellowfin tuna prices.
Inability to increase export client base as projected due to insufficient high-quality yellowfin tuna supply	TambaCo has not been able to sign up several North American clients that are looking for fresh and chilled, sashimi grade (AA- and A-grade) tuna because of a lack of sufficiently high-quality raw material availability. The tuna that is currently sourced by North American companies is almost exclusively caught by industrial pelagic long-lining fleets in the Pacific, Indian, and Atlantic oceans. This method of catch results in much higher shares of AA- and A-grade quality, so landing prices for such tuna are usually lower than for small-scale hand-lining fleets.	TambaCo will continue to focus on freshness and quality through technical assistance programs with fishers, improved buying station infrastructure, and upgrades to its existing processing facilities. TambaCo would continue to build a compelling marketing story as to why its tuna, despite not necessarily being AA- or A-grade, is either more sustainable or responsibly sourced or both. Moreover, B-grade tuna still has significant export value across the world, even if it does not command the same premium as sashimi-grade.
Little/Low uptake on the Responsible Seafood Basket product	The Responsible Seafood Basket marketing concept has yet to be developed. There is uncertainty as to the extent of uptake of this product line in domestic and export markets.	This product line is projected to comprise only 8% of the Company's revenue by 2024. Assuming TambaCo generates zero sales from this, the equity investment return remains positive. Moreover, the Company is actually more profitable (under current market conditions) when it focuses only on pelagic species. These species have been added to diversify risk and increase the overall impact of the strategy. As a result, if the Responsible Seafood Basket needed to be phased out, it would not necessarily damage the return to investors.

RISK	DESCRIPTION	MITIGANTS
<b>Key Risks Affecting Sales</b>		
Sales price undercut by other local competitors	Local TambaCo competitors have been observed selling tuna products on the export market below the cost of raw materials. There are indications and allegations that certain Philippine tuna businesses are being used as an opportunity for money laundering and other illegal activities. <sup>85</sup>	Again, TambaCo must focus on building a unique brand reputation and customer constituency for its products, in some cases highlighting the illegality of supply alternatives to underscore its own unique selling points.
<b>Key Risks Affecting Fishery Management Improvement Program</b>		
Reliance on operating partners to implement fishery improvement efforts	TambaCo cannot be responsible for successful implementation of fisheries management improvement across all 80 communities, and partners could fail to execute.	TambaCo has experience working with a number of potential fishery management improvement operating partners in the Philippines and abroad, providing some flexibility.
Fish stock biomass cannot be maintained despite sound fisheries management improvement implementation	None of the fisheries management plans impacts the entire stock, making it harder to control effort and thus long-term raw material availability for TambaCo.	From an investment perspective, the cash flow of TambaCo does not rely on significant stock restoration, and instead generates profits through product value additions and supply chain efficiencies. Moreover, a broad sourcing portfolio, both in terms of species and geographies, affords lower reliance on any individual fishery improvement effort.
Leakage due to continued illegal and overfishing by competitors	Fish protected and not caught by fishers involved with the fisheries management improvements are illegally or irresponsibly caught by other fishers or industrial fleets.	TambaCo will work with LGUs in all its procurement hubs to improve monitoring and enforcement of IUU fishing activity.
<b>Key Risks Affecting General Business Environment</b>		
Corruption puts business operations at risk	The Philippines is ranked 85 out of 175 countries in terms of public sector corruption (the higher the rank number, the more corrupt the country). <sup>86</sup> Corruption already exists in the tuna industry and can occur at virtually any stage in the supply chain.	TambaCo is acutely aware of the corruption challenges in the Philippines and has established internal policies for mitigating them.
Inflation and currency risks	ISDA Strategy investors will most likely be investing with U.S. dollars and are subject to currency risks due to TambaCo operating primarily in Philippine pesos.	The exchange rate between the U.S. dollar and Philippine peso has remained relatively stable over the last five years, fluctuating no more than 6% against the period average. <sup>87</sup>

<sup>85</sup> The allegation of tuna businesses being used as a front for money-laundering occurs in many developing countries across Asia, Africa, and Latin America.

<sup>86</sup> Transparency International's 2014 Corruption Perceptions Index (<http://www.transparency.org/cpi2014>)

<sup>87</sup> Oanda (<http://www.oanda.com/currency/historical-rates/>)

## APPENDIX

### OPERATIONAL AND FINANCIAL PROJECTIONS

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
<b>NEARSHORE FISHERIES COMMUNITIES</b>	5	10	15	18	20	20	20	20	20	20
# of Fishers	250	500	750	900	1,000	1,000	1,000	1,000	1,000	1,000
# of Vessels	125	250	375	450	500	500	500	500	500	500
<b>HIGHLY MIGRATORY FISHERIES AND COMMUNITIES</b>										
# of Fishing Communities	35	42	48	54	60	60	60	60	60	60
# of Fishers	8,400	10,920	13,440	15,960	18,000	18,000	18,000	18,000	18,000	18,000
# of Vessels	2,800	3,640	4,480	5,320	6,000	6,000	6,000	6,000	6,000	6,000
<b>Total Communities</b>	<b>40</b>	<b>52</b>	<b>63</b>	<b>72</b>	<b>80</b>	<b>80</b>	<b>80</b>	<b>80</b>	<b>80</b>	<b>80</b>
<b>Total Fishers</b>	<b>8,650</b>	<b>11,420</b>	<b>14,190</b>	<b>16,860</b>	<b>19,000</b>	<b>19,000</b>	<b>19,000</b>	<b>19,000</b>	<b>19,000</b>	<b>19,000</b>
<b>Total Vessels</b>	<b>2,925</b>	<b>3,890</b>	<b>4,855</b>	<b>5,770</b>	<b>6,500</b>	<b>6,500</b>	<b>6,500</b>	<b>6,500</b>	<b>6,500</b>	<b>6,500</b>
<b>RAW MATERIAL VOLUME (mt)</b>										
Tunas and Mahi Mahi	763	967	1527	1961	2452	2452	2452	2452	2452	2452
Nearshore Species	0	29	128	233	324	324	324	324	324	324
<b>FINISHED GOODS VOLUME (mt)</b>										
Live	-	7	13	19	25	25	25	25	25	25
Fresh and Chilled	357	477	617	753	877	877	877	877	877	877
Frozen	-	-	164	284	430	430	430	430	430	430
Tunas and Mahi Mahi	357	457	701	893	1,111	1,111	1,111	1,111	1,111	1,111
Nearshore Species	-	250,000	93	163	221	221	221	221	221	221
Sub-total Export	318	422	658	852	1064	1064	1064	1064	1064	1064
Sub-total Domestic	39	61	135.5	203.5	268	268	268	268	268	268
<b>Total</b>	<b>357</b>	<b>483</b>	<b>793.5</b>	<b>1055.5</b>	<b>1332</b>	<b>1332</b>	<b>1332</b>	<b>1332</b>	<b>1332</b>	<b>1332</b>
<b>REVENUE</b>										
Export Sales	\$6,188,883	\$8,433,726	\$12,632,516	\$16,543,692	\$21,072,556	\$21,873,313	\$22,704,499	\$23,567,270	\$24,462,827	\$25,392,414
Domestic Sales	\$562,977	\$891,296	\$1,526,622	\$2,133,566	\$2,704,647	\$2,807,424	\$2,914,106	\$3,024,842	\$3,139,786	\$3,259,098
Others	\$337,593	\$466,251	\$707,957	\$933,863	\$1,188,860	\$1,234,037	\$1,280,930	\$1,329,606	\$1,380,131	\$1,432,576
<b>Total</b>	<b>\$7,089,453</b>	<b>\$9,791,274</b>	<b>\$14,867,095</b>	<b>\$19,611,121</b>	<b>\$24,966,064</b>	<b>\$25,914,774</b>	<b>\$26,899,536</b>	<b>\$27,921,718</b>	<b>\$28,982,743</b>	<b>\$30,084,088</b>
% Growth		38.1%	51.8%	31.9%	27.3%	3.8%	3.8%	3.8%	3.8%	3.8%
<b>OPERATING EXPENSES</b>										
<b>Cost of Goods Sold</b>										
Raw Material Procurement	\$3,648,920	\$4,971,723	\$7,832,050	\$10,434,855	\$13,438,425	\$13,949,085	\$14,479,150	\$15,029,358	\$15,600,473	\$16,193,291
Raw Material Logistics	\$425,367	\$558,103	\$805,053	\$1,008,845	\$1,220,101	\$1,203,141	\$1,186,418	\$1,169,927	\$1,153,665	\$1,137,629
Processing	\$106,342	\$143,932	\$214,175	\$276,867	\$345,419	\$351,374	\$357,431	\$363,593	\$369,862	\$376,238
Packaging	\$141,789	\$191,909	\$285,567	\$369,157	\$460,558	\$468,498	\$476,575	\$484,791	\$493,149	\$501,651
Shipment of Finished Goods	\$1,203,904	\$1,660,093	\$2,288,136	\$2,937,255	\$3,615,070	\$3,752,443	\$3,895,035	\$4,043,047	\$4,196,683	\$4,356,157
<b>Total Cost of Goods Sold</b>	<b>\$5,526,322</b>	<b>\$7,525,759</b>	<b>\$11,424,982</b>	<b>\$15,026,980</b>	<b>\$19,079,572</b>	<b>\$19,724,540</b>	<b>\$20,394,609</b>	<b>\$21,090,716</b>	<b>\$21,813,831</b>	<b>\$22,564,965</b>
<b>SG&amp;A</b>										
Personnel	\$283,578	\$391,651	\$892,026	\$1,176,667	\$998,643	\$1,036,591	\$941,484	\$977,260	\$869,482	\$902,523
Other Operating Expenses	\$354,473	\$367,173	\$418,137	\$413,672	\$394,971	\$307,485	\$239,377	\$186,355	\$145,077	\$112,943
Fishery Improvement Program	\$2,080,706	\$2,142,816	\$2,239,666	\$1,996,114	\$1,824,888	\$1,257,835	\$1,183,470	\$1,226,948	\$1,138,460	\$1,175,541
Maintenance	\$70,250	\$206,364	\$295,363	\$304,009	\$307,840	\$278,007	\$241,519	\$201,577	\$158,792	\$112,714
<b>Total SG&amp;A</b>	<b>\$2,789,006</b>	<b>\$3,108,003</b>	<b>\$3,845,192</b>	<b>\$3,890,463</b>	<b>\$3,526,342</b>	<b>\$2,879,917</b>	<b>\$2,605,849</b>	<b>\$2,592,140</b>	<b>\$2,311,812</b>	<b>\$2,303,721</b>
<b>EBITDA</b>	<b>-\$1,225,875</b>	<b>-\$842,489</b>	<b>-\$403,079</b>	<b>\$693,679</b>	<b>\$2,360,149</b>	<b>\$3,310,316</b>	<b>\$3,899,077</b>	<b>\$4,238,863</b>	<b>\$4,857,100</b>	<b>\$5,215,401</b>
EBITDA Margin	-17.3%	-8.6%	-2.7%	3.5%	9.5%	12.8%	14.5%	15.2%	16.8%	17.3%
<b>CAPITAL EXPENDITURES</b>										
Existing Processing Plant Upgrade	\$85,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
New Processing Plants	\$ -	\$2,781,000	\$1,909,620	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Buying Stations	\$405,042	\$278,129	\$286,473	\$295,067	\$303,919	\$ -	\$ -	\$ -	\$ -	\$ -
FMI-related CAPEX	\$1,114,975	\$525,278	\$535,528	\$509,915	\$461,193	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Total CAPEX</b>	<b>\$1,605,017</b>	<b>\$3,584,406</b>	<b>\$2,731,621</b>	<b>\$804,982</b>	<b>\$765,112</b>	<b>\$ -</b>				

The image shows two large industrial fishing vessels on the open ocean. The vessel on the left is white with a red stripe, and the one on the right is grey with a red stripe. Both have complex superstructures with masts and antennas. The sea is choppy with white foam from the boats' wakes. Numerous birds, likely gulls, are flying in the sky and around the boats. A large, solid blue rectangular box is centered over the image, containing white text. The text is arranged in two main sections: the top section reads 'INDUSTRIAL-SCALE FISHERIES' in a bold, sans-serif font, with 'FISHERIES' being significantly larger than 'INDUSTRIAL-SCALE'. A thin white horizontal line separates this from the bottom section, which reads 'INVESTMENT BLUEPRINTS' in a similar bold, sans-serif font.

# INDUSTRIAL-SCALE FISHERIES

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## INVESTMENT BLUEPRINTS

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## INDUSTRIAL-SCALE FISHERY CHALLENGES

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**T**he Encourage Capital team analyzed numerous, severely distressed, industrial-scale fisheries, in Chile and Brazil, where stock levels have been reduced to as low as 10% of estimated maximum sustainable yields (MSY) in the fishery. While this degree of distress poses clear management challenges and potential risks to impact investors, it also offers outsized investment returns in the event that the proposed strategy succeeds in restoring the targeted stock.

Large fisheries in a depleted state face complex management challenges, where economic distress can be severe and may have already driven many fishers out of the fishery. Almost by definition, extreme overcapacity in the fishing fleet and in the associated market infrastructure likely exists, and the failure of authorities and fishers alike to prevent the declines more than likely reflects a history of stakeholder conflict and inadequate management, often accompanied by rampant illegal activity. The longer time horizons, uncertainty, and collective action problems associated with stock recovery make it difficult for individual fishers to take action, while also presenting greater risk to investors.

However, as in conventional distressed assets investing, the panic and short-termism that often surround collapse—whether of a company, a market, or a fishery—creates opportunities for those investors willing to invest for the future. With distressed fisheries this is certainly the case, as valuable assets such as fishing rights, vessels, and processing infrastructure can often be purchased at a steep discount while those players who do stay in the fishery are often the most amenable to change.

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Valuable assets such as fishing rights, vessels, and processing infrastructure can often be purchased at a steep discount while those players who do stay in the fishery are often the most amenable to change.

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## THE INDUSTRIAL-SCALE FISHERIES INVESTMENT THESIS

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**T**he industrial-scale fisheries investment strategy is focused on the implementation of comprehensive fisheries management improvements that incorporate a minimum threshold of 75% to 90% of fishing activity in a specific depleted species or fishery, and is aimed specifically at restoring the fishery to sufficient biomass to enable fishing effort at maximum sustainable yield, with the potential to dramatically increase the number of meals produced. Importantly, the offer of private funding to finance management activities that can achieve fishery restoration at scale in a severely distressed fishery may also be able to catalyze critical government policy reforms. Private capital can reduce the amount of government funding required to create change, can support commercial interests that might otherwise oppose reform, and can possibly even induce government action.

The industrial-scale fisheries investment strategy requires investment into fisheries management improvements, fishery assets (such as fishing quota or vessels), and seafood companies to increase and maximize the value of increasing catch volumes over time.

Because there is large potential impact and financial upside tied to the restoration of depleted stocks, this strategy seeks first to implement comprehensive fishery management reforms that affect the entirety of the fishery, and then to acquire assets that appreciate in value as the stock size and landings increase. Similar to the small-scale fisheries strategy, value is also generated through increased supply chain efficiencies and value addition to the products. This market connectivity increases each strategy's capacity to implement broad-scale improvements that might otherwise be undermined by the existing supply chain. By bundling investments into comprehensive fishery management improvements with investments into fishing assets and seafood companies, investors can support sustainability, generate cash flow, and own assets with value that is tightly correlated to fishery health, a value that rises over time as stocks recover.

Given the state of depletion in such fisheries, investors would be unwise to consider deploying capital into the associated fishing assets and seafood companies without simultaneously supporting comprehensive fisheries management improvements. In any case, for impact investors, investments in commercialization activities by themselves do not ensure implementation of sustainability improvements on the water, and could in fact exacerbate fishery distress by failing to constrain fishing effort at the same time it offers

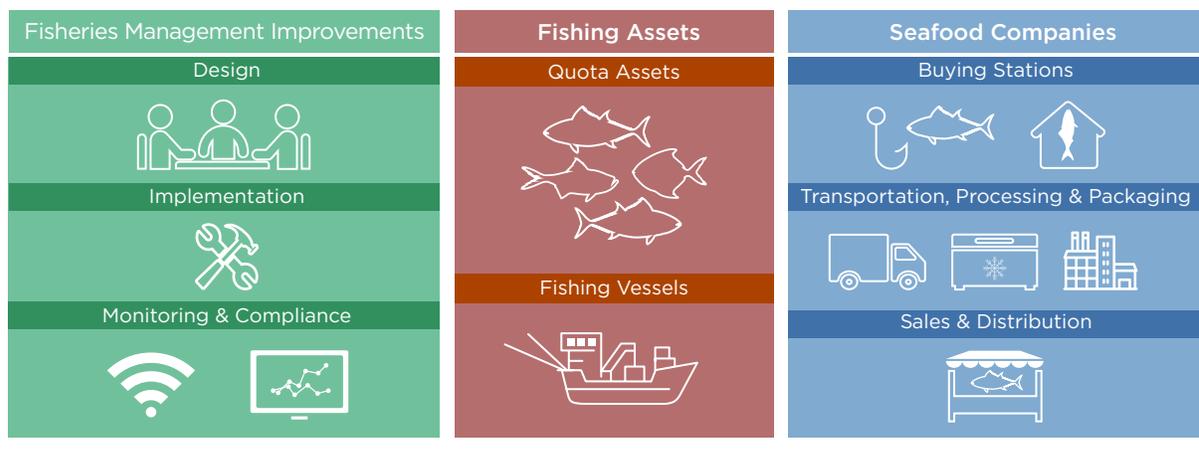
higher value to fishers for their landed catch, thus heightening the incentive to overfish for short-term gains. The industrial-scale investment strategy supports sustainability outcomes and profitability by bundling investment into fisheries management improvements with investment into assets and businesses to deliver impact and financial returns.

These commercial value drivers have the potential to generate increasing cash flow, in some cases even

incorporating premium pricing for sustainability branding, but they rely on fish stock recovery to increase income and generate investment returns.

Finally, the economic benefits generated through the investments can, in turn, be offered to fishers as rewards for compliance with sustainable fishing practices, creating a strong financial incentive for stewardship that counters the existing incentives that drive short-term overfishing and depletion.

Figure 1: The Bundled Investments



The industrial-scale investment strategy supports sustainability outcomes and profitability by bundling investment into fisheries management improvements with investment into assets and businesses to deliver impact and financial returns.



## A PROPOSED INVESTMENT DESIGN METHODOLOGY

### THE INVESTMENT BLUEPRINT DEVELOPMENT PROCESS

Encourage Capital undertook a 10-step process, engaging in dialogue with a wide range of fisheries stakeholders, advisors, and consultants, to develop and evaluate the challenges, opportunities, and risks profiled within the industrial-scale Investment Blueprints. For the proposed impact investment strategies to be viable, Encourage Capital's 10-step review process needed to determine whether the potential cash flow generated by investments in fishing assets and seafood companies could generate a financial return sufficient to attract the capital required to implement comprehensive management improvements in the fishery. Figure 2 illustrates the 10 key steps involved in the profiling and analysis of each fishery, the development and evaluation of the fisheries management and business plans, and the financial modeling and structuring associated with each proposed industrial-scale fisheries investment strategy.

FIGURE 2: Blueprint Development Process

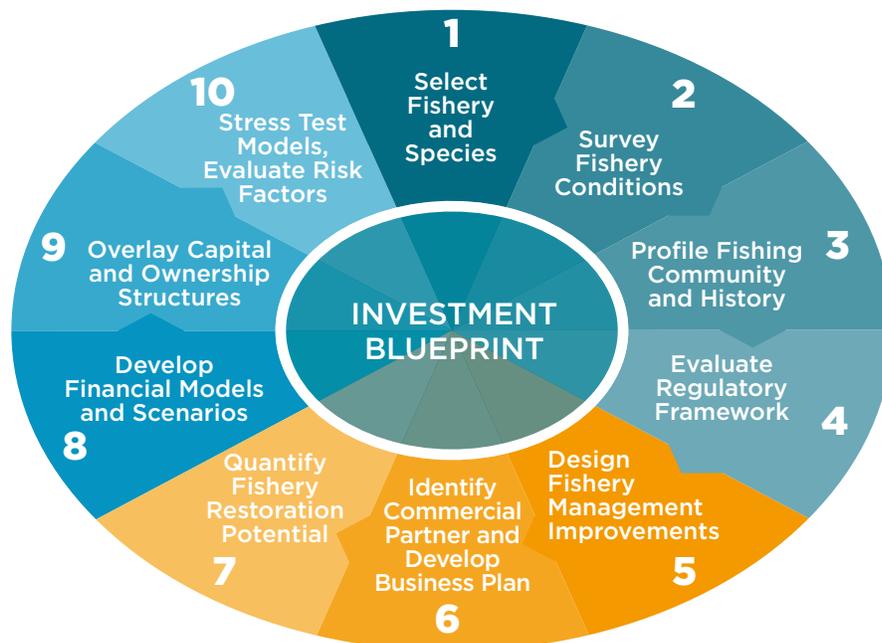


Figure 3 briefly summarizes the key questions our 10-step analysis sought to answer in order to shape and evaluate the investment opportunities:

FIGURE 3: 10-Step Blueprint Development Process: Key Questions

10-STEP REVIEW	KEY QUESTIONS AND EVALUATION CRITERIA
<b>1. Select Fishery and Species</b>	<ul style="list-style-type: none"> <li>• Is there commercial market demand for the species?</li> <li>• Does the fishery currently or will it potentially produce sufficient volume to generate commercial value?</li> <li>• Is the fishery in proximity to commercial markets or transport infrastructure to reach commercial markets?</li> </ul>
<b>2. Survey Fishery Conditions</b>	<ul style="list-style-type: none"> <li>• What is the estimated level of distress and depletion in the fishery?</li> <li>• What types of management improvements are required?</li> <li>• How large is the fishing fleet and is it feasible to implement sustainable fishing practices sufficient to incorporate the minimum threshold of fishing effort necessary to affect the entirety of the stock and support stock restoration?</li> </ul>
<b>3. Profile Fishing Operators, Community, and History</b>	<ul style="list-style-type: none"> <li>• Which industrial fishing companies are active in the fishery? How consolidated is the existing industrial fishing fleet?</li> <li>• Is there existing organization, leadership, or local governance among fishers in the fishery?</li> <li>• What is the history of the industry and fishers' relationship with fisheries authorities and with each other?</li> <li>• Is the industry and/or are fishers in the given fishery interested in transitioning to sustainable fishing practices?</li> </ul>
<b>4. Evaluate Regulatory Framework</b>	<ul style="list-style-type: none"> <li>• How robust is the current regulatory framework?</li> <li>• Are there any regulatory tools that enable fishers and investors to have tenure over the fishing resource (e.g., limited access fishing permits, Territorial Use Rights Fisheries or TURFs, Total Allowable Catch (TAC) systems, etc.)?</li> <li>• Are fisheries authorities willing to collaborate with private partners to implement fishery management improvements?</li> </ul>
<b>5. Design Fishery Management Improvements</b>	<ul style="list-style-type: none"> <li>• What management interventions are required to restore the fishery?</li> <li>• Can project developers design a clear, viable plan to implement comprehensive fishery management improvements?</li> <li>• Are there effective implementation partners that can be engaged in the project?</li> <li>• What are the costs of the management improvements, and do the financial benefits earned by investors outweigh the costs of the improvements?</li> </ul>
<b>6. Develop Business Plan</b>	<ul style="list-style-type: none"> <li>• What seafood businesses or assets can generate cash flow or long-term asset value with improved fishery management?</li> <li>• Are there existing mission-aligned companies or social entrepreneurs capable of executing a viable business plan?</li> <li>• Are clear value drivers present to support a commercial business model such as stock recovery, product certification, waste reduction, supply chain upgrades to increase efficiency, higher value markets, or margin capture?</li> </ul>

FIGURE 3: 10-Step Blueprint Development Process: Key Questions (continued)

10-STEP REVIEW	KEY QUESTIONS AND EVALUATION CRITERIA
<b>7. Quantify Fishery Restoration Potential</b>	<ul style="list-style-type: none"> <li>• What do our scientific models suggest is the potential range for recovery in the fishery, given species' life cycles and fecundity, current biomass state, expected fishing effort and mortality, predation factors, and other management interventions?</li> <li>• What timelines for recovery do the models suggest?</li> </ul>
<b>8. Develop Financial Models and Scenarios</b>	<ul style="list-style-type: none"> <li>• Does the combined cost of fishery management improvements and commercial investment generate sufficient cash flow to reward fishers and repay investors?</li> <li>• What are the upside and downside cases of potential impact and financial performance?</li> </ul>
<b>9. Overlay Capital and Ownership Structures</b>	<ul style="list-style-type: none"> <li>• Based on the cash flow projections, how should the strategy be capitalized? With equity? With debt?</li> <li>• Are philanthropic capital or forms of credit enhancement required to generate sufficient returns to attract private capital?</li> </ul>
<b>10. Stress Test Models, Evaluate Risk Factors</b>	<ul style="list-style-type: none"> <li>• What are the primary risk factors that could impair the strategy's success?</li> <li>• Can those factors be mitigated through structuring decisions or other means?</li> </ul>

## THE APPROACH TO FISHERIES MANAGEMENT IMPROVEMENTS

At the heart of each Investment Blueprint lies a proposed set of fisheries management improvements that seek to protect and restore fish stocks, reduce bycatch of unwanted species, and protect and restore marine habitat. The recently published *Governance and Marine Fisheries: Comparing Results Across Countries and Stocks* states: "The elements of effective fisheries management are well-understood. Strong management means enacting measures to both prevent overfishing and, more importantly, implementing measures to reduce fishing pressure if stocks become depleted. Key practices include evaluating the status of fish and shellfish stocks, designing appropriate management measures to limit fishing mortality, and enforcing these regulations to prevent or reduce negative fishing impacts."<sup>1</sup>

In practice, such measures might include the following: the development of stock assessment programs with robust catch accounting systems and scientific research on species of specific concern; the registration and limitation of fishing vessels in a given fishery; establishment of maximum harvest limits as determined by scientific research; rules on the size of individual fish landed, establishment of closed seasons and no-take zones (sometimes called marine protected areas); and the use of rigorous enforcement capacity, with on-board observer coverage, electronic monitoring devices, policing activity, and criminal prosecution when necessary.

At the heart of each Investment Blueprint lies a proposed set of fisheries management improvements that seek to protect and restore fish stocks, reduce bycatch of unwanted species, and protect and restore marine habitat.

<sup>1</sup> Hillborn, et al., "Ocean Prosperity Roadmap: Fisheries and Beyond," Synthesis Report White Paper, 2015.

In addition to government-sponsored fisheries management improvements, significant philanthropic funding has been directed to support sustainable fisheries certification strategies and consumer awareness campaigns over the past 10 years in an effort to educate customers and put pressure on seafood companies to source from or directly implement sustainable fishing practices. The Marine Stewardship Council (MSC), regarded as one of the certification bodies with the highest sustainability standards, has developed extensive tools for use in assessing and certifying fisheries, which can be employed to guide the design of privately funded fisheries management improvements. The World Wildlife Fund and the Sustainable Fisheries Partnership have also developed the notion of Fisheries Improvement Projects, or “FIP”s, and provide design frameworks that support both incremental and comprehensive management improvements, even in fisheries that require significant time frames to recover and be eligible for certification status.

Each approach to improving fisheries management practices has its benefits and limitations. Government interventions can be broad in reach, but are often underfunded and lack the resources to ensure fisher compliance. Certification strategies have put strong standards in place and created incentives for seafood companies to fund management improvements, but have been challenged for being ill-suited to fisheries with long-term recovery horizons and for being cost-prohibitive for small-scale fisheries. As a result, only approximately 8.5% of fisheries landings globally have achieved MSC certification.<sup>2</sup> And although FIPs have been implemented in approximately 150 fisheries, they lack uniform standards or progress measurements, making it difficult to assess their performance.<sup>3</sup>

Encourage Capital attempts to borrow from the best practices set forth by all of these important fishery stakeholders, tailoring its proposed fisheries management improvements to the conditions and context of each specific fishery profiled.

Encourage Capital attempts to borrow from the best practices set forth by all of these important fishery stakeholders, tailoring its proposed fisheries management improvements to the conditions and context of each specific fishery profiled.

<sup>2</sup> Marine Stewardship Council, “MSC in numbers,” [msc.org](http://msc.org), 2015.

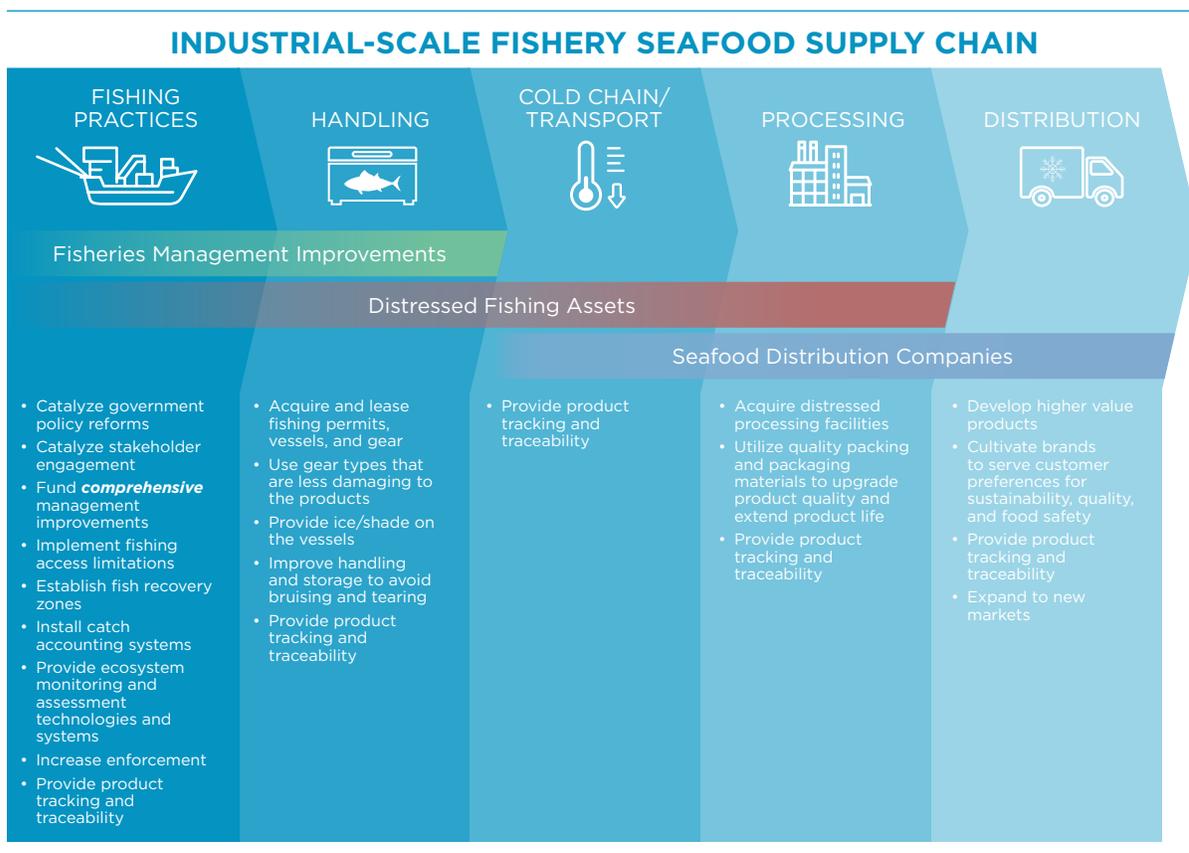
<sup>3</sup> T. McLanahan, J. Castilla, “Fisheries Management: Progress Toward Sustainability”, The David and Lucille Packard Foundation, Blackwell Publishing, 2007.

## THE INVESTMENT PROFILE

It is against this backdrop that the industrial-scale fishery Investment Blueprints propose investments that bundle fisheries management improvements, distressed assets, and seafood distribution businesses into a robust strategy to generate both impact and financial returns. From a solutions design standpoint, where the small-scale strategy can succeed with incremental fisheries improvements, the industrial-scale strategy requires *comprehensive* fisheries management reforms to ensure stock restoration and financial returns. The Investment Blueprints therefore target a robust set of interventions and multiple methods for ensuring fisher compliance. Similarly, the asset acquisition component of the strategy aims to allow investors to benefit from fishery restoration, to reward the more significant upfront risks undertaken.

The industrial-scale fisheries Investment Blueprints propose to fund change on the water, look to the supply chain investments to deliver baseline returns, and turn to the fishing asset ownership to generate potential upside returns correlated with long-term fishery restoration. Figure 4 shares examples of the potential bundled investments, depending on the fishery and geographic location.

FIGURE 4: Industrial-Scale Fisheries Supply Chain



## CORE VALUE DRIVERS

While the level of distress in the fishery creates challenges, it also creates opportunity, as distressed assets can sometimes be purchased at “fire-sale” prices, enabling investors to direct funds to turnaround efforts on a large scale. In addition, fishers and other stakeholders weary of fighting over the “crumbs” remaining in the fishery may be more ready to embrace reform. Even more than the catalytic impact that private investment capital can create in small-scale fisheries, investment capital deployed in large, severely distressed fisheries, in partnership with fishing communities and competent project implementation partners, can look like salvation to industry, fishers, and communities that have suffered greatly from the impacts of fishery decline.

Encourage Capital has identified several key value drivers that support the proposed industrial-scale investment strategy including the following:

1. Robust collaboration in creating and refining the fisheries management improvements among fishing communities, government, commercial partners, and project developers
2. The implementation of partnerships with fishers interested in transitioning to sustainable practices.
3. The use of strategies that require the engagement of strong project developers and implementation partners with the ability to manage the execution of multiple environmental, community, and commercial activities.
4. The employment of strategies that secure specific government commitments to align with the fisheries management improvements.
5. The inclusion of fisheries management improvements with enforceable limits to fishing access and harvest.
6. The use of new data technologies that will reduce the cost of monitoring and fisher compliance.
7. The use of explicit financial incentives to reward fishers for sustainable practices, including higher prices or profit sharing.
8. The industrial-scale fishery Investment Blueprints look to a related but distinct set of *financial return* value drivers, which are focused on generating value from stock recoveries plus additional value for the landed catch volumes throughout the supply chain by:
  - Increased landings volume over time in line with stock recovery, rising biomass, and rising Total Allowable Catch limits
  - Improved product quality through improvements in harvest, handling, processing, and packaging
  - Manufacture of raw materials into higher-value product forms
  - Achievement of price premiums and market access through certification and sustainability branding
  - Access to higher value market segments
  - Creation of self-amortizing structures or devising exit sales to strategic buyers

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Even more than the catalytic impact that private investment capital can create in small-scale fisheries, investment capital deployed in large, severely distressed fisheries, in partnership with fishing communities and competent project implementation partners, can look like salvation to industry, fishers, and communities that have suffered greatly from the impacts of fishery decline.

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### RISK FACTORS TO CONSIDER

Because the industrial-scale fishery strategy puts larger amounts of capital at risk, and requires access limitations as the fishery recovers, the regulatory risk embedded in this strategy is greater than in the small-scale fisheries approach. Risks to the industrial-scale strategy include (but are not limited to) the following:

- Fisheries management improvement implementation could fail to incorporate enough fishers or vessels to achieve critical mass, thereby impairing stock recovery.
- Fisheries authorities may not provide promised enforcement resources.
- The commercial business operations may not be competitive or successful.

- The complex overall project execution could fail to complete project implementation, or could prove to have unintended consequences.
- Fishing assets may decline in value (quota) or require unanticipated capital expenditures to maintain (vessels); any weakening of access limitations could dilute asset values by allowing new entrants or illegal fishing activity to occur.
- Exit strategies may not generate the targeted values.

It is important to note that the industrial-fishery Investment Blueprints do rely on stock recovery to generate the targeted financial returns, although they also offer a base-case return from seafood company investments.

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The regulatory risk embedded in this strategy is greater than in the small-scale fisheries approach.

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## STRUCTURE AND TERMS

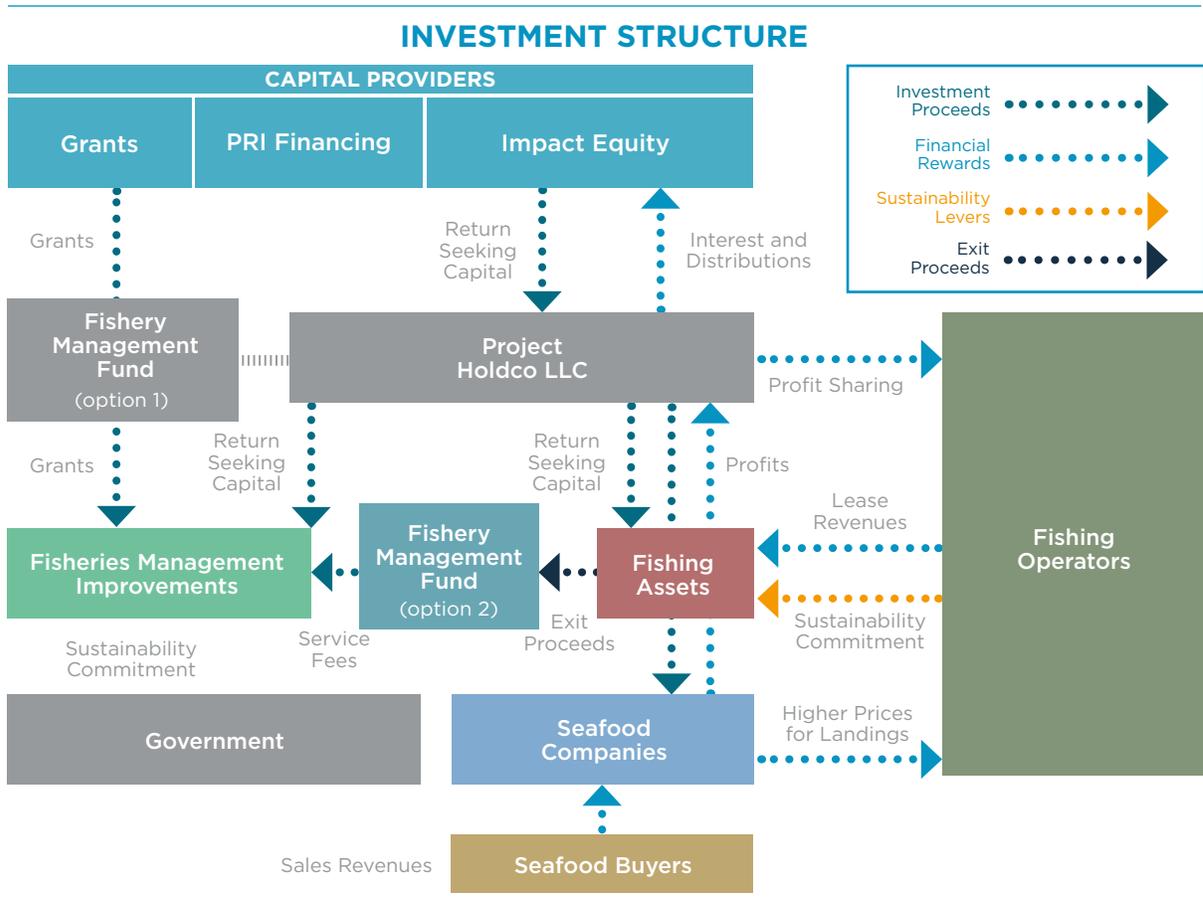
The industrial-scale fisheries Investment Blueprints propose equity investments to achieve the impact and financial returns targeted. The Investment Blueprints also contemplate the use of program-related investments, or other low-interest rate debt financing, for up to 15% of total capital required. Although the seafood company investments are expected to be profitable in the short to medium term, impact investors supporting this strategy should have a longer-term time horizon, with a 10-year investment outlook and a probable midterm refinancing requirement for any debt components of the capital structure.

The industrial-scale fisheries Investment Blueprints also contemplate the establishment of a Fishery Management Fund (FMF) for use either in funding a portion of the contemplated fisheries management improvements or as a reserve for unanticipated

additional improvements required. The FMF could be funded with grant capital or funding from multilateral or development finance institutions interested in supporting distressed fisheries strategies. The Fishery Management Fund could aggregate a pool of such capital to implement a portfolio of similar projects, and could be disbursed by fishery-specific project implementers in alignment with the project design process, impact priorities, and fisheries management improvements described herein.

Figure 5 lays out the flow of funds and cash flows that are associated with the industrial-scale fisheries strategies.

FIGURE 5: Industrial-Scale Fisheries Investment Structure



## THE INDUSTRIAL-SCALE FISHERIES INVESTMENT BLUEPRINTS

Encourage Capital developed two Investment Blueprints to demonstrate how the industrial-scale fisheries strategies could work to generate both financial and impact returns. Encourage engaged with its partners and advisors to develop and evaluate the challenges, opportunities, and risks associated with each Investment Blueprint, utilizing the 10-step evaluation and diligence process described above. Each Investment Blueprint is tailored to the selected fishery’s unique stakeholder participants, regulatory context, fishery and management challenges, supply chain, market dynamics, and intervention cost estimates to propose “ground-truthed” investment proposals and analysis.

Figure 6 provides a profile of the two industrial-scale fishery Investment Blueprints in Chile and Brazil:

FIGURE 6: Industrial-Scale Fisheries Investment Blueprint Summaries

	THE MERLUZA STRATEGY	THE SAPO STRATEGY
Country	Chile	Brazil
Proposed Investment Amount	\$17.5 million	\$11.5 million
Investment Term	10 years	11 years
Fishery/Species Focus	Common Hake	Monkfish
Core Investments	<ul style="list-style-type: none"> <li>• Fishery Management Improvements</li> <li>• Fishing Quota</li> <li>• Seafood Company</li> </ul>	<ul style="list-style-type: none"> <li>• Fishery Management Improvements</li> <li>• Fishing Vessels and Permits</li> <li>• Seafood Company</li> </ul>
Targeted Fish Stock Impacts	<ul style="list-style-type: none"> <li>• Increase stock biomass by 177% to 269% from current levels</li> </ul>	<ul style="list-style-type: none"> <li>• Increase stock biomass by 100% from current levels</li> </ul>
Targeted Fisher Livelihood Impacts	<ul style="list-style-type: none"> <li>• Pay fishers 50% premium for raw materials</li> <li>• Empower fishing communities as commercial and conservation partners</li> </ul>	<ul style="list-style-type: none"> <li>• Pay fishers 30% premium for raw materials</li> <li>• Empower fishing communities as commercial and conservation partners</li> </ul>
Targeted Increase in Meals Produced	<ul style="list-style-type: none"> <li>• 136 million additional meals annually by year 10</li> </ul>	<ul style="list-style-type: none"> <li>• 7.5 million meals annually by year 11</li> </ul>
Projected Financial Returns <sup>43</sup>	<ul style="list-style-type: none"> <li>• 16.4% base case with up to 35% equity return with exit sale to strategic buyer</li> </ul>	<ul style="list-style-type: none"> <li>• 18% base case with up to 22% equity return with exit sale to strategic buyer</li> </ul>

The section that follows provides a detailed review of The Merluza Strategy, the Chilean industrial-scale fishery investment strategy. Encourage Capital plans to disseminate the detailed Brazilian industrial-scale strategy in the coming months. We hope that a broad range of fishery stakeholders, including entrepreneurs, investors, NGOs, multilateral institutions, philanthropies, the seafood industry, and other sustainable fisheries advocates, can all make use of these strategies in achieving real change for people, protecting and restoring marine ecosystems, and helping to feed the world.

<sup>4</sup> The targeted financial returns assume conservative EBITDA exit multiples and quota valuations with sales to strategic buyers in year 10.

# **THE MERLUZA STRATEGY**

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**AN INVESTMENT BLUEPRINT  
FOR INDUSTRIAL-SCALE  
FISHERIES IN CHILE**

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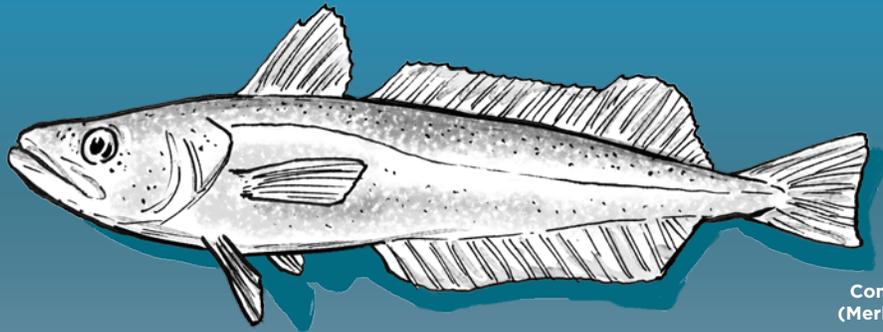
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## THE MERLUZA STRATEGY: AN INDUSTRIAL-SCALE FISHERIES INVESTMENT IN CHILE

Encourage Capital has worked with support from Bloomberg Philanthropies and The Rockefeller Foundation to develop an impact-investing strategy supporting the implementation of sustainable fishing improvements in the distressed common hake fishery in Chile. The Merluza Strategy is a hypothetical \$17.5 million impact investment to restore the hake fishery to its full biological and economic potential.



Common Hake  
(*Merluccius gayi*)

The \$17.5 million would fund the implementation of comprehensive fishery management improvements across the fishery, acquire 36% of the total fishing rights (or “quota”) in the fishery, and create a new hake processing and distribution business incorporating jumbo squid products and sales. The Merluza Strategy targets the generation of a 16.4% base-case equity return with upside potential up to 35%, while simultaneously restoring hake stock to 75% of its biomass at Maximum Sustainable Yield ( $B_{MSY}$ ), generating \$104 million<sup>5</sup> in additional income for fishers divided among nearly 1,800<sup>6</sup> fishers across 12 caletas and delivering 136 million additional legal hake meals-to-market annually.<sup>7</sup>

*Illustration by Brett Affrunti*

While Project Merluza is based on analysis of actual fishing communities, fishing conditions, and commercial business operations to incorporate realistic assumptions of costs, returns, and risks affecting the potential outcomes of the project, Encourage Capital has synthesized its findings into a general case study that we hope can be used as a roadmap for fishery stakeholders interested in impact investing opportunities more broadly in the sustainable fisheries space. As such, most of the company and programmatic references herein use pseudonyms in place of the actual names of the organizations on which the analysis was based. Where used, such pseudonyms will be used consistently throughout the remainder of this text.

<sup>5</sup> Calculated as the NPV of the total annual premium payout over the 10-year investment horizon, discounted by 4.0%, the Chilean rate of inflation.

<sup>6</sup> Assuming two fishers per vessel on average across the hake and squid fishery

<sup>7</sup> Based on total allowable catch in year ten versus current, applying a processing yield of 44% and assuming portion size of 200 g. This figure represents the number of additional meals available in perpetuity if the stock recovered to 75% of  $B_{MSY}$ .

## THE MERLUZA STRATEGY

The Chilean Common Hake (*Merluccius gayi*), or “merluza común” as it is known in Spanish, has been Chile’s most economically and culturally significant fishery over the last century, supporting more than 7,000 fishers at its peak with a biomass of over 1.5 million metric tons (mt). Over the course of the commercial history of the fishery, it has experienced a cyclical pattern of extreme abundance and overfishing-driven depletion. This pattern was punctuated by two major collapses in the 1960s

and early 2000s. The most recent collapse in the early 2000s is widely attributed to the combination of overfishing and predation by jumbo squid—an invasive predator from northern waters—which suddenly appeared in tremendous abundance. Ten years following this collapse, the stock biomass is estimated to be less than 200,000 mt, with the average size of landed fish falling by more than 10 centimeters<sup>8</sup> and as many as 5,000 artisanal fishers exiting the fishery.<sup>9</sup>

FIGURE 1: Typical Size Range within Hake Landings



In February 2013, passage of the *Nueva Ley de Pesca y Acuicultura N°20.657* (the Fishing Law) opened the door for comprehensive reform in hake fishery management. This law required, for the first time, that fishing limits be set by scientific committee, the goal being to isolate management of the stock from the political and commercial pressures that led to its collapse in the early 2000s. In a single year, the scientific committee succeeded in reducing the Total Allowable Catch (TAC) for common hake by more than 50%.

Unfortunately, the ambitious scope of the new law was not met with commensurate resources or political will to properly enforce it. In fact, since the law was passed, overfishing has continued largely unabated, with as much as three times the TAC being harvested illegally and sold to the domestic market each year as unreported landings. With only a handful of industrial vessels, all equipped with Vessel Monitoring Systems (VMS) and onboard monitors, fishing the entirety of the industrial quota, the illegal harvest is widely understood to stem from the artisanal sector.

<sup>8</sup> R. Alarcon, et al, “Estimation of the Biomass of Jumbo Squid (*Dosidicus gigas*) Off Central Chile and Its Impact on Chilean Hake,” CalCOFI Report 49, 2008.

<sup>9</sup> E. Plotnek, “Barriers to Marine Stewardship Council Certification in the Artisanal South Pacific Hake Fishery in Chile,” Universidad del Pais Vasco, 2014, supported by information from Sernapesca.

Curtailing this illegal harvest has proven particularly challenging for regulators, for a variety of reasons. First, nearly all artisanal common hake vessels measure less than 12 meters in length and, as such, are neither obliged to carry VMS nor required to unload at designated ports. Fish are landed at up to 35 landing sites (known in Chile as caletas, or coves), in many cases by unlicensed vessels with little or no official quota allocation. Moreover, these landings are infrequently if ever weighed or inspected by the authorities.<sup>10</sup>

These challenges are compounded, and in fact reinforced, by the fragmented and highly inefficient supply chain into which the product is fed. Over the course of up to a week, the fish wind their way toward Santiago, the capital city, by truck—often unrefrigerated—and changing hands between as many as five intermediaries. Along the way, much of the product spoils and few if any attempts are made to distinguish the legality or origins of the fish.

Once in Santiago, brokers at the country's primary seafood terminal, known as the *Terminal Pesquero Metropolitano*, oversee the sale and distribution of 70% to 90% of all common hake landings (nearly all of which is sold domestically). Leveraging their dominant market position and networks of intermediaries, this cartel is able to establish artificially low beachside (or “ex-vessel”) prices nationally, while coordinating among themselves to evade inspections by the Chilean fisheries authorities (SERNAPESCA). A lack of alternative commercialization pathways and dependence on intermediaries to transport their product to market conspires to lock hake fishers across the country into

a low-margin, volume-driven production model that incentivizes overfishing and poor product quality.

To combat this confluence of fishery management and supply chain issues, The Merluza Strategy proposes the investment of \$17.5 million to implement comprehensive fishery management improvements, acquire industrial fishing quota, and create a new processing and distribution business for hake and jumbo squid. Merluza's innovative approach would reduce the hake fishing effort by at least 27%, utilizing robust data collection and technology systems to improve fisher compliance with sustainable fishing practices, and offering financial incentives that reward sustainability over time.<sup>11</sup>

At its heart, The Merluza Strategy seeks to dramatically improve the stock status and commercialization of the common hake fishery and, in the process, meaningfully improve artisanal fisher livelihoods in the most important hake-fishing caletas in Chile. If successful, Merluza would restore the common hake stock to 75% of its biomass at Maximum Sustainable Yield ( $B_{MSY}$ )<sup>12</sup> within a 10 year time frame, allowing for increased landings of up to 70,000 mt per year, and putting the stock on a path to full recovery.<sup>13</sup> In addition, through dramatic improvements in the harvest, handling, and supply chain, Merluza targets a payout of \$104 million in additional revenue to fishers over 10 years, to be divided among 1,800 participant artisanal fishers, plus the creation of approximately 136 million additional seafood meals. Merluza is expected to generate a levered equity return of 16.4% in the base case over a 10-year horizon, with additional upside in the case of a more robust stock recovery.

## IMPACT AND FINANCIAL RETURNS

- Increase hake stock biomass by 177% in the base case, and 269% in the upside case.
- Increase incomes for almost 1,800 artisanal fishers across 12 communities through premium payout of over \$58,000 per fisher, or a total of \$104 million over the 10-year hold period in the base-case scenario.<sup>14</sup>
- Increase meals-to-market by 685 million meals over the 10-year hold period of the investment, and 136 million annually thereafter in perpetuity.
- Targets a base-case 16.4% levered equity return over the 10-year hold period

<sup>10</sup> C. Leal, et al, “What Factors Affect the Decision Making Process When Setting TACs?: The Case of Chilean Fisheries,” *Marine Policy* 34, 2010.

<sup>11</sup> This reduction only includes the retirement of 20% of Merluza' quota holdings and a vessel retrofit program shifting hake fishing effort to the squid fishery in Region VII. The actual reduction in hake fishing mortality should be much larger as IUU fishing is reduced in each of the target caletas through improved management plans, backed by robust monitoring, enforcement, and economic incentives.

<sup>12</sup> Biomass at MSY has been estimated by the Instituto de Fomento Pesquero (IFOP) to be approximately 630,000 mt and by University of California, Santa Barbara to be approximately 625,000 mt. All references herein to biomass at MSY refer to the IFOP projection

<sup>13</sup> Full recovery is considered to be 100% of  $B_{MSY}$

<sup>14</sup> These numbers are discounted to present value.

## KEY VALUE DRIVERS

The Merluza Strategy can be conceived of as a pay-for-performance mechanism through which the return to investors is tied directly to the extent to which the fishery management improvements they finance

are successful in increasing the total stock biomass and landings. Merluza presents a compelling impact investing opportunity for the following reasons:

VALUE DRIVERS	DESCRIPTION
<b>Implements effective fishery management improvements</b>	The Merluza Strategy presents an opportunity to support and enhance critical aspects of the implementation of Chile's groundbreaking new Fishing Law, freeing authorities to focus their limited public resources on monitoring and enforcement, while leveraging novel technologies and partnerships to deliver comprehensive fishery management improvements more effectively at lower cost.
<b>Creates an investment position that appreciates in value as the stock recovers</b>	The acquisition of fishing quotas, in combination with the creation of a hake and squid processing and distribution business, generate increasing asset values as the hake stock recovers.
<b>Leverages strong regulatory enabling conditions</b>	Chile's new Fisheries and Aquaculture Law, passed in 2013, creates a strong foundation for investment into the fishery with scientifically determined total allowable catch (TAC) volumes and a robust transferable quota system that limits fishing effort and seeks to manage stocks in accordance with maximum sustainable yield.
<b>Uses innovations to increase fisher compliance</b>	The use of onboard data capture technologies, dockside catch accounting, and other data systems, in combination with financial market incentives to reward fishers for sustainable practices, can increase fisher compliance with fishery management improvements, reducing the overall amount of illegal fishing activity.
<b>Establishes best-in-class partnerships</b>	Merluza would seek to partner with complementary operating partners, including NGOs, social enterprises, academic institutions, and seafood industry experts to offer the strongest possible leadership and execution of the overall strategy. In addition to these formal operating partners, the project would actively engage regulators, retailers, food service companies, and other actors aligned in the goal of eliminating illegal hake fishing.
<b>Engages experienced commercial management</b>	Merluza would recruit experienced, mission-aligned seafood executives with a commitment to sustainably sourced products, to launch and execute its hake and squid processing and distribution business, drawing from a rich network of individuals in Chile's well-developed seafood sector.
<b>Leverages a strong commercial market position</b>	Merluza's ownership of 60% of the industrial quota (or 37% of total quota, including industrial and artisanal quota) and linkages enabling sourcing of 71% of the artisanal landings would give the strategy tremendous leverage in the fishery and provide a dominant market position for the Company. The Company would be the only vertically integrated, fully-traceable seafood company sourcing exclusively from artisanal fishers, and the largest supplier of both common hake and jumbo squid in the country.  In addition, there is a meaningful opportunity to reconfigure the existing supply chain and convert the 200%-500% margin currently associated with transport inefficiencies and waste into Merluza enterprise value.
<b>Supported by strong underlying demand fundamentals</b>	Merluza expects to benefit from the positive socioeconomic trends in Chile, as well as Chilean consumers' shift in food preferences toward healthier, responsibly sourced products. In addition, the growing awareness of the illegal hake issue sparked by government, NGO, and media campaigns is driving demand for legal and traceable seafood products in Chile. This growing demand, combined with sustainable sourcing requirements among Chilean and international retailers, is increasing pressure to adhere to sustainable and responsible sourcing policies in Chile.
<b>Positive investment climate</b>	Chile is rated as Investment Grade by all three major rating agencies, has one of the lowest sovereign risk premiums in Latin America, and is considered one of the most attractive countries in which to invest in the region.



## PROFILE OF THE MERLUZA STRATEGY FISHERY

### SPECIES LIFE HISTORY

The Chilean common hake, or South Pacific hake, is a groundfish species of the family Merlucciidae. This family is in the same taxonomic order, Gadiformes, as cod and haddock and shares many life history characteristics with those more widely known species. Although generally associated with the benthos (seafloor), common hake inhabit the shallow to upper continental slope between 50 and 500m depth and ranging some 1,500 miles along the Chilean coastline from Coquimbo to Puerto Montt.<sup>15</sup> Juvenile hake tend to be found near the coast, with individuals moving to deeper waters as they mature and returning to the coast to spawn.<sup>16</sup>

Common hake occur in a wide range of salinities and tolerate a variety of environmental conditions, making it a resilient species whose abundance is primarily limited by human fishing pressure, predation by jumbo squid, and competition with other species. Much like cod, this hardiness combined with tremendous fecundity facilitates huge populations which, in turn, play a critical top-down control role on the ecosystems they inhabit. It also makes the species susceptible to biological tipping points that lead to dramatic collapses when the population structure is altered by changes in fishing and natural mortality.

The common hake has an estimated lifespan of 17 to 21 years in females and 11 to 15 years in males, and is an asynchronous spawner, capable of reproducing more than once in a single breeding season.<sup>17</sup> Eggs and larvae are found throughout the year along the Chilean coast, although the most significant spawning takes place between July and November. A secondary smaller spawning period occurs between December and February.<sup>18</sup> This dual spawning period is notable, given that the current commercial closed-season extends for only one month, leaving the stock particularly vulnerable during the remaining spawning periods. Expanding this closed season is a priority of conservation practitioners and Merluza alike.

### STOCK PROFILE AND CURRENT STATUS

The fishery has historically supported both an industrial and an artisanal fleet, both of which operate in Regions IV through X of Chile (see Figure 2). The industrial fleet is prohibited from fishing within the first five nautical miles of the shore, which is reserved for the exclusive use of the artisanal fleet. Fishing rights, in this case transferable quotas, are currently allocated 60% to the industrial sector and 40% to the artisanal sector, although actual landings do not reflect this split as a result of illegal and underreported harvest by the artisanal sector.

<sup>15</sup> D. Queirolo et al, (2013), "Gillnet selectivity for Chilean hake (*Merluccius gayi gayi* Guichenot, 1848) in the Bay of Valparaíso," *Journal of Applied Ichthyology* 29(4): 775-81.

<sup>16</sup> San Martin, et al, "Temporal Distribution of Juvenile Hake of Central Southern Chile," *Aquatic Living Resources*, 2011.

<sup>17</sup> V. Ojeda, et al, "Validación de los métodos aplicados en la estimación de edad y crecimiento, y determinación de la mortalidad en merluza común en la zona centro-sur," Informe Final FIP, 1997.

<sup>18</sup> C. Vargas and L. Castro, "Spawning of the Chilean Hake *Merluccius Gayi* in the Upwelling System of Talcahuano in Relation to Oceanographic Features," *Scientia Marina* 65(2), 2001.

FIGURE 2: Spatial Distribution of Hake Biomass<sup>19</sup>

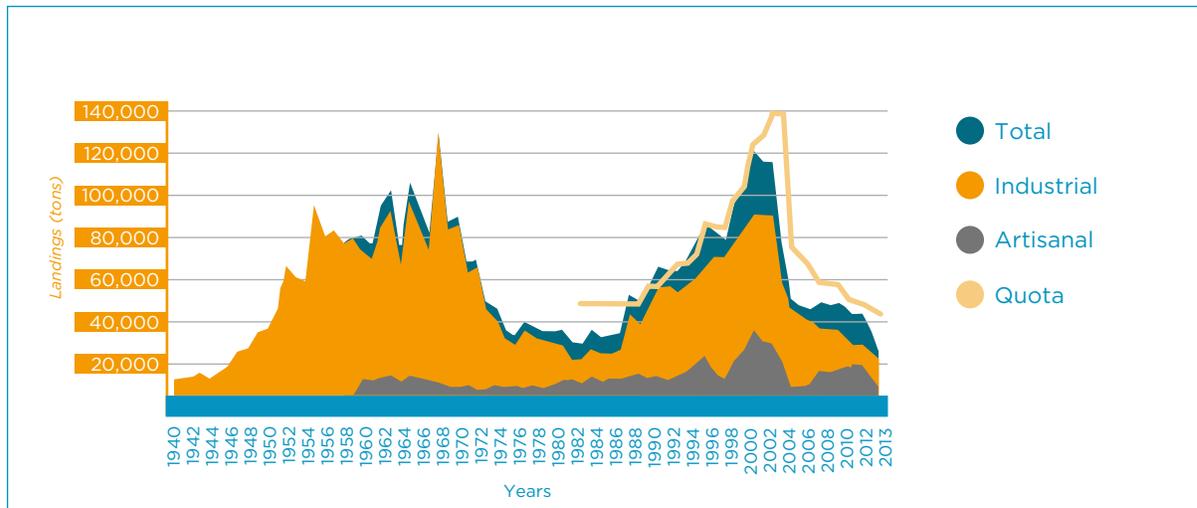
REGION	CALETAS INCORPORATED INTO MERLUZA	% OF ARTISANAL QUOTA
IV	-	4.30%
V	San Pedro, Puertecito, Portales, Membrillo	32.90%
VI	-	3.80%
VII	Llico, Duao, La Trinchera, Maguillines, Loanco, Pelluhue	27.90%
VIII	Cochologüe	30.80%
IX	-	0.20%
XIV-X	-	0.10%
<b>Total</b>		<b>100%</b>



The first official records of commercial hake harvest in Chile date back to the 1930s, initially based out of the ports of Valparaiso and San Antonio.<sup>20</sup> The

fishery had two peak landing periods in the late 1960s and early 2000s, both of which were followed by dramatic collapses in biomass (see Figure 3).

FIGURE 3: Historical Landings and Quota Allocation for Common Hake<sup>21</sup>



<sup>19</sup> S. Lillo, et al, "Evaluación hidroacústica de merluza común, año 2011," Final Report, FIP Project 2011, Instituto de Fomento Pesquero, 2012.

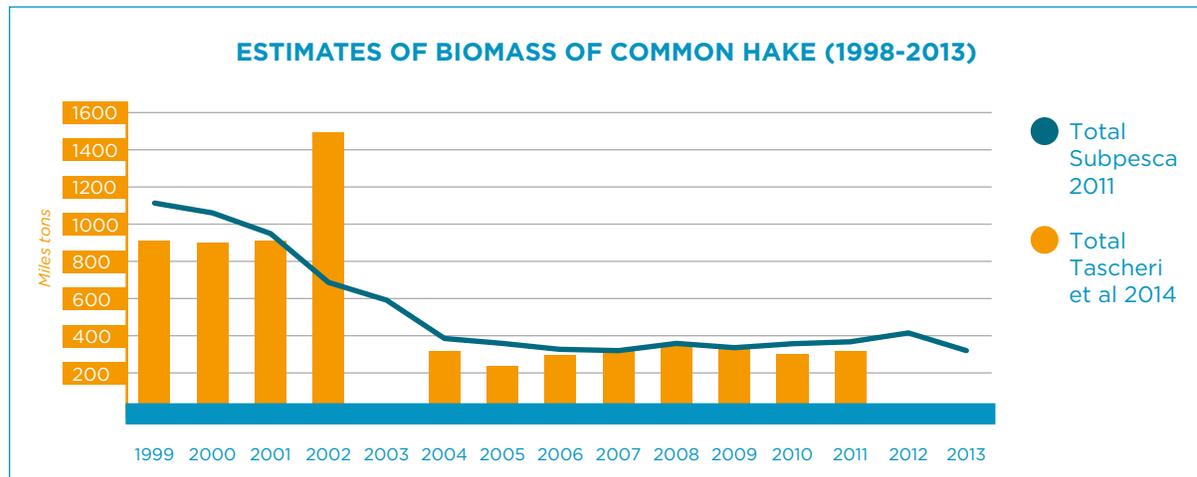
<sup>20</sup> Instituto de Fomento Pesquero (IFOP), "Merluza común," Segundo Informe - Final, 2014.

<sup>21</sup> Subpesca, "Cuota Global Anual de Captura de Merluza Común," Subsecretaria de Pesca, Valparaiso, 2011.

The collapse in the early 2000s, during which the stock biomass fell by as much as 90%, is believed to have been caused by a confluence of overfishing and the sudden appearance and dramatic rise in abundance of jumbo squid (*Dosidicus gigas*)—a major predator of the common hake. This spike

in overfishing was government sanctioned to an extent, as SUBPESCA, the quota-setting fishery authority at the time, dramatically overestimated the stock biomass in 2002 (see Figure 4), and subsequently set the TAC far higher than could be supported by the hake population.<sup>22</sup>

FIGURE 4: Trends in Total Biomass, According to SUBPESCA (in Orange) (2011) and Tascheri, et al.<sup>23, 24</sup>



Over the period of 2002 to 2014, the estimated stock biomass fell from 1.6 million mt to between 200,000 and 300,000 mt (see Figure 4). Currently, the stock biomass is believed by the Instituto de Fomento Pesquero (IFOP)—a private, nonprofit organization that provides the technical background and scientific assessments for the regulation and management of the sector—to be approximately 27% of total biomass at MSY, although many academics and practitioners are anecdotally more pessimistic.<sup>25</sup> SERNAPESCA has classified the stock as overexploited since 2005 and at risk of collapse.<sup>26</sup>

Of particular concern is the almost complete absence of individuals over the age of five, with as high as 94% of the catch comprising age classes younger than three years. Moreover, between 2004 and 2010, the average length of individuals landed by both the industrial and artisanal sectors has decreased from 46cm to 33cm in total length,<sup>27</sup> below the estimated 37cm size at which the fish sexually matures.<sup>28</sup> In 2012, over 70% of the population was believed to be below 37cms. Additionally, there is evidence of a reduced length at the onset of sexual maturity due to the heavy

<sup>22</sup> H. Arancibia and S. Niera, "An Overview of the Chilean Hake (*Meluccius gayi*) Stock, a Biomass Forecast, and the Jumbo Squid (*Dosidicus gigas*) Predator-Prey relationship Off Central Chile," CalCOFI Report 49, 2008.

<sup>23</sup> Subpesca, "Cuota Global Anual de Captura de Merluza Común," Subsecretaría de Pesca, Valparaíso, 2011.

<sup>24</sup> Tascheri, et al, "Estatus Y Posibilidades de Explotación Biológicamente Sostenibles de los Principales Recursos Pesqueros Nacionales," Segundo Informe - Final, 2014.

<sup>25</sup> Stock status is indicated by the spawning stock biomass (SSB) relative to an unexploited population ( $SSB_0$ ). Target reference point is  $0.5SSB_0$ , and  $0.2SSB_0$  is the limit reference point below which the stock would be at risk of collapse.  $0.3SSB_0$  is a precautionary reference point and between 0.3 and  $0.5SSB_0$  the stock would be assumed to be fully exploited (IFOP 2014). In the early 1970s, SSB was below  $SSB_0$ , but it then experienced sustained growth until 1996. Between 1996 and 2005 SSB was drastically reduced to 12%  $SSB_0$  and came to an overexploited state with risk of collapse.

<sup>26</sup> R. Alarcón, et al, "Biología reproductiva de merluza común," Informe Final, Corregido Proyecto FIP 2006-16, 2009.

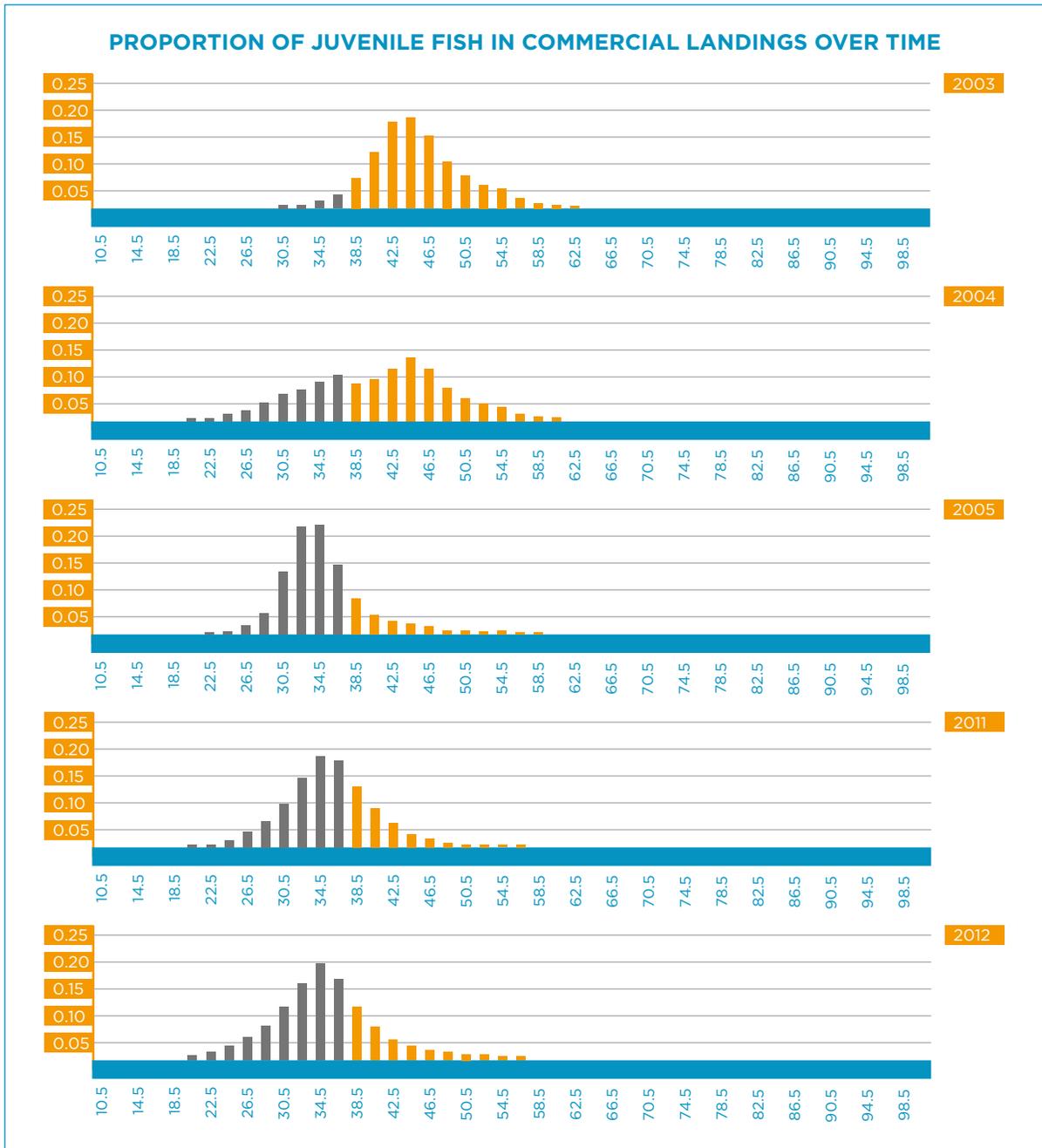
<sup>27</sup> D. Queirolo et al. (2013), "Gillnet Selectivity for Chilean Hake (*Merluccius gayi gayi* Guichenot, 1848) in the Bay of Valparaíso," *Journal of Applied Ichthyology* 29(4): 775-81.

<sup>28</sup> R. Alarcón and H. Arancibia (1993), "Talla de primera madurez sexual y fecundidad parcial en la merluza común, *Merluccius gayi gayi*," *Cienc. Tec. Mar.* 16, 33-45.

fishing mortality exerted on younger age classes, creating a genetic drift toward a population of smaller fish on average. This trend toward smaller, younger fish has significant biological

and commercial implications and is believed to be another factor hampering a robust recovery.<sup>29</sup> See Figure 5.

FIGURE 5: Relative Frequency of Individuals by Length (cm). Dark Represents the Fraction Under 37 cm. (IFOP 2014)



<sup>29</sup> R. Tascheri, et al, "Monitoreo de las capturas de merzula común," Informe Final FIP 2005-07, 2005.



Since 2005, the stock has remained well below its limit reference points despite the dramatic reduction in quotas.<sup>30</sup> This decline is likely attributable to a continuation of the same factors that led to the original collapse, including:

- High levels of predation by jumbo squid
- Undeclared/illegal removals (including bycatch and discards) in both sectors, but particularly

illegal, unreported, and unregulated (IUU) fishing in the artisanal sector

- Continued legal overfishing due to scientific committee TAC recommendations in excess of the replenishing capacity of the stock due to poor data regarding the extent of illegal fishing and squid-related mortality

### HAKE-SQUID INTERACTIONS

Jumbo squid are the largest and most abundant marine invertebrate in the southeastern Pacific, with individuals reaching lengths of 3 meters and up to 50 kg in weight.<sup>31</sup> The species has an average lifespan of 1 to 1.5 years and breeds only once in its life. The life history strategies and population structure of this species are known to be heavily influenced by environmental factors, particularly El Niño events,<sup>32</sup> making its abundance fairly unpredictable. However, its short lifespan, wide trophic niche, and relative hardiness make the species remarkably resilient.<sup>33</sup> Despite the species' abundance and widespread distribution, spanning from southern Chile to the Pacific Northwest, remarkably little is known about its ecology.

From 1978 to 1990, jumbo squid essentially disappeared from Chilean waters, which scientists attribute to changes in oceanographic conditions as a result of El Niño events in the early 1980s. Then in 1990, the species suddenly returned to Chilean waters, where it remained at varying degrees of abundance—even supporting a commercial fishery for a time in Region IV—until it disappeared again from Chilean waters, likely in connection with the El Niño events of 1997–1998. In 2001, however, the species made a sudden and dramatic return to Chile's coast and has remained abundant ever since (see Figure 6).<sup>34, 35</sup>

<sup>30</sup> Limit reference points set boundaries that are intended to constrain harvesting within safe biological limits in which the stocks can produce maximum sustainable yield. Fishery management strategies should ensure that the risk of exceeding limit reference points is very low. If a stock falls below a limit reference point or is at risk of falling below such a reference point, conservation and management action should be initiated to facilitate stock recovery. The fishing mortality rate that generates maximum sustainable yield should be regarded as a minimum.

<sup>31</sup> Nigmatullin, et al, "A Review of the Biology of the Jumbo Squid *Dosidicus gigas*," Fisheries Research 54, 2001.

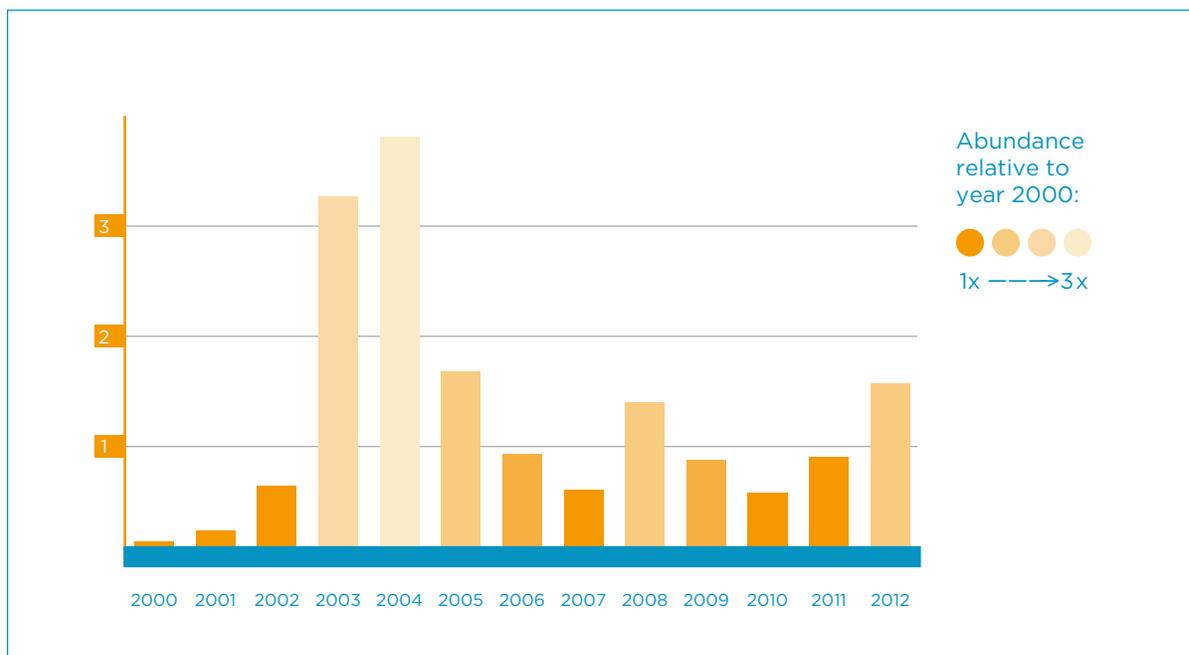
<sup>32</sup> H.T. Hoving, et al, "Extreme Plasticity in Life — History Strategy Allows a Migratory Predator (Jumbo Squid) to Cope with a Changing Climate," *Global Change Biology*, 19: 2089–2103.

<sup>33</sup> Seafood Watch. Jumbo Squid. [http://www.seafoodwatch.org/-/m/sfw/pdf/reports/mba\\_seafoodwatch\\_jumbosquidmexicoreport.pdf](http://www.seafoodwatch.org/-/m/sfw/pdf/reports/mba_seafoodwatch_jumbosquidmexicoreport.pdf).

<sup>34</sup> F. Rocha and M.A. Vega, "Overview of the Cephalopod Fisheries in Chilean Waters," Fisheries Research 60, 2003.

<sup>35</sup> Schmiede and Acuna, "Regreso de las jibias (*Dosidicus gigas*) a Coquimbo," *Revista Chilena de la Historia Natural*, 1992.

FIGURE 6: Index of Relative Abundance of Giant Squid in Research Vessel Hauls During the Period of Stock and Landings Decline<sup>36</sup>



The fact that this emergence coincided with the collapse of the common hake stock has fueled significant controversy in the fishing sector, leading to renewed efforts to study its role in the ecosystem. Although much remains unknown, recent studies show that in Chile, more so than in other parts of the squid's range, the species feeds at a higher trophic level,<sup>37</sup> with stomach content analysis revealing common hake as a dietary staple.<sup>38</sup>

Though few scientists deny that squid exert meaningful top-down pressure on common hake, the degree to which squid predation caused the collapse of hake fishery and are inhibiting its

recovery is still subject to broad disagreement. Studies range from attributing little to no role to squid while others estimate that as much as 90% of the hake biomass disappeared due to squid predation.<sup>39</sup> Despite these extremes, the emerging consensus is that the collapse of the stock could only have occurred through the combination of predation and high levels of overfishing.<sup>40, 41, 42</sup> The extent of squid mortality has historically been included in annual stock assessments for hake; however, in 2015, mortality from squid was removed from the model, allowing the quota to rise despite an actual fall in hake biomass.

<sup>36</sup> S. Lillo, et al, "Evaluación hidroacústica de merzula común, año 2011," Final Report, FIP Project 2011-03, Instituto de Fomento Pesquero, 2012.

<sup>37</sup> G. Ruiz-Cooley, "Tracking Large Scale Patterns of  $\delta^{13}C$  and  $\delta^{15}N$  Along the E Pacific Using Epi-mesopelagic Squid as Indicators," *Ecosphere* 3(7), 2012.

<sup>38</sup> Ulloa, et al, "Habitos alimentarios de *Dosidicus gigas* frente a la costa centro-sur de Chile," *Revisa Chilena de Historia Natural* 79, 2006.

<sup>39</sup> Ibanez et al, "El impacto ecologico de calamari *Dosidicus gigas* sobre las poblaciones de pesces en el Oceano Pacifico", *Amici Molluscarum* 21(7), 2013.

<sup>40</sup> Ibanez, et al, "El impacto ecologico de calamari *Dosidicus gigas* sobre las poblaciones de pesces en el Oceano Pacifico," *Amici Molluscarum* 21(7), 2013.

<sup>41</sup> Alarcon-Munoz, et al, "Jumbo Squid Biomass Off Central Chile: Effects on Chilean Hake," *CalCOFI* 49, 2008.

<sup>42</sup> L. Zeidberg and B. Robinson, "Invasive Species Expansion by the Humboldt Squid in the Eastern North Pacific," *National Academy of Sciences* 104, 2007.

## STOCK MANAGEMENT APPROACH AND CHALLENGES

### REGULATORY CONTEXT

The implementation of a new fisheries and aquaculture law in 2013 ushered in several major changes in fisheries management in Chile. The new law established that all commercial fisheries require management committees that must follow the recommendation of a scientific committee when it comes to setting annual catch limits (not exceeding recommendations by more than 5%), with the goal of managing stocks to  $B_{MSY}$ .<sup>43</sup> Additionally, all closed-access fisheries, including those of the common hake, require a management plan, developed by the specific management committee for that fishery, which once approved, become legally binding.<sup>44</sup> The scientific committees determine the total allowable catch limits and quota allocation range based on robust, age-structured stock assessment models informed by the best available science. Although these committees are not immune to political and social pressure, they provide a much more independent and rigorous approach to catch limit setting than existed in the past, and are a dramatic step forward in fisheries management in Chile.

Three institutions—SUBPESCA, IFOP, and SERNAPESCA—are responsible for management, implementation, and enforcement of the Fishing Law. SUBPESCA, also known as the Undersecretary of Fisheries and Aquaculture, belongs to the

Ministry of Economy, Development and Tourism, and regulates and manages fisheries and aquaculture through policies and standards development. IFOP, the Fisheries Development Institute, is a private, nonprofit organization that provides the technical background and scientific assessments for the regulation and management of the sector. SERNAPESCA, the National Fisheries and Aquaculture Service, also belongs to the Ministry of Economy, Development and Tourism, is responsible for monitoring and enforcement of the Fishing Law, and provides the official statistics from landing data.

Artisanal and industrial fishers play an advisory role in decision-making through participation in various councils and species-level management committees. For the hake, the management committee is formed by members from representatives of the industrial (three members) and artisanal sectors (seven members), SUBPESCA Subpesca (one member), SERNAPESCA Sernapesca (one member), and the processing industry (one member). Of note, the Fishing Law mandates that a management committee for the hake be formed by August 2014, with a management plan approved shortly thereafter. As of now, the management committee is in place; however, a management plan has not been ratified.<sup>45</sup>

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<sup>43</sup> E. Plotnek, "Barriers to Marine Stewardship Council Certification in the Artisanal South Pacific Hake Fishery in Chile," Universidad del País Vasco, 2014.

<sup>44</sup> E. Plotnek, "Barriers to Marine Stewardship Council Certification in the Artisanal South Pacific Hake Fishery in Chile," Universidad del País Vasco, 2014.

<sup>45</sup> E. Plotnek, "Barriers to Marine Stewardship Council Certification in the Artisanal South Pacific Hake Fishery in Chile," Universidad del País Vasco, 2014.

## ILLEGAL FISHING ACTIVITY

The most critical challenge from a sustainability standpoint in this fishery is illegal, unreported, and unregulated (IUU) fishing in the artisanal sector, since the industrial sector has reduced effort significantly in recent years and is well-regulated. IUU fishing refers to that done outside the harvest limits, such as during closures, in protected areas, or landing fish under the legal size limits. It also refers to fishing trips and removals of biomass that are not officially declared or wrongly reported and are thus not captured by official records. Informal estimates from regulators, nonprofits, and fishers themselves suggest that illegal landings by artisanal fishers are in the range of two to four times the reported landings, depending on the caleta. Market data suggests that at least three times the total allowable catch is being sold on the domestic market.<sup>46</sup> It appears that the 50% reduction of the TAC in 2014, rather than cutting fishing pressure, only led to dramatic underreporting, and may in fact have served to empower informal supply chain actors willing to commercialize illegal landings.

Harvest by unregistered vessels, which in turn do not have quota allocations, is another issue challenging the fishery. It is believed that up to 30% of the vessels in the artisanal fishery might not be registered, with this issue particularly prevalent in Region VII.<sup>47</sup> After the massive earthquake in 2010,

the government gave out hundreds of unlicensed vessels and subsidies to agriculturalists in this region in an effort to restore economic livelihoods, effectively converting many farmers to hake fishers. These fishers were unlicensed, were untrained, and had an entirely different ethic toward the sea than did hake fishers in Regions V and VIII, who had been harvesting the stock for generations. As a result of these factors, Region VII has the highest levels of illegal hake fishing. The Merluza Strategy seeks to address this issue through large-scale vessel registration programs and gear transitions, which are described in more detail in the Impact Investment Thesis section below.

In the industrial fishing fleet, the main concern is discarding, which is prohibited by law. Although there is no size limit for hake, undersized hake are believed to be discarded, given the lower commercial value and processing yield of small fish. Stock assessments attempt to account for these IUU issues, but since the magnitude of underreporting of landed fish in the artisanal fishery and discarding by industrial fishers is largely unknown, errors in these assumptions and consequences on stock assessments are potentially substantial. SUBPESCA has recently instituted an on-board observer program on industrial trawlers to further investigate discards and bycatch in the sector.

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## CLOSURES AND SIZE LIMITS

While the industrial fleet has minimal mesh size of 100mm set by law, there is no mesh size limit for the artisanal gillnet fishery. Since 2005, an escape panel in the nets for juveniles is also mandatory for industrial fishers. Trawling, and in fact all industrial harvest, is banned within five nautical miles from the coast, leaving nearshore populations entirely to the artisanal sector. Moreover, there is a closed

season in the fishery that extends for a single month during one of the peak hake spawning seasons, which applies to all fleets targeting hake. It is, however, permissible to catch hake as a nontarget species in other fisheries during this closure. There is no established minimal landing size limit for any of the fleets.

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<sup>46</sup> E. Plotnek, "Barriers to Marine Stewardship Council Certification in the Artisanal South Pacific Hake Fishery in Chile," Universidad del País Vasco, 2014.

<sup>47</sup> SERNAPESCA *personal communications*.

## TOTAL ALLOWABLE CATCH (TAC) AND QUOTAS

In the common hake fishery, various schemes for assigning the annual TAC are applied. The TAC of the industrial fishery is split into quotas for each individual vessel. The TAC of the artisanal fleet is first split by region and then split by area and organization, known as a Régimen Artesanal de Extracción (RAE).

Each RAE has a charter and set of bylaws that bind member fishers to a set of fishery management and commercialization practices. The artisanal fleet has by law a minimum share of 35% of the quota, with quotas set in 2015 at 60% to the industrial fleet and 40% to the artisanal fleet.

## GEAR AND ENVIRONMENTAL IMPACTS

### Industrial

The industrial fleet exclusively uses demersal trawls. Compared to bottom trawls, the demersal trawls have no doors to continuously plough into the seabed, although they can touch or get dragged atop the seabed. Hake aggregations are located by acoustic sonars, so the majority of the catch is hake, but the gear is known to be of low selectivity.

Data from research vessels suggest that at least 75% of the capture from demersal trawls at the depth of 200–400 meters is common hake, 9% jumbo squid (*Dosidicus gigas*), 3.5% nylon shrimp (*Heterocarpus reedi*), 2.6% blue squat lobster (*Cervimunida johni*), 1.7% was red squat lobster (*Pleuroncodes monodon*), and 1.4% Chilean grenadier (*Coelorinchus chilensis*). The remaining 3% consist of Besugo (*Epigonus crassicaudus*), Pacific sandperch (*Prolatilus jugularis*), bigeye flounder (*Hippoglossina macrops*), Patagonian grenadier (*Macruronus magellanicus*), American elephantfish/cockfish (*Callorhynchus callorhynchus*), snoek (*Thyristeres atun*), and kite ray (*Zearaja chilensis*).<sup>48</sup> The kite ray (*Zearaja chilensis*) found in the survey is the only one listed as vulnerable by the IUCN.<sup>49</sup>

There is currently no systematic information gathered on bycatch and discards in this fishery. Estimates of catch discards in the industrial sector vary widely, depending on the source, with anecdotal reporting suggesting a range between 2% (according to the industry<sup>50</sup>) and 5%–7% (according to the IFOP<sup>51</sup>). SUBPESCA's on board observer program should help to shed further light on the extent of these issues.

### Artisanal

The total size of the artisanal hake fleet remains largely unknown, with 2,368 vessels officially licensed with SERNAPESCA but probably closer to 500–700 active vessels. The most important regions for artisanal fishing by landings are Regions V, VII, and VIII, which have a share of around 90% of the total artisanal quota allocation.<sup>52</sup> Artisanal capture occurs almost exclusively by gillnets, with only 1% to 2% of fishers operating longlines with a small number of hooks (essentially handlines with more than one hook). Longlines have historically been the gear of choice in the artisanal sector and tend to be more selective and to yield higher quality fish; however, a massive shift toward gillnets occurred with the collapse of the stock in the early 2000s, as shown in Figure 7.

<sup>48</sup> H. Arancibia and S. Niera, "An Overview of the Chilean Hake (*Meluccius gayi*) Stock, a Biomass Forecast, and the Jumbo Squid (*Dosidicus gigas*) Predator-Prey Relationship Off Central Chile," CalCOFI Report 49, 2008.

<sup>49</sup> The IUCN Redlist of Threatened Species, "Zearaja chilensis," [www.iucnredlist.org](http://www.iucnredlist.org), 2015.

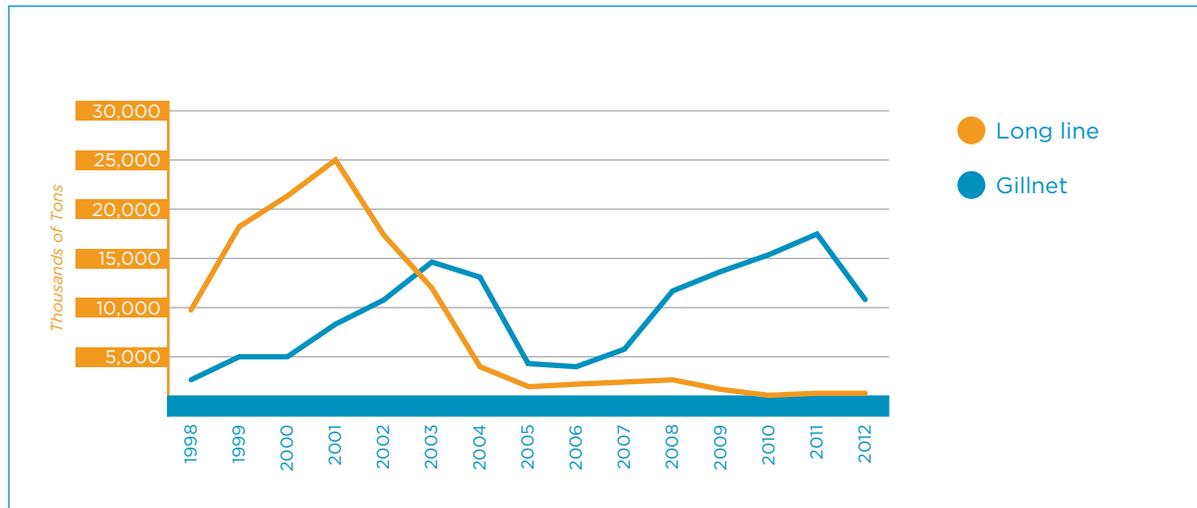
<sup>50</sup> Congelados Pacifico representative manager, *personal communication*.

<sup>51</sup> Instituto de Fomento Pesquero (IFOP), "Merluza común," Segundo Informe - Final, 2014.

<sup>52</sup> Subsecretaría de Pesca y Acuicultura de Chile, Departamento de Pesquerías, "Estado de Situación de las Principales Pesquerías Chilenas," Marzo, 2014.



FIGURE 7: Artisanal Hake Landings by Gear Type (IFOP 2012)<sup>53</sup>



This rapid shift in gear type was a response to the diminished size and abundance of hake populations in artisanal fishing zones. This change in the hake population is further reflected in the shrinking mesh sizes, decreasing on average from 8.9cm in 2006 to 6.4cm in 2012.<sup>54</sup> Generally, mesh size decreases from north to south, ranging from less than 5cm in Valparaíso to 8.4cm in Cocholgüe.<sup>55</sup> These decreasing mesh sizes have a direct impact on the size of fish caught. A study by Queirolo, et al found that mesh sizes of 5.2, 6.8, and 7.6cm landed fish of 30.9, 40.2, and 43.9cm on average, respectively.<sup>56</sup>

Since 2005, the majority of hake landings have been well below what scientists and regulators think should be the minimum size limit of 37cm in

all fishing areas except for San Antonio (Region V), where average landing size remained slightly above the reference size.<sup>57</sup> This size-selectivity is problematic, since the majority of the population has not reached sexual maturity by the time it is harvested, and since capture of juvenile hake impairs stock recovery by limiting reproduction.

Catch per unit effort (CPUE) has also declined substantially with the stock collapse in the early 2000s, although there is substantial variability across sites. CPUEs of 100–300kg per fishing trip were recorded in Region V, 300–800kg per fishing trip in Region VII, and 600–1200kg per fishing trip in Region VIII (Figure 8).

<sup>53</sup> Instituto de Fomento Pesquero (IFOP), “Merluza común,” Segundo Informe – Final, 2014.

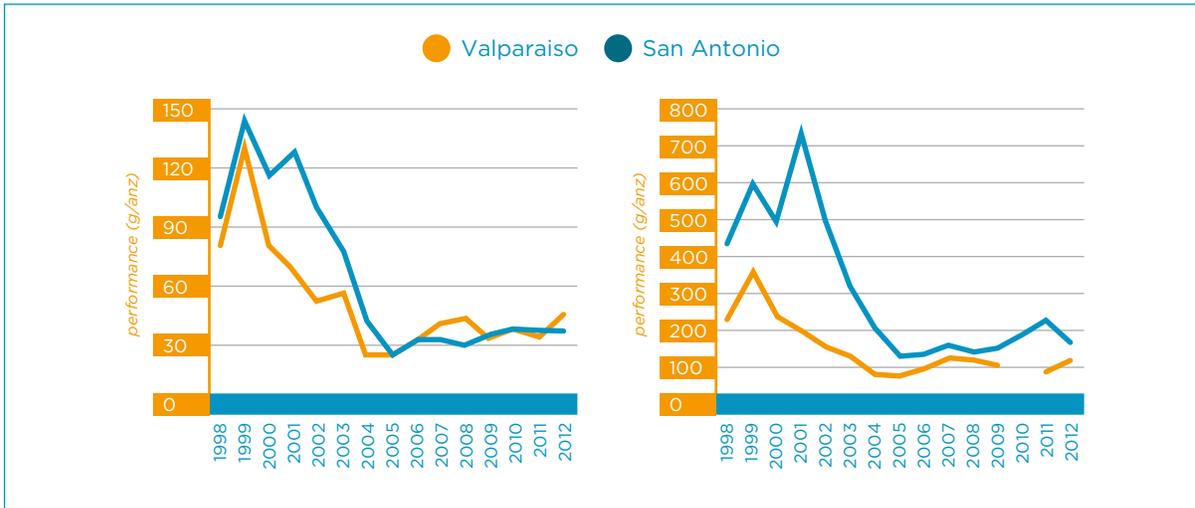
<sup>54</sup> D. Queirolo, et al, (2013), “Gillnet Selectivity for Chilean Hake (*Merluccius gayi gayi* Guichenot, 1848) in the Bay of Valparaíso,” *Journal of Applied Ichthyology* 29(4): 775–81.

<sup>55</sup> D. Queirolo, et al, (2014), “Composición de especies en la pesquería artesanal de enmalle de merluza común *Merluccius gayi gayi* en Chile central,” *Revista de biología marina y oceanografía* 49(1): 61–69.

<sup>56</sup> Queirolo et al, “Caracterización de las Redes de Enmalle en la Pesquería Artesanal de la Merluza Común,” FIP 2009–23, Pontificia Universidad Católica de Valparaíso, 2011.

<sup>57</sup> Instituto de Fomento Pesquero (IFOP), “Merluza común,” Segundo Informe – Final, 2014.

FIGURE 8: Trends in CPUEs in the Artisanal Fishery in Valparaiso and San Antonio



In terms of artisanal bycatch, there is limited comprehensive data available; however, a study by Queirlo, et al, of 34 caletas and 772 vessels found that the bottom-set gillnet fishery had bycatch of

roughly 5% by weight. The main bycatch species were lemon crab (*Cancer porteri*), squat lobster (*Pleuroncodes monodon*), and lorna drum (*Sciaena deliciosa*).<sup>58</sup>

**CURRENT SUPPLY CHAIN**

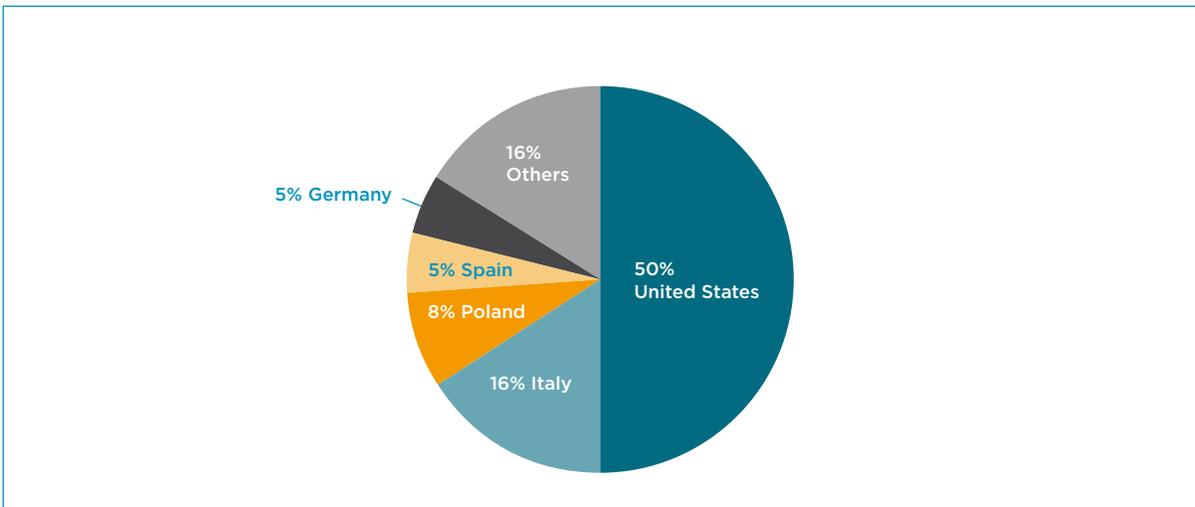
**HAKE**

**Industrial**

The industrial hake supply-chain is characterized by a high level of vertical integration, with three major players—Blumar and Congelados Pacifico working as a single joint venture, and Pesquera Grimar—harvesting, processing, and exporting nearly all

the industrial landings. Industrial hake is harvested by two vessels, flows through up to three large processing plants, and is packaged and shipped. The main markets for industrial common hake are the United States and Europe (Figure 9).

FIGURE 9: Main Export Destinations for Common Hake Landed by Industrial Sector



## Artisanal

In contrast, the artisanal supply chain for common hake is highly fragmented, opaque, and inefficient, with all of the product destined for the domestic market and as much as 90% of that passing through the country's largest seafood terminal, the Terminal Pesquero Metropolitano in Santiago.<sup>59</sup> The perishable nature of the product, coupled with the fact that most caletas do not have facilities to store products longer than a few hours after arrival to port, leaves artisanal fishers with very little market power. Hake landings typically change hands three to five times on their way to Santiago, with the markup from dock to final sale to consumer

ranging from 200% to 500%, absent any value-added processing.

Moreover, an entrenched group of traders at the Terminal Pesquero have established an oligopoly through which they are able to exclude other vendors, set artificially low ex-vessel prices nationwide, coordinate among themselves to avoid SERNAPESCA inspections, and pay premiums for fish harvested during closed seasons or bad weather events.<sup>60</sup> These artisanal supply chain dynamics are widely believed to be facilitating, if not driving, much of the overfishing problem.

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## SQUID

Data from the Food and Agriculture Organization of the United Nations (FAO) indicates no landings of Humboldt squid prior to the mid-1960s, with commercial fisheries in Latin America first established in Peru and Mexico, and with Japanese backing arriving in the 1970s. The industry only began to take off in the early 1990s, with total catch in 1999 of 134,000 mt in Latin America. Today, global production has grown to over 900,000 mt,<sup>61</sup> with Peru accounting for 52% of landings in 2012, followed by China (27%) and Chile (15%).<sup>62</sup>

Currently, the largest squid importers are China, Japan, Italy, Spain, and the United States. The demand for jumbo squid surged in 2013, driven primarily by expanding demand from China, combined with an uptick in demand from new markets such as Russia, Singapore, and Brazil. Over the last decade, Peru has become an increasingly important player, with reported landings above 400,000 mt per year. Peru is trying to consolidate the artisanal fishery for jumbo squid by introducing

new legislation aimed at bringing the artisanal sector into the export business.<sup>63</sup>

In Chile, the industrial seafood companies have started to invest in infrastructure to monetize the recent abundance of this resource. One example is the joint venture between Seafrost and Industrial Pesquera Santa Mónica, called "Fripusa," which plans to expand cold storage facilities in Chile and add processing capacity. The extent of industrial harvest, however, is limited to only 20% of the TAC of 200,000 mt, with the remainder being given to the artisanal sector. Artisanal fishers in Chile have also been actively trying to increase their harvest and processing capacity for squid, as nearly 50% of the TAC in 2014 went unfished despite strong international wholesale prices. Federations in San Antonio and La Serena have received government sponsorship to build processing plants, but there is a clear need for larger-scale commercialization channels and export expertise.

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<sup>59</sup> Instituto de Fomento Pesquero (IFOP), "Merluza común," Segundo Informe - Final, 2014.

<sup>60</sup> Sernapesca *personal communication*

<sup>61</sup> FAO 2014. FAO Online Queries, Global capture database.

<sup>62</sup> Food and Agriculture Organization of the United Nations, Globefish.org News Archive, 2014.

<sup>63</sup> Food and Agriculture Organization of the United Nations, Globefish.org News Archive, 2014.



### SOCIOECONOMIC PROFILE

There is surprisingly little robust data on the current socioeconomic conditions of hake fishers in Chile, likely because of the general informality of the artisanal sector and the fact that fishers tend to be organized around landing sites (caletas) rather than distinct fishing communities that can be easily demarcated and profiled. The 2007 census and more recent academic research, however, provides some insights.

In 2007, the national census reported that 1,224 people were employed either directly or indirectly in the artisanal hake fishery. This significantly underestimates the number of hake fishers, given that 96% of these respondents were in Regions V and VIII, which now constitute only two of the three major hake fishing hubs. This statistic also highlights the recent and dramatic rise of Region VII as a major player in the hake industry, a trend that only began in 2010, following the earthquake.

The census also reveals a thoroughly male-dominated sector, with men comprising 98.9% of fishers. This dominance is further reflected in the gender pay gap, with men making 168,000 CLP/month (US\$ 2,947/year) in 2007 and women only 106,000 CLP/month (US\$ 1,859/year). This amounts

to less than one-third of the national average income in 2007. Even compared to other fishers, artisanal hake fishers were earning 53% of the mean income of the fishing sector as a whole.<sup>64</sup>

Of the respondents, 77% reported being the sole income earner for their families—compounding the economic implications of the hake collapse. This economic vulnerability is exacerbated by low levels of coverage from formal social and welfare programs. Only 0.1% of fishers reported insurance coverage for catastrophic illness, 0.5% had renter's or employment insurance, 12% had life insurance, and 28% had some form of pension. More positively, 91% reported having some form of health insurance.<sup>65</sup>

These statistics stand in stark contrast to fishers operating in the industrial sector, who earned 335,000 CLP/month (US\$ 5,877/year) in 2007, roughly 73% of the national per capita income and 8% higher than the average fishing sector income. As of 2010, there were an estimated 2,400 employees in the industrial hake sector—400 operating the fleet and 2,000 involved in processing.<sup>66</sup>

<sup>64</sup> Instituto Nacional de Estadísticas de Chile, "Censo Agropecuario y Forestal," 2007.

<sup>65</sup> Arancibia, et al, "Evaluación de estrategias de recuperación en la pesquería de merluza común," Universidad de Concepción, FIP 2009-22, 2010.



## THE MERLUZA IMPACT STRATEGY

### IMPACT INVESTMENT THESIS

The Merluza Strategy's impact thesis is predicated on the assumption that by reducing overall fishing effort through a comprehensive set of interventions affecting over 70% of the stock, hake mortality can be sufficiently reduced to allow the stock to recover, thus improving fisher livelihoods and increasing food supplies over time.

Specifically, Merluza aims to restore the hake fishery to 75% of its estimated biomass at maximum sustainable yield<sup>67</sup> over a 10-year period, increasing hake landings by 177%, and delivering at least 136 million additional seafood meals to market each year, while setting it on a path to full recovery.<sup>68</sup>

To accomplish these impact objectives, The Merluza Strategy proposes the following bundled set of investments (See Figure 10):

**Step 1:** Invest \$2.0 million up front into comprehensive fishery management improvements in the 12 largest hake-fishing caletas\*. The investment would fund the establishment of a new team and fisheries management company ("FMC") that would implement a wide range of fisheries management improvements. These activities would include the implementation of full vessel monitoring and catch documentation coverage, replacement of all nets below a minimum mesh size, the retrofitting as many as 70% of hake fishing vessels in the region with the highest IUU fishing to instead fish jumbo squid, and the coordination of extensive technical assistance and broader stakeholder engagement programs.

**Step 2:** Invest \$9.4m into the acquisition of 60% of the industrial hake quota, 80% of which would be re-allocated to artisanal fishers in Merluza caletas, while 20% would be held, unfished and in reserve, to reduce fishing mortality and support stock recovery.<sup>69</sup> The quota ownership would give Merluza a means by which to immediately legalize a large portion of the IUU landings in the participant caletas. Quota would only be allocated to caletas fully engaged in Merluza improvement activities and where Sernapesca was present to inspect and certify all landings as legal. The quota asset would also give investors significant upside exposure to a stock recovery, as the value of the quota could rise dramatically with the stabilization and restoration of the fishery.

**Step 3:** Invest \$6.1 million<sup>70</sup> into the creation of a vertically integrated hake and squid processing and distribution company (called "HakeCo" or "the Company") that would source and commercialize hake and squid from the participant caletas, reconfiguring the prevailing supply chain, while modernizing artisanal fishing and landing practices to generate higher value for lower volumes. HakeCo would use financial incentives to reward fishers complying with fishery management improvements, paying an estimated 50% price premium relative to current market ex-vessel prices for all raw materials that met Merluza compliance standards.

<sup>67</sup> IFOP and University of California-Santa Barbara estimate biomass levels at MSY of approximately 630,000 mt.

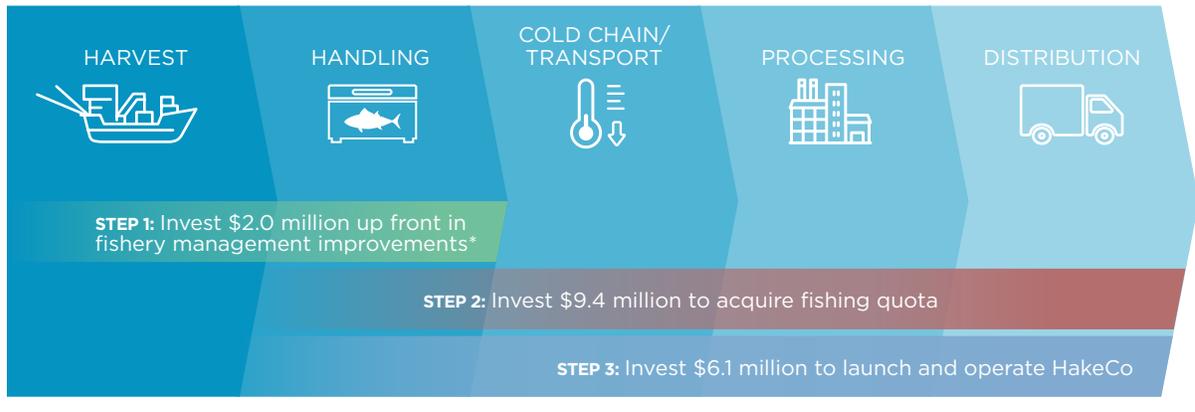
<sup>68</sup> Full recovery would be to at least 100% of biomass at MSY.

<sup>69</sup> This is the maximum share of industrial quota that can go unfished without being reallocated.

<sup>70</sup> This represents only the initial costs to establish the commercial operations.

\* Merluza budgets an additional \$2.5 million in fishery management expenses over the investment term funded by cash flow from operations.

FIGURE 10: The Merluza Strategy Investments



The proposed bundling of the investments into fishery management improvements with the HakeCo reflects the notion that fishery improvement efforts must be supported by clear and immediate market-based incentives to achieve compliance. Fishery improvement efforts that attempt to curtail harvest without offering economic alternatives, such as the 2014 TAC reduction, have the potential to create controversy and conflict without necessarily moving the needle on stock recovery because they

fail to address the interrelated social, biological, and economic drivers of overfishing. The Merluza Strategy attempts to address these multiple drivers while building on the strong foundation laid by the new Fishing Law.

Steps 1 and 2 will be described in the Impact Strategy section of this report, while Step 3 will be described in the Commercial Investment Thesis section further below.

The Merluza Strategy aims to restore the hake fishery to 75% of its estimated biomass at maximum sustainable yield over a 10-year period, increasing hake landings by 177%, and delivering at least 136 million additional seafood meals to market each year, while setting it on a path to full recovery.

\* Merluza budgets an additional \$2.5 million in fishery management improvement expenses over the investment term



### STEP 1: FISHERY MANAGEMENT IMPROVEMENTS

The fishery management improvements proposed by Merluza and implemented by the newly established FMC would be directed at the artisanal sector, for two primary reasons. First, the artisanal sector is the largest contributor to the IUU fishing that is believed to be preventing the hake's recovery. Second, Merluza proposes the acquisition of 60% of the industrial quota, 80% of which would be leased to participant caletas and 20% of which would be left unfished as a recovery reserve. This action would further reduce the relevance, from a fisheries management perspective, of the industrial sector.

Merluza proposes a rollout of the management improvements into four participant caletas in year 1, another four in year 2, expanding to a total of 12 by year 4. This approach leads to high organizational and fixed asset costs in the first three years, which are necessary to gain the market leverage required to drive systemic reform in the fishery. The proposed caleta-level rollout schedule is detailed in Figure 11 below, along with the associated share of the artisanal landings of hake incorporated in the Merluza portfolio.

FIGURE 11: Artisanal Shares Incorporated into the Management Improvements

INITIATION YEAR	CALETA	REGION	SHARE OF TOTAL ARTISANAL QUOTA BY CALETA (2015)	CUMULATIVE SHARE OF ARTISANAL QUOTA INCORPORATED INTO STRATEGY
1	Cocholgue	VIII	18%	18%
1	San Antonio	V	11%	29%
1	Portales	V	10%	39%
1	Duao	VII	11%	50%
2	Maguillines	VII	5%	55%
2	Pelluhue	VII	4%	59%
2	Loanco	VII	3%	62%
2	El Membrillo	V	3%	65%
3	San Pedro	V	2%	67%
3	Llico	VII	2%	69%
4	La Trinchera	VII	1%	70%
4	Tumbes	VIII	1%	71%

The primary elements of the fishery management improvements in the target caletas are outlined below:

CORE FISHERIES MANAGEMENT COMPONENTS	ACTIVITIES	PROPOSED MANAGEMENT IMPROVEMENTS
Stakeholder Engagement	Government Engagement	<ul style="list-style-type: none"> <li>• Partner with advocacy groups to lobby the government to expand the seasonal closure period by one month and institute area closures to protect reproductive individuals during spawning</li> <li>• Co-create product label with SERNAPESCA to verify the Company's product as legal and sustainable</li> <li>• Conduct workshops with SERNAPESCA authorities to help integrate Catch Documentation System (CDS) data into annual stock assessments</li> <li>• In year 3, begin workshops and training to transition CDS management to SERNAPESCA for rollout nationally and to other species</li> </ul>
	Community Engagement	<ul style="list-style-type: none"> <li>• Design and oversee implementation of caleta-specific fishery management plans outlining proper harvest, landing, and catch-documentation practices, as well as key environmental considerations regarding ecosystem impacts, closed seasons, bycatch, discards, and bait use</li> <li>• Provide extensive technical assistance to participant fishers to ensure their full understanding of Merluza management improvements and to build knowledge and capacity around jumbo squid harvest, thus ensuring full transition away from hake</li> <li>• Conduct consumer awareness campaign with fishers, nonprofit partners, regulators, and retailers highlighting IUU fishing issues</li> <li>• Prepare and publicly disseminate annual report on fishery improvement plan progress against target benchmarks, with external audits every three years</li> </ul>
Policy Rules and Tools	Exclusive Access Rights	<ul style="list-style-type: none"> <li>• Ensure that quota allocations—a form of exclusive access—is monitored and properly enforced through installation of Vessel Monitoring Systems (VMS) and an enhanced SERNAPESCA presence in the caletas</li> <li>• Register all vessels in the participant caletas</li> </ul>
	Fishing Rules	<ul style="list-style-type: none"> <li>• Purchase all fish from participant fishers to eliminate discarding, but only pay premium for fish larger than 35cm initially and 38cm by year 5</li> <li>• Replace all destructive gear, including gillnets with a mesh size below 7cm, and incentivize use of hand-lines through price premiums, given the higher selectivity of the gear and quality of fish landed</li> <li>• Expand seasonal closure (described above)</li> </ul>
Reduce Fishing Effort	Stock Recovery	<ul style="list-style-type: none"> <li>• Purchase 60% of industrial quota and leave 20% reserve unfished for 10 years (see Acquisition of Fishing Quota, below)</li> <li>• Retrofit 70% of vessels in the Merluza caletas in Region VII caletas to fish jumbo squid</li> <li>• Dramatically reduce and minimize IUU fishing in the 12 largest hake landing sites in Chile</li> </ul>

CORE FISHERIES MANAGEMENT COMPONENTS	ACTIVITIES	PROPOSED MANAGEMENT IMPROVEMENTS
Compliance	Catch Accounting	<ul style="list-style-type: none"> <li>Design, implement, and operate Catch Documentation System in each caleta</li> <li>Install weighing stations in caletas, staffed by the Company and SERNAPESCA, to ensure that landings comply with quota allocations and are properly accounted for in fishery management data</li> </ul>
	Product Traceability	<ul style="list-style-type: none"> <li>Design and implement full traceability system, from buying stations to final point of sale by HakeCo</li> </ul>
	Biological Monitoring and Assessment	<ul style="list-style-type: none"> <li>Fund and support existing research to map out sensitive ecosystems and spawning grounds in target caletas</li> <li>Fund and support existing research on hake-squid interactions and impact on hake mortality</li> </ul>
	Local Enforcement Systems	<ul style="list-style-type: none"> <li>Sign contracts with the leadership of each of the 12 caletas stipulating that in exchange for access to all loaned infrastructure (vessel equipment, ice machines, etc.) and quotas, the caleta must comply with the guidelines of the fishery management plan; any caleta found in breach of the agreement could lose all future access to these valuable assets as well as the 50% premium paid for raw materials by the Company</li> <li>Codify fishery management improvement activities into the bylaws of each caleta and/or “Regimen Artesanal de Extracción” (RAE), leaving violators subject to losing access to future quota allocation as well as the ability to participate in the Company’s supply chain</li> </ul>

### THE TRANSITION TO JUMBO SQUID

In Region VII, where the highest levels of IUU fishing are reported, Merluza proposes to invest in the gear and infrastructure necessary to divert a large portion of this fleet toward the harvest of jumbo squid, with HakeCo providing a profitable commercialization channel for fishers. In the squid fishery, there is no allocation of quota to individuals, but rather a global TAC with caps set on the artisanal and industrial sectors. This approach, albeit an imperfect one from a fisheries management approach, would facilitate new

entrants from Merluza caletas.<sup>71</sup> A proposal for the vessel transition is outlined in Figure 12.<sup>72</sup> Not all vessels will be transitioned, as some have official quota allocations that will be repatriated if left unfished and transferred outside of the Merluza caletas, which would counteract the goals of the strategy. As such, the goal in Region VII is to transition primarily those fishers with little or no quota to squid fishing to rationalize hake landings with legal harvest limits.

The Merluza Strategy proposes to invest in the gear and infrastructure necessary to divert a large portion of this fleet toward the harvest of jumbo squid, with HakeCo providing a profitable commercialization channel for fishers.

<sup>71</sup> This may change as the fishery comes under more careful management.

<sup>72</sup> This chart is largely indicative, as the actual retrofits would be based on the willingness of fishers in each caleta to participate and the relative landings versus quota allocation of each vessel.

FIGURE 12: Transition to Squid Fishing by Caleta, Including Percentage of Vessels Transitioned and Additional Landings

CALETAS	REGION	% VESSEL TRANSITIONED TO SQUID	ADDITIONAL SQUID LANDINGS - 2020 (MT)	TOTAL SQUID LANDINGS - 2020 (MT)
Cocholgüe	VIII	-	-	9,000
Puertecito- Pacheco Altamirano	V	-	-	9,000
Portales	V	-	-	4,500
Duao	VII	70%	5,544	5,544
Maguillines	VII	70%	3,185	3,185
Pelluhue	VII	70%	3,185	3,185
Loanco	VII	70%	1,960	1,960
El Membrillo	V	-	-	-
San Pedro	V	-	-	-
Llico	VII	70%	840	840
La Trinchera	VII	70%	525	525
Tumbes	VIII	-	-	-
<b>TOTAL</b>			<b>15,239</b>	<b>37,739</b>

Conversations with these fishers reveal a keen interest in finding alternatives to hake fishing so long as proposals present a better economic value proposition. As previously discussed, for most fishers in Region VII, hake fishing is not their historical vocation, but rather an activity of last resort forced on them by the destructive impacts of the 2010 tsunami. As SERNAPESCA continues to expand and assert its authority to levy fines, seize vessels and trucks, and even revoke quotas—all

recent developments in Chile—illegal fishing will present an increasingly significant risk.

Fortunately, Merluza estimates that illegal fishers in this region earn between US \$5,000 and \$7,500 per year from the sale of illegal hake, whereas legal harvest of jumbo squid—facilitated by the provision of the right gear and a reliable commercialization path—could yield over \$14,000 per year, with fewer days at sea and lower risk of prosecution.

## MANAGEMENT AND IMPLEMENTATION

Merluza would create a dedicated subsidiary, referred to hereafter as the Fisheries Management Company (FMC), staffed by a team of experienced fisheries

personnel to ensure sound design, implementation, and operational management of the fishery management improvements (see Figure 13).

FIGURE 13: Fisheries Management Company Staff

POSITION	ANNUAL SALARY (USD)	NUMBER
General Manager	\$144,000	1
VP Operations	\$72,000	1
Executive Associate	\$21,600	1
Administrative Assistant	\$18,000	2

Merluza proposes that the team be lean and that the implementation of the fishery management improvements be primarily contracted to technical service providers. The FMC would manage these service providers and be responsible for reporting progress to investors and the broader stakeholder network of the project. Moreover, FMC would have control over the budget and financing of the fishery management improvements, would work closely with HakeCo, and would seek wherever possible to use the services of community members to espouse a greater sense of partnership.

Importantly, because the fishery management improvements would incorporate implementation of critical aspects of the Fishing Law, SERNAPESCA's limited resources could be focused more effectively on the necessary and currently inadequate enforcement activities.

The Merluza Strategy proposes to further partner with best-in-class technical, academic, and policy advocacy partners to design and implement the fishery management improvements, including these:

- Leading NGOs and academic institutions capable of defining the critical elements of the fishery management plans and leading elements of Merluza's engagement with government authorities
- Existing fishery management improvement implementing organizations whose efforts could be incorporated into or expanded on by Merluza

- Shellcatch LLC, a privately held company that specializes in affordable technology solutions for boat-to-plate traceability and has strong relationships with hake caleta leadership and communities; Shellcatch could serve as a community liaison and implement certain aspects of the fishery management improvements
- MarActivo, a Chilean fisheries science and policy consulting firm that has worked for years to improve the management and commercialization of artisanal fisheries, could serve as the primary implementation partner for a broad range of fishery management improvements
- Blueyou Consulting, a consulting firm with global expertise in artisanal fishery management improvements design, could assume responsibility for formalizing and crafting the budgets for fishery management improvements and aligning improvement efforts with international certification standards

Finally, The Merluza Strategy would use third-party verification and auditing of the fishery management improvements, as well as ensure their implementation in each fishing site. This would be intended to create additional discipline and accountability across the fishery. The auditors would be asked to conduct formal annual reviews of fishing practices and management systems, and to perform "surprise" audits in a handful of communities each year.

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## SUSTAINABLE FISHING REWARDS PROGRAM

Fishers willing to commit to fisheries management improvements and serve as suppliers to Merluza's sourcing strategy would be eligible to participate in Merluza's Sustainable Fishing Rewards Program

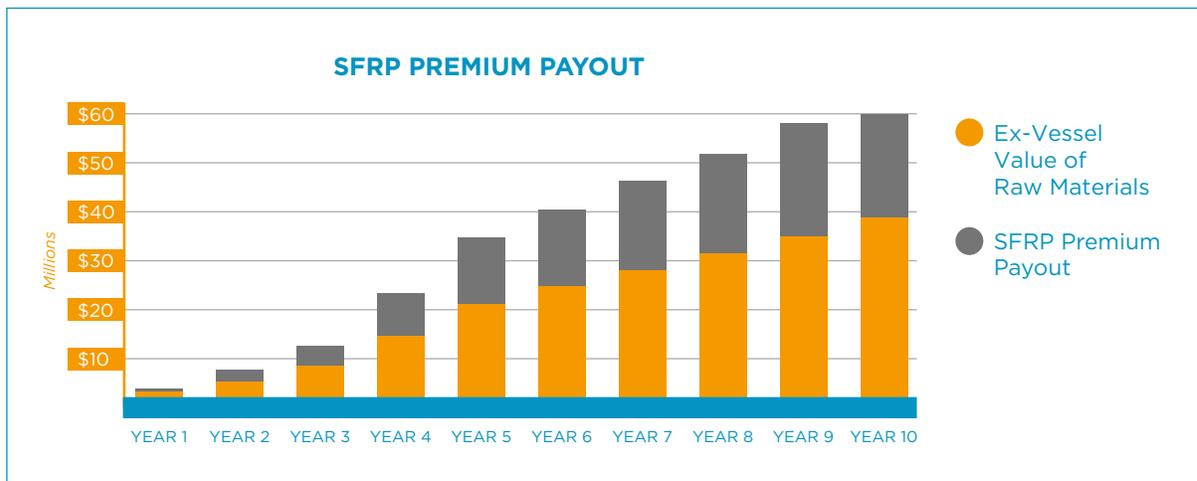
(SFRP). Merluza proposes to utilize the SFRP as an incentive to catalyze and sustain the implementation of sustainable fishing practices that support the hake recovery.

### Raw Material Premium

HakeCo expects to be able to pay 50% more than prevailing beachside prices for raw materials from the participant caletas that meet its sourcing criteria. HakeCo would only source seafood from current members of the participant caletas, and on the basis of individual and caleta compliance with the current sustainability requirements as determined by

local monitoring and annual third-party verification. Prices for specific volumes of landings would be paid directly to fishers so long as their membership in the caletas remains secure. Overall, the increased prices paid out for raw materials would generate an estimated \$103 million in additional income over 10 years, or nearly \$58,000 per fisher in present value terms<sup>73</sup>, as shown in Figure 14.

FIGURE 14: Profit Share Program Expansion (FMF and Premium)



### Fishery Management Fund

In addition, Merluza would distribute 50% of the proceeds from the sale of its quota holdings, up to a maximum of \$25 million, to endow a Fishery Management Fund (FMF).<sup>74</sup> The FMF would be structured to support the operating costs of The Fishery Management Company (FMC) in perpetuity by using the proceeds of the quota sale to establish an endowment. The proceeds would be invested in a low-risk investment portfolio, and annual interest earned could be used to fund ongoing fisheries management activities across the hake fishery. Assuming that the base case allocated a quota value of \$25 million, the FMF could generate between \$750,000 and \$1.25 million annually to continue to support the fishery management efforts. This mechanism would ensure the continued implementation and oversight of fishery management improvements in the caletas following the exit of Merluza and its subsidiaries from the fishery. The FMF mechanism would further provide a long-term,

transparent source of funding administered by a multi-institutional decision-making body that could decide how best to allocate the fund's revenue under competing demands.

The Fishery Management Fund would have the following governance and membership requirements:

- The FMF must be established as a trust fund, wholly owned and governed by The Fishery Management Company.
- FMF's governance must include six rotating board members from among the 12 fishing caletas, each with one vote, plus one voting member from SERNAPESCA and two from the FMC management team.
- Any FMC board member has the right to veto any proposed investment or modification to the FMF charter.

<sup>73</sup> Both figures given in present value terms.

<sup>74</sup> The concept and structure of the FMF is borrowed in part from the structures used by The Nature Conservancy's Water Funds, used in Ecuador and Colombia.

- Beyond paying the salaries of FMF's staff, the board can determine to what use to put the funds each year, subject to the constraint that they be directed toward fishery improvement activities in the caletas. Such uses could include investments in upgrades to Merluza-installed equipment, improved monitoring technologies, hake fishery research projects, and/or costs associated with sustainability certifications such as the Marine Stewardship Council or Fair Trade.

### Additional Compliance Measures

In addition to the price incentives offered by The Sustainable Fishing Rewards Program, Merluza also proposes that HakeCo secure legal contracts with the leadership of each of the 12 caletas, stipulating that in exchange for access to all loaned infrastructure (vessel equipment, ice machines, etc.) and quotas, the caleta must comply with the fishery

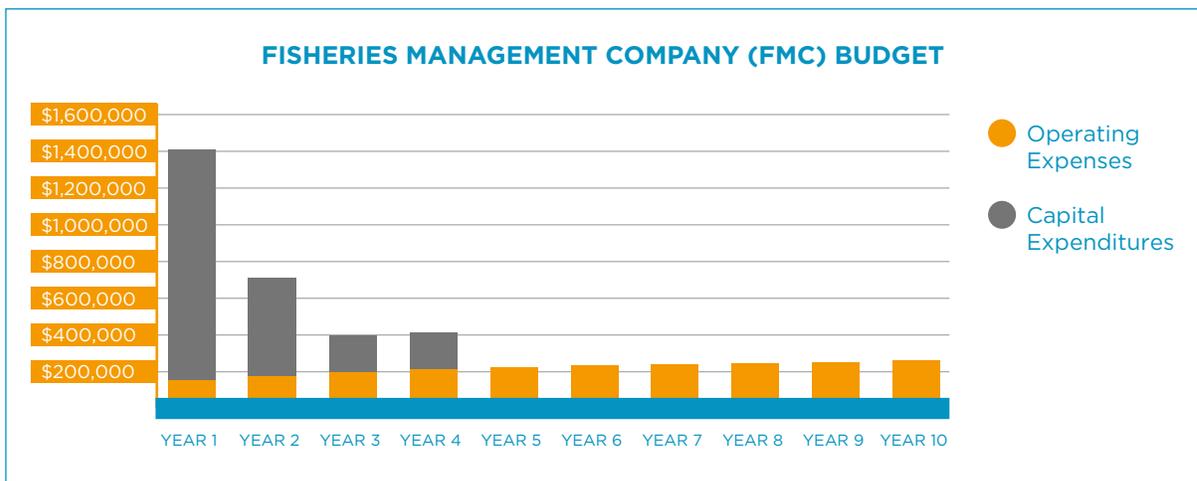
management improvements. Any caleta found in breach of the agreement could lose access to these valuable assets as well as the 50% premium paid for raw materials by the company. All valuable infrastructure in the communities would be installed in such a way that it could be quickly removed in the case of sanctions or other disruptions in the caleta. This structure is legally enforceable and would create a self-policing mechanism in which the caleta leadership could use any of a wide variety of punitive measures, including revocation of quota allocations, vessel licenses, or membership to the federation to deter individual violators. This structure highlights the important interplay between FMC and HakeCo, wherein economic incentives and infrastructure would be used to enforce sustainability activities where sanctions on individual fishers by HakeCo by itself would be legally or politically infeasible.

### FISHERY MANAGEMENT IMPROVEMENT BUDGET

All activities associated with the implementation of the fishery management improvements would be the responsibility of FMC. Certain management improvements would require one-time, upfront capital expenditures, such as for the purchase of vessel monitoring equipment, new gear, and

other equipment or infrastructure. However, most of the management activities would require ongoing oversight of and execution by third parties providing these services. The annual FMC budget is shown in Figure 15.

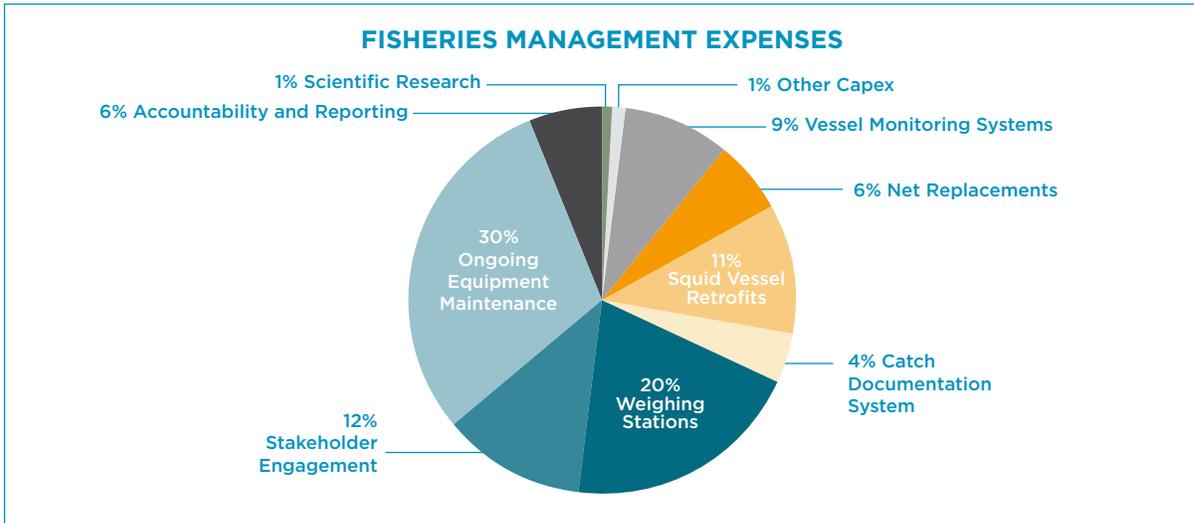
FIGURE 15: Annual FMC Budget



The fishery management improvements budget over the 10-year horizon of the investment is estimated to be \$4.5 million. These expenses break

out, according to the aforementioned fishery management plan categories, as shown in Figure 16.

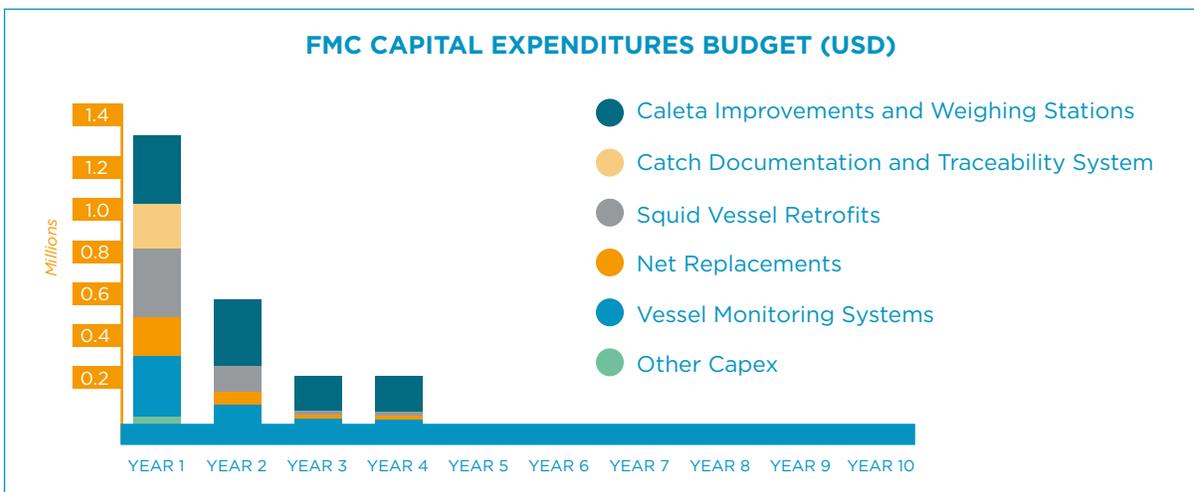
FIGURE 16: FMC Expense Categories



Fishery management expenses are expected to fall dramatically in year 3 of the strategy, given the rollout into eight of the 12 caletas, specifically the largest ones, in the first two years. Total costs in these early years would be driven primarily by high upfront capital expenditures associated with design, purchase, and installation of new equipment

in the caletas, including vessel monitoring systems, catch documentation infrastructure and materials, and new gears for vessel retrofits. By year 4, no additional capital expenditures would be needed, because the management improvements would have been rolled out to all 12 caletas (see Figure 17).

FIGURE 17: Evolution of FMC Capital Expenditures over 10 Years

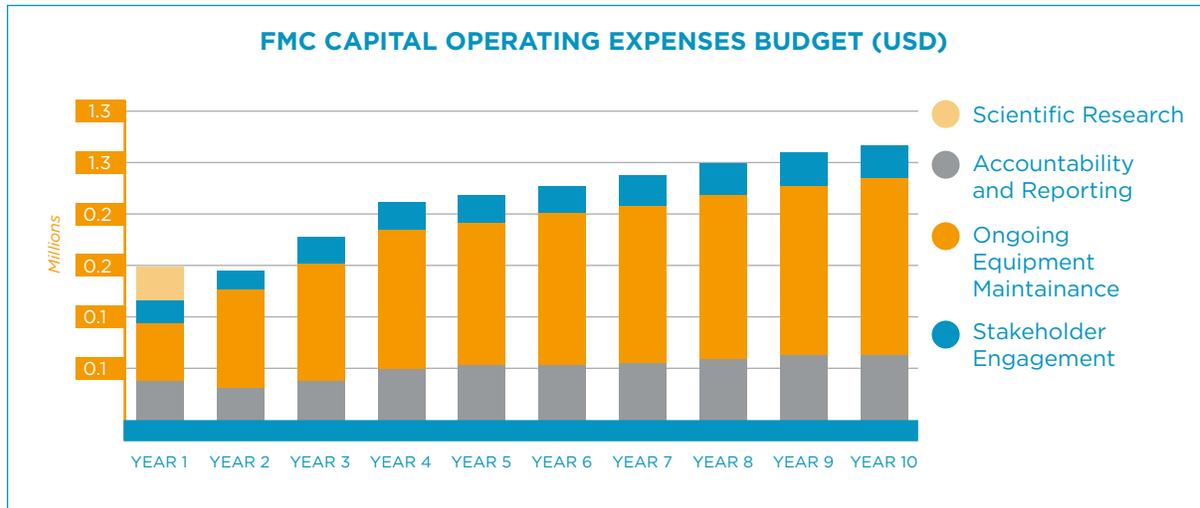




Ongoing FMC operating expenses continue to increase gradually over time, primarily driven by stakeholder engagement activities, maintenance of fishery management equipment installed in

the caletas, ongoing oversight of VMS and CDS systems, and accountability and reporting measures such as external audits. See Figure 18 below.

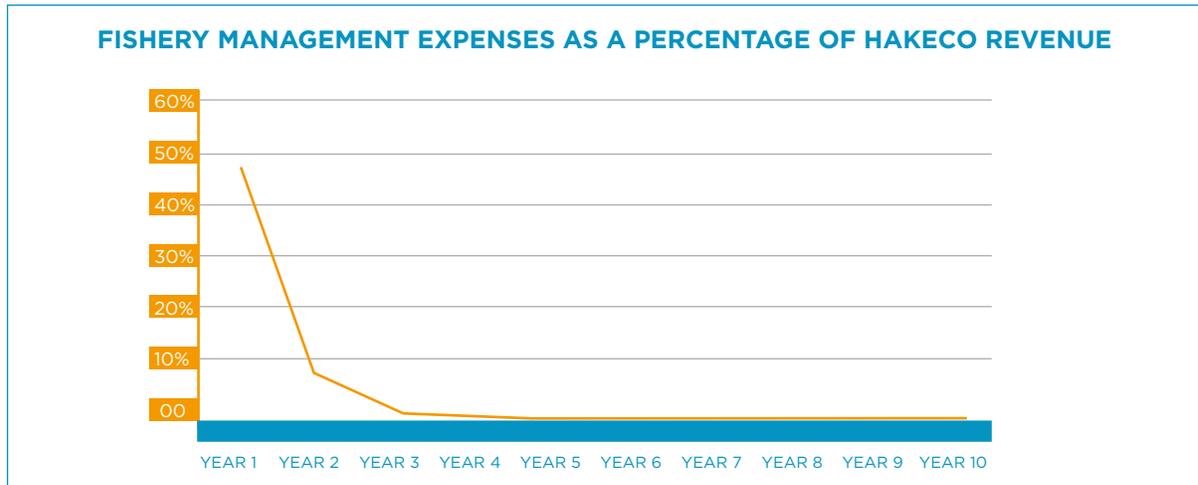
FIGURE 18: FMC Operating Costs over 10 Years



Over time, as shown in Figure 19 FMC's costs would diminish dramatically as a share of the projected hake revenue generated by HakeCo, illustrating the

power of early, comprehensive investment in fishery improvements leading to biomass increases and higher profits.

FIGURE 19: Fishery Management Expenses as a Share of HakeCo Revenues



### STEP 2: ACQUISITION OF FISHING QUOTA

In addition, The Merluza Strategy proposes to acquire 60% of the industrial hake quota (equivalent to 8,200 mt of hake in 2015) from two industrial fishing companies that have expressed an interest in exiting the fishery until the stock recovers. FMC would manage a quota leasing program, first leasing the quota to HakeCo at the prevailing market rate. FMC would then use the leasing fees to pay for a portion of the fishery improvement activities, while HakeCo would subsequently lease this quota, at little or no cost initially, to participant caletas.

FMC would only plan to lease up to 80% of the quota in any given year. The remaining 20% would be left unfished, to reduce fishing effort and to help recover the stock more quickly—the greatest share of a transferable quota allocation that can remain unfished by a quota-owning entity over a three-year period without facing potential seizure and reallocation by the government.

Upon leasing the quota, HakeCo would distribute it to the participant caletas based on (1) harvest efficiency, (2) perceived willingness of caletas to comply with Merluza fishery improvements, and (3) ease of enforcement. For example, caletas Puertecito and Portales are known among NGOs and other practitioners for being more particularly progressive in terms of their willingness to adopt fishery management improvements while also having the vessel capacity to assume additional quota.

Beyond supporting the impact strategy, the quota holding enables investors in Merluza to have a secure financial stake in the future value of the fishery, with the potential to generate an outsized return should the fishery recover. Even if holding quota prices remain constant, an achievement of 75% of  $B_{MSY}$  in the fishery could increase the aggregate quota value by four times<sup>75</sup>, driving the returns of the project.

The Merluza Strategy proposes to acquire 60% of the industrial hake quota (equivalent to 8,200 mt of hake in 2015) from two industrial fishing companies that have expressed an interest in exiting the fishery until the stock recovers.

<sup>75</sup> Assuming a present value of the total estimated quota value in the tenth year, discounted by the Chilean rate of inflation.

## TARGETED IMPACTS

The Merluza Strategy targets a range of social and environmental impact returns, as follows:

ENVIRONMENTAL IMPACTS	
<b>Biomass Restoration</b>	<ul style="list-style-type: none"> <li>Recover the hake stock to at least 75% of biomass at MSY by the end of 10 years.<sup>76</sup></li> <li>Endow Fishery Conservation Fund with up to \$25 million from the proceeds generated through the sale of the hake quota in year 10</li> </ul>
<b>Bycatch Reduction</b>	<ul style="list-style-type: none"> <li>Avoid the bycatch of at least 1,500 mt of nontargeted species over the first 10 years of the project.<sup>77</sup></li> </ul>
<b>Habitat Protection</b>	N/A
<b>Time Horizon</b>	10 years
SOCIAL IMPACTS	
	<ul style="list-style-type: none"> <li>Increase incomes for almost 1,800 artisanal fishers across 12 communities through raw material premium payouts of over US \$58,000 per fisher over 10 years, or \$104 million in total in the base-case scenario.<sup>78</sup></li> <li>Empower fishers and fishing communities through the installation of market infrastructure that increases their bargaining power with buyers of landed seafood products</li> </ul>
<b>Increase in Meals Produced</b>	<ul style="list-style-type: none"> <li>Generate an additional 62,000 mt in landings annually by year 10 as the hake stock recovers, producing an estimated 136 million additional hake meals annually thereafter.</li> <li>Generate an additional 15,200 mt in landings annually through new access to jumbo squid production, delivering an estimated 25 million additional meals annually thereafter</li> </ul>
<b>Time Horizon</b>	10 years

Merluza was able to take advantage of existing stock assessment models for the common hake fishery to estimate the range of potential stock biomass levels and timelines associated with a restoration of the fishery. In particular, Merluza consulted models provided by the University of California Santa Barbara (UCSB) and the Instituto de Fomento Pesquero (IFOP) to inform its fishery management improvement proposals.

By comparing the projection scenarios from each modeling group and flexing the model assumptions to reflect the timing and scope of Merluza's proposed interventions, it was possible to infer relative probabilities of various recovery scenarios over the term of the project. Based on

these efforts, Merluza established base-case, upside, and downside recovery scenarios, with a recovery to 75% of  $B_{MSY}$  appearing to be the most reasonable impact target given the scale of the proposed interventions and the uncertainty surrounding the biological, economic, and policy context over a 10-year period.

The existing stock assessment models in use for the fishery do not allow for a refined analysis of the impact of all of the specific interventions contemplated in the fisheries management improvements. Investors and project developers interested in supporting Merluza could consider building tailored models that may provide more refined recovery estimates.

<sup>76</sup> According to IFOP and UCSB, a total biomass under MSY management equates to roughly 630,000 mt of total biomass in the water.

<sup>77</sup> This assumes that 20% of the industrial quota will go unfished over the course of the 10 years, and that the industrial sector is subject to at least 5% bycatch rates. There will likely be additional bycatch avoided by transferring quota to the artisanal sector, particularly through the adoptions of handlines; however, the extent of this reduction is uncertain so it has not been included in the impact return estimate.

<sup>78</sup> Returns based on total premium payout over 10 years of project discounted to present value terms, using the Chilean rate of inflation as the discount rate.



## THE MERLUZA COMMERCIAL INVESTMENT THESIS

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### STEP 3: LAUNCH AND OPERATE HAKECO

To further capture the value of the investments in fishery management improvements, The Merluza Strategy proposes to launch a vertically integrated seafood company that harvests, processes, and distributes hake and jumbo squid products to domestic and international buyers.

#### VALUE PROPOSITION

Merluza's commercial value proposition is premised on two key drivers: (1) that implementation of *comprehensive* fishery management improvements can restore the stock biomass, allowing for total landings to increase by up to 270% by year 10; and (2) that ownership of a processing and distribution business that increases in profitability as a result of expanded throughput, unlocks supply chain efficiencies through vertical integration, and adds value to products through better handling, processing, and sale into higher value markets, can reinforce sustainability objectives, while producing attractive financial returns.

#### SUMMARY OF BUSINESS STRATEGY AND CONCEPT

While the FMC management team would oversee the fishery management activities, HakeCo would seek to commercialize sustainably harvested hake and squid raw materials from the 12 caletas. This business would serve as the first vertically integrated commercialization channel for artisanal hake and squid in Chile, seeking to reconfigure the prevailing supply chain for these products. To some extent, this strategy mirrors that of the large, and once highly profitable, industrial seafood companies, although HakeCo would not own vessels or other depreciating assets such as trucks and processing plants. This “asset light” strategy would improve the Company's flexibility in adapting to changing stock conditions and would match capacity more closely to resource availability.

Merluza proposes that HakeCo oversee landing and handling improvements in each of the caletas, including the installation of buying stations staffed by HakeCo personnel. The buying stations would ensure that landings are properly weighed, documented, and certified as legal by SERNAPESCA—thus providing valuable data to inform fishery management efforts and clearly differentiating legal from illegal hake at the point of origin. Merluza's investments into the artisanal supply chain would enable it to incorporate much greater supply volumes from existing hake quota allocations and from increased squid landings, growing its throughput and profitability. These investments in combination would improve the volume, quality, legality, and reliability of the hake and squid catch.

## RAW MATERIAL SOURCING STRATEGY AND HARVEST PLANNING

### Sourcing Network

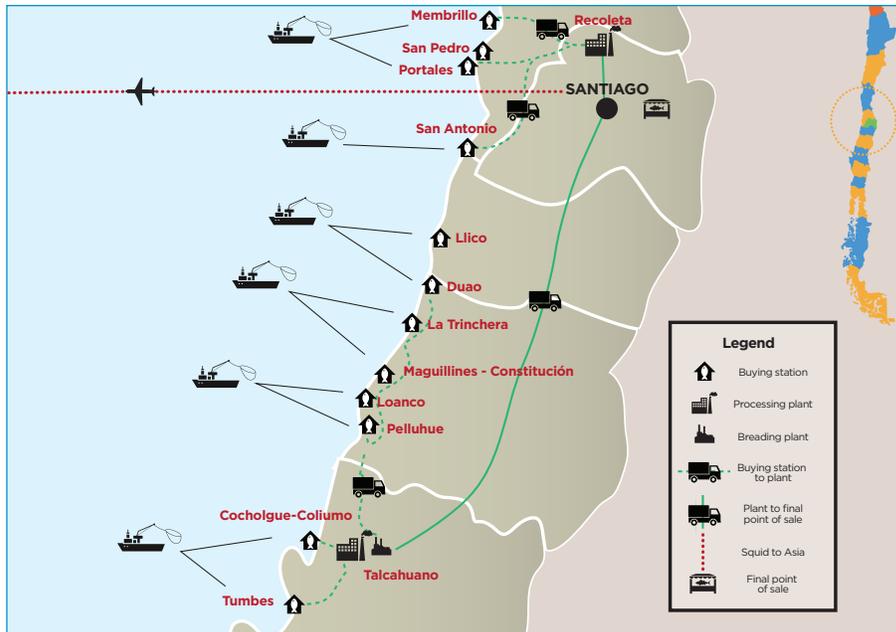
One potential supply chain map is outlined in Figure 20, with all hake and squid from Region V transported to a Santiago facility for cold storage and processing, while a significantly larger volume of squid and hake raw materials from Regions VII and VIII would be processed at facilities further south. All hake finished goods would be sold on the domestic market, while squid would be sold both domestically and to Asian and regional export markets.

Given the sustainability challenges and rampant illegality in the hake harvest, HakeCo would focus on ensuring that only legal hake is landed in participant caletas. In order to do this, vessel activity must be closely managed and monitored. Before each vessel outing, a buying station employee (or SERNAPESCA official whenever possible), working in tandem with the FMC's sustainability compliance systems, would record the vessel number, occupants, and departing time. FMC's program would have installed VMS on board all vessels, passively recording harvest locations, duration of fishing activities, and confirmation of gear type. On the boat, the fishers would use a biodegradable monofilament net with

a mesh size of 7cm, provided by FMC. Additional fishing practices used to minimize bycatch and habitat impacts would be implemented through FMC's technical assistance programs and monitored by FMC and its auditors.

The Merluza Strategy would have access to 71% of the artisanal hake landings across Chile and 42% of the 200,000 ton jumbo squid landings incorporated into the Merluza sustainability program, but would conservatively target the processing of 40% of the landings for hake and 17% of the squid. HakeCo would begin sourcing raw materials from eight caletas in the first two years and 12 caletas by year 4, spanning Regions V, VII and VIII. The current quota allocations and landings of these caletas would be supplemented with industrial hake quota acquired by FMC, leased to HakeCo, and delivered to the caletas to allow for increased landings from quota recipients. In addition, jumbo squid would provide landings from an abundant and currently underexploited resource. The TAC for jumbo squid of 200,000 mt is split 80% artisanal, 20% industrial, with nearly 50% remaining unharvested in 2014 due to a lack of infrastructure for harvest and commercialization by the artisanal

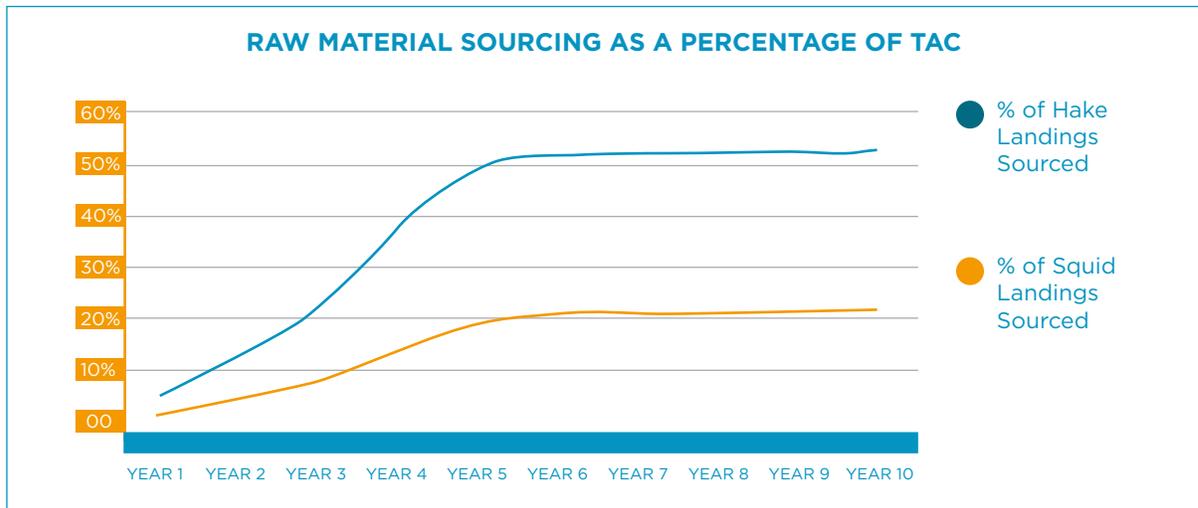
FIGURE 20: Supply Chain Visualization



sector. This TAC is set by scientific committee based on a stock assessment, and a management committee is presently being formed to lay out a management plan for the species. Conversations with fishers and authorities alike confirm that the

species is extremely abundant, but only a few caletas have access to the equipment and processing capacity to exploit the large cephalopod. Figure 21 shows the raw material sourcing plan for both hake and squid as a percentage of their projected TACs over time.

FIGURE 21: Hake and Squid Raw Material Sourcing Relative to TAC



### Management of Seasonal Supply Volatility

The hake fishing season is open for 11 months per year with a one-month closed season while the fish are spawning, and would likely be shortened to 9-10 months per year with Merluza's proposed extension of the seasonal closure period. Beyond this, landings remain relatively consistent throughout the year. The jumbo squid species can be fished year-round, and is believed to be abundant along the entire Chilean coastline as far south as Region VIII, making it an ideal candidate for harvest while hake remain scarce. Moreover, HakeCo will have access to large cold storage facilities in both Regions V and VIII, where inventory of hake can be stored to allow for sales year-round.

### Caleta Supply Agreements

Merluza seeks to establish long-term supply agreements with hake fishers to commit to offtake of a baseline share of hake and squid landings over time. Leveraging the tools offered by the Sustainable Fishing Rewards Program, Merluza would link the premium price paid to fishers with compliance with the fisheries management improvements, including

certain requirements regarding size, type of gear used, and other sustainability covenants that would form the basis of a sustainable sourcing policy for HakeCo. While a baseline market price would be paid immediately upon product delivery, premiums would be paid one month in arrears to ensure adequate time for verification of fisher compliance with the sustainability covenants. If fishers were found to be in breach of the supply agreement terms, they would lose access to the premium and could face fines, loss of access to infrastructure leased to them by the Company, and other penalties. The caleta leadership could also, if it deemed appropriate, ban the marketing of products outside the HakeCo channel, impose fines, and even revoke individual quota allocations and membership to the fishing association. HakeCo would ideally seek to establish a tribunal of fishers, fishing association leadership, and company representatives responsible for hearing cases and determining penalties. The supply agreement terms and covenants could be thought of as a supplement to the rules imposed within the context of the jurisdiction of the fishing authority.

## OPERATIONS

### Landing and Temporary Storage

Fish landed would be stored in onboard cooling tanks to maintain quality and hygiene standards. Any fishers provided with gear or participating in the quota leasing program would be required to land in one of the participant caleta port facilities, which SERNAPESCA would designate as official landing sites for that region for all vessels. Upon docking, the fish would be unloaded, weighed at the dockside, cleaned, transferred to ice boxes, and stored. The cooling containers on the vessels would be cleaned and put back on the vessel. By the time it reaches the cold storage chamber, each box of hake would have been inspected and registered by SERNAPESCA, graded by the buying station staff, and registered as inventory in HakeCo's database. To clearly differentiate HakeCo's legally harvested product, each box would be labeled with the species, weight, and date of capture. Cold storage containers would be provided by HakeCo and loaned to the caletas, along with other infrastructure.

### Distribution from Caleta to Processing Center

Merluza proposes that raw material transport be outsourced, with refrigerated trucks picking up the fish every one or two days, depending on the production flows. These trucks would be sealed upon loading and opened by one of HakeCo's employees only after reaching the processing facility. Radio-frequency identification tags in the boxes would give HakeCo information regarding the location of the shipments at all times. Upon reaching the facility, all products would be registered to ensure that the boxes match the departing inventory records.

### Processing

Merluza intends for HakeCo to enter into a long-term contract processing agreements with one of the major facilities in Region VIII and a smaller processing facility in Region V. Both these plants can handle fresh and frozen products, but only the major facility is able to process breaded products. In terms of capacity, the Region VIII plant should be sufficient to process all the raw materials from Regions VIII and VII, while the Santiago plant processes raw materials from Region V. The finished goods from both plants would be packaged and released for distribution. Both contemplated processing facilities are already equipped with cold storage facilities that provide a timing buffer in the supply chain. Inventory management would provide a valuable service to clients that require constant supply.

### Distribution to Market

HakeCo would plan to manage direct sales efforts while contracting the delivery process. The Company would create a rich network of client relationships in three promising domestic sales channels: fresh markets, food service, and retail. The HakeCo value proposition would be unique for Chile, as it would be the sole company able to source strictly legal and fully traceable seafood from artisans.

The following is a summary of the processing operations:

#### CONTRACT PROCESSING PLANT - REGION VIII

Capacity (Mt/Year)	300,000
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#### CONTRACT PROCESSING BREADED - REGION VIII

Capacity (Mt/Year)	3,000
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#### SANTIAGO PROCESSING PLANT - REGION V

Capacity (Mt/Year)	30,000
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## SQUID

Squid harvest, landing, and processing would follow the same general process as the hake, with the following modifications:

- Harvest: Rather than gillnets, squid vessels would use winches with longline gear provided by FMC to handle the heavy species.
- Processing: All the squid would be processed in the Region VIII plant, since the largest harvest volumes would come from Regions VII and VIII. As Portales becomes a meaningful supplier of squid, HakeCo could seek to establish a joint venture with caleta Puertecito, which is already equipped with facilities capable of processing

up to 25,000 mt of squid. In this event, HakeCo would need to make investments in an individual quick-freezing tunnel, conservation chamber, and some additional plant modifications to double processing capacity, as the caleta is already near full capacity.<sup>79</sup>

CALETA SAN ANTONIO INVESTMENTS	COST
Freezing Tunnel	\$750,000
Conservation Chamber	\$200,000
Plant Modifications	\$550,000

## Market Context

Chileans consume only 12.9 kg of seafood on an annual per capita basis, versus global average consumption of over 17 kg per capita.<sup>80</sup> This represents only one-sixth of Chilean meat consumption; however, fish and seafood per capita sales in Chile rose by 3.9% in 2013, a higher rate than the 3.7% observed in overall food sales in the country.<sup>81</sup> Many attribute the low seafood consumption in Chile to the historically poor quality of wild-caught seafood products as a result of underinvestment in modernizing the sector. Of all the fish and seafood landed in Chile for human consumption, 57% is currently converted into frozen products, 33% is sold fresh and chilled, and 10% is processed into cured and preserved products. Sales in frozen fish and seafood increased dramatically by 22% annually over the last

five years, rising from US \$5.2 million in 2008 to US \$19.8 million in 2013. Sales in fresh seafood amounted to US \$650 million in 2013.<sup>82</sup>

For decades, hake has been the most popular and widely consumed fish in Chile, with fried merluza as common as hot dogs or burgers in traditional markets and middle-income restaurants. Moreover, “bocaditos de merluza,” or breaded hake, has been in the supermarkets for decades, competing with other value-added products such as frozen hamburgers and chicken nuggets. HakeCo expects to be price competitive with other suppliers of hake products to the market, and its supply of certifiably legal and traceable fish would likely help securing increasing market share.

For decades, hake has been the most popular and widely consumed fish in Chile, with fried merluza as common as hot dogs or burgers in traditional markets and middle-income restaurants.

<sup>79</sup> These investments have been modeled into the Merluza base case.

<sup>80</sup> Food and Agriculture Organization of the United Nations, “The State of World Fisheries and Aquaculture,” Rome, 2014.

<sup>81</sup> Euromonitor International, “Downsizing Globally: The Impact of Changing Household Structure on Global Consumer Markets,” April Strategy Briefing, 2013.

<sup>82</sup> Euromonitor International, “Frozen Processed Food in Chile,” March Country Report, 2015.



## Sales Channels

HakeCo would target three primary market segments for both hake and squid.

SPECIES	TARGET CUSTOMER SEGMENTS		
	INTERNATIONAL EXPORT	REGIONAL EXPORT	DOMESTIC MARKETS
Common Hake	N/A	Food Service	Fresh Market Food Service
Jumbo Squid	Wholesale	N/A	Retail Food Service

\*Market segments highlighted in orange are the primary market targets.

## Target Customer Segments

### Hake

HakeCo would initially pursue three primary market segments for its common hake product: the fresh market (known as “ferias”), the food service market, and retail/supermarkets—with 100% of the product destined for the domestic market initially. Until the stock recovers and an MSC certification is attainable, export markets look less attractive, given the lack of price competitiveness of Chilean hake versus other international whitefish alternatives.

In 2014, hake sales were split roughly as follows between the four market segments:

CHANNEL	VOLUME
Retail (Supermarkets)	11,000* mt
Food Service	10,000* mt
Fresh Market	30,000-50,000* mt
Export	5,500 mt
<b>TOTAL</b>	<b>56,500 - 76,500 mt</b>

\*These constitute the best estimates, owing to high levels of unreported landings.

The food service market is a well-developed channel delivering meals to shift workers, with \$2.4 billion in annual sales.<sup>83</sup> Frozen fillets of common hake were a staple of the food service industry prior to the stock’s collapse, and constitute an affordable protein source for workers. The largest, and arguably most attractive, opportunity for HakeCo in this market is the subset of companies servicing the National School Lunch Program. This program provides 540 million rations per year, with five companies—Hendaya, Distal, Alicopsa, Osiris, and Coan—accounting for 40% of the program. Apart from the National School Lunch Program, there are compelling opportunities to sell frozen fillets to companies servicing the extractive industries, particularly mining, manufacturing, forestry, pulp and paper, and fishing—all of which provide daily meals to their workers. This market segment is serviced by over 50 companies, with three dominant players—Aramark, Sodexo, and Compass Group Chile—each providing between 60,000 and 300,000 meals per day. Food service companies have concerns about a lack of quality and assured supply of common hake, as well as a strong interest

<sup>83</sup> [http://gain.fas.usda.gov/Recent%20GAIN%20Publications/Food%20Service%20-%20Hotel%20Restaurant%20Institutional\\_Santiago\\_Chile\\_10-28-2013.pdf](http://gain.fas.usda.gov/Recent%20GAIN%20Publications/Food%20Service%20-%20Hotel%20Restaurant%20Institutional_Santiago_Chile_10-28-2013.pdf).

in incorporating frozen hake fillets into their meal programs. In place of hake, these companies have resorted to whitefish import substitutes, which are more expensive and less popular. Promisingly, many of these companies participate in large government contracts, such as the National School Lunch Program, such that a government mandate to source only legal, traceable fish could put HakeCo in a sole-source supply position. Similarly, American and European companies being serviced by these food service companies could exert critical influence on the procurement policies in this market segment.

Another attractive market for common hake is the retail/supermarket segment. Chile has one of the most modern and sophisticated retail industries in the world; however, its seafood sections are far from world-class, given the lack of availability of diverse, high-quality offerings. The three biggest supermarket chains—Walmart Chile, Cencosud (which owns supermarket brands Jumbo and Santa Isabel), and SMU (which owns supermarket chains Unimarc and Bigger and convenience stores OK Market)—constitute a combined 87% of total market share.<sup>84</sup> All these retailers sell hake in the form of fresh and frozen fillets, as well as a variety of breaded forms. These retailers share many of the same concerns over the reliability of seafood products, both from both quality and legality standpoints. Selling illegal and low-quality fish presents a threat to their brand and their food safety standards. For these companies, the current supply chain is rife with business risks and critical bottlenecks, since quality and legality remain outside their control.

The final market segment the Company seeks to penetrate is the fresh market, which is currently the most important final point of sale for hake, by far. There were over 400 ferias operating in Santiago in 2014, with nearly all seafood being sold in these markets purchased from the Terminal Pesquero

Metropolitano. Despite the low quality and sweeping predominance of illegally harvested fish, some of the highest prices for hake in Chile are found in these markets. HakeCo would seek to penetrate the fresh fairs for this reason, and particularly because whole fresh fish offer the highest profit margin, given the lack of required processing.

HakeCo would be well positioned to capitalize on these market segments with unique selling points, including providing a large and reliable source of legal, high-quality, SERNAPESCA-certified product sourced from artisanal fishers. HakeCo would expect to enter the market by hiring a sales team with a robust client network in the retail, food service, and fresh market segments.

### Squid

Squid would be sold primarily on the international wholesale market, where demand has grown from only 100,000 mt to more than 900,000 mt over the last 15 years, driven primarily by rapidly growing demand in China, Russia, Singapore, and Brazil.<sup>85</sup> Frozen squid fillets are priced as a commodity, with little differentiation in price by origin and wholesale prices ranging from \$1.5 to \$2.5 per kg. Data from Spain and the United States shows somewhat higher wholesale prices, between \$2 and \$3 per kg, but generally indicates a lack of value-added offerings. HakeCo would attempt to pioneer these value-added products in small volumes on the domestic market.

Over time, the Company would seek to further differentiate its squid products on the international market through value-added offerings. Moreover, HakeCo's jumbo squid would be harvested by handline—a highly selective gear type—by artisanal fishers, thus opening the door for further differentiation through sustainable and responsible-sourcing certifications.<sup>86</sup>

<sup>84</sup> Feller Rate October 2013 statistics, [www.feller-rate.cl](http://www.feller-rate.cl), 2015.

<sup>85</sup> Food and Agriculture Organization of the United Nations, [Glofish.org](http://Glofish.org) News Archive, 2014.

<sup>86</sup> For the purposes of the model, no premiums have been assumed and prices have been set at the lowest end of the international wholesale range.

## MANAGEMENT AND ROLES

The Merluza Strategy would recruit a HakeCo management team drawn from the industrial fishing sector with deep experience in the commercialization of common hake and squid. HakeCo would need to be staffed to fulfill the following roles, in view of the scale and complexity of operations:

- Chief Executive Officer (CEO), working across the entire value chain with a deep understanding of seafood processing and distribution at scale, as well as the integration of responsible-sourcing practices
- Chief Operating Officer (COO), responsible for overseeing sourcing and logistics, particularly managing the buying stations and all product logistics
- Plant Manager, responsible for managing all contract plant operations as well as ensuring the quality and legal integrity of raw materials and finished goods

Each caleta would also need a full-time local staff member to monitor the buying station and FMC activities. During the initial years of implementation of the fishery management improvements in the

largest, and most challenging caletas, HakeCo would employ multiple buying station employees per caleta. As FMC expanded its efforts to additional caletas, the employees would be shared until the full sourcing portfolio was operational, when HakeCo would expect to employ one full-time employee per caleta.

Other critical positions at the Company include CFO, sales director, accountant, and sales associates, as outlined in Figure 22:

FIGURE 22: HakeCo Staff

POSITION	ANNUAL SALARY (USD)	QUANTITY
CEO	\$144,000	1
COO	\$84,000	1
Plant Manager	\$84,000	1
Sales Director	\$84,000	1
CFO	\$72,000	1
Sales Associates	\$21,600	5
Accountant	\$18,000	1
Buying Station Staff	\$18,000	12

## COMPETITION

No vertically integrated companies in Chile currently exist that source common hake or squid from artisanal fishers at scale. On the industrial side, a few fully vertically integrated companies do target common hake and squid for human consumption, including Blumar, Congelados Pacifico (COPA), Pesquera Grimar, and Seafrost (a Peruvian company), all of which harvest, process, and sell

export their own products primarily. None of these companies have sustainable or responsible sourcing policies, although the three Chilean firms have unsuccessfully explored the potential for Marine Stewardship Council certification on two occasions in the last 10 years. In general, as hake stocks have diminished, these companies have shifted their efforts toward aquaculture and fishmeal production.

No vertically integrated companies in Chile currently exist that source common hake or squid from artisanal fishers at scale.



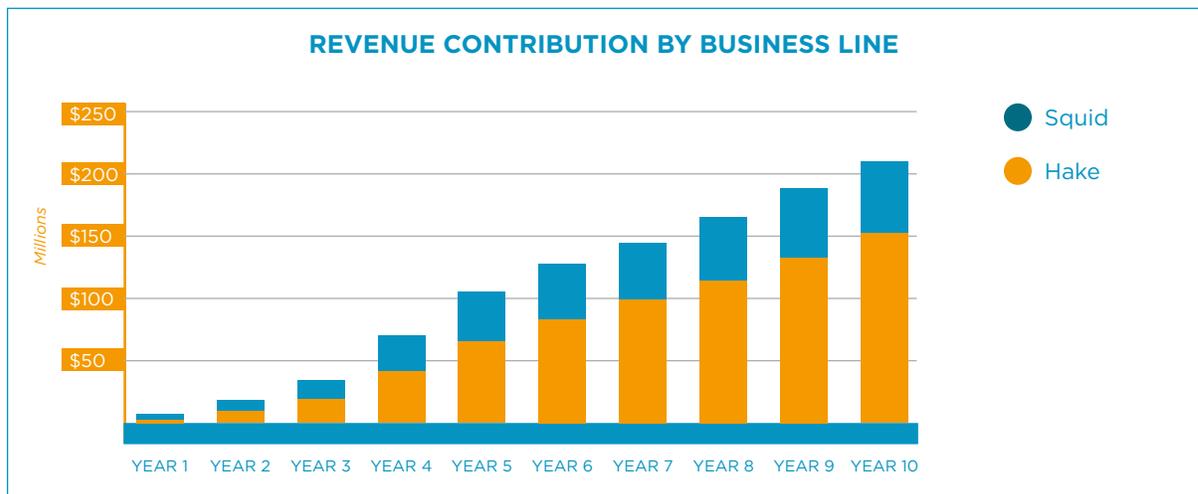
## THE MERLUZA STRATEGY FINANCIAL ASSUMPTIONS & DRIVERS

Merluza' revenue and expenses are generated through its three investment positions, including the Fisheries Management Company, the industrial quota acquisition, and HakeCo operations. While the proposed transaction structure for Merluza involves two distinct entities, the cash flow profile of Merluza is presented on a consolidated basis throughout the remainder of this report.

### REVENUE MODEL AND PRICES

Merluza revenues are driven primarily by increasing hake and squid volumes over time according to the buildup shown in Figure 23. HakeCo would only accept legally harvested hake and squid, such that increased throughput can occur initially by incorporating additional caletas into its sourcing portfolio, and thereafter only through stock recovery leading to increases in the Total Allowable Catch.

FIGURE 23: Revenue Contribution by Different Channels



The relative contribution of hake would depend in large part on the extent to which the stock recovers and how that is reflected in the Total Allowable Catch. If the stock recovers more rapidly, leaving open the option for certification and subsequent exports of hake to North American markets, the revenue contribution of hake relative to squid could increase dramatically.<sup>87</sup>

Merluza' base case assumes starting sales prices set at the current market prices and growing at 5% thereafter, 1% higher than projections for Chilean baseline inflation over the same period. Figure 24 shows prices and product composition used as the starting point for Merluza financial projections:

FIGURE 24: Price Per Product Type

PRODUCT	PRICE (USD)	% OF SALES (BY VALUE)
<b>HAKE</b>		
Fresh Fillets	\$4.44	31%
Frozen Fillets	\$5.16	36%
Breaded Products	\$5.56	33%
<b>SQUID</b>		
Body	\$1.19	56%
Fins	\$0.95	20%
Rings (Tentacles)	\$1.27	24%

The unit economics of the hake and squid business lines under the base-case assumptions are outlined below in Figure 25:

FIGURE 25: Relative Hake and Squid Economics<sup>88</sup>

<b>HAKE ECONOMICS</b>			<b>SQUID ECONOMICS</b>		
	<b>PRE-PROCESSING</b>	<b>POST-PROCESSING</b>		<b>PRE-PROCESSING</b>	<b>POST-PROCESSING</b>
Raw Material Price (CLP/kg)	\$450		Raw Material Price (CLP/kg)	\$135.00	
Purchase Price (USD/kg)	\$0.71	\$1.71	Purchase Price (USD/kg)	\$0.21	\$0.31
Transport of Raw Materials	\$0.10	\$0.20	Transport of Raw Materials	\$0.10	\$0.14
Processing	\$0.90	\$2.10	Processing	\$0.29	\$0.41
Transport of Finished Goods		\$0.14	Transport of Finished Goods		\$0.14
<b>Total Cost per Kg Sold</b>		<b>\$4.22</b>	<b>Total Cost per Kg Sold</b>		<b>\$0.99</b>
<b>Sales Price</b>		<b>\$5.03</b>	<b>Sales Price</b>		<b>\$1.15</b>
Gross Margin		16%	Gross Margin		14%

<sup>87</sup> No certification or price premium is assumed in the model.

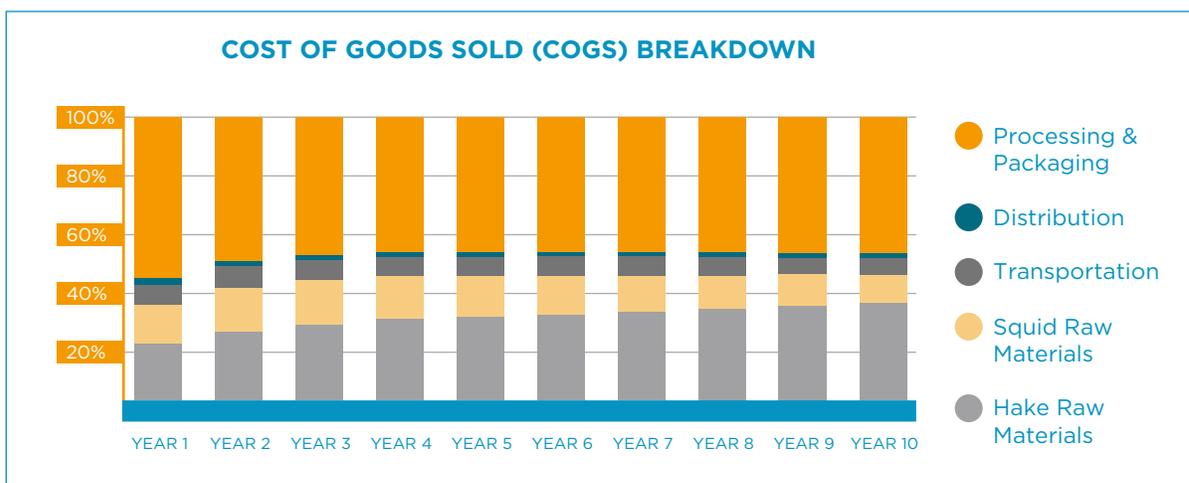
<sup>88</sup> Sales price represents a weighted average of all product types.

## COST STRUCTURE

The largest contribution to Merluza's cost of goods sold (COGS) is contract processing charged to HakeCo. This is a higher proportion of COGS than in many processing and distribution businesses due to the asset light model of the company. In lieu of up-front investments in plants and their ongoing maintenance, this approach provides additional

flexibility although at the cost of paying for the overhead plus a premium to another processing company. As shown in Figure 26, as expected, hake and squid raw materials comprise the next largest categories, with transportation and distribution contributing a small but consistent amount each year.

FIGURE 26: Breakdown of COGS by Expense Category



Merluza's Selling, General and Administrative Expenses (SG&A) costs for the consolidated company are presented in Figure 27. Over time, the retail stocking fee grows as a share of SG&A due to an increase in value-added hake and squid products

destined for retail rather than wholesale or fresh markets. Growing business development costs also reflect an intentional effort to create new product families and market segments.

FIGURE 27: Breakdown of SG&A by Expense Category

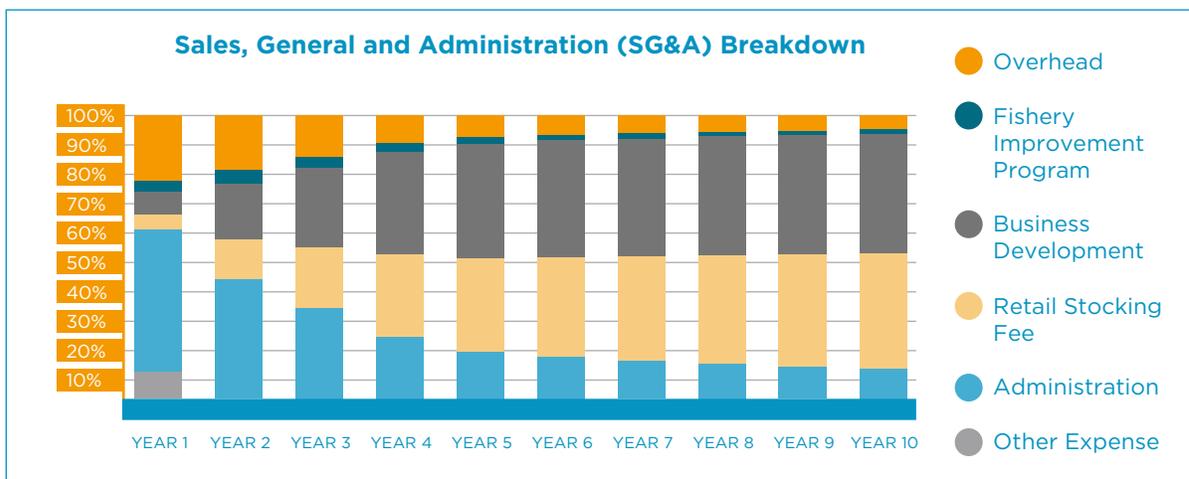
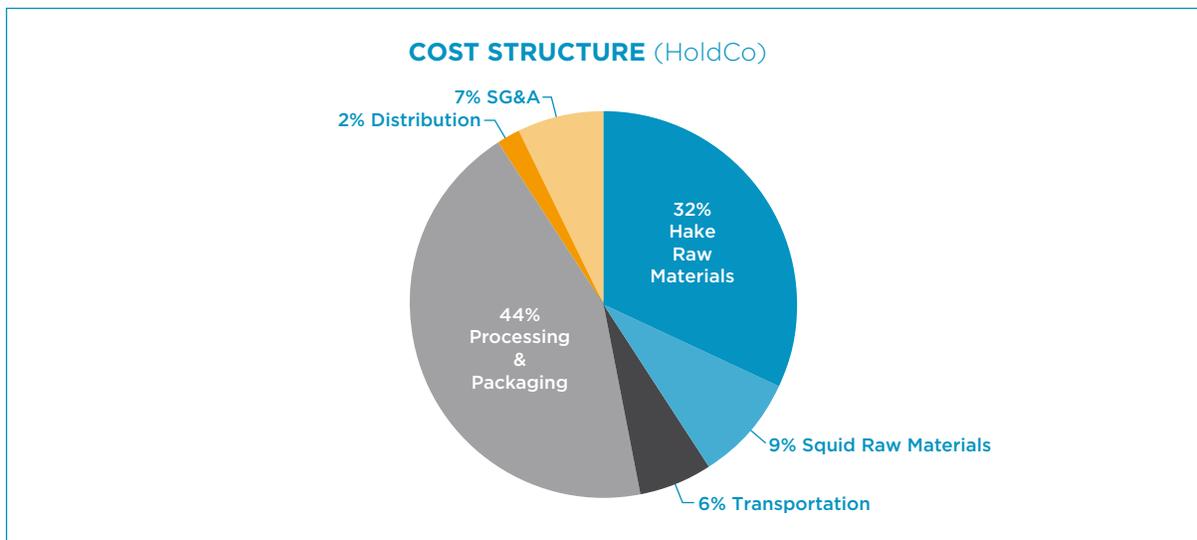




Figure 28 reflects the overall cost structure of HoldCo, the consolidated company. Raw material costs comprise a large share of the business, in line with other food processing and distribution

businesses, although with a higher percentage of Processing and Packaging costs due to the asset-light model as previously discussed.

FIGURE 28: Cost Structure for Consolidated Company<sup>89</sup>



<sup>89</sup> Proportions based on year 10 of Merluza



## THE MERLUZA STRATEGY TRANSACTION STRUCTURE

### SOURCES OF FUNDS

The Merluza Strategy proposes a \$17.5m investment consisting of \$16.8 million in equity and \$723,000 in commercial debt to finance working capital. Figure 29 summarizes the sources of funds contemplated for the transaction.

### PROGRAM RELATED INVESTMENT (PRI)

The base case does not assume any Program Related Investment to demonstrate the maximum financial capacity of the strategy. Although TMC expects to function profitably without any philanthropic subsidy, the use of PRI at attractive interest rates would provide a more efficient capital structure, and could be used to fund the quota acquisition. Such an acquisition is ideally suited for PRI debt as it indirectly funds all the fisheries management improvement-related costs through the leasing fee charged by FMC to HakeCo, thereby providing a steady and segregated cash flow to service the debt.

FIGURE 29: Total Sources of Funds

TOTAL SOURCES	FMC	HAKECO	CONSOLIDATED	CAPITALIZATION
Sponsor Equity	\$11,572,241	\$5,186,667	\$16,758,908	96%
Total Debt	\$ -	\$722,621	\$722,621	4%
Foundation PRI	\$ -	\$ -	\$ -	0%
Foundation Grant	\$ -	\$ -	\$ -	0%
Government Grant	\$ -	\$ -	\$ -	0%
<b>Total Sources</b>	<b>\$11,572,241</b>	<b>\$5,909,288</b>	<b>\$17,481,529</b>	<b>100%</b>

### POTENTIAL CHILEAN GRANT SUPPORT

Although the base case does not assume any grant support for the project, a wide range of such funds is available to fishers through the Fisheries Management Fund and the Fund for Development of Artisanal Fisheries, both under Chile's Ministry of Economy, Development, and Tourism, as well as through regional governments. Artisanal caletas, including Portales and Puertecito, have successfully applied for and received grants as large as \$1 million and have used these funds to finance processing plants, cold storage, vehicles, boat engines, fishing gear, and safety equipment. Many of these funds have full autonomy to issue grants without requiring political approval, and as a result often have short turnaround times of only a few months.

### USES OF FUNDS

The Merluza Strategy proposes uses of funds as indicated in Figure 30.

FIGURE 30: Use of Funds for FIPCo, HakeCo and Consolidated HoldCo

TOTAL USES	FMC	HAKECO	CONSOLIDATED	CAPITALIZATION
Cash	\$133,333	\$266,667	\$400,000	2%
Buying Stations	\$ -	\$2,820,000	\$2,820,000	16%
Processing, Packaging, and Storage Infrastructure	\$ -	\$2,000,000	\$2,000,000	11%
Working Capital	\$ -	\$722,621	\$722,621	4%
FMC Operations	\$133,493	\$ -	\$133,493	1%
FMC Caleta Fixed-assets	\$801,200	\$ -	\$801,200	5%
FMC Vessel Modifications	\$1,027,395	\$ -	\$1,027,395	6%
Quota Acquisition	\$9,376,816	\$ -	\$9,376,819	54%
Transaction Fees	\$100,000	\$100,000	\$200,000	1%
<b>Total Uses</b>	<b>\$11,572,241</b>	<b>\$5,909,288</b>	<b>\$17,481,529</b>	<b>100%</b>

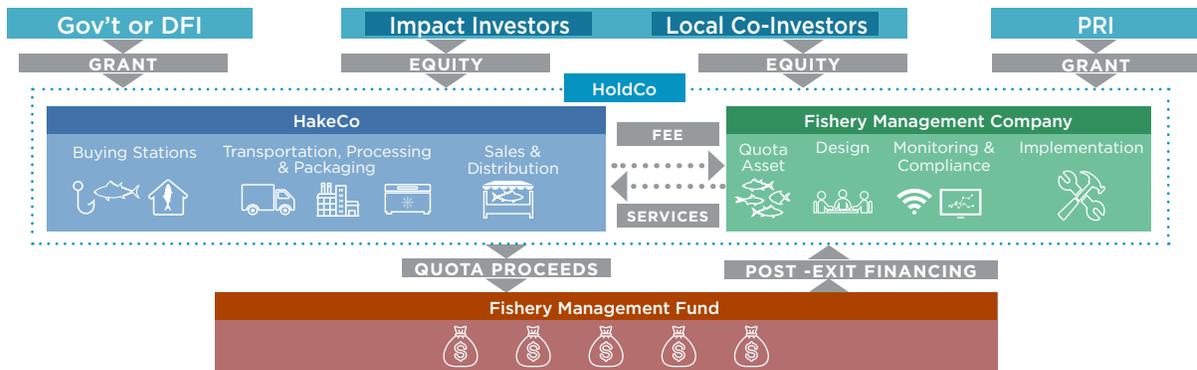
### STRUCTURE AND GOVERNANCE

The most efficient system for foreign-based investors and foundations to invest into The Merluza Strategy would be through a holding company, here called “HoldCo.” HoldCo would be the parent company and 100% owner of FMC, the entity holding the quota assets and responsible for the majority of the fishery management-related investments. The board of both HoldCo and FMC would be controlled by the investor group as the sole equity owner. FMC would also be overseen by an advisory committee composed of leaders from the fishing communities, academic experts, and other key stakeholders in fishery to provide additional local insight and legitimacy to the

proposed fishery management activities and progress toward stock recovery. The advisory board would be a nonvoting board and would serve largely in an advisory capacity. (See Figure 31).

HoldCo would also be the parent company and majority shareholder of HakeCo, the entity holding the commercial assets and responsible for the procurement, processing, and distribution of the hake and squid. Merluza proposes that HakeCo’s board have five total seats, with the primary investor group controlling three and the other two controlled ideally by a local co-investor. Decisions would be taken by simple majority.

FIGURE 31: Capital Structure (Note: PRI Is Optional and Not Included in Base Case)



## SUMMARY OF RETURNS

Figure 32 summarizes the most relevant financial and impact return metrics of The Merluza Strategy.

Appendix A includes a comprehensive view of the Financial Projections of the consolidated company.

FIGURE 32: Summary of Returns and Impact Metrics

SUMMARY OF BASE CASE FINANCIAL RETURNS		SUMMARY OF BASE CASE IMPACT RETURNS	
Total Equity Investment	\$16,758,908	Total Biomass Increase (t)	301,770
Time Horizon (years)	10	Total Avoided Bycatch (t)	1,502
Total Leverage Level	4.1%	Total Habitat Protected (acres)	N/A
Equity IRR	16.4%	Total Fisher Income Increase	50%
		Aggregated Income Increase (PV\$ - 10yr)	\$103,703,161
		Aggregated Income Increase Per Participant Fisher (PV\$ - 10yr)	\$57,677
		Total Fishers Incorporated	1,798
		Total Caletas Incorporated	12
		Total Annual Meals Increased (hake)	136,214,400
		Total Annual Meals Increased (squid)	25,398,333

Year	EBITDA (Millions)
YEAR 1	-1
YEAR 2	0
YEAR 3	1
YEAR 4	2
YEAR 5	3
YEAR 6	4
YEAR 7	5
YEAR 8	6
YEAR 9	7
YEAR 10	8

**10-YEAR EBITDA**

Millions

## SENSITIVITY ANALYSIS

Several key inputs have a particularly pronounced effect on the financial return of the project. As such, the model has been forecast under multiple scenarios that flex the following key variables:

**Quota Acquisition Price:** The acquisition of the industrial quota represents the largest single investment of Merluza, and the price paid has a significant impact on the financial return. Fortunately, the transferability of industrial quota in Chile and liquidity in that market provide relatively good data for pricing the quota. The base case of the model is informed by these market prices and the discounted cash flows associated with the potential value generated against that price. As such, the base case assumes the acquisition price of the industrial quota will be \$9.4 million, versus

\$16.3 million in the downside and \$8.1 million in the upside. In the downside scenario the project IRR falls to 10.2% while in the upside scenario the IRR increases to 15.0%.

**Premium Paid to Fishers:** Aligning economic incentives is a core premise of The Merluza Strategy investment thesis. As such, the strategy proposes to pay a premium to fishers on top of the prevailing artisanal ex-vessel market price. The base case sets that premium at 50%, while the downside scenario assumes a 60% premium and the upside a 40% premium. Paying a higher premium to fishers is not necessarily “bad” for the company, but it does adversely affect the cost of raw materials. In the downside scenario the project IRR falls to 3.4%, while in the upside scenario the IRR increases to 19.8%.

**Annual Changes in Sales Prices:** As with any processing and distribution business, the cash flows of the Company are sensitive to changes in the sales price of the finished goods. The sales prices used in the model are based on thorough diligence of the market segments into which HakeCo intends to sell. Although these initial prices are important to the IRR, they are also better known and based on current market intelligence. The changes in these prices over time, particularly in a 10-year model, will prove to be particularly impactful on the IRR. The base-case scenario assumes current market prices with moderate inflation of 5% per year. The downside scenario assumes prices rise at 2% per year (or 2% below core inflation), while the upside scenario assumes 6% annual increases. Given that the model runs over a 10-year period, the IRR is highly sensitive to these changes, with the IRR falling below 0% in the downside case while increasing to 28.2% in the upside scenario.

**Working Capital:** One of the great challenges of a seafood business sourcing from artisans is the need to pay cash at the time of raw material purchase while having to wait significant amounts of time to be paid by buyers. Moreover, the volatility in seafood supply relative to the need to fulfill constant supply agreements requires holding significant inventory. Both scenarios create significant demand for working capital. The model assumes 30 inventory days in the base case, 60 in the downside case, and 15 in the upside scenario. In the downside scenario the IRR falls to 10.9%, while in the upside scenario the IRR increases to 17.6%.

**HakeCo EBITDA Exit Multiple:** The valuation of Merluza in year 10 is modeled through a “Sum-of-the-Parts” analysis in which HakeCo is valued

separately from the quota. The valuation of HakeCo is based on the assumption of the sale to a strategic buyer at a multiple of earnings before interest, taxes, depreciation, and amortization (EBITDA). This multiple is a function of the risk/return ratio that the company might offer to a potential investor. A multiple of 4x (“4 times”) EBITDA is assumed in the base case, versus 3x in the downside and 5x in the upside. This is a conservative range based on available transaction comparables in the region that often sell at 6x to 9x EBITDA. This lower multiple reflects the more limited upside potential of HakeCo to buyers when the quota is removed from the valuation. In the downside scenario the IRR falls to 12%, while in the upside scenario the IRR increases to 15.9%.

**Stock Recovery:** The extent to which the stock recovers is the most critical driver of the overall impact return objective of the project, and an important contributor to the financial return. From a financial standpoint, the recovery trajectory dictates the total raw material availability to and profitability of HakeCo, while having an even larger impact on the value of the quota assets that were valued as if sold separately in year 10. This valuation was assessed by discounting the expected future cash flows the quota could generate under 5% annual price appreciation and a 5% increase in processing yield as a result of larger fish being landed on average.<sup>90</sup> As explained previously, the base-case scenario assumes a recovery to 75% of  $B_{MSY}$  while the downside and upside scenarios assume recoveries to 50% and 100% of  $B_{MSY}$  respectively. In the downside scenario, the project IRR falls to 11.6% while in the upside scenario the IRR increases to 17%. This upside is dampened by the FMF proceeds share.

<sup>90</sup> Processing yields in hake generally increase 1% per additional cm of length over 30 cm according to processors consulted.



## KEY MERLUZA STRATEGY RISKS AND MITIGANTS

The Merluza Strategy presents a range of potential risks that require mitigation or incorporation into the valuation analysis, as shown below:

RISK	DESCRIPTION	MITIGANTS
<b>KEY RISKS IMPACTING FISHERY IMPROVEMENT PROGRAMS</b>		
<b>Non-compliance by Fishers</b>	The strategy hinges on building a long-term commercial relationship with artisanal fishers. This would be essential both for securing raw materials and for ensuring fidelity to proposed fishery improvements. Contracts would be difficult to enforce, and the investment in place, the correct gear, and the right monitoring process might be insufficient to limit illegal fishing activity among fishers.	Merluza relies on a combination of increased government enforcement, low-cost monitoring, and economic incentives to ensure compliance. On the commercial side, HakeCo would have a fish buyer on site, making sure to source only from fishers who are fishing in compliance with FMC restrictions. Finally, Merluza would use third party auditors to investigate and monitor fisher compliance with management improvements over time.
<b>Natural Disasters</b>	Tsunamis or earthquakes might produce shocks to the supply in specific regions.	The key to addressing the impact of natural disasters is a quick response to restore production in case of a shock. The Company would have alternative routes-to-market to deal with temporary shocks, as well as holding inventory of frozen goods.
<b>Stock Recovery</b>	Given that Chilean common hake represent a single stock spanning the length of the country, efforts to change practices in only a few regions may be undermined by bad practices elsewhere.	FMS proposes a comprehensive set of fishery management improvements that incorporate over 70% of the total landings by working with fishers who span much of the stock's distribution ranges.
<b>Biological Risk</b>	Warming oceans could facilitate even higher biomasses of squid at the expense of a hake recovery. In addition, scientific estimates of hake stock recovery could be mistaken, slowing stock restoration, halting growth in landings, and impairing the profitability of the commercial operations and the value of the quota assets.	Merluza should engage stock assessors to develop a more refined model to project the impact of specific interventions and reduce the uncertainty regarding stock recovery. Nevertheless, biological risk will be present and cannot be fully mitigated in any case.

RISK	DESCRIPTION	MITIGANTS
<b>KEY RISKS IMPACTING RAW MATERIAL SOURCING VOLUME</b>		
<b>Community Engagement</b>	Fishers might choose to sell their legal production to other buyers, looking for better short-term conditions.	Merluza would pay a meaningful price premium.
<b>Legal Practices</b>	Fishers might try to commercialize illegal fishing through other existing intermediaries.	Premiums, as well as use of Merluza equipment in the caletas, are subject to keeping operations free of illegal harvest. If a fisher is found to be in violation of the fishery management plan, they would lose access to commercial incentives as well as potentially facing sanction from the caleta.
<b>Squid Threat</b>	High levels of predation by jumbo squid might put the hake recovery in jeopardy.	Moving artisanal fishers in Region VII from hake to squid would be a priority from the beginning of the strategy execution. Moreover, as the entire squid TAC is harvested, the biomass of this predator will fall.
<b>KEY RISKS IMPACTING RAW MATERIAL COSTS</b>		
<b>Oligopoly</b>	Several fishers or caletas might associate as to artificially raise the cost of raw materials.	HakeCo should strive to consider the specific concerns and needs of each individual caleta when managing relationships. However, the financial model assumes a 60% rise in raw material prices by year 4 (in excess of inflation) as the existing supply chain is reconfigured and prices of raw materials are no longer held artificially low by the Terminal Pesquero. Further rises in raw material prices can be absorbed by the business although it will compress margins on the HakeCo.
<b>KEY RISKS IMPACTING REVENUE</b>		
<b>Legislative Changes</b>	The Fishing Law protects the allocation of quotas to the industrial and artisanal sectors until 2032. Nevertheless, as with any country, Congress could introduce modifications to the law that might impact the value of quota assets.	According to lawyers close to the Fishing Law, changes to the quota allocation are highly unlikely. In addition, Chile has among the more stable regulatory regimes governing fisheries management, and has demonstrated recent commitments to improving management and policy affecting its fisheries.
<b>IUU Overflow</b>	More biomass and better prices might motivate fishers from other regions to catch illegal hake. A significant overflow of illegal fishing might reduce the prices in the domestic market significantly.	The hake strategy would weaken and displace informal distribution channels, so illegal production would not easily find intermediaries to reach established clients in the bigger cities. Moreover, SERNAPESCA has increasing authority to prosecute the transport and commercialization of illegal hake.
<b>Stock Assessment and Quota</b>	To translate the benefits of the stock recovery into financial returns at the levels projected, the increase in biomass would need to be recognized by the scientific committee and result in a higher Total Allowable Catch for the entire fishery. If the TAC doesn't rise accordingly, the IRR of the project would fall.	Merluza proposes working closely with the Scientific and Management committees for hake, to make sure they have information about what is happening in the caletas and trends in landings. This is a critical piece of FMC's stakeholder engagement.



RISK	DESCRIPTION	MITIGANTS
<b>KEY RISKS IMPACTING GENERAL BUSINESS ENVIRONMENT AND MARKET POSITION</b>		
<b>Strategy Execution Risks</b>	Merluza requires a coordinated implementation of fishery management improvements alongside the operation of the commercial seafood business, requiring multiple skills and the integration of a complex set of stakeholder and customer requirements. The execution of the strategy could prove to be more difficult than anticipated.	Merluza would engage highly experienced management talent to refine its strategy and coordinate its implementation. In addition, Merluza would expect the management team to engage additional subcontracted expertise to implement key elements of the program.
<b>Market Risk</b>	Common hake has a wide variety of low-cost substitutes, including tilapia, pangasius, and a variety of wild-caught whitefish. Moreover, unless the hake can be certified, it is unlikely to compete favorably on the export market.  In addition, dramatic fluctuations in hake volumes (whether through reduced illegal catch or through faster than anticipated recovery,) could cause price volatility, raising prices sharply relative to market demand, or reducing prices significantly with increased volume of supplies.	Chilean consumers currently prefer common hake to any of these substitutes, and most economists agree that seafood prices are likely to rise in excess of inflation, given rising global demand for healthful protein products.
<b>Political Landscape</b>	Several political scandals have come to light in Chile. Some of them involve members of Congress receiving irregular contributions from companies with special interests in the Fishing Law.	Transparency and responsible practices by Merluza can demonstrate the potential role of the fishing industry in improving the economy, the livelihoods of rural communities, and Chile's environment. These practices in turn should reduce political risks to the company.



## APPENDIX

### OPERATIONAL AND FINANCIAL PROJECTIONS

#### CASH FLOWS

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
# of Fishing Communities	4	8	10	12	12	12	12	12	12	12
# of Fishers	1,238	1,618	1,718	1,798	1,798	1,798	1,798	1,798	1,798	1,798
# of Vessels	619	809	859	899	899	899	899	899	899	899

#### SALES VOLUME (mt)

Hake	569	1,779	3,444	6,954	10,483	12,269	13,900	15,512	17,139	18,832
Squid	2,181	6,286	10,954	19,115	26,417	28,745	29,480	29,774	29,774	29,774
<b>Total Volume</b>	<b>2,750</b>	<b>8,065</b>	<b>14,399</b>	<b>26,069</b>	<b>36,900</b>	<b>41,014</b>	<b>43,380</b>	<b>45,286</b>	<b>46,912</b>	<b>48,606</b>

#### REVENUES

Hake	\$3,003,384	\$9,860,015	\$20,047,253	\$42,500,123	\$67,266,700	\$82,666,312	\$98,340,044	\$115,230,512	\$133,676,523	\$154,227,146
Squid	\$2,635,617	\$7,795,363	\$14,593,182	\$26,373,862	\$38,800,059	\$44,329,470	\$47,736,116	\$50,622,795	\$53,153,934	\$55,811,631
<b>Total</b>	<b>\$5,639,000</b>	<b>\$17,835,377</b>	<b>\$36,640,434</b>	<b>\$69,237,986</b>	<b>\$106,066,759</b>	<b>\$126,995,783</b>	<b>\$146,076,160</b>	<b>\$165,853,307</b>	<b>\$186,830,457</b>	<b>\$210,038,777</b>
<i>YoY Growth in Sales</i>		216%	94%	100%	53%	20%	15%	14%	13%	12%

#### OPERATING EXPENSES

Hake Raw Materials	\$942,374	\$3,681,718	\$8,244,928	\$18,177,340	\$28,513,857	\$34,735,318	\$40,934,184	\$47,508,672	\$54,588,929	\$62,381,282
Squid Raw Materials	\$667,714	\$2,401,509	\$4,835,988	\$9,214,998	\$13,244,788	\$14,988,190	\$15,986,294	\$16,791,553	\$17,463,215	\$18,161,743
Transportation	\$329,919	\$1,157,185	\$2,293,918	\$4,301,050	\$6,628,609	\$8,022,986	\$8,906,393	\$9,679,789	\$10,386,400	\$11,147,721
Process & Packaging	\$2,675,654	\$7,733,574	\$14,940,834	\$29,728,710	\$45,259,975	\$53,833,809	\$61,537,639	\$69,420,714	\$77,688,248	\$86,741,101
Distribution	\$113,679	\$346,700	\$643,750	\$1,212,151	\$1,784,388	\$2,062,658	\$2,268,927	\$2,463,354	\$2,653,888	\$2,859,661
<b>Total</b>	<b>\$4,729,340</b>	<b>\$15,320,685</b>	<b>\$30,959,418</b>	<b>\$62,634,250</b>	<b>\$95,431,615</b>	<b>\$113,642,961</b>	<b>\$129,633,436</b>	<b>\$145,864,081</b>	<b>\$162,780,680</b>	<b>\$181,291,510</b>

#### SG&A

<b>Total Overhead</b>	<b>\$2,153,395</b>	<b>\$2,675,115</b>	<b>\$3,662,040</b>	<b>\$5,665,128</b>	<b>\$7,813,108</b>	\$9,121,871	\$10,389,079	\$11,727,983	\$13,167,027	\$14,758,700
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#### EBITDA

Total Operating Cash Flow	\$(1,243,735)	\$(160,423)	\$18,977	\$938,607	\$2,822,036	\$4,230,951	\$6,053,645	\$8,261,243	\$10,882,750	\$13,988,567
<i>EBITDA Margin</i>	\$ -	\$(0)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

#### CAPITAL EXPENDITURES

FIP CAPEX	\$998,775	\$434,460	\$190,632	\$190,102	\$ -	\$998,775	\$ -	\$ -	\$ -	\$ -
Processing Capacity CAPEX	\$4,820,000	\$ -	\$ -	\$ -	\$ -	\$4,820,000	\$ -	\$ -	\$ -	\$ -
Quota Acquisition	\$8,139,600	\$ -	\$ -	\$ -	\$ -	\$8,139,600	\$ -	\$ -	\$ -	\$ -

# **THE SAPO STRATEGY**

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**AN INVESTMENT BLUEPRINT  
FOR INDUSTRIAL-SCALE  
FISHERIES IN BRAZIL**

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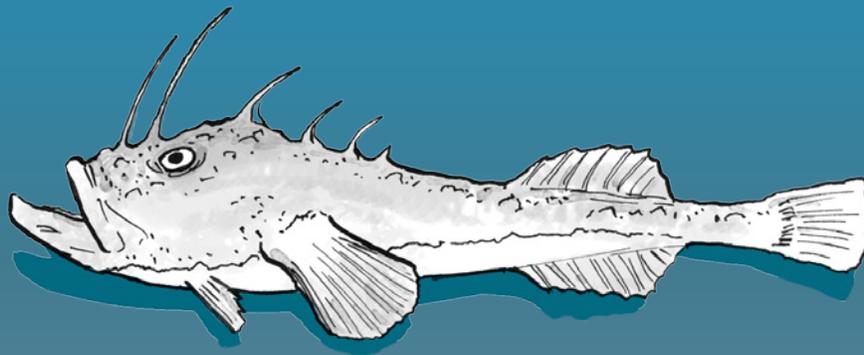
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## INTRODUCTION

Encourage Capital has worked with support from Bloomberg Philanthropies and The Rockefeller Foundation to develop and evaluate an impact investing strategy supporting the implementation of sustainable fishing improvements in the distressed monkfish (*Lophius gastrophysus*) fishery in Brazil. The Sapo Strategy (Sapo) is a hypothetical \$11.5 million greenfield impact investment to create Brazil's first sustainability-focused, vertically integrated seafood company, with the objective of restoring the stocks of both the monkfish and related fisheries to full productive potential. In a fishery that does not have quota or other forms of formal tenure over the resource, this approach suggests how fisheries management investments in Brazil can support the needs of a cash-constrained public sector, and yield attractive returns to investors while restoring marine ecosystems and benefiting local economies.



*Monkfish (Lophius gastrophysus)*

The \$11.5 million investment would be predicated on working with authorities to reform fisheries policy to ensure access limitations, establish secure, stable resource tenure in the form of a “catch share” system<sup>1</sup>, and strong enforcement and monitoring. The strategy would enable the design and implementation of comprehensive fishery management improvements, purchase and retire up to 15 double-rigged trawl vessels and licenses, control at least 85% of licenses/quota and associated gillnet vessels in the monkfish fishery, and create a new monkfish processing and distribution business to manage sales and export to international buyers. Given the current challenging policy environment in Brazil, certain enabling considerations must be met in order for the strategy to be viable. Sapó is targeting an 17.5% base case levered (equity) IRR, with upside potential of over 30%, while simultaneously restoring the monkfish stock biomass, generating \$7.9 million in additional revenues to fund gillnet fishers’ incomes and offer social benefits, and increasing meals-to-market by 7.5 million portions annually over the eleven-year investment period.

While the Sapó Strategy is based on analysis of actual fishing communities, fishing conditions, and commercial business operations to incorporate realistic assumptions of costs, returns, and risks affecting the potential outcomes of the strategy, Encourage Capital has synthesized its findings into a general case study that we hope can be used as a roadmap for fishery stakeholders interested in impact investing opportunities more broadly in the sustainable fisheries space. As such, most of the Company and programmatic references herein use pseudonyms in place of the actual names of the organizations on which the analysis was based. Where used, such pseudonyms will be identified clearly throughout the remainder of this text.

<sup>1</sup> Catch shares are a type of management system that dedicates a secure share of fish or fishing area, to individual fishermen, communities or fishery associations. Each year, the Total Allowable Catch (TAC) also known as a “catch limit” is set with portions of the limit divided among fishery participants.



## THE SAPO STRATEGY

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**T**he Sapó Strategy outlines an opportunity for private impact capital to help make the Brazilian monkfish gillnet fishery sustainable, while developing a profitable business and creating a range of positive environmental and social impacts throughout the region.

Given the history of management challenges in the Brazilian deep-water fisheries in the southern and southeastern regions of the country (of which the monkfish fisheries are a part), Sapó is positioned as an opportunity to drive positive change and offer an example to other industrial fisheries that sustainability and profit need not be in conflict.

Brazilian monkfish are caught using two primary gear types: gillnet and trawl. While the domestic monkfish gillnet fishery has a formal management plan on paper, monitoring and enforcement is weak, and there have been no efforts to collect data or evaluate the stock status and bycatch numbers since 2007. The domestic trawl fleet has very little formal regulation, with no defined access limitations on the number of vessels, vessel quotas, minimum catch size, or allowed landings. Lacking a formal monitoring and catch accounting program, statistics are generally self-reported (if at all), and there is no reliable way to verify consistent compliance.<sup>2</sup>

While this situation is not uncommon for fisheries in many parts of the world, the current policy challenges in Brazil are such that fundamental policy and management changes would be needed in order to create a viable investment environment. This strategy illustrates how the right enabling policies can mobilize and leverage private investment to restore marine resources and meet the goals of multiple stakeholders.

Before an overall management plan can be fully developed, high-quality, third-party scientific assessments must be completed to ensure that there is sufficient potential for sustainability improvements to justify these interventions. The resulting management improvements may include establishing a total allowable catch (TAC) across both gear types (reducing the portion allocated to trawl vessels), vessel quotas, access limits, gear modifications, closed seasons, and no-take zones. What is certain, however, is the need for strong resource tenure for investors, effective implementation, monitoring, and enforcement, and a firm commitment to catch accounting, on-board data collection and verification, and ongoing scientific assessments of stock, bycatch, and habitat impacts.

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<sup>2</sup> The Brazilian Institute of the Environment (IBAMA).

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Fundamentally, Sapo's innovative approach is to provide capital and assets to an association of fishing operators committed to sustainability, while developing and funding ongoing fisheries management efforts.

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Upon completing the scientific assessments, developing a management plan, and securing commitments from the government and industry, Sapo proposes to invest a total of \$11.5 million in equity and program related investments under a phased strategy to:

- 1) Finance and implement a strict and comprehensive management plan and related fisheries management improvements that address both the trawl and gillnet fleets
- 2) Fund the buyout and retirement of approximately half of the current double-rigged trawl vessels harvesting monkfish, and, upon securing access and TAC limitations on the trawl fishery, retire the licenses and implied share of TAC/quota associated with the vessels
- 3) Launch an export-oriented, vertically integrated processing and distribution business delivering sustainably certified monkfish products to high-value export markets
- 4) Secure the remaining available gillnet licenses and rights to acquire a pro-rata share of any new quota and/or licenses issued under the management plan as the stock recovers, in order to ensure control and monitoring of on-the-water fishing activities
- 5) Upgrade the gillnet fleet and enter into an agreement with an association of fishers, (who are contractually committed to sustainable management practices), to operate the vessels under a profit sharing and/or lease arrangement

- 6) Increase the catch volumes of the improved gillnet fleet operations (within the constraints of the management plan), while reducing the trawl harvest through the vessel buyout and TAC/quota restrictions
- 7) Continue to explore and test more selective harvest and gear alternatives over the long-term

Additional investments in the enterprise over time under this graduated strategy would be funded organically, through project cash flows, and with follow-on commercial loans. Revolving credit facilities would help finance working capital needs.

Fundamentally, Sapo's innovative approach provides capital and assets to an association of fishing operators committed to sustainability, while developing and funding ongoing fisheries management efforts. These changes must be built on commitments from policymakers, enforcement authorities, and the industry to take concrete steps to permanently reform resource stewardship. Without such reforms, management improvements may be undermined by new entrants or illegal, unreported, and unregulated (IUU) fishing activity. Bundling government reforms with private investment across the supply chain aims to ensure compliance with sustainable practices by stamping out destructive or illegal activities, controlling key assets and leverage points to push sustainable practices down the supply chain, and creating positive economic incentives.

Sapo would seek to collaborate with four primary stakeholder groups to execute the strategy. First, Sapo would work with NGOs, researchers, and government authorities to build on recent efforts to reform the demersal trawl fishery as a core

tenet of Sapo's value proposition to this segment. Second, Sapo would establish a joint-venture with a best-in-class seafood processing, distribution, and marketing team, under a newly formed holding company hereafter referred to as the "MarketCo". This part of MarketCo's business would be responsible for implementing and managing local processing and distribution operations, and for developing the marketing and sales channels for both export and niche domestic markets. Also falling under MarketCo would be an asset holding company (AssetCo), which would invest in licenses, vessels and infrastructure assets.

Third, Sapo would engage with a mission-aligned gillnet fishing operator to jointly establish an independent association of fishers (CatchCo), led by the operator and committed to strong, sustainable management reforms. CatchCo would operate the vessels owned by AssetCo under a long-term concession agreement, benefitting from offtake guarantees by MarketCo at premium prices, in exchange for a "right-of-first-offer" for CatchCo's product. CatchCo would also receive a minority equity stake in MarketCo, vesting over the 11 year investment horizon, as well as a purchase option on any vessels held by AssetCo at the end of Year 11.

Fourth, Sapo would partner with NGOs, regulators, and the fishery management committee to help finance and implement an MSC Fisheries Improvement Program, with the ultimate goal of MSC certification of the gillnet monkfish fishery. If successful, the Brazilian monkfish fishery would not only be the first MSC-certified monkfish fishery in the world,<sup>3</sup> but would also be the first MSC certified fishery of any kind in Brazil.

In sum, the Sapo strategy seeks to restore the monkfish fishery biomass over an 11-year period, driving a 100% to 200% increase in regulated, sustainable TAC and landings (assumed at a 100% increase, or 3,800 mt, in the base case), and generate 7.5 million additional seafood meals to market each year.<sup>4</sup> Sapo's base case financial returns assume a conservatively-valued exit sale of its commercial operations after Year 11 to either management, which will be granted a right of first offer, or an international strategic buyer. This exit strategy is supported by current industry consolidation and vertical integration trends and the demand for consistent access to critical sources of supply. Sapo targets an 17.5% levered IRR over the investment period, with significant upside potential should stocks show greater recovery and harvest potential.

#### Impact and Financial Returns

- Reduction of overall bycatch by 50%, of threatened species bycatch by 75%, and of total discards by 60%
- Reduction in the share of trawl catch from 60%-70% of total landings currently to less than 15% of total landings by Year 11, with an absolute trawl harvest reduction of between 40%-60% from current levels
- Increase monkfish stock biomass through better science and management, with an associated sustainable TAC growth of 100% in the base case, and 200% in the upside case
- Grow annual meals-to-market by nearly 375% by Year 11, representing a 7.5 million meal increase
- Increase aggregate fisher incomes by \$7.9 million over 11 years while expanding employment in the gillnet fishery from 18 to 90 people, and creating over 100 new jobs in the business operations
- Offer professional benefits through CatchCo, including insurance, profit sharing, back office support, education, improvement in on-board living conditions (including internet access for all crewmembers), and professional training opportunities
- Targets a base case equity IRR of 17.5% over an 11-year period

<sup>3</sup> Marine Stewardship Council, 2014.

<sup>4</sup> Base case TAC is based on the limited studies that have been undertaken on the stock and could be revised as stock assessments provide additional information on the biomass of the species. Wahrlich et al. "Structure and Dynamics of the Monkfish *Lophius gastrophysus* Fishery of Southern and Southeastern Brazil," Boletim do Instituto do Pesca, Sao Paulo, 2002.

## KEY VALUE DRIVERS

Sapo offers financial incentives for CatchCo fishers to support regulatory reform and aligns financial incentives with stock management performance, as increases to monkfish stock biomass and landings resulting from the fishery

management improvements drive cash flow and value generation. Sapo presents an intriguing impact investing opportunity due to the following key value drivers:

VALUE DRIVERS	DESCRIPTION
<b>Catalyzes positive regulatory momentum</b>	Creates meaningful financial and stakeholder incentive to push fisheries authorities, NGOs, academics, and industry to execute on plans to install a management committee for Brazil's southern and southeastern (S-SE) demersal fisheries (which include monkfish) in order to reform policies and re-initiate stock assessments, monitoring, and enforcement activities.
<b>Implements effective fishery management improvements</b>	Reduces the active DR trawl fleet by up to 50%, <sup>5</sup> while limiting new entrants, placing catch limits in the form of Individual Transferable Quotas (ITQs) on remaining vessels, lowering fishing mortality from trawl gear by 40%-60% of current values (on top of a 2.0x to 2.5x monkfish catch volume increase), reducing juvenile landings, and supporting a faster, permanent stock recovery.
<b>Creates an investment position that appreciates in value as the stock recovers</b>	Acquisition of fishing permits and vessels in combination with the launch of a monkfish processing and distribution business increases profits and asset values as monkfish sustainable yield grows by between 1,800 mt and 2,300 mt over the investment period (under the base case).
<b>Uses innovations to increase fisher compliance</b>	The use of on-board data capture technologies, dockside catch accounting, and other data systems, in combination with higher aggregate and per unit prices to reward fishers for sustainable practices can increase compliance with management improvements.
<b>Engages best-in-class partnerships</b>	Sapo would create a network of stakeholder partnerships comprised of leading international and local marine conservation NGOs, CatchCo, MarketCo, industry fishing associations, and local research universities to offer the strongest possible leadership and execution of the overall strategy and resource management.
<b>Capitalizes on margin expansion opportunities</b>	Vertical consolidation of the supply chain is expected to create operating efficiencies and improve EBITDA margins relative to current conditions. In addition, the conversion of existing sales from frozen to fresh products yields a 20-30% price premium in European markets, while MSC certification is believed to command a premium of between 5-10% in elite markets since no such product is available today. <sup>6</sup> Sale of livers and waste products for fishmeal, currently not exploited, will increase overall value of raw material by an estimated 10-20%.

<sup>5</sup> Depending on specific assumptions made regarding the number of DR trawl vessels actively harvesting monkfish at present.

<sup>6</sup> Because there are no current MSC analogues to this fishery, and due to its unique demand characteristics, a "sustainability premium" remains speculative, and would offer potential investment upside. However, the Sapo model does not rely on this factor in order to be profitable.

**VALUE DRIVERS**

**DESCRIPTION**

**Leverages strong market position and product differentiation**

Ownership of strategic productive assets (fishing licenses, vessels, and processing) would secure access to high-quality raw materials, pose a strong barrier to entry, ensure compliance with sustainability standards, and enable quality control and chain-of-custody across the supply chain.

The Marine Stewardship Council Certification (MSC) would offer a unique value proposition and differentiation as the only MSC-certified monkfish in the world. This would create the first vertically integrated seafood producer in Brazil with full product chain-of-custody (enabled by vertical integration), focused on quality, sustainability, and product differentiation. As a result, the Sapó operations promise to be an attractive supplier to European and U.S. markets seeking sustainable seafood supply sources.

Finally, unlike other groundfish/whitefish, there are no close substitutes for monkfish tails due to their unique flavor and texture, (with lobster tails or scallops being the closest comparable product), and no substitutes for monkfish liver.

**Is supported by strong underlying market fundamentals**

Strong demand growth in the EU, U.S., and Asia over the past 30 years has surpassed production, while the U.S. market remains relatively immature and continues to grow. With top-quality product retailing for up to \$50/kg in some target markets, monkfish is among the world's highest-value seafood products. Monkfish stomachs and livers are a delicacy in Asia, where seafood demand fundamentals are especially strong.

Limited global supply could be further pressured by a potential EU deepwater trawl ban, creating additional pressure on many monkfish fisheries and benefitting sustainably harvested product.

**EXECUTION CHALLENGES**

It is important to acknowledge upfront the anticipated difficulties involved in executing the investments outlined here. These difficulties include: the possibility that this stock simply cannot be harvested sustainably at commercially viable scale; its coexistence with several highly threatened species which have in the past been captured as bycatch; and the potential for weak political will or lack of commitment on the part of authorities to reform and enforce management plans for all gear-types that catch monkfish.<sup>7</sup>

Because of the limitations to the existing management framework and enforcement, (particularly in the trawl fishery), the Sapó Strategy investment is strictly conditional upon securing specific regulatory reforms in advance of any significant capital investment. This will ensure

regular monitoring, enforcement of regulations, and binding resource tenure for investors in the fishery.<sup>8</sup> To do otherwise would be akin to making a real estate investment in a country that doesn't enforce property rights. The first requirement of any investment, therefore, must be to secure binding, enforceable commitments from Brazilian fisheries authorities.

Because the Sapó Strategy is a complex, multi-phased, greenfield project, that depends entirely on effective policy reforms and ongoing enforcement, executing the strategy would be a challenge (the PRS Political Risk Index ranks Brazil #50 of 140 countries, and the World Bank ranks it #116 of 189 countries for ease of doing business).<sup>9,10</sup> While Sapó partially mitigates this risk by pursuing a phased investment strategy, and protects investor

<sup>7</sup> Recognizing that improvements in only the gillnet fishery will not address stock management concerns if this only accounts for 30% to 40% of total harvest volumes.  
<sup>8</sup> The conditional nature of this strategy, due to the fact that the investment thesis is wholly dependent upon external, regulatory changes to the status-quo, is a key difference between the Sapó Strategy and other Investment Blueprints prepared as part of the Investing In Sustainable Global Fisheries report.  
<sup>9</sup> The PRS Group, 2014. "Political Risk Index".  
<sup>10</sup> World Bank Group, 2015. "Ease of Doing Business Rankings, June 2015".



capital by limiting investments until demonstrated reform is achieved, the overall strategy risk is much higher due to the uncertainty of the policy environment in Brazil. While a fishery with a history of consistent, strong management policies would enable a simpler approach, Sapo's implementation necessarily requires additional complexity and a longer timeframe to engage multiple stakeholders and secure the required reforms.

The Brazilian Ministry of Fisheries and Aquaculture, which was the central fisheries authority in Brazil when Sapo was first conceived and developed, was formally disbanded in October 2015 as

part of a broader federal restructuring, and its functions were consolidated under the Ministry of Agriculture. As of this writing, questions remain as to how this may influence the direction of fisheries policy in the country, and this uncertainty is currently a significant risk for any industrial scale sustainable fisheries investment strategy in Brazil. However, our hope is that the recommendations put forth by this case study build support for partnerships and commitments with impact-oriented investment strategies among authorities and other critical fishery stakeholders such as NGOs and the fishers themselves.



## PROFILE OF THE SAPO STRATEGY FISHERY

Despite featuring the world's 15th longest coastline (8,400 km), 5th largest population (205 million), and 3rd largest agriculture exports (by value), Brazil remains a relatively small player in the marine wild capture fishing industry, ranking 26th in the world and comprising just 0.86% of global production. The Brazilian seafood industry produces approximately 575,000 mt of wild capture marine seafood each year, employs 550,000 people and exports approximately 7%, with the remainder consumed domestically.<sup>11, 12, 13</sup> Though the landings of Brazilian monkfish (*Lophius gastrophysus*) (1,500–2,000 mt) currently represent only a small portion of Brazil's total annual landed volume (0.3%), virtually all of it is sold to high-value export markets in Europe and Asia, comprising 2.5% of total Brazilian seafood exports by value. Being a bottom-dwelling species, monkfish is currently only harvested using gillnet and trawl gears — both of which generate bycatch-with trawl capable of significant habitat damage. Finished product yield is only about 25% of the live monkfish weight, and the product is sold as processed tails, cheeks, liver, or whole gutted fish to European, Asian, and North American markets.<sup>14</sup>

### SPECIES LIFE HISTORY

Globally, the seven commercially harvested monkfish species of genus *Lophius* are poorly understood by the scientific community due to their inaccessible habitat, (being buried in mud at great depths) and the relatively short period of time that they have been commercially harvested. Of these, the Brazilian monkfish, *L. gastrophysus*, is perhaps the least studied, with most assumptions about this species' population dynamics, life history, and behavior based on closely-related species such as *Lophius piscatorius*, found in Europe and the North Sea. What is known is that *L. gastrophysus* is a bottom dwelling fish, which appears to spawn in relatively dense aggregations in the shallower range of its habitat, from 100 m to 200 m, with a prolonged spawning season that runs from August to January, corresponding with the Southern Hemisphere spring and early summer.<sup>15</sup> Juvenile fish settle in the shallow continental shelf waters from ~30 m to 150 m, move to deeper sections of the continental shelf as they grow, and finally live the remainder of their life cycle as mature adults in the deep waters of the continental slope, some 250 km offshore,

<sup>11</sup> <http://www.fao.org/fishery/facp/BRA/en>

<sup>12</sup> Ibid.

<sup>13</sup> <http://www.seafish.org/media/765540/brazil.pdf>

<sup>14</sup> Irish Sea Fisheries Board, "Monkfish Quality Guide," [www.bim.ie](http://www.bim.ie), 2006.

<sup>15</sup> Valentim et al. "Length Structure of Monkfish, *Lophius gastrophysus*, Landed in Rio de Janeiro," *Brazil Journal of Aquatic Science and Technology* 11(1), 2007.

seasonally returning to shallower waters to spawn. The Brazilian *L. gastrophysus* is among the midsized monkfish species, reaching lengths of up to 100 cm and weighing up to 20 kg. Its maximum

life span is about 25 years for females and 12 years for males, with a reproductive age of 5-7 years and at a length of approximately 50 cm.<sup>16</sup>

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### STOCK PROFILE AND CURRENT STATUS

The Brazilian monkfish is currently landed by either a small gillnet fishing fleet (consisting of two vessels), or a double-rigged trawl fleet with an estimated 20 to 30 vessels actively catching monkfish as bycatch while targeting other species. Overfishing during the first half of the past decade is believed to have driven the monkfish nearly to a point of collapse; however, despite the absence of formal stock and landings data, some fisheries stakeholders believe that the stock has stabilized and perhaps even recovered somewhat in recent years.

Until the late 1990's, the monkfish was considered by Brazilian fishers to be a "trash" fish, caught as bycatch and usually discarded by demersal trawlers targeting snapper, shrimp, and squid.

Starting in 1999, the government initiated its "REVIZEE" program as part of an effort to exploit new deep-water fishery resources within the Brazilian EEZ, unleashing a commercial expansion

down Brazil's continental slope. Sophisticated European vessels equipped with deep-water trawl and gillnet technologies, the latter coming primarily from Spain and capable of fishing to depths of 900 m, were introduced to the Brazilian industry for the first time and represented the first directed monkfish fishery. The national fleet followed the foreign vessels, which occupied the waters beyond the shelf break using long line and trawl gear, which domestic vessels had previously only employed in waters less than 200 m deep.

The Brazilian monkfish fishery experienced declining catch volumes, falling from a peak of nearly 10,000 mt in 2001 to current estimated landings of approximately 20% peak volumes. The core challenges to the fishery are poor governance, inadequate management, historically persistent bycatch, and suboptimal commercialization, which are summarized below:

- Lack of effective governance, together with a foreign charter vessel technology transfer program, led to fleet overcapitalization and overfishing between 2001 and 2005.
- Significant unmanaged and potentially illegal fishing by the industrial double-rigged trawl fleet, which currently lands 1.5x to 2.3x more product than the relatively better-managed gillnet vessels, and for which most catch consists of lower-value juvenile fish accompanied by substantial bycatch.
- Absence of data on current stock biomass and lack of catch accounting hampers the ability of fisheries authorities to establish appropriate catch limits and identify adaptive management interventions.
- History of bycatch by the foreign charter gillnet fleet operating in the early 2000s, for which up to 60% of catch<sup>17</sup> was composed of incidental species, several of them threatened.
- Inefficient supply chain and quality management, which undervalues the product in global markets.

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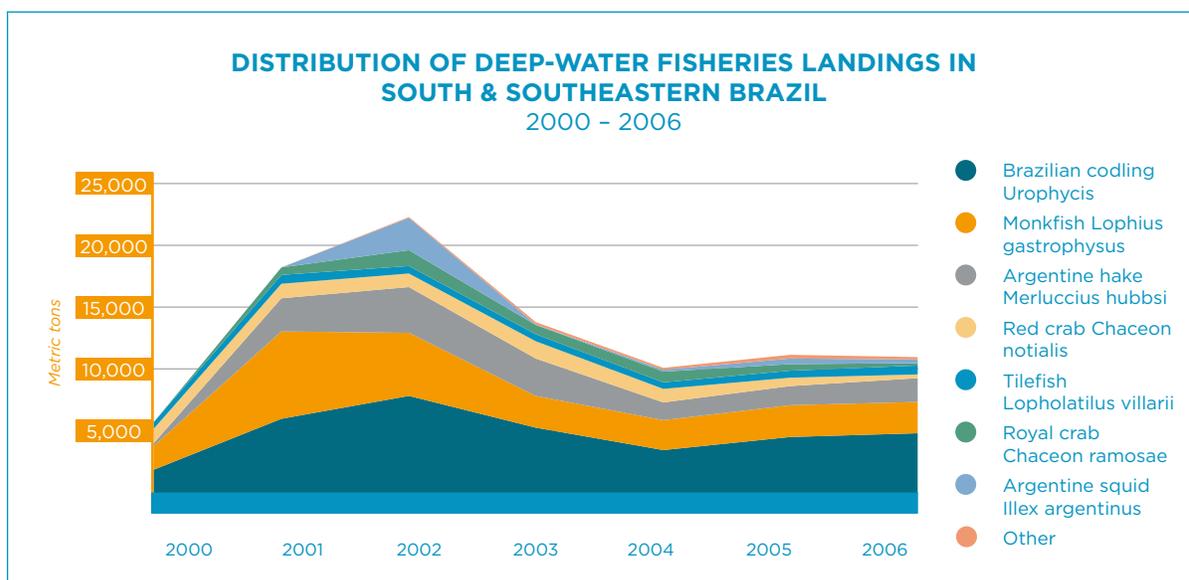
<sup>16</sup> Valentim et al. "Length Structure of Monkfish, *Lophius gastrophysus*, Landed in Rio de Janeiro," Brazil Journal of Aquatic Science and Technology 11(1), 2007.

<sup>17</sup> By number of individual organisms caught.

Following the arrival of gillnet vessels in 2001, monkfish landings increased dramatically. In a pattern typical of the “Gold Rush” effect seen in other high-value Brazilian fisheries, catch volumes increased nearly tenfold in just two years, reaching nearly 10,000 mt (including discards), with a total export value of \$21 million. Despite attempts to reduce fishing effort, the 2002 landings of over

5,000 mt far exceeded the 2,500 mt precautionary TAC recommended by scientists. After 2003, with the departure of the foreign vessels, and landings fell sharply, stabilizing at close to 2,500 mt until 2007, when data collection ceased (see Figure 1).<sup>18</sup> In recent years, an estimated 1,500 mt to 2,000 mt of monkfish have been harvested annually by the gillnet and trawl fleets combined.<sup>19</sup>

FIGURE 1: Deepwater Landings in S-SE Brazil Between 2000 and 2006



### HISTORICAL CONTEXT

Following the opening of the monkfish fishery in 1999 under REVIZEE, detailed biological, technical, and operational data was collected, and several detailed studies were undertaken in 2001 at the height of the foreign charter program. A complete stock assessment, with fisheries management recommendations, was presented to government and industry in April 2002. The study estimated a biomass of nearly 63,000 mt, with a spawning biomass of 32,000 mt.<sup>20</sup> The 2001 harvest, at 16% of total biomass (up to 60% in localized, highly-fished zones), overexploited the fishery and put it at serious risk of collapse. Observing this, the study recommended an immediate catch reduction of 70%, to a limit of 2,500 mt (4% of total biomass).

This would allow the monkfish population to stabilize, while giving scientists the opportunity to collect better data. The study noted that upon stock recovery, the TAC could likely be sustainably increased to 6% of total biomass (approximately 3,800 mt).<sup>21</sup>

The Consultant Committee for the Management of Deepwater Resources (CPG), including representatives from the fishing industry (vessel-owners, fishers, and industry workers), government, and academia, was created in 2002 to govern deepwater fisheries in S – SE Brazilian waters. Among the CPG’s first actions was to propose a monkfish management plan for the gillnet fleet and

<sup>18</sup> Perez et al., “Deep Water Fisheries in Brazil: History, Status, and Perspectives,” *Latin American Journal of Aquatic Research* 37(3), 2009.

<sup>19</sup> Personal communication, 6/2015.

<sup>20</sup> Spawning biomass is a population metric used to account for the biomass that is able to reproduce.

<sup>21</sup> Perez et al. “Biomass Assessment of the Monkfish *Lophius gastrophysus* Stock Exploited by a new Deep-water Fishery in southern Brazil,” *Fisheries Research* 72, 2005.

restrict foreign chartered gillnet operations during the second half of 2002.<sup>22</sup> After a promising start, however, internal disagreements led to the CPG disbanding in late 2007. Efforts at monitoring, data collection and enforcement effectively disappeared, and the management plan was sidelined. Although the foreign gillnetters had left, the remaining trawlers and a new five-vessel domestic gillnet fleet continued to operate using the technology and international market access introduced by REVIZEE. As a result, the overfishing and associated stock declines continued. The management plan was finally implemented in 2008, but by then the damage had been done, as the stock was already declared overexploited and headed towards collapse as early as 2004.<sup>23</sup>

In July of 2008, Brazilian President Lula da Silva created a dedicated Ministry of Fisheries charged with increasing national seafood consumption and boosting fish production by 40%, largely via aquaculture expansion. The new ministry wielded an increased budget and hired many new employees during the following years, yet management and enforcement of wild-catch fisheries regulation continued to suffer.

In October of 2015, the Ministry of Fisheries and Aquaculture was dissolved and incorporated into the national Ministry of Agriculture, under a spending reduction plan. As of this writing, management of Brazil's fisheries falls under the jurisdiction of the Ministry of Agriculture, though significant uncertainty regarding the future of Brazilian fisheries policy and management remains.

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## GEAR AND ENVIRONMENTAL IMPACTS

### DOUBLE-RIGGED TRAWL FLEET

Trawling intensified on the continental slope areas off of Brazil starting in 1999, as a consequence of both the national fleet moving beyond traditional fishing areas due to stock depletion, and the REVIZEE program of chartered foreign trawlers exploring deep-water fishing grounds within the Brazilian EEZ.

While these vessels targeted several species, monkfish was an important retained product. Most of the chartered trawlers exited Brazilian waters after 2002, but were quickly replaced by a national fleet of over 35 vessels, including the double-rigged trawlers for the shallower shelf and slope breakwaters, and the deeper water stern trawlers.

Currently, only the domestic double-rigged trawl fleet is actively fishing in depths from 100 m to 250 m, and is legally permitted to land monkfish as incidental catch. Although at least 50 vessels are licensed to fish, financial distress due to the

collapse of whitefish prices and the strong local currency<sup>24</sup> between 2008 and 2013 sidelined many operators. According to local fishers, there are only between 20 and 30 trawl vessels currently catching monkfish. Despite the reduced vessel number, this fleet catches between 900 mt and 1,400 mt annually, representing between 60% and 70% of current total monkfish landings in Brazil.<sup>25</sup>

Because the trawl fleet is confined to shallower waters, its monkfish catch is significantly smaller than that of gillnet vessels, and primarily consists of juveniles. This key sustainability risk factor is compounded by the open access nature of the fishery, lack of absolute catch limits and quota restrictions, and ineffective monitoring. Economically, the smaller product is of lower commercial value, with degraded quality due to the harvest method and poor onboard handling.

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<sup>22</sup> Perez et al. "Deep-water Fisheries in Brazil: History, Status, and Perspectives," *Latin American Journal of Aquatic Research* 37(3), 2009.

<sup>23</sup> Perez et al. "Deep-water Fisheries in Brazil: History, Status, and Perspectives," *Latin American Journal of Aquatic Research* 37(3), 2009.

<sup>24</sup> The real is the national currency of Brazil (BRL).

<sup>25</sup> The largest local processor of monkfish from this fishery estimates that it buys between 1,500 and 2,000mt of raw material from the trawl fleet, and there are at least two other processors that have been known to process this product.

Although at least 50 vessels are licensed to fish, financial distress due to the collapse of whitefish prices and the strong local currency between 2008 and 2013 sidelined many operators.

#### GILLNET FLEET

Starting in 2001 with the arrival of the Spanish vessels, the gillnet fleet targeted the upper continental slope between 200 m and 500 m deep along the southeastern and southern Brazilian coast (within the designated fishery boundary between 21° S and the border with Uruguay). This fishery was the first in Brazil directed specifically at monkfish, which had previously only been caught as trawl bycatch prior to 2001.

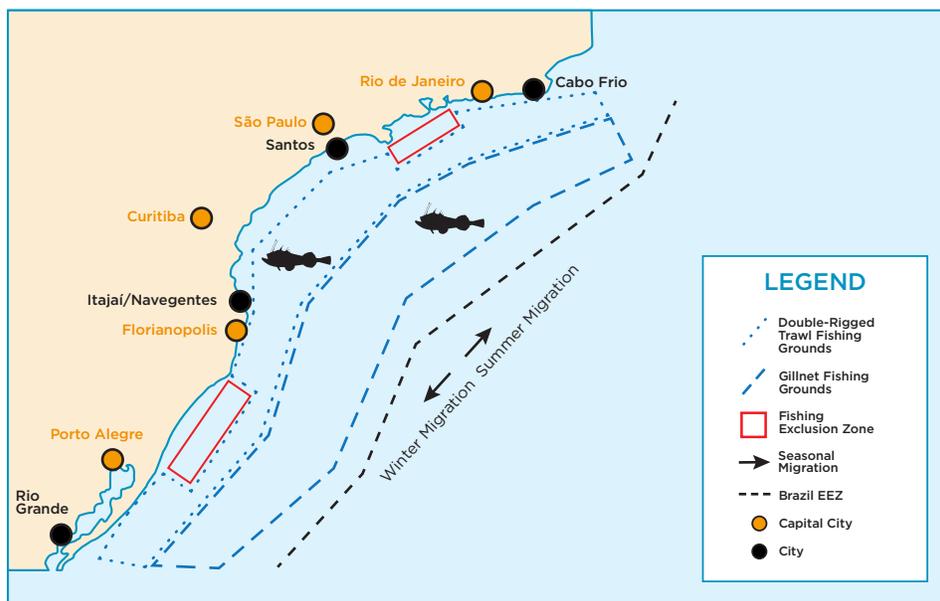
To reach the gillnet fishing grounds along the continental slope, at depths of greater than 250 m, these vessels must travel 250 km out to sea, a trip that takes between 12 and 14 hours. The gillnets in this fishery are not set vertically using floating buoys to stretch the net, as in other gillnet fisheries, but are rather weighted and allowed to fall slack across the bottom where the monkfish are entangled in the mesh as they “crawl” across the seabed. The soak time of the nets is between 2 and 3 days (weather dependent), and each

vessel carries four sets of 1,000 nets, with each set stretching for 10 km.

Fishing trips last between 5 and 15 days, depending on the season and weather, with shorter trips during the stormy winter months. The fish are harvested, gutted onboard, and frozen. Product landed in Rio Grande is taken directly to the central processing and packing facility, while product landed in Itajaí is collected by freezer truck and transported approximately 12 hours south to Rio Grande for packing and export (refer to Figure 2).

Today, there are only two active gillnet vessels, with one operating out of the port of Itajaí, in the state of Santa Catarina, and the other in Rio Grande, in Rio Grande do Sul. Harvest volumes have averaged just 600 mt during the past few years, which is 900 mt short of the already highly precautionary total allowable catch (TAC) of 1,500 mt currently set for the gillnet fishery.<sup>26</sup>

FIGURE 2: Map of the Monkfish Fisheries in Brazil, Including the Shallower-Water Trawl Fishery and Deep-Water Gillnet Fishing Grounds



<sup>26</sup> This based on the conservative recommendation made in Perez et al 2005 to establish a TAC of 6% of 63,000mt, the estimated  $B_{MSY}$ .

While the reduction in fleet size from ten vessels to two is the result of a range of factors, and commonly cited reasons include over-leverage and financial distress, overcapacity given the low TAC, declining catch volumes, prices softening in other fisheries (forcing companies out of business), the challenging nature of operating this gear type, lower catch per unit of effort, and the “aging-out” of experienced vessel operators without adequate succession.

Although no in-depth research has been conducted since the gillnet management plan was put into practice, a bycatch assessment conducted on the foreign charter gillnet fleet in

2001 found high incidental catch and discards. Of the total biomass caught, just 40.7% was monkfish. Especially concerning was that several of the slow-growing bycatch species were highly threatened or collapsed, notably the angel shark (*Squatina argentina*) and wreckfish (*Polypriion americanus*). While the relative amount of bycatch of these two particular species was low (1.2% and 1.0%, respectively, of monkfish landed, by number of organisms) compared to others such as beardfish (*Polymixia loweyi*, 14.5%), silver john dory (*Zenopsis conchiffer*, 10.2%), and royal crab (*Chaceon ramosae*, 55.7%), these already stressed populations could not afford additional pressure.<sup>27</sup>

## REGULATORY CONTEXT AND CHALLENGES

### DOUBLE-RIGGED TRAWL FISHERY MANAGEMENT

The double-rigged trawl fleet currently lacks a robust management plan for either monkfish, or for the “target” species of this multispecies fishery, which are primarily hake (*Merluccius hubbsi*) and codling (*Urophycis mystacea*).<sup>28</sup> There is a rule against retaining monkfish at levels greater than 5% of the total landed volume, but anecdotal evidence suggests that faced with declining prices for the target species, some in the trawl fleet are retaining the higher-value monkfish at levels exceeding this 5% limit without adequately reporting these landings.

While catch and effort limits are almost entirely lacking in this fishery, with open access, no TAC, and unlimited effort allowed, this fishery does have a limited season, which extends for only three months between March and May. However, this leads to a “race-to-fish” during the open season, and with inadequate surveillance, monitoring, and catch accounting along most of the coastline, extensive year-round fishing occurs throughout a sizable portion of the fleet.<sup>29</sup>

Allowed depth ranges do not overlap with the gillnet fishery, as the double-rigged trawl vessels may only fish at depths between 100 and 250 m. Vessel operators are required to keep logbooks, maintain

VMS (vessel monitoring systems), and use observers on 20% of trips covered, but this latter requirement has not been met since fisheries authorities suspended the observer program in 2010.<sup>30</sup>

There has been no formal assessment of bycatch issues on the trawl fleet, though trawlers are well known to be problematic in this regard by virtue of the gear type used, as large nets are dragged along the bottom, scooping up whatever lies in their path. In fact, the double-rigged trawl fishery is by definition non-selective, as even the landings requirements for this fishery state that no single retained species may make up more than 15% of the total catch volume.<sup>31, 32</sup>

The paucity of monitoring data, the inaccurate catch accounting, and the lack of market transparency make it impossible to know for certain what the negative economic and environmental implications of the trawl fleet are for Brazil’s monkfish resource. However, this is a critical challenge to the long-term sustainability and economic viability of the fishery, and is an essential component to any long-term impact investment strategy in the monkfish fishery.

<sup>27</sup> Wahrlich et al. “A Bycatch Assessment of the Gillnet Monkfish *Lophius Gastrophysus* Fishery Off Southern Brazil,” *Fisheries Research* 72, 2005.

<sup>28</sup> Perez et al. “Deep-sea Fishery off Southern Brazil: Recent Trends of the Brazilian Fishing Industry,” *North Atlantic Fishery Science* 31, 2003.

<sup>29</sup> Source: Personal interviews with local researchers, processors and fishermen, June 2015.

<sup>30</sup> Perez et al. “Biomass Assessment of the Monkfish *Lophius gastrophysus* Stock Exploited by a new Deep-water Fishery in southern Brazil,” *Fisheries Research* 72, 2005.

<sup>31</sup> Perez et al. “Deep-water Fisheries in Brazil: History, Status, and Perspectives,” *Latin American Journal of Aquatic Research* 37(3), 2009.

<sup>32</sup> Unlike these other species, monkfish may only comprise 5% of landings volume.

## GILLNET FISHERY MANAGEMENT

Unlike the trawl fleet, the gillnet fishery has a somewhat robust management plan by Brazilian standards, being among the most comprehensive of any national fishery that is not part of an international management structure.<sup>33</sup> Each vessel must have a license to target monkfish, with a current limit of nine licenses which are restricted from fishing in waters shallower than 250 m, and must collectively harvest below a highly-precautionary, “stock recovery” TAC set at 1,500 mt.

Nets must be tagged with a vessel register so that owners can be traced to and held responsible for any abandoned “ghost fishing” nets, a development that has led operators to outfit the gear with tracking beacons for easy recovery. In contrast to the trawl fishery, there is currently no closed season for monkfish.<sup>34</sup> Logbooks, VMS, and observers are technically required with 100% coverage; however, the on-board observer program was suspended in 2010 for this fleet as well.

Legally retained bycatch is allowed for just two products under the gillnet management plan: the deep water commercial crab species (*Chaceon* spp.), and the tilefish (*Lopholatilus villari*), each of which must each be limited to 5% or less of the total commercial landings by volume. Otherwise, bycatch must be discarded or donated to the crew or local communities.<sup>35, 36</sup> While there is no minimum legal size, juvenile fish are virtually absent from these deep waters. The management plan established a minimum net mesh size of 280 mm to select for larger individuals and reduce bycatch, though tests performed with mesh sizes of up to 320 mm have shown significantly higher performance in this regard.<sup>37</sup>

Harvest exclusion areas in the south and southeast shelf waters were established to reduce bycatch and to protect spawning grounds, particularly for the highly threatened wreckfish (*Polyprion americanus*), and angel shark (*Squatina argentina*), following lessons learned from the REVIZEE program. Nevertheless, the use of exclusion areas could be further expanded to reduce bycatch while protecting vulnerable populations and spawning aggregations. Voluntary efforts undertaken by existing operators offer promising anecdotal evidence of bycatch reduction potential, particularly of threatened species, though further study is required. Unlike traditional, stretched net gillnet fisheries in shallower waters, which have been known to catch marine mammals, turtles, birds, and a range of incidentally entangled fish species, at depths of over 250 m there are far fewer such interactions. Practitioners claim that the use of the slack entangling net lying anchored on the bottom targets only benthic species crawling or swimming along the seabed. Unlike some gillnet fisheries, the nets are not baited, and catch efficiency apparently does not fall off significantly when soak times are reduced to less than 48 hours (compared to soak times of nearly five days when the last formal bycatch assessment was undertaken on the foreign fleet), which further reduces bycatch volumes.

Deep-water fishing activities have concentrated on the slope at depths between 250 m and 1,000 m, where the seabed is primarily mud and sand. As such, the habitat is generally resilient and, despite some limited deep-water stern-trawl<sup>38</sup> activity between 2000 and 2007, this habitat is not believed to have sustained long-term damage. Double-rigged trawl vessels are restricted from operating at these depths.<sup>39</sup>

<sup>33</sup> Jose Perez and Paulo Pezzuto, “Análise da Dinâmica da Pesca de Arrasto do Sudeste e Sul do Brasil,” Universidade do Vale do Itajaí, 2005.

<sup>34</sup> Wahrlich et al. “A Bycatch Assessment of the Gillnet Monkfish *Lophius Gastrophysus* Fishery Off Southern Brazil,” *Fisheries Research* 72, 2005.

<sup>35</sup> Perez et al. “Deep-water Fisheries in Brazil: History, Status, and Perspectives,” *Latin American Journal of Aquatic Research* 37(3), 2009.

<sup>36</sup> Du Mont, personal communication, 2015.

<sup>37</sup> Wahrlich et al. “Deep-sea Fishery Off of Southern Brazil: Recent Trends of the Brazilian Fishing Industry,” *Journal of Northwest Atlantic Fishery Science* 31, 2003.

<sup>38</sup> Unlike double-rigged trawlers, stern-trawlers are designed for the requirements of deep-water trawling; however, this fleet has not been active in recent years as the limited catch volumes for such large, fuel-hungry vessels have generally deemed this to be cost prohibitive.

<sup>39</sup> Perez et al. “O Ordenamento De Uma Nova Pescaria Direcionada Ao Peixe-Sapo No Sudeste E Sul Do Brasil,” 2002.

## CURRENT SUPPLY CHAIN

### DOUBLE-RIGGED TRAWL FISHERY SUPPLY CHAIN

The trawl vessel operators tend to be large -scale, horizontally integrated industrial multi-species producers, with home ports in Rio Grande (Rio Grande do Sul state), Itajaí (Santa Catarina), Santos (São Paulo), Niterói (Rio de Janeiro), and Cabo Frio (Rio de Janeiro). Such producers handle the pre- and post-processing distribution and

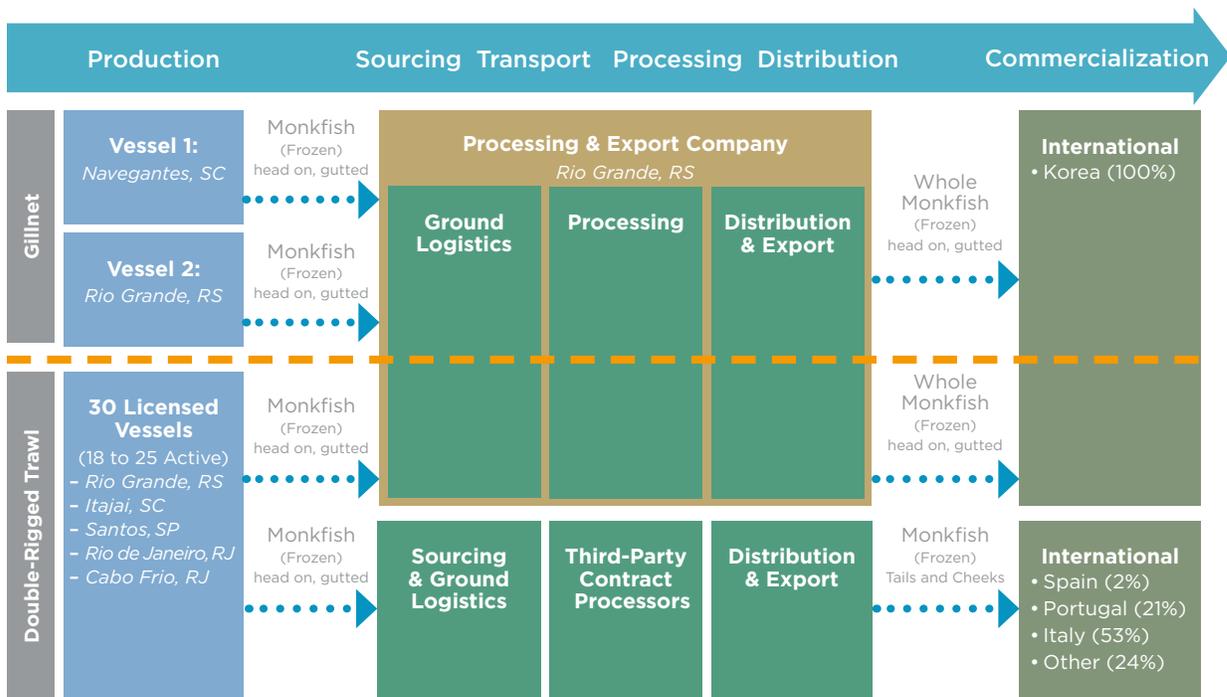
export (or contract with partners who do this). The processor role in this supply chain is almost entirely contracted, meaning that processors do not take ownership of the product, and a large portion of the final product is exported to Europe, primarily to Portugal, Spain, and France.

### GILLNET FISHERY SUPPLY CHAIN

The gillnet fleet has two vessels, each dedicated entirely to monkfish production with no interests in other species. One of the vessels is owned and operated by a vertically integrated Asian export company, and the other is independently owned but sells exclusively to the same Asian exporter. This export company also owns a post-harvest processing facility in the port of Rio Grande.<sup>40</sup> Though it currently sources all of the gillnet monkfish product from both vessels, it does not appear to have a sustainability orientation.

The second vessel lands a portion of its harvest in Rio Grande during the winter months, but the majority is landed in the port of Itajaí/Navegantes, Santa Catarina, where the buyer collects the whole (head-on) frozen, gutted fish off of the boat and transports it 775 km (about 10 hours driving time) south to the post-harvest facility in Rio Grande, from where it is exported. An illustration of the current monkfish supply chain is included in Figure 3.

FIGURE 3: Current Structure of the Monkfish Supply Chain in Brazil



<sup>40</sup> Located in the state of Rio Grande do Sul, close to Brazil's border with Uruguay.

## SOCIO-ECONOMIC PROFILE

Unlike small-scale artisanal fishers, industrial fishers are not among the poorest in society, though most come from disadvantaged backgrounds, and nearly half of all crew members lack a primary education.

Despite their relatively comfortable income (by Brazilian standards), crewmembers endure extreme danger and grueling conditions working at sea for weeks at a time, hundreds of kilometers from shore. Death at sea is not uncommon, and career-ending injuries risk pushing individuals back into financial hardship. The work is physically and emotionally challenging, and fishers are only able to spend a few days a month with family and friends on shore. Because fishers are paid a portion of the total landings value, they share risk in the overall enterprise and their livelihoods are constantly under threat from stock declines, landings variability, bad weather, equipment failures, and fisheries policy.

Because fewer vessels are needed to harvest up to allowed harvest levels, landings per crew member per year are much higher in industrial fisheries. In the monkfish gillnet fleet, this landings number is nearly 50 mt per crew member per year — significantly more than the 1 to 3 mt that near-shore, small scale fishers land per year in Brazil's artisanal fisheries.<sup>41</sup>

The larger commercial vessels have several crewmembers, averaging between 5 and 15 people per vessel in the domestic fleet. There is also a hierarchy of command, with corresponding income stratification. The captain, who may or may not be the vessel owner, is in charge, often with a trusted, experienced first mate managing fishing operations on deck while the captain maneuvers the boat. Because these vessels go to sea for weeks at a time, commercial vessels will often have a full-time chef onboard.

Unlike small-scale fisheries, there is a strict division of labor, and deckhands will generally be assigned different tasks based on experience and skill. The deckhands may be further stratified by their job or experience level, though this is not always the case.

Crew members, particularly deckhands, are often migrants from poorer rural areas, sometimes only for a specific season, and may work in multiple fisheries depending on seasonal activity and restrictions. As a result, there is very little data on where the crew members come from, and the level of community impact that fisheries improvements might achieve. What is clear, however, is that fishers in general, especially deckhands, come from among the least privileged sectors of society in Brazil.

The state of Santa Catarina, home to the port of Itajaí, ranks first among Brazilian states in terms of median income, education, and public health, and its literacy rate of 95% ranks it among the top three states in the country.<sup>42</sup> Yet in a recent survey by the regional fishing association, 49% of fishermen in the state had not completed primary school, and only 14% had graduated from high school.<sup>43</sup> While hard to quantify, illiteracy is a problem, with levels much higher than the regional average, according to vessel owners.<sup>44</sup> The average age of commercial fishermen in southern Brazil is between 40 and 42 years of age, and nearly all are male.

Despite the low education levels and disadvantaged upbringings of many crewmembers, commercial fishing is relatively lucrative, in large part to compensate for the hardships of the job. Income levels in the São Paulo based trawl and gillnet fleet range from \$2,100 to \$8,500, (\$5,300 average), close to the average annual incomes of \$5,600 in the southern region of the country, and higher than average incomes for workers without a primary school education (\$3,000) and with a primary but not a high school education (\$3,500).<sup>45</sup>

<sup>41</sup> This number is representative of harvest levels in other small scale fisheries in Brazil based on conversations with fishers and other fisheries we've evaluated; however, it will ultimately depend on factors such as the species harvested, relative species abundance, and gear type used.

<sup>42</sup> "Ideb: Santa Catarina supera metas e lidera entre os Estados - Terra Brasil". Noticias.terra.com.br. Retrieved 2014-08-03.

<sup>43</sup> SINDIPI, 2008. "Diagnóstico da Cadeia Produtiva da Pesca nos Municípios do litoral centro-norte catarinense."

<sup>44</sup> Personal communication.

<sup>45</sup> Brazil's Institute of Geography and Statistics (IBGE), 2010. "2010 National Demographic Census."



## THE SAPO IMPACT STRATEGY

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### IMPACT INVESTMENT THESIS

The Sapó Strategy proposes a \$11.5 million investment to stabilize and restore the Brazilian monkfish stock biomass to 100% of its estimated stock biomass at maximum sustainable yield ( $B_{MSY}$ )<sup>46</sup> (estimated at 63,000 mt) over an 11-year period, reduce the bycatch of unwanted and threatened species by 75% annually, and feed more people by increasing monkfish landings by nearly 5.0x. This would also deliver an estimated 7.5 million additional, sustainable meals to market over the 11-year investment horizon.

The impact investment thesis underpinning Sapó is supported by the following four impact drivers:

1. A 40%–60% reduction in both legal and IUU (illegal, unreported, and unregulated) monkfish landings by trawl vessels, resulting from vessel buybacks, catch limits, and management improvements to the trawl fishery.
2. A 75% reduction of juvenile monkfish catch, further enabling stock recovery and stabilization.
3. The implementation of science-based bycatch mitigation strategies in order to reduce total bycatch by 50%, reduce threatened-species bycatch by 75%, and decrease total discards by 60%.
4. The use of financial incentives to reward fishers for compliance with fisheries management improvements, including a 25% ex/vessel price premium and a vessel licensing concession arrangement in which participating CatchCo fishers will be able to use the vessels and infrastructure, while CatchCo would retain 60% of the total value of the catch to pay out to fishers and fund social benefits.

Upon the investor commitment of \$11.5 million to establish MarketCo, the capital would be deployed in stages over an assumed 7-year period, as follows:

**Step 1:** Invest \$750,000 out of the opening FMI reserve fund to pay for robust monkfish stock and bycatch assessments across both gear types; this will enable researchers to collect baseline data, establish sustainability targets, determine the feasibility of achieving these targets, collaborate with stakeholders, and define the scope of management improvements.

**Step 2:** Secure binding regulatory commitments from fisheries authorities and stakeholders in partnership with leading NGO policy advocates prior to committing to commercial investment; this will ensure that authorities implement and enforce strict, science-based access limits and vessel quotas for the double-rigged trawl fleet.<sup>47</sup>

**Step 3:** Fund a \$2.8 million voluntary trawl vessel buyback program to retire up to 15 trawl vessels currently fishing monkfish during the first two years, reducing overall trawl fishing effort<sup>48</sup> and eliminating juvenile monkfish catch by up to 75% with the transition to deep-water gillnets.

<sup>46</sup> Level of stock biomass at Maximum Sustainable Yield (MSY), which is the theoretically largest yield (or catch) that can be taken from a species' stock over an indefinite period without impairing the fishery or driving it to collapse.

<sup>47</sup> Step 2 is a critical lynchpin for this strategy to be in a position to succeed.

<sup>48</sup> Dependent upon Step 2 to limit catch/vessel and establish overall TACs.

- a. Negotiate with the government to obtain either purchase options or right of first offer on any new licenses/quota issued for the gillnet fishery due to TAC increases resulting from better management.
- b. Study the socio-economic profile of both the trawl and gillnet fleets' crews, evaluate opportunities to bring former trawl crews into CatchCo and better address their needs.

**Step 4:** MarketCo would deploy the remaining \$750,000 in FMI reserve funds to implement a comprehensive fishery management improvement program in the monkfish gillnet fishery, which would be administered by CatchCo and funded over the long-term by MarketCo's commercial revenues. The management improvements would target:

- a. Significant reduction of bycatch – Particularly threatened species, by means of Step 1's recommended actions
- b. Monkfish stock recovery and stabilization at near  $B_{MSY}$  – Based on initial stock assessment data, develop and fund a plan to sustainably optimize yields over time, managed with strict TAC and vessel quota,
- c. International market-recognized sustainability designation(s) such as Marine Stewardship

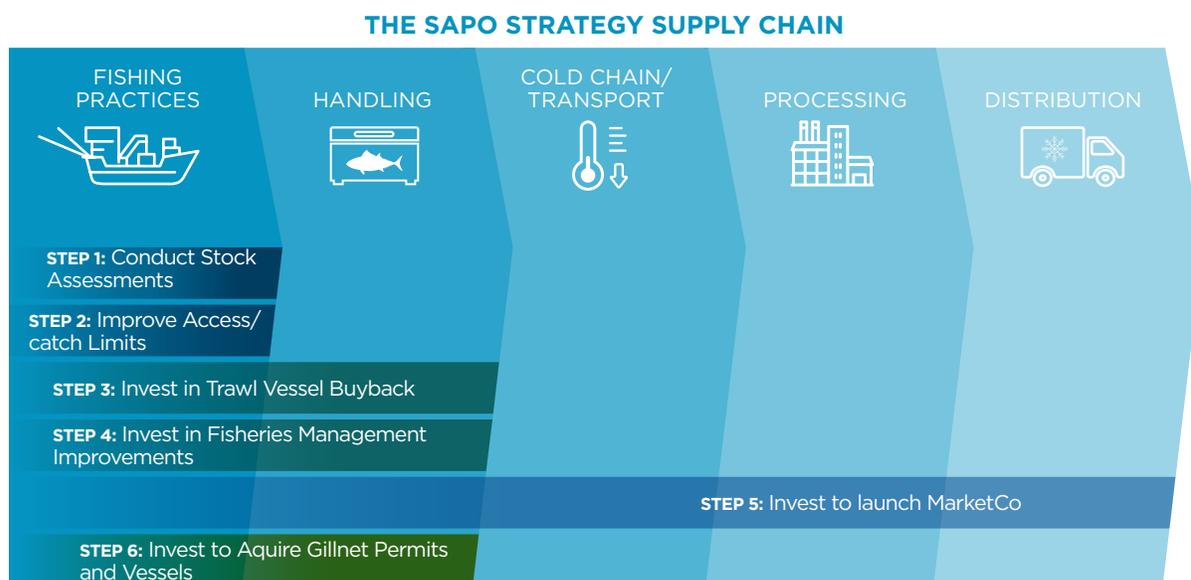
Council ('MSC') certification and SeafoodWatch "best alternative" labels

**Step 5:** In parallel with Step 4, invest \$2.0 million to launch MarketCo's asset light processing, distribution, and marketing business, and partner with leading gillnet operators to establish "CatchCo", an independent NGO serving as a sustainable monkfish fishers association to recruit, train, and employ fishers, provide social benefits, administer a Sustainable Fishing Rewards Program (SFRP) and implement fisheries management improvements (FMIs).

- a. Establish two subsidiaries under MarketCo, an operating company (OpCo) and an fisheries infrastructure asset company (AssetCo)

**Step 6:** Invest up to \$5.0 million in staged investments to exercise purchase options<sup>49</sup> on quota and licenses and expand the gillnet fleet under AssetCo<sup>50</sup> ownership as the stock recovers and TAC increases. The AssetCo investments would also include construction of two different landing facilities and in-house processing facilities as product volume scales up and project risks fall. These capital expenditures are assumed to be partially funded by commercial mortgage loans and cash flow from ongoing MarketCo business operations.

FIGURE 4: The Sapo Strategy's Supply Chain Interventions



<sup>49</sup> Obtained through the retirement of the double rigged trawl vessels.

<sup>50</sup> AssetCo is a subsidiary under MarketCo that holds all of the hard infrastructure assets, while the other subsidiary, MarketCo's Operating Company, would seek an asset light strategy.

Steps 1 through 4 are described in the Impact Strategy section of this report, while Steps 5 and 6 are described in the Commercial Strategy section of the report, but are highlighted herein as they serve as the cornerstone to the financial incentives that can be utilized to ensure durable sustainable

fisheries practices over time. If successful, The Sapo Strategy would catalyze government reform and implement significant management improvements, the combination of which would constitute a sustainable management regime for the directed gillnet monkfish fishery.

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### STEP 1: EVALUATE FEASIBILITY THROUGH INVESTMENT IN ROBUST FISHERIES RESEARCH

Because there have been no formal stock assessments of the fishery for nearly fifteen years, The Sapo Strategy recommendations are preliminary in nature. As a first step, investors must therefore invest \$750,000 to undertake an updated assessment of the monkfish stock in S – SE Brazil, as well as updated bycatch and habitat impact

assessments for both the double-rigged trawl and the gillnet fisheries. The assessments would allow investors to refine and solidify their plans before making significant investments. If found to be unfeasible at this stage, the Sapo thesis should either be modified or abandoned.

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### STEP 2: ESTABLISH AND ENFORCE ACCESS LIMITATIONS AND OTHER REGULATORY COMMITMENTS

To achieve a restoration and stabilization of the monkfish biomass, there must be an effective vessel and catch limitation in place in the fishery. The financial distress faced by trawlers currently discourages new entrants, but as the fishery recovers management efforts may be threatened by the same “tragedy of the commons” dynamic that created the problem initially.

The Brazilian Ministry of Fisheries was disbanded in October 2015 and its functions rolled into the powerful Ministry of Agriculture. Since most of the management reform elements outlined herein require stable, science-based policies and effective enforcement, this structural change may pose a short-term challenge while the new management framework is established. Sustainable fisheries impact investors, hoping to capture landings value and stock recovery upside, would likely find this proposition to be prohibitively risky without the assurance that the resource will be protected from overfishing and illegal harvesting.

Equally important is that fishing licenses and landings are protected from “dilution” caused

by unanticipated fleet expansion. This should be ensured by implementating a program of catch shares that allow the investor to hold a pro-rata quota in the fishery as a de facto property right. This quota would then increase in value as fisheries management investments lead to stock recovery and increased TAC.

Sapo proposes a collaboration with conservation partners to request that the management authorities implement the following elements into a new monkfish fishery management plan:

1. Establish a science-based TAC for the entire monkfish stock, with total limits for each gear type and vessel quotas.
2. Implement regulations to enable the effective conversion of trawl quota and/or licenses to gillnet.
  - a. Secure purchase options, or a right of first offer, on any new gillnet licenses/quota that are issued during the 11-year investment period in exchange for MarketCo’s funding of FMI efforts.

3. Cap double-rigged trawl vessel licenses at the number of vessels currently fishing, up to a maximum of 25 (before the vessel buybacks/retirements described in Step 3), and set individual vessel quotas based on the TAC.<sup>51</sup>
  - a. Enforce catch limits, minimum catch size, no-take zones, and seasonal closures based on assessment results.
4. Clarify procedures and tenure of vessel license and quota allocations, and provide strong legal guarantees against arbitrary seizure and/or dilution of licenses and quota.
5. Limit new gillnet licenses/quota to sustainable, science-based TAC levels, to be reviewed every two years.
  - a. Issue no new licenses/quota to the double-rigged trawl fleet as the TAC increases.
6. Secure a government commitment to assume all costs of biannual stock and bycatch assessments after the Sapó Strategy investment period ends.<sup>52</sup>
7. Secure commitments to equip fisheries authorities with the resources to enforce against and prosecute IUU fishing activity.
8. Establish a minimum catch size of 50 cm to minimize the capture and sale of juvenile individuals.
9. Implement and enforce no-take zones, closed seasons, and rotating fishing grounds based on recommendations gleaned from the stock and bycatch assessments, to be reviewed every two years.

### STEP 3: TRAWL VESSEL BUYBACK PROGRAM

Upon securing government management commitments, Sapó proposes implementing a double-rigged trawl vessel buyback program to reduce fishing effort.<sup>53</sup> The result would be a decrease in the juvenile monkfish catch, and other bycatch, while protecting seabed habitat. Shifting monkfish catch volumes from the trawl to the gillnet fishery should strengthen the business model and operations of MarketCo and CatchCo, while helping to fund critical management improvements. Specific elements of the vessel buyback program would include:

1. Invest \$2.8 million to acquire up to 15 of the remaining trawl vessels and licenses (assuming a cap is established as described in Step 2).
2. Permanently retire the associated trawl vessel licenses in order to lower the cap on licenses, and in return for the \$2.8 million buy-back investment, receive a guaranteed, enforceable purchase option on any additional gillnet licenses and quota that may result from TAC increases as the stock recovers in the future.
3. Study the socio-economic profile of both the trawl and gillnet fleets' crews, understand what their needs are and how these should be addressed, and evaluate opportunities to transition the former trawl crews into CatchCo and better address their needs.
4. Transition willing trawl vessel captains and crew to the gillnet fishery as a livelihood alternative.
5. Scrap the trawl vessels, thereby ensuring that they are not redeployed at a future date or into other fisheries.

<sup>51</sup> There are currently an estimated 8 to 12 such vessels actively fishing in the region.

<sup>52</sup> Sapó will assume all scientific assessment costs during the first 11 years.

<sup>53</sup> Remaining trawlers would be subject to TAC limitations both for that gear-type and on a per vessel basis.

#### STEP 4: FISHERIES MANAGEMENT IMPROVEMENTS

In parallel to the trawl vessel buyback program and associated regulatory reform, Sapo would implement comprehensive fisheries management improvements (FMIs) for the gillnet fishery, with the goal of Marine Stewardship Council (MSC)

certification. The FMIs would be designed to dovetail with the Brazilian fisheries authorities' regulatory commitments, and would include the components of the MSC Fisheries Improvement Project, including the following key elements:

CORE FISHERIES MANAGEMENT COMPONENTS	ACTIVITIES	PROPOSED MANAGEMENT IMPROVEMENTS
Stakeholder Engagement	Government Engagement	<ul style="list-style-type: none"> <li>In addition to the regulatory reforms sought in Step 1, assist the government to create and implement a regional fisheries management committee                             <ul style="list-style-type: none"> <li>Ensure regular meetings and processes</li> <li>Convene committee representatives from industry, NGOs, government, and academia</li> </ul> </li> </ul>
	Community Engagement	<ul style="list-style-type: none"> <li>Create a committee to lead and manage the FMIs, centralize reporting, assign tasks, update indicators of Fisheries Management Improvements progress and monitor milestones and deadlines</li> <li>Prepare and publically disseminate annual report on FMI progress against target benchmarks, with external audits every three years</li> </ul>
Policy Rules and Tools	Fishery Management	<ul style="list-style-type: none"> <li>Based on the updated information gleaned from the bycatch studies, the FMIs must develop and implement a plan for reducing bycatch in the monkfish gillnet fishery                             <ul style="list-style-type: none"> <li>Actions would likely include increasing gillnet mesh size from 280mm to 320mm, identifying and expanding no-take zones with seasonal restrictions, capping maximum soak times for nets,<sup>54</sup> and requiring net tracking beacons</li> </ul> </li> <li>Implement minimum monkfish size restriction of 50cm</li> <li>As dictated by feasibility study and scientific assessments in Step 1, develop a robust management plan for the remaining trawl vessels</li> </ul>
Reduce Fishing Effort	Improve Access Limitations	<ul style="list-style-type: none"> <li>See Step 2</li> </ul>
	Trawl Vessel Buyback	<ul style="list-style-type: none"> <li>See Step 3</li> </ul>
Compliance	Catch Accounting	<ul style="list-style-type: none"> <li>Design, implement and operate an electronic Catch Documentation System (CDS)</li> <li>Reestablish an onboard observers program for the gillnet fleet, with data collected using eLogs</li> <li>Structure and implement a program to monitor the landings of the gillnet and trawl fleets that harvest monkfish</li> </ul>
	Product Traceability	<ul style="list-style-type: none"> <li>Design and implement full traceability system from point of capture to final sale</li> </ul>

<sup>54</sup> Precedent studies on foreign charter vessels leaving nets in the water for 4.5 to 5 days have indicated serious bycatch concerns with lower quality product and significant discards, while local fishers experimenting with soak times of less than 48 hrs. have indicated successful reduction of bycatch, product degradation, and discards without financially punitive commercial implications such as lower catch volumes or higher operating costs.

CORE FISHERIES MANAGEMENT COMPONENTS	ACTIVITIES	PROPOSED MANAGEMENT IMPROVEMENTS
	Biological Monitoring and Assessment	<ul style="list-style-type: none"> <li>• Fund and publish scientific reports based on primary and secondary research on bycatch impacts and proposed mitigation strategies</li> <li>• Fund ongoing bycatch assessments and research to quantify the impacts of mitigation strategies, course-correcting as needed</li> <li>• Fund research to map out sensitive ecosystems, bycatch “hotspots”, and spawning grounds</li> <li>• Undertake a new stock assessment including the last data available in order to update information regarding the current status of the resource</li> <li>• Update the MSY derived TAC benchmarks for management</li> </ul>
	Local Enforcement Systems	<ul style="list-style-type: none"> <li>• Install Vessel Monitoring Systems (VMS) on all vessels in the gillnet and trawl fisheries</li> <li>• Implement strict sustainable management covenants with CatchCo, as the operator of the gillnet fleet, with appropriate rewards and penalties to ensure compliance</li> <li>• Stipulate to CatchCo fishers under a long-term supply agreement that in exchange for access to the fishery and productive assets, operators must implement the fishery management plan, meet product quality control standards, ensure proper maintenance and care of assets and meet supply commitments over the investment period</li> <li>• Any CatchCo member found to be in violation of the agreement is subject to forfeiture of access to the fishery and any benefits derived through the CatchCo membership/consortium structure</li> <li>• This structure is legally enforceable and would create a self-policing mechanism in which the CatchCo leadership could impose a wide variety of punitive measures upon those members who violate the terms of the agreement</li> </ul>
	Fisher Financial Incentives	<ul style="list-style-type: none"> <li>• Flat 25% ex/vessel premium in price paid to CatchCo, and guaranteed offtake by MarketCo</li> <li>• CatchCo equity stake (10%) in MarketCo</li> <li>• Additional premiums for the harvest and sale of high-quality fresh product and MSC certification</li> <li>• A Fishery Benefit Trust would offer social support in the form of insurance, training, risk sharing, and microlending services through the CatchCo structure, funded by a portion of CatchCo’s 60% share of net landings value<sup>55</sup>; the specific products and benefits offered would be determined as part of the socio-economic needs assessment and stakeholder collaboration mentioned under Step 3</li> </ul>

## MANAGEMENT AND IMPLEMENTATION

Sapo would first partner with and fund leading university researchers, local consultants and conservation NGOs to undertake scientific assessments of stock status and bycatch, and formulate a comprehensive, long-term fisheries management plan to address deficiencies. CatchCo would serve as the implementing partner of the

FMI outlined in Step 4, while serving as a partner in managing the trawl vessel buyback program.

In addition, Sapo would try to establish partnerships with international marine conservation NGOs to advocate for policy reforms and management improvements for the deep-water fleets of southern Brazil. The NGO’s role would be to help define critical elements of the fishery management improvements,

<sup>55</sup> CatchCo will receive 60% of the landings value per trip after trip expenses have been paid out, less a CatchCo concession administrative fee of 2.75% paid to MarketCo.

and would lead the Sapó Strategy's engagement with Brazilian fisheries authorities. Finally, Sapó would formalize partnerships with key stakeholders involved in the fisheries management improvements, including NGOs, research institutions, government, the Marine Stewardship Council, and a newly-formed demersal fishery management committee.

To ensure proper implementation and ongoing compliance, Sapó plans to use third-party verification and auditing of the fisheries management improvements to create additional discipline and accountability. The auditors will be asked to review monthly reports provided by CatchCo and the implementing partners, and to conduct formal annual reviews and surprise audits of fishing practices and management systems.

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### SUSTAINABLE FISHING REWARDS PROGRAM

The primary justification for establishing CatchCo as an independent, non-profit association for fishers and vessel operators is to have a vehicle through which to administer the Sustainable Fishing Rewards Program (SFRP). The SFRP encompasses the raw material premiums, the share of net landings value

paid to CatchCo, and 10% equity in MarketCo. The CatchCo SFRP structure serves as a strong incentive for members to implement and manage sustainable fishing practices, ensure improved handling and high quality product delivery, and guarantee that MarketCo's infrastructure assets are well-maintained.

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### RAW MATERIAL PREMIUM

Under the Sapó base case, MarketCo pays a flat 25% premium to prevailing monkfish ex/vessel prices when fishers meet the sourcing criteria and fisheries management requirements. These activities can be closely monitored by MarketCo, as the vessel owner, through investments in onboard cameras, VMS, eLogging capabilities, temperature sensors for the hold, and onboard observer

coverage, among others. All payments made to fishers for their 60% of the product value would be paid to CatchCo, which would equitably and transparently distribute the majority of the funds to the captain and crew. The remaining portion would be withheld by CatchCo to be applied to a Fishery Benefit Trust (FBT).

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### THE CATCHCO FISHERY BENEFIT TRUST

The FBT would pay for additional benefits for fishers such as health insurance, disability, family support services, health and wellness benefits and ongoing training and educational opportunities. In addition, it would serve as a risk pooling component, and a small part would be paid out to all members as a quarterly bonus to support those fishers who suffer bad luck and are affected by idiosyncratic volatility in weather, prices or harvest. Depending upon its ultimate structure (to be co-created with the CatchCo fishers themselves), the FBT could also be designed to help buffer fisher earnings over multiple years as well, aggregating savings during the good years which are invested in the fund and paid out to fishers during the lean years. As it grows, a portion of this fund could serve as a micro-lending facility

for qualifying members who are in need of financing and are shut out by traditional banking channels. The exact budgets and priorities of the FBT would be determined through the socio-economic needs assessment and stakeholder collaboration process mentioned under Step 3. The base case assumes that 70% of the premiums paid out go to fund the FBT, which is 16.9% of total CatchCo landings revenues.

The FBT would also hold the 10% in MarketCo equity assigned to CatchCo, which would be paid out to the FBT following the successful exit of the investment (assumed to occur in Year 11 under the base case model). This would endow the FBT going forward, and support CatchCo members after the end of the investment period.

### FISHERIES MANAGEMENT IMPROVEMENTS BUDGET

The fisheries management improvements are estimated to require \$1.5 million in up-front investments to cover up to the first 4 years of the program, after which point the ongoing management expenses would be funded out of MarketCo's commercial operations. The total cost in constant 2015 dollars would be \$5.2 million over the ten years, averaging \$476,000 per year, which would pay for stock assessments, data

collection, bycatch studies, mitigation plans, the reestablishment of a fisheries management committee, and project implementation/administration (Figure 5). Over time Sapó's costs would diminish dramatically as a share of the projected monkfish revenue, illustrating the power of long-term stock improvements and raw material availability (Figure 6).

FIGURE 5: Cost Structure of Fisheries Management Improvements Budget

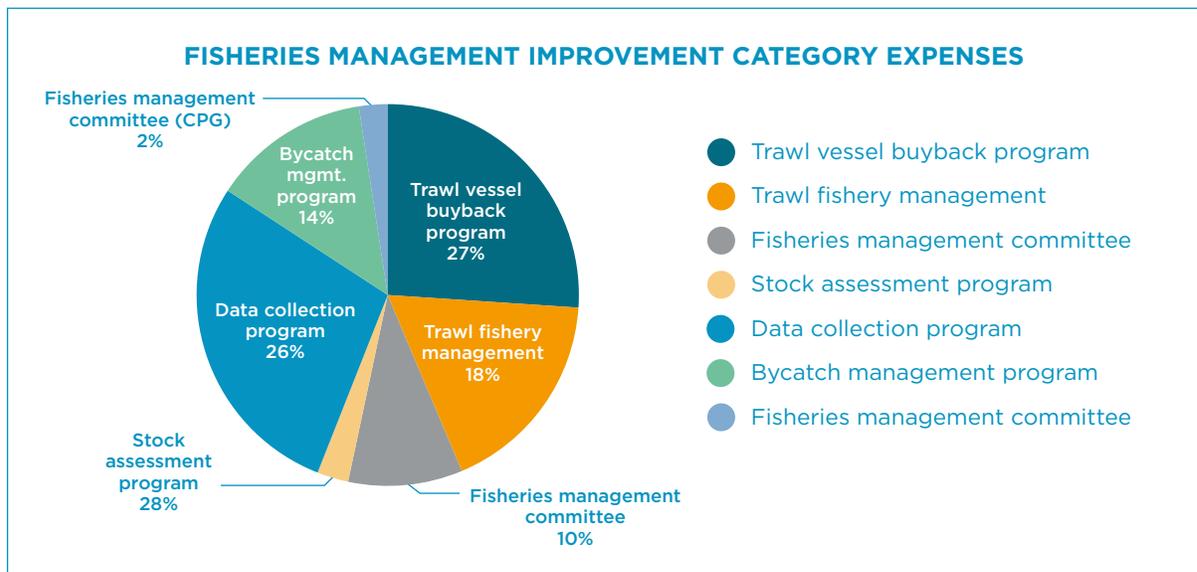


FIGURE 6: FMI Expenses as a Percentage of MarketCo Revenue Over Time

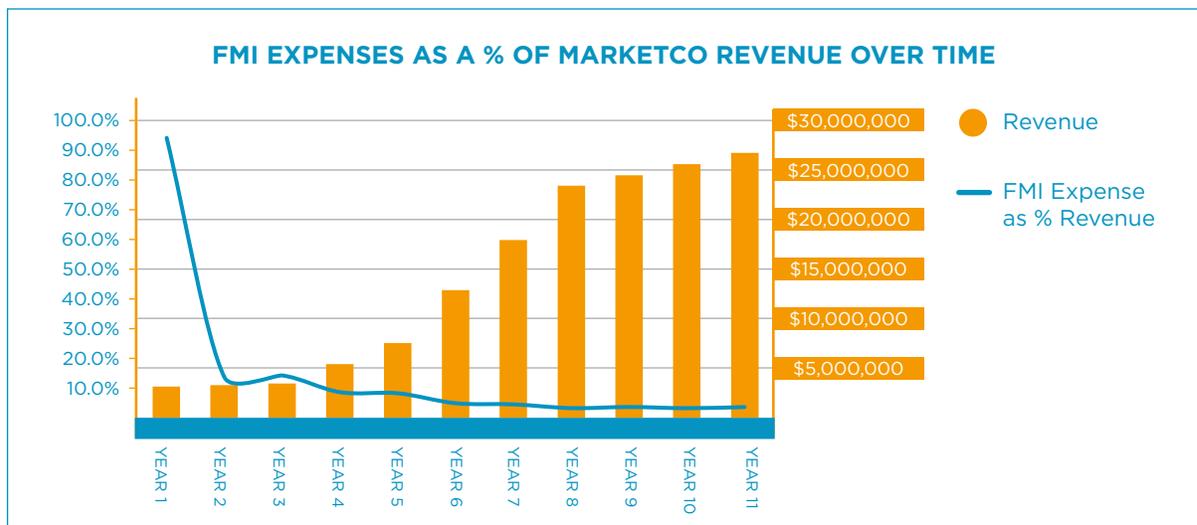
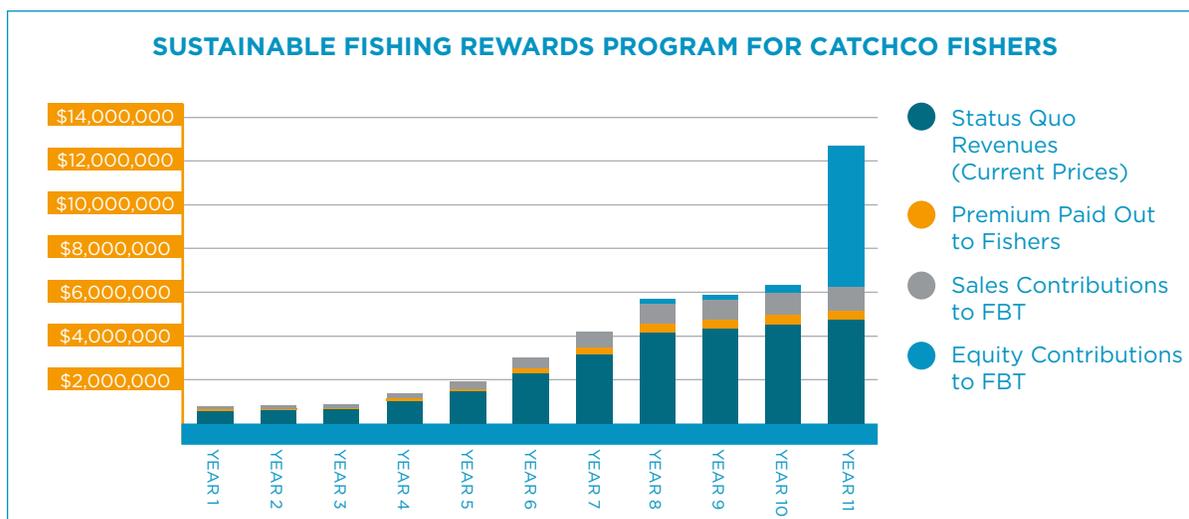


FIGURE 7: Sustainable Fishing Rewards Program for CatchCo



**TARGETED ENVIRONMENTAL IMPACTS**

Sapo targets a range of social and environmental impact returns, as follows:

ENVIRONMENTAL IMPACTS	
<b>Biomass Restoration</b>	<ul style="list-style-type: none"> <li>Stock increases of between 25-100%, in order to reach 63,000 mt <math>B_{MSY}</math> (current biomass is unknown, but believed to still be significantly below <math>B_{MSY}</math>)</li> </ul>
<b>Bycatch Reduction</b>	<ul style="list-style-type: none"> <li>Reduction of monkfish juvenile catch by 75%.</li> <li>Reduction of wreckfish catch by 80%, angel shark catch by 80%, and royal crab catch by 50%</li> </ul>
<b>Time Horizon</b>	11 years
SOCIAL IMPACTS	
<b>Increase in Meals</b>	<ul style="list-style-type: none"> <li>Estimated at 7.5 million additional meals per year at the end of Year 11<sup>56</sup></li> </ul>
<b>Employment growth</b>	<ul style="list-style-type: none"> <li>Growth in gillnet vessel crew employment from 18 to 90 people as the fleet scales up under the sustainable management regime; while many of these crewmembers are anticipated to transition from the unsustainable trawl fleet, that fishery is already facing severe financial distress and layoffs, as well as regulatory threats, and may not be a viable long-term option in any case for most of these fishers</li> <li>MarketCo business operations will create approximately 100 new jobs</li> </ul>
<b>CatchCo Security and Income Benefits</b>	<ul style="list-style-type: none"> <li>Fishers who join CatchCo will be paid 25% above prevailing first-sale prices for following sustainability guidelines, in addition to 10% premium for fresh product (reflecting higher market prices of fresh vs. frozen)</li> <li>Access to insurance products, healthcare, working capital, emergency reserve funds and risk pooling options will be evaluated and formulated together with members of CatchCo during Year 1</li> <li>Under CatchCo, vessel crew would be provided with education and job training opportunities to expand skills in other areas as demanded</li> </ul>
<b>Social Impacts of Trawl Fleet Management</b>	<ul style="list-style-type: none"> <li>Closely study the implications of trawl improvements as part of the buyback program, and determine how best to transition trawl crew to either the CatchCo structure or other opportunities – given the economic challenges faced by the trawl fleet during the past several years, many people have already left this fishery and current vessel owners are eager to sell their aging, inefficient, costly vessels</li> <li>Due to these circumstances, and the desire of so many to “escape” this fishery and transition to something more lucrative, we anticipate minimal, if any, net negative social impacts; however, this will be closely monitored</li> </ul>
<b>Time Horizon</b>	11 years

<sup>56</sup> Based on total landings increase by the gillnet fleet over the life of the project, calculated assuming a 200g portion size.



## THE SAPO COMMERCIAL STRATEGY

### STEP 5: LAUNCH AND OPERATE MARKETCO

#### A VALUE PROPOSITION

Sapo's value proposition is premised on five key drivers: (1) implementation of fisheries management improvements that restore and stabilize the stock biomass, allowing for total gillnet monkfish landings to increase by over 400% by Year 11, from the current 600 mt to 3,250 mt (85.5% of the assumed 3,800 mt sustainable TAC in place by Year 11, with the trawl fleet assigned the remaining 14.5%); (2) operating efficiencies gained through vertical integration of the supply chain; (3) accessing new, higher-value markets with increased product differentiation accompanying MSC certification and/or SeafoodWatch yellow or green designations; (4) higher-value product mix (including a higher percentage of fresh product); and (5) increased product utilization through sales of livers to high value markets and waste products for fish meal. Sapo estimates that these five factors can generate revenue growth for the CatchCo fishers of 7.9x, or \$3.3 million, and increasing MarketCo's export driven revenues by over 8.4x, or \$23.7 million over the 11-year investment period.<sup>57</sup>

#### SUMMARY OF BUSINESS STRATEGY AND CONCEPT

Sapo proposes to launch MarketCo as a holding company of a set of vertically integrated operations that contribute to harvesting, processing, and distributing monkfish products to primarily European, Asian, and North American buyers. However, operations would initially be structured under an "asset light" OpCo subsidiary, a marketing, distribution, and export company with minimal hard assets, relying on a contract processing partner and third party infrastructure for logistics and other business needs.

However, through a process of phased, debt-financed expansion, MarketCo would ultimately own the hard infrastructure under its AssetCo subsidiary to run a state of the art processing operation, provide vessels to CatchCo, own license and quota (should it be adopted), and develop landing and docking facilities, all of which will meet GlobalGAP, HACCP, U.S. FDA, and EU export requirements and provide full traceability across the supply chain.

<sup>57</sup> As measured by Freight on Board (FOB) values, a commonly used metric which takes assumes revenues received before consideration of any import taxes, tariffs, or shipping costs.

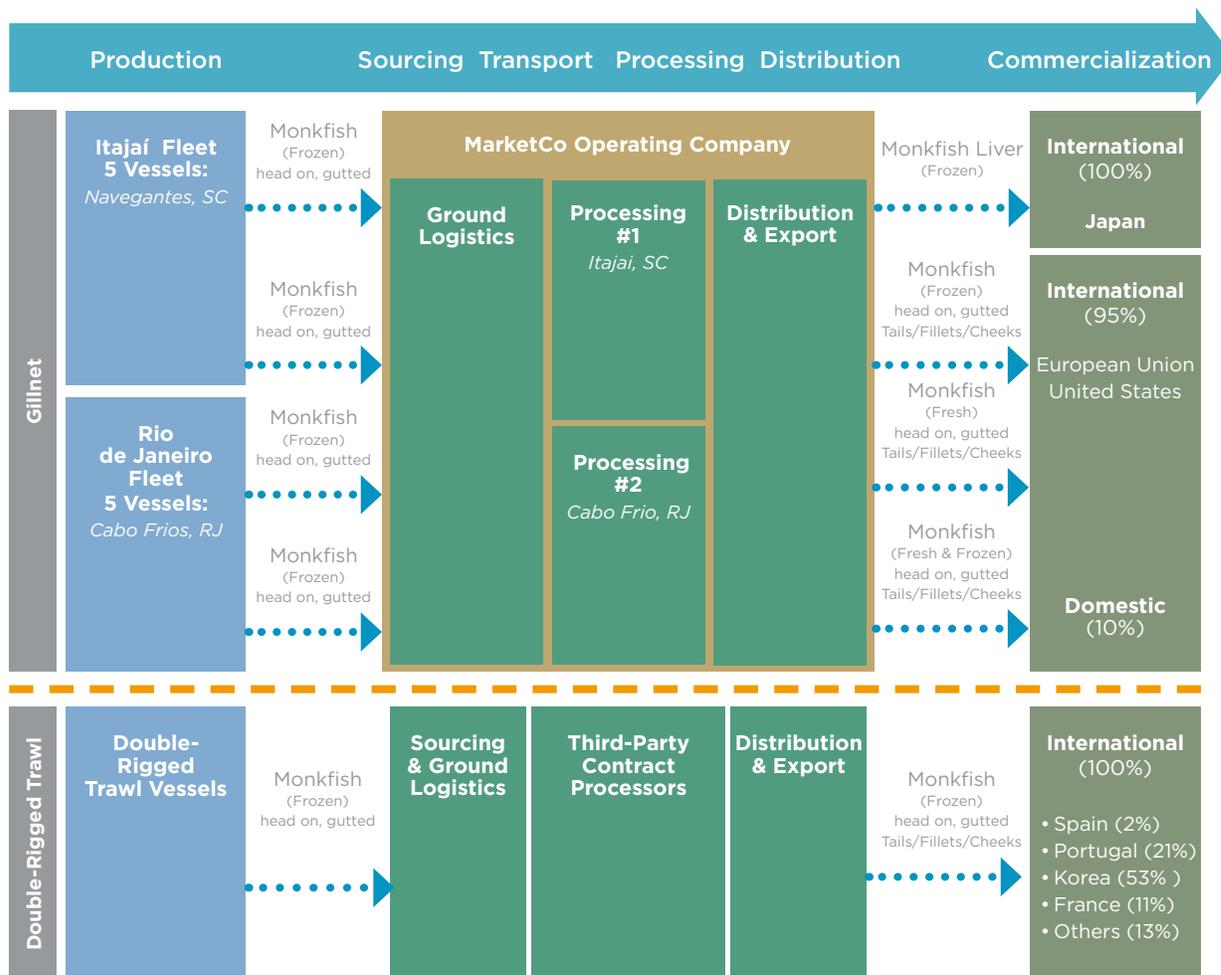
Over a period of 5 years, AssetCo proposes to invest up to \$5 million in equity funded by the MarketCo’s (holding company) Capex reserve cash balance to acquire 8 gillnet fishing vessels, monkfish fishing licenses and quota.

Sapo would install an experienced, mission-aligned management team to lead MarketCo in fulfilling its core functions across the supply chain. In addition, under the “CatchCo” construct, Sapo would partner with an experienced fishing monkfish vessel operator to establish a non-profit association which would manage all on-water gillnet operations through a concession arrangement with AssetCo, provide new crew training to build capacity, offer organizational benefits and risk mitigation products (specifics to

be determined through socioeconomic evaluation and stakeholder engagement). For MarketCo, this arrangement guarantees a stable supply of responsibly harvested monkfish as it funds fishery management improvements across the gillnet fleet. The chart below summarizes the core commercial investments and activities that Sapo would invest in and coordinate (in addition to the fisheries management improvements described above) across the monkfish supply chain:

CATCHCO (PARTNER)	MARKETCO		
<p style="text-align: center;"></p> <p style="text-align: center;"><b>Sustainable Monkfish Production</b></p> <ul style="list-style-type: none"> <li>• Execute vessel leasing agreements with MarketCo</li> <li>• Organize a collective of Fishers to captain and crew the gillnet fishing fleet</li> <li>• Provide exclusive access to gillnet vessels and monkfish licenses</li> <li>• Harvest and deliver monkfish landings</li> </ul>	<p style="text-align: center;"></p> <p style="text-align: center;"><b>Fishing Vessel and License Concessions</b></p> <ul style="list-style-type: none"> <li>• Acquire up to 15 existing trawl vessels and convert linked fishing licenses to gillnet fleet; retire trawl vessels</li> <li>• Acquire up to 9 existing monkfish fishing licenses</li> <li>• Lease vessels and licenses to CatchCo in exchange for long term supply contracts</li> </ul>	<p style="text-align: center;"></p> <p style="text-align: center;"><b>Processing and Packaging</b></p> <ul style="list-style-type: none"> <li>• Construct modern, efficient, and hygienic landing facilities</li> <li>• Construct ice and cold storage system</li> <li>• Lease processing capacity</li> <li>• Construct or acquire new processing facility as landed volumes increase</li> <li>• Ensure product quality for export, including HACCP, Global GAP and country specific qualifications</li> </ul>	<p style="text-align: center;"></p> <p style="text-align: center;"><b>Branding and Marketing</b></p> <ul style="list-style-type: none"> <li>• Cultivate branding strategy to feature MSC certification</li> <li>• Develop marketing strategy and channel to reach higher-value market segments in Europe, Asia and North America</li> </ul>

FIGURE 8: Envisioned Supply Chain Under the Sapo Strategy



## STEP 6: STAGED INVESTMENT IN HARVEST, PROCESSING AND LANDING INFRASTRUCTURE, INCLUDING FLEET EXPANSION AS ALLOWED BY TAC INCREASES

### PHASED VESSEL ACQUISITION AND CONCESSION PLAN

Over a period of 5 years, AssetCo proposes to invest up to \$5 million in equity funded by the MarketCo's (holding company) Capex reserve cash balance to acquire 8 gillnet fishing vessels, monkfish fishing licenses and quota.<sup>58, 59</sup> Under the base case, the purchase of the first vessel is assumed to occur at the end of Year 3; however, the rationale behind staging the investment is to maintain flexibility, and the decision to invest in assets should only be undertaken once project risk is reduced and governance is deemed effective.

The vessel and permit acquisition enable MarketCo to create a de facto long-term tenure over the monkfish resource in order to best capture the expected future value created in the fishery, even if a formal quota system is not established in the interim. It also will be a point of leverage in enforcing compliance with sustainable fishing practices and quality controls (including MSC certification) to achieve the targeted impact returns, to differentiate the product, and to realize the full value of the landed volumes.

<sup>58</sup> The remaining -\$8 million would be financed by commercial mortgage loans secured by the assets themselves - total capital committed to vessels over the 5 years period would be \$12.2 million, including debt and equity.

<sup>59</sup> Note that Sapó anticipates that the vessel acquisitions will be financed in part through commercial-rate bank loans that in combination with the equity investments described enable purchase of \$12.2 million of gillnet fishing vessels over time.

MarketCo would seek to establish a joint venture with CatchCo, a hypothetical fishing vessel operator with experience in the capture and landing of monkfish in Brazilian waters. CatchCo would implement the on-the-water fisheries management improvements, and would receive a concession to operate MarketCo's gillnet vessels and permits, serving as the supplier of the gillnet monkfish landings to the processing and distribution operations of the company. In return, the CatchCo fishers would be able to utilize the vessel and keep 60% of the landings value after trip expenses have been paid out. This compares favorably to current catch sharing arrangements in which crews share 20-50% of the net landings value, and solves a critical problem for operators who cannot afford the risk of purchasing and holding vessels on their personal balance sheet, and do not want to tie up that capital. In addition, individual vessel owners are rarely able to take advantage of tax benefits associated with accelerated depreciation of the assets.

CatchCo's leadership would ideally have a shared vision of long-term stewardship of the monkfish resource and habitat, as well as a demonstrated commitment to sustainable fishing practices. Sapo would seek a co-investment of 10% of the total vessel acquisition cost from CatchCo in order to put CatchCo capital at risk and better ensure alignment of the CatchCo partnership activities and interests.

The vessel concession licensing structure, well-established in industrial fisheries around the world, is analogous to the farming leasehold arrangements and operating partnerships common in large-scale agriculture, in which independent operating companies lease farmland from landowners, then manage farming operations and either pay a fixed lease or share of returns (and associated risks) with the asset owner. The concession agreement MarketCo would execute with CatchCo would incorporate (1) an in-kind concession "payment"

for the use of vessels, in the form of the 40% of remaining catch by value after paying out trip expenses; (2) an administrative fee of 2.75% of the CatchCo net landed value paid to MarketCo to cover administrative expenses; (3) a robust supply offtake agreement; (4) sustainability compliance requirements and covenants, (5) quality standards, and (6) vessel maintenance requirements.

The supply agreement terms would commit a minimum share of monkfish landings, never in excess of Total Allowable Catch volumes (or the associated quota on a per vessel basis), to MarketCo for processing and distribution. This would have two critical benefits. First, before investing in capital infrastructure or marketing activities, MarketCo must ensure a minimum product throughput in order to become profitable. MarketCo's profitability, in turn, drives continued investment back into the fishery management improvements, training, price premiums, and profits for CatchCo. Second, the supply agreement terms and commitments ensure full traceability and sustainable product sourcing. The supply agreement terms would require strict adherence to fisheries management improvements, including catch documentation/vessel logging, areas fished, bycatch reduction tactics, ongoing bycatch data collection and assessment, size limits, and other measures to be defined.

Sapo believes that the vessel concession model can allow fleet capitalization to occur in a managed fashion that coordinates fleet management and logistics and employs sustainable fishing practices. In this manner, the gillnet fishing fleet, growing in size as the monkfish biomass stabilizes and recovers, is actively monitored for compliance, can support traceability of the product, is improving product quality and food safety, and creates opportunities for economies of scale and product differentiation.

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## LANDING FACILITIES

Phased installation of modern landing facilities would likely first occur in Itajai, Santa Catarina, followed by a second investment elsewhere once scale is achieved (with Cabo Frio, in Rio de Janeiro being a promising location). These landing sites would improve the handling of the landed volumes as they are moved from ship to shore, reduce

direct waste of damaged products, and improve the hygiene and food safety compliance of the landing activities. These improvements, in turn, would enable MarketCo to capture higher prices for greater volumes of final products delivered to market, even without any increase in biomass or Total Allowable Catch levels. (See Figure 9).

## PROCESSING AND PACKAGING

Sapo proposes that the initial processing activities be contracted to third-party processing plants during the first 5 years, due to the initially low volumes of raw material and the tremendous uncertainty and risk in making large, debt-financed capital investments before the business model has been validated and the management regime has proven effective and durable.

Eligible processors would need to hold a valid sanitation certificate through the Brazilian Ministry of Agriculture's Federal Inspection Service (SIF, in Portuguese), which is required for sales of finished goods both across state lines and for export. Sapo has identified four third party contract processing facilities with SIF certification: one near a current monkfish landing facility, and at least two other

facilities in the Itajaí region in the process of obtaining SIF status. All four of the eligible facilities are qualified to export frozen product, with only one able to export fresh product, which is held to a much more stringent criteria.

In the second phase of the capital plan, upon achieving raw material landings volumes of close to 2,000 mt, (assumed in year 5 under the base case), AssetCo would invest \$2.2 million in a new, state-of-the-art, in-house processing operation for monkfish and retained bycatch, with a line capacity of 2,000 mt and storage capacity of 500 mt. The processing facilities would be designed to enable efficient processing of both fresh and frozen monkfish for overnight shipment to customers around the world.

## RAW MATERIAL SOURCING STRATEGY AND HARVEST PLANNING

As regulators and scientists gather additional stock assessment data, assuming strong evidence of stock recovery, the total monkfish TAC could be increased to 3,800 mt, 85% of which Sapo assumes to be allocated to the gillnet fishery (~3,250 mt). Assuming that stocks increase, monitoring and enforcement improve, and the science becomes more robust, TAC increases could result in landings of up to 70%-80% of MSY, a level consistent with better-managed monkfish stocks in other parts of the world.<sup>60, 61</sup>

MarketCo's supply agreement and vessel concession program would enable it to source consistent supplies of sustainably harvested monkfish, while sharing 60% of the total net landed value with CatchCo. By reducing catch volumes in the trawl fishery through the vessel buyback program, and elimination of IUU fishing activities, Sapo would enable an increase in gillnet monkfish landings from the current ~600 mt to the current TAC of 1,500 mt. Assuming that the total TAC can be sustainably increased to 3,800 mt as the stock stabilizes and better science informs management, Sapo would consider the expansion of the gillnet fleet capacity accordingly. The current model assumes scaling

the fleet to 10 vessels over the first seven years, in coordination with strict monitoring, best-in-class science, (including frequent data collection, stock assessments, and bycatch assessments), and adaptive management of the fleet in response to research outcomes.

The harvest strategy would ultimately support fleets and processing facilities at each of the two regional hubs (See Figure 9). The first of these will be based in Navegantes/Itajaí. These Itajaí and Navegantes sister cities are separated by the Itajaí-Açu River, which forms a natural deep-water harbor, and serves as the largest commercial fishing port in the country. The port is also the eighth largest export site in the country, in a municipal region of 250,000 people. Because Santa Catarina is the center of Brazil's meat industry, the port specializes in the exportation of perishable food products. Navegantes Airport offers domestic commercial flights to the major hubs in southern Brazil, with 14 daily direct flights to São Paulo and four daily flights to Rio de Janeiro. The fishing grounds along the continental slope are located approximately 170 km due east of the port, or 12 hours by boat.

<sup>60</sup> Using NOAA's proxy measure for monkfish MSY based on pristine biomass, and assuming a pristine biomass equal to the measured biomass in 2001 of 63,000mt, the MSY in this fishery may in theory be as high as ~8,000mt based on comparable numbers from the U.S. monkfish fishery.

<sup>61</sup> Although nearly all global monkfish fisheries fall short on sustainability measures, this is primarily due to the high levels of bycatch and habitat damage associated with the gear types, which is dominated by trawl gear. However, there are several stocks that are currently considered well-managed from a sustainable yield standpoint, including Iceland and North America.

The second hub would eventually be added as sustainable seafood production ramps up after year 8 with monkfish producing at near-MSY and other products being brought into the model. This would likely be in the state of Rio de Janeiro, with Cabo Frio a potential location due to its deep, natural harbor, low traffic, existing fishing industry and processing facilities, and access to fishing grounds. Cabo Frio is located 150 km due east of the city of Rio de Janeiro, which is a 2½-hour trip by truck, and it is home to an

existing processing facility with licenses to process and export frozen fish. Cabo Frio currently processes monkfish caught from the local trawl fleet. A primary attraction is its location on the seaward end of a cape that lies just 100 km from the fishing grounds, cutting travel time to between five and seven hours (depending on vessel type) and enabling the more-efficient sourcing of fresh product, which (unlike frozen fish) cannot remain at sea for more than a few days and still maintain its high quality.

### SALES CHANNELS

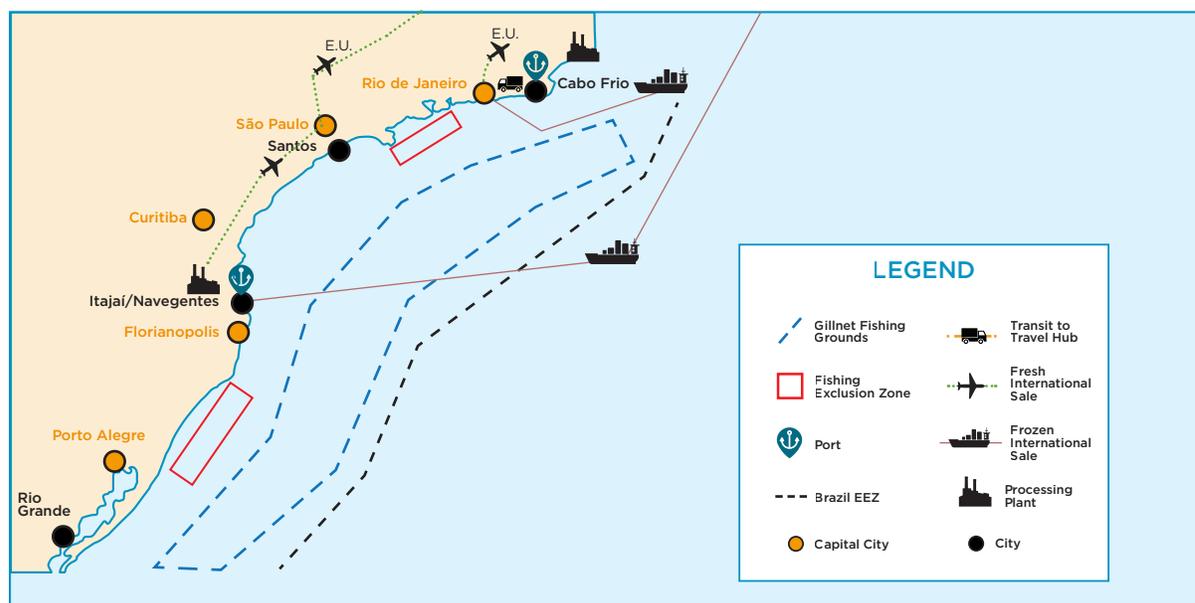
MarketCo's branding and marketing strategy for the monkfish tails would be aimed at direct sales to retail operations such as Migros, Coop, and Waitrose, which are representative of retailers serving relatively affluent customer segments in Switzerland, France, Germany, Spain, and the U.K. Each of the retail customers highlighted herein has made explicit sustainability commitments to source seafood from certified or otherwise sustainably harvested fisheries.

Since at present there are no MSC-certified monkfish fisheries anywhere in the world, Sapó believes that many buyers are eager to access sustainably harvested monkfish products in adequate

volumes. While there is no specific assignment of a "sustainability premium," evidence suggests that well-managed gillnet monkfish products receive a price premium on the order of 7.5% to 15%, particularly when sold to the established EU buyers. Sapó would expect that 100% of sales of monkfish tails be delivered through this channel for the first three years of production.

Livers would be processed into ankimo and sold to food service companies in Japan, with gradual expansion to Japanese restaurants in Brazil.<sup>62</sup> As scale grows, the company would seek large buyers willing to pay higher prices for quality products.

FIGURE 9: Map of Harvest and Route-to-Market Strategy Under the Sapó Strategy



<sup>62</sup> Brazil is home to a large Japanese diaspora nearly as large as that in the U.S., and there are more Japanese nationals living in São Paulo than any other city in the world besides Tokyo.

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The demand for monkfish comes almost entirely from the EU and Asia, as well as a growing North American market. France, Spain, and Portugal were the initial consumers of monkfish, and remain among the top buyers for the product.

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While not initially a significant source of revenues, sales to high-end Brazilian food service should be pursued, cultivating the local market through elite restaurants and the adaptation of “Brazilian-style”

preparations such as “monkfish churrasco.” As foie gras was recently banned in the city of São Paulo, the monkfish liver, often called “foie gras de mer,” could be a popular replacement among wealthy paulistanos.

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### MARKET CONTEXT

Monkfish was considered to be a “trash” fish until the past few decades, having previously been caught only as bycatch by vessels targeting commercially attractive groundfish such as hake and cod. Up until the latter part of the 20th century, it was referred to as “poor man’s lobster,” in reference to the firm, slightly sweet tail-meat similar in consistency to lobster or scallops. However, the product began to take hold in European haute-cuisine during the 1960s and 1970s, particularly in France, and worldwide

production and commercial value began to grow. Its popularity spread to North America (which was a major producer of the product but had no domestic market) during the 1990s, and began to appear as a staple in upscale restaurants during the early 2000’s. Korea and Japan experienced an even more rapid growth in demand for not only the firm white meat of the monkfish tails and cheeks, but also the liver, which is used in a variety of dishes and often prepared as “ankimo”, similar to foie gras and especially sought after in Japan.

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### DEMAND

No longer the “poor man’s lobster,” monkfish is today among the top 10 highest value seafood products in the world, and demand is growing rapidly. Eleven countries constitute 97% of demand for the product, importing approximately \$421 million annually.<sup>63</sup> The demand for monkfish comes almost entirely from the EU and Asia, as well as a growing North American market. France, Spain, and Portugal were the initial consumers of monkfish, and remain among the top buyers for the product. The U.K., Switzerland, and Germany also have strong but somewhat smaller demand, though these markets are somewhat smaller. While the upmarket food service industry has been a primary driver of monkfish demand, there is increasing penetration into the retail grocery segment, as Europeans are learning how to prepare this slightly unconventional fish (Figure 10).

South Korea has become a dominant player in the global market during recent years, such that over 50% of North American exports and ~50% of Brazilian product is destined for this market (Figure 11). Seoul imports ~19,000 mt annually, with a total value of over \$75 million (~\$4-\$5/kg FOB).<sup>64</sup> With the relatively recent boom in popularity, there are now thousands of restaurants specializing in a dish called agujjim, or “braised spicy monkfish,” which sells for \$50 to \$90 a serving. While Europeans demand processed tails and cheeks, Koreans will typically buy the fish whole (gutted), as this market also values the stomach and liver of the fish, in some cases more than the tail meat.

In North America, the market remains somewhat less mature, with strong and growing penetration in the upscale food service segment, especially in large urban centers along the East Coast. However, smaller market food service providers outside of

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<sup>63</sup> FAO FishStat, 2014.

<sup>64</sup> Freight on Board (FOB) value, a commonly used metric which takes assumes revenues received before consideration of any import taxes, tariffs, or shipping costs.

FIGURE 10: Monkfish Product Volume Demanded by Major International Markets

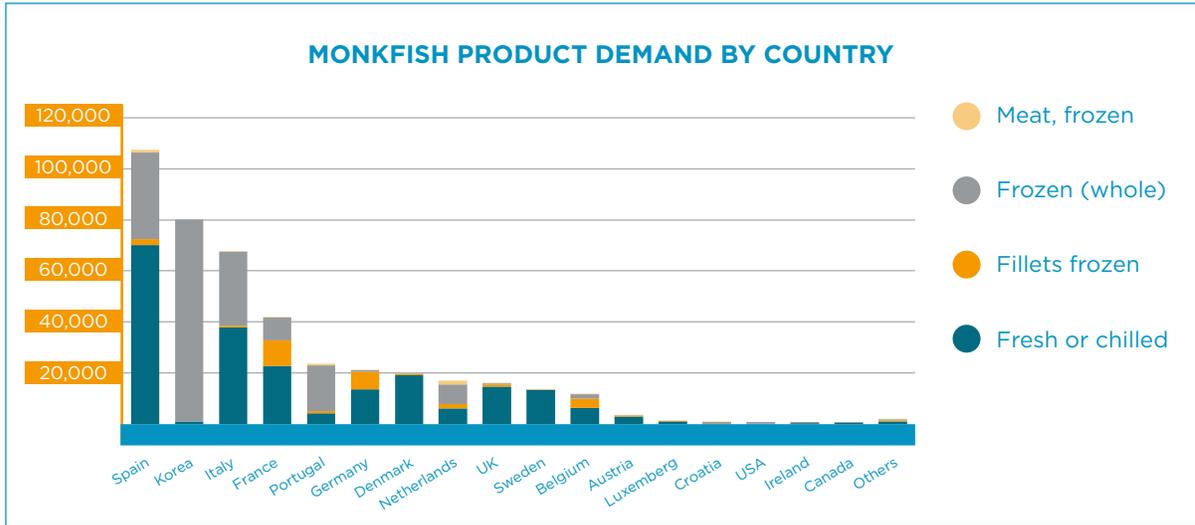
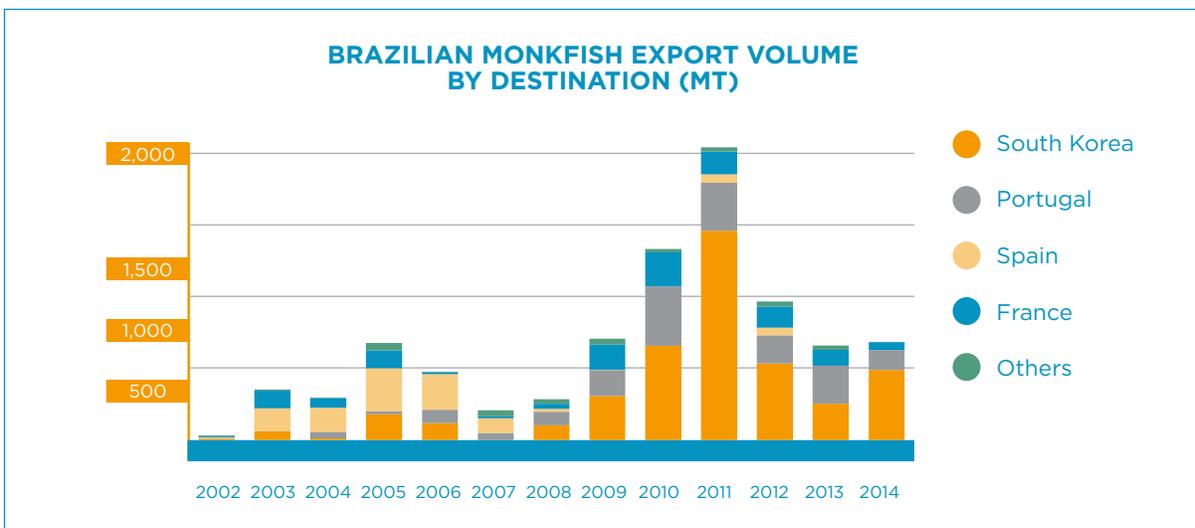


FIGURE 11: Brazilian Monkfish Exports by Destination (2002-2014)



the Eastern Seaboard are still an undeveloped market, and there is likewise relatively little retail demand, as many Americans are not familiar with how to prepare the fish.

Monkfish is virtually unknown as a domestic product in Brazil; however, given its popularity in Portugal, many Brazilians who travel there enjoy it as “*tamboril*”, and do not realize that the same product is available locally back home. While the business strategy is based on an export proposition, there is significant upside potential in developing the domestic market through high-end food service providers, which could command higher margins and would be a valuable hedge against currency fluctuations and domestic inflation.

Buyer power is relatively low for this product, however, because sourcing high-quality, traceable product in adequate volumes is extremely challenging. As a result of this, buyers are effectively “price takers,” despite the fact that in many cases producers are quite fragmented. This dynamic is a result of high barriers to entry, enforced TACs, overfishing in Namibia, and declining CPUE in the European fishery.

High-quality, fresh, product has the highest demand, and may command a price premium of 20%–30% over comparable frozen, trawl-caught fisheries. There is also a strong indication among buyers in the major European monkfish markets

of a willingness to pay an additional premium for MSC certification, as many leading retailers have signed pledges to purchase only MSC certified or Conservation Alliance FIP compliant products.<sup>65</sup> In the absence of MSC-certified product, these retailers are desperate to fulfill growing demand for monkfish while abiding by their sustainability pledges. The challenge faced by most fisheries is the fact that the majority are trawl-harvested, and therefore cannot meet guidelines around bycatch.

Brazil is thus in a position to become the largest global provider of premium quality, gillnet-caught, MSC certified and/or Conservation Alliance FIP compliant monkfish in the world. Ideally, this would have the additional impact of ushering in a shift to sustainable seafood production and consumption in the country, which in time would create a domestic high-end consumer market for responsibly sourced local product at a scale that would support quality and fisheries management upgrades across Brazil’s many fisheries currently under pressure.

FOB price varies by export destination as a result of regional market prices, but also varies in large part due to the nature of the products exported. The products that reach markets in France, for instance, are usually value added filet and tail products that fetch a high price per kilogram when compared with the entire monkfish that typically is exported to South Korea (Figure 12).

FIGURE 12: FOB Product Prices Received by Exporters from Primary Export Destinations



<sup>65</sup> <http://www.solutionsforseafood.org/wp-content/uploads/2015/03/Alliance-FIP-Guidelines-3.715.pdf>

## SUPPLY

While generically referred to worldwide as simply “monkfish,” the product is actually made up of seven commercial species within the *Lophius*

genus, which are effectively pure substitutes. There is little or no differentiation between species in the market (Figure 13).

FIGURE 13: Global Monkfish Species Distribution and Status

SPECIES	ENGLISH NAME	OCEAN	GEOGRAPHY	LATITUDE/ LONGITUDE	MAX L	AVG. L	MAX. WT	MAX. AGE	IUCN REDLIST STATUS
<i>Lophius piscatorius</i>	Angler	N. Sea, NE Atlantic, Med.	N. Scandinavia to Strait of Gibraltar, incl. Mediterranean	75°N - 30°N, 28°W - 46°E	200cm	100cm	57.7kg	24 yrs	Not Eval
<i>Lophius budegassa</i>	Blackbellied angler	E. Atlantic, Mediterranean	British Isles to Ivory Coast of Africa; east to Italy	59°N - 12°N, 18°W - 2°E	100cm	50cm	n/a	21 yrs	Not Eval
<i>Lophius gastrophysus</i>	Blackfin goosefish	W / SW Atlantic	N. Carolina (U.S.), Gulf of Mexico, south to Argentina	39°N - 39°S	90cm	45cm	18kg	19 yrs	Least Concern
<i>Lophius vaillanti</i>	Shortspine African angler	E. Atlantic	African; Cape Verde to Gabon	17°N - 5°S	50cm	40cm	n/a	n/a	Not Eval
<i>Lophius vomerinus</i>	Devil anglerfish	SE Atlantic	Namibia & South Africa	25°N - 37°S, 12°E - 99°E	95cm	50cm	n/a	11 yrs	Near Threatened
<i>Lophius americanus</i>	American angler	NW Atlantic	Canadian Maritimes to Cape Hatteras, NC	60°N - 25°N, 81°W - 52°W	120cm	90cm	22.6kg	30 yrs	Not Eval
<i>Lophius litulon</i>	Yellow goosefish	NW Pacific	Japan, Korea, & the Yellow & East China seas	n/a	100cm	57cm	n/a	n/a	Not Eval

The total annual monkfish landed globally have averaged near ~100,000 mt in recent years, with an average global first sale value of ~\$450 million, or \$5.25/kg. There are six major fisheries globally across the following geographies: (1) North Sea and Barents Sea (including Norway, Iceland, Denmark, and U.K.); (2) North America and NW Atlantic (Canadian Maritimes south to North Carolina); (3) East Asia / South China Sea / East China Sea (China, Japan, Korea, Taiwan); (4) SE Atlantic (Namibia, South Africa); (5) East Atlantic and North Africa (U.K., France, Portugal, Spain, Morocco, Italy); and (6) SW Atlantic (southern/southeastern Brazil). Landings are highest in the East Atlantic/ North African fishery, due to both the large number of EEZs it covers, as well as the abundance of two of the larger monkfish species cohabiting these waters, *L. piscatorius* and *L. budegassa*, which make up about 30% of total landings (Figure 14; Figure 15). The latter fishery was also the first to start harvesting monkfish commercially at scale,

and as such is the most mature and scientifically well-understood. SW Africa produces the second greatest volumes, at 16% of total catch; however, this stock has been listed by the IUCN and others as “Near Threatened,” and suffers from overexploitation, insufficient monitoring, enforcement, and data collection.

Globally, the majority of monkfish landings are via trawl fleets in all fisheries, which make up close to 90% of the total catch. The Asian and Southern Africa fleets are 100% trawl, and the Eastern Atlantic/N. African fisheries have small numbers of gillnet landings but are substantially trawl-directed fisheries as well. The fisheries in the NW Atlantic, SW Atlantic, and N. Atlantic are characterized by both trawl and gillnet, though gillnet is in the minority and made up only about 35% of the North American production, 30-40% of Brazilian landings, and less than 15% of the North Atlantic production as of 2014.<sup>66</sup>

<sup>66</sup> FAO FishStat Dataset, 2015.

FIGURE 14: Global Landings by Country, Species, and Region

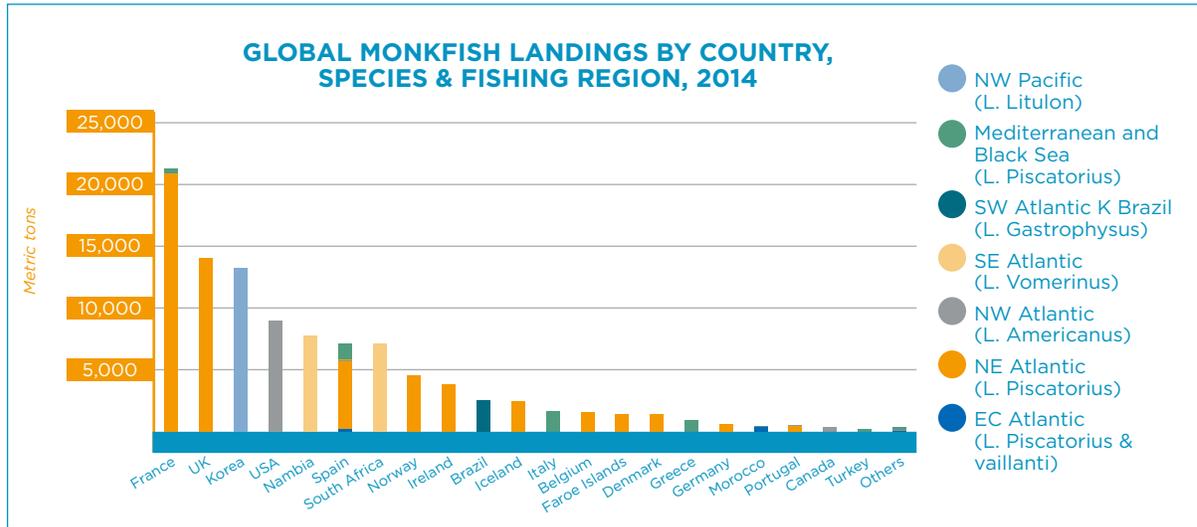
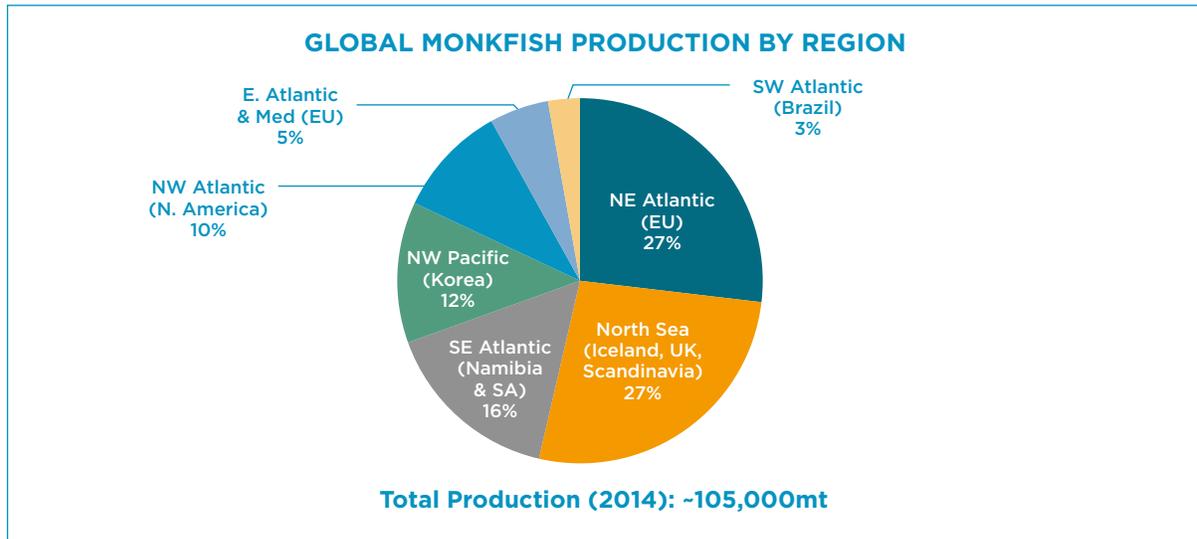


FIGURE 15: Global Production by Region



Because of the dominance of trawl gear in harvesting this species, many concerns have been expressed about the sustainability of production, and demand is high for the gillnet-caught fish, which tend not only to be larger and of higher quality, but also to be caught with a much more selective gear that may potentially reduce discards of the target species by nearly 50%, with substantial bycatch reduction as well. In addition, gillnets are

fixed gear-types that fish “passively,” so the impact on the seafloor and sensitive habitats is minimal compared to the highly disruptive and unselective trawl gear. However, fishing monkfish with gillnets requires an additional level of skill and experience, and is much more difficult than trawling and is more difficult than trawling, which has limited the adoption of this gear-type.



### COMPETITION

The Sapo Strategy has identified three classes of competing monkfish suppliers internationally: (1) vertically integrated producers, (2) low-cost operators, and (3) small-scale operators. Large, well-capitalized, consolidated, vertically integrated players operate in, Asia, North America, and Europe. Although this segment has significant scale and reach, fisheries in these regions tend to have higher costs of production, so the majority of this catch is trawl, which is of lower quality and is less desirable than that caught by gillnet. Almost all of the products offered by the vertically integrated segment are frozen. As the primary consumer markets are co-located with these fisheries, the majority of this product is not exported but sold locally or regionally.

Low-cost operators typically operate in Namibia, South Africa, China, and North Africa, where labor costs are low and fuel prices are often subsidized. Virtually all of the monkfish in this segment is trawl-caught, and there are often inadequate fisheries management frameworks, governance, traceability,

quality control, and post-harvest infrastructure in place, for which the highest-end buyers are willing to pay a premium. Previously, Brazil was not cost competitive with this group. However, with the Brazilian *real* devaluing some 60% since 2011 relative to the dollar — with half of that decline occurring in the past year — this cost gap with the low-cost producer segment has narrowed.

Smaller, gillnet vessels focus primarily on procurement of fresh product in North America and Iceland, with a concentration on end-customers who demand premium quality, sustainability, traceability, and branding. These suppliers are trying to enter the same markets that Sapo targets, and while they are higher-cost producers, they have both strong connectivity to high-value markets and strong relationships with buyers. This class of product is constantly in short supply and demand is growing, given sustainability commitments made by many of the major buyers, which at present they are having trouble meeting.

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Low-cost operators typically operate in Namibia, South Africa, China, and North Africa, where labor costs are low and fuel prices are often subsidized.

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## FINANCIAL ASSUMPTIONS AND DRIVERS

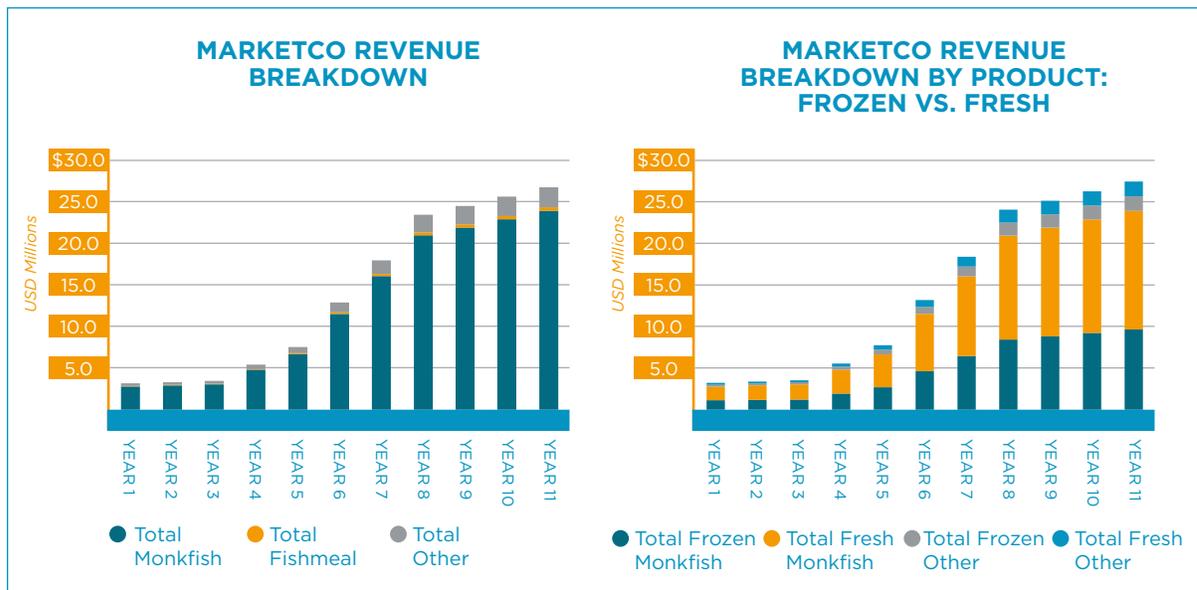
The Sapo Strategy's revenue and expenses are generated through its investment positions, including the trawl vessel buyback program, fishery management improvements, holding companies, and MarketCo launch and expansion. While the proposed transaction structure for the strategy involves various entities, the cash flow profile of Sapo is often presented on a consolidated basis throughout the remainder of this report.

### REVENUE MODEL AND PRICES

The revenue model assumes that Sapo revenue is generated by sales of processed monkfish products as well as legally retained bycatch from fishing efforts (primarily tilefish), and the sale of waste products for fishmeal. Prices were taken from averages of current FOB<sup>67</sup> to various international markets, as well as the domestic prices where relevant. (See Figure 16.)

A whole monkfish, when processed, can be broken down into various marketable products that meet tastes of final consumers in Europe and Asia. The contribution to the strategy's revenue of various monkfish finished products is derived from the current state of the market demand, where European markets primarily demand fresh and frozen tail, while whole fish more typically are exported to Korea.

FIGURE 16: MarketCo Projected Revenue Profiles



<sup>67</sup> FAO FishStat Dataset, 2015.

Base-Case Monkfish Price Assumptions by Product Type

PRODUCT	FOB PRICE/KG (USD)	% OF SALES (BY VALUE)	PRODUCT	FOB PRICE/KG (USD)	% OF SALES (BY VALUE)
<b>FROZEN</b>			<b>FRESH</b>		
Whole (Gutted)	\$3.75	5.5%	Whole (Gutted)	\$4.69	15.9%
Tail (Bone-in)	\$9.25	19.4%	Tail (Bone-in)	\$11.56	24.3%
Tail Loin	\$11.25	10.2%	Tail Loin	\$14.06	12.8%
Cheek	\$11.25	2.2%	Cheek	\$14.06	2.7%
Liver	\$10.50	3.1%	Liver	\$13.13	3.8%

Fresh Monkfish is projected to constitute the majority of MarketCo's revenue, with large portions also made up of frozen fish product, and

fishmeal. The breakdown of each type of product's projected average annual revenue is shown in Figure 17.

FIGURE 17: Sapo Monkfish Revenue Breakdown Across All Monkfish Products, All Years

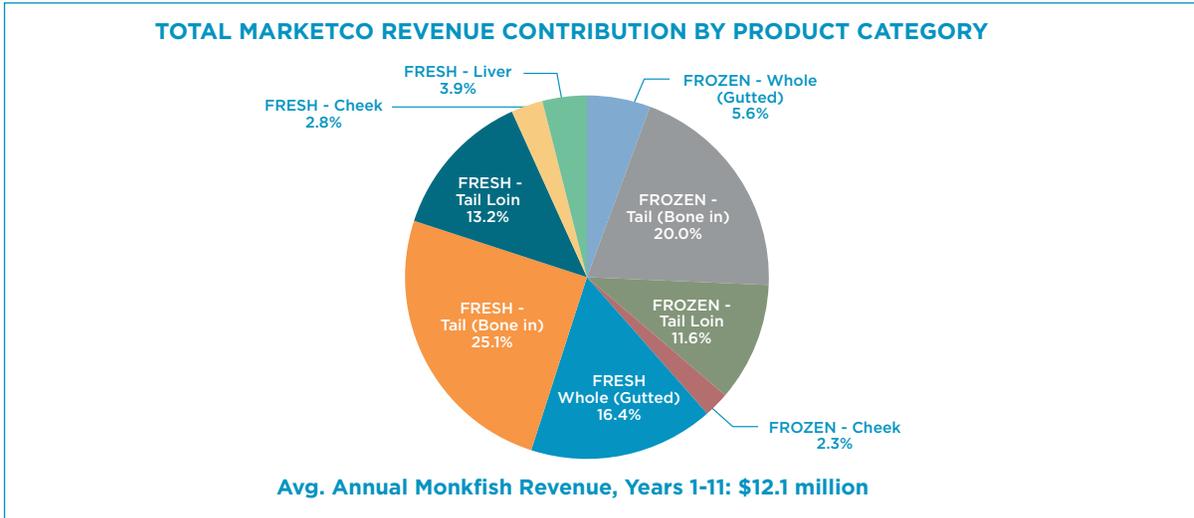
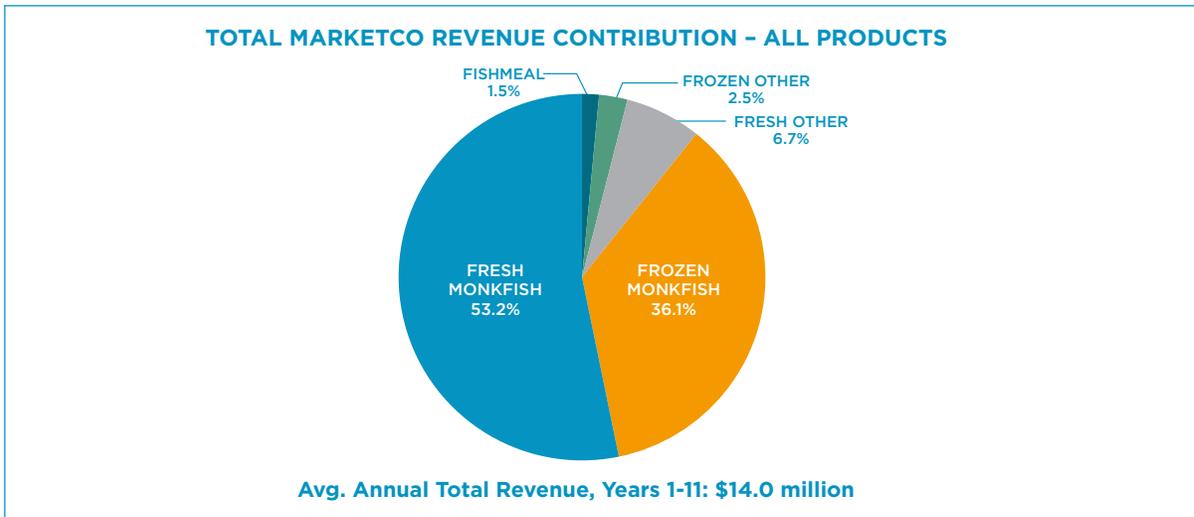


FIGURE 18: Total MarketCo Revenue Contribution by Product



### COST STRUCTURE

The Sapo Strategy's Cost Of Goods Sold, (COGS) represents the lion's share of operating expenses (broken down in Figure 18; Figure 19). This is a higher proportion of COGS than in many comparable businesses because MarketCo has few large assets that would otherwise contribute

to OpEx. Other expenses include Operations and Maintenance (O&M), Selling, General, and Administrative costs (SG&A), Depreciation and Amortization (D&A) and the Fisheries Management Improvements (FMI). See Figure 20.

FIGURE 19: OpEx Profile

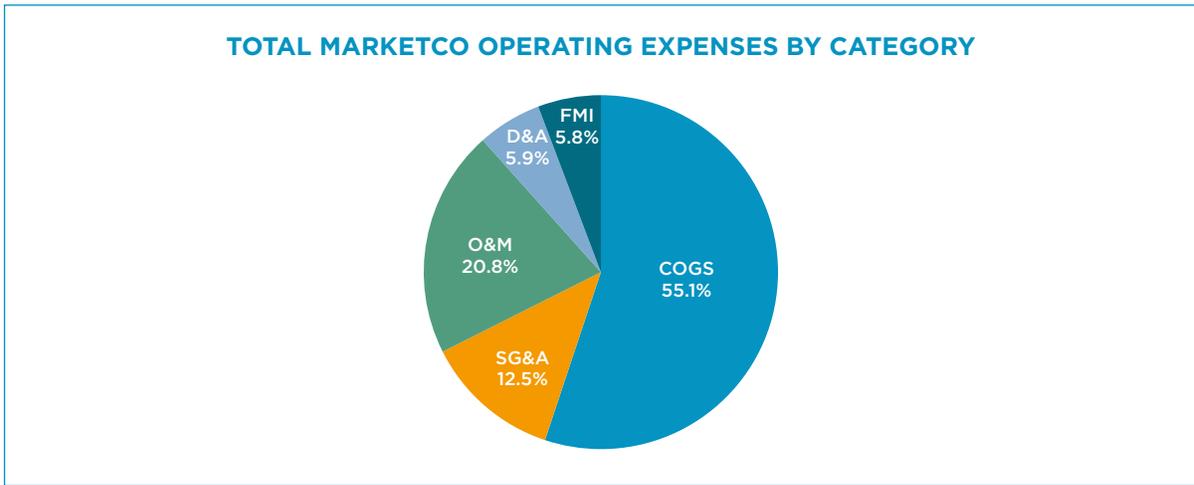


FIGURE 20: Cost of Goods Sold Breakdown

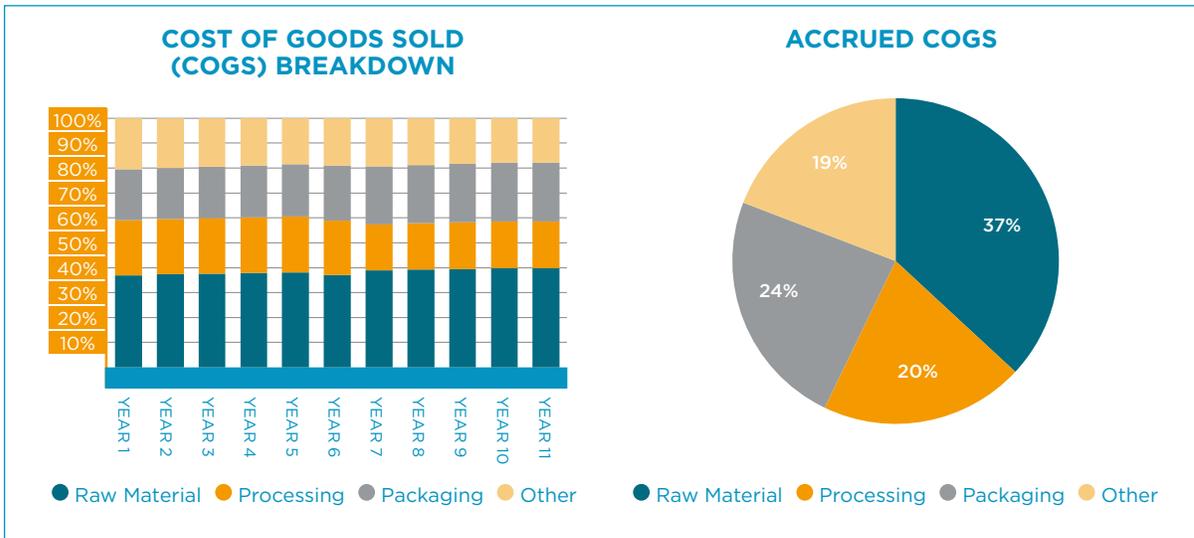


FIGURE 21: Sales, General, and Administrative Breakdown

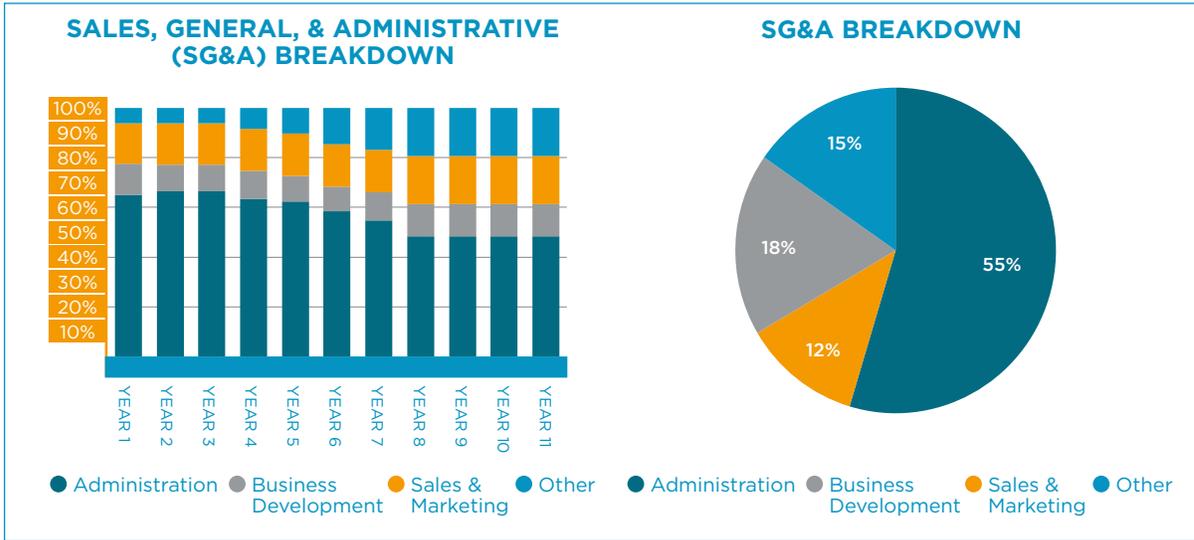
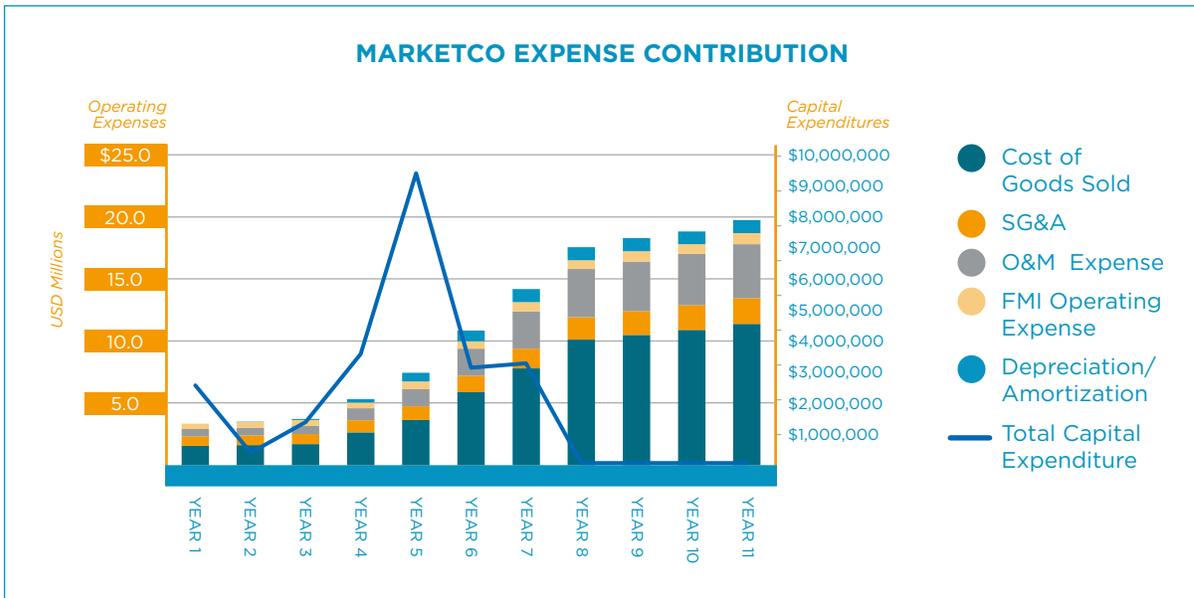


FIGURE 22: All Expenses by Category



## TRANSACTION STRUCTURE

### SOURCES AND USES OF FUNDS

As a new venture, Sapo carries significant development and early-stage execution risk. However, with a skilled team and attractive, scalable financial and impact returns, it should be able to attract impact equity with a 10 to 12-year time horizon. Due to the early-stage equity risk at the outset of Sapo, and the lack of an operating track record, this venture is unlikely to obtain unsecured commercial loans. However, as Sapo invests in its hard-assets base, the strategy would seek out commercial mortgage loans, and look for additional credit enhancement in the form of a loan guarantee. Here we also assume a \$2 million low-interest PRI loan to help finance the most impact oriented activities such as implementation of the Fisheries Management Improvements, including vessel buybacks. However, a portion of this could potentially be grant funded as well (Figure 23).

Capital investment requirements under Sapo are segmented between (1) commercial infrastructure and operations; and (2) fisheries improvement activities including vessel / license buybacks from the trawl fleet.

The initial investment proceeds will be used to fund the strategy development, company establishment, and capital expenditures, including the fisheries management improvements, as well as the construction of the central processing facility and cold chain logistics, which would be phased in over a period of approximately five years.

As the working capital needs increase, Sapo should seek to secure a commitment to a revolving credit facility such as those offered by the Brazilian Development Bank (BNDES), in order to finance the variable and high working-capital requirements of a business with Sapo's profile (ideally as part of a loan guarantee package).

FIGURE 23: Sources and Uses of Initial Sapo Strategy Investment Capital

SUMMARY SOURCES & USES OF FUNDS			
	Commitment	Balance	% of Total
Revolver - BNDES	1,000,000	-	-
Subordinated note / PRI		2,000,000	17.4%
Sponsor Equity		9,500,000	82.6%
<b>Total sources</b>		<b>\$11,500,000</b>	<b>100.0%</b>
Fund Minimum Cash Balance		\$500,000	4.3%
Capex Reserve - Processing Facility		2,250,000	19.6%
Capex Reserve - Gillnet Fleet Upgrade		2,500,000	21.7%
Capex Reserve - Logistics Infrastructure		1,000,000	8.7%
General & Administrative Startup Costs		1,000,000	8.7%
FMI Reserve		1,500,000	13.0%
Trawl Vessel Buyback Program		2,750,000	23.9%
<b>Total uses</b>		<b>\$11,500,000</b>	<b>100.0%</b>

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The Sapo Strategy's opening \$11.5 million investment would be made into a 'MarketCo' holding company, under which there would be two complementary entities, each with a distinct capital structure, risk profile, and operating characteristics

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### STRUCTURE AND GOVERNANCE

Under Brazilian law, the most efficient structure for foreign private equity investments is to establish a Brazilian-domiciled investment shell company under the "limitada" structure, which would then make investments into local targets. The sponsor equity under Sapo would own 75% of the equity and four of six board seats, with two seats for MarketCo management, which will own 15% of the equity. The CatchCo would hold one board observer seat and would also own 10% of the equity.

Sapo would also establish an advisory committee made up of academic experts, industry leaders, policy experts, and key buyers. The advisory committee would exercise no formal governance over the commercial business, but would provide a diversity of stakeholder views to the proposed fishery management activities, lending credibility to the process and ensuring effective integrated resource management.

The Sapo Strategy's opening \$11.5 million investment would be made into a 'MarketCo' holding company, under which there would be two complementary entities, each with a distinct capital structure, risk profile, and operating characteristics, as follows:

**MarketCo's "AssetCo":** A special-purpose vehicle holding the physical PP&E (Plant, Property, and Equipment) assets associated with the production, storage, processing, distribution, marketing, and export of product.

**MarketCo's "OpCo":** An "asset-light" operating company specializing in the processing, distribution, marketing, and export of product,

with the objective of creating the leading Brazilian processor and exporter of sustainably harvested seafood.

The "AssetCo" type structure is used commonly in Brazil, and elsewhere, as a "special purpose vehicle" (SPV) to provide some protection and fungibility of assets in the event that the operating company experiences any difficulties. While not entirely protected from the credit of the OpCo and CatchCo, this structure would give the operating company greater financial flexibility, while limiting recourse to its assets. In addition, accelerated depreciation on the assets and possible tax credits may offer greater optionality to monetize these currently unrecognized tax benefits. This is done in markets such as renewable energy and the "New Markets Tax Credit" in the U.S., which in the initial years offer significant tax credits that far exceed limited taxable current income.<sup>68</sup> As a "ring-fenced",<sup>69</sup> collateralized entity, AssetCo may be viewed as a better credit than an integrated operating company, since the assets are shielded by labor claims and other regulatory risks faced by the OpCo.

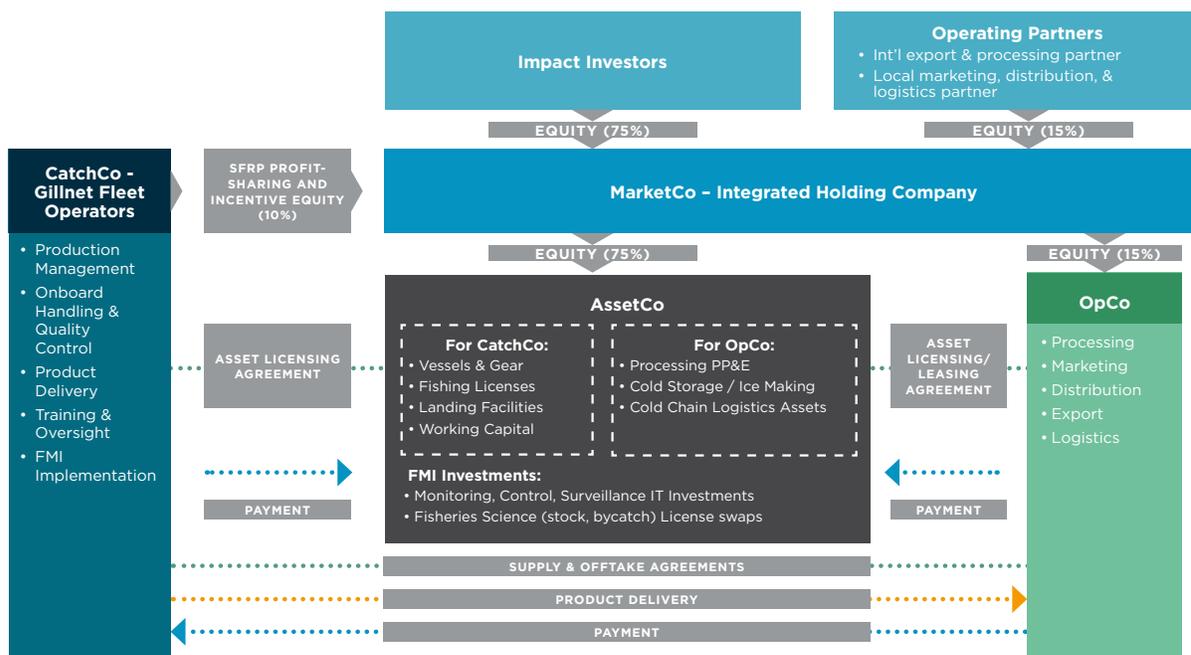
Finally, this structure enables MarketCo to offer incentive equity or attract outside equity investment directly into either the OpCo or the AssetCo without affecting ownership of the other. Given the importance of this hard infrastructure in terms of enforcing and maintaining sustainable management, this would, for example, allow MarketCo to sell a controlling stake in the OpCo without losing control of these strategic assets. (Figure 24).

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<sup>68</sup> Under Brazilian tax law, the accelerated depreciation tax benefits and NOLs would roll up to the MarketCo holdco level.

<sup>69</sup> A ring fence is a protection based transfer of assets meant to protect those assets from undue restrictions, tax burdens, or other country specific laws.

FIGURE 24: Ownership Structure



### EXIT STRATEGY

If the Sapó Strategy is able to restore distressed monkfish biomass over an 11-year period, combined with a 100% to 200% increase in regulated, sustainable TAC and landings (assumed at ~3,800 mt, equal to a 100% increase, in the base case), AND fisheries policy and governance continues to strengthen around a limited access catch share scheme and resource tenure is relatively assured under Brazilian law, then MarketCo will make a very attractive target for either management or a strategic buyer.<sup>70</sup> The impact provisions would be enforced post-exit by retaining the contractual commitments on the part of CatchCo and MarketCo, and would be further enhanced by continued ownership by the management. The Sapó Strategy’s financial sponsor would grant MarketCo management a right of first offer agreement in the event that they wish to pursue a management buyout. Similarly, CatchCo would have a similar first offer right on the vessels and licenses/quota, subject to continued adherence

to fisheries management standards and supply agreements with MarketCo, though this could also be structured as a purchase option.

However, given the trend toward consolidation and vertical integration throughout the Brazilian middle market, and especially in the fishing industry, we anticipate significant interest for a domestic or international strategic buyer at the end of Year 11. Using a relatively conservative exit multiple of 6.0x Year 11 (LTM) EBITDA, (which compares favorably to the current sector averages for Latin America of between 7.5x and 10.0x for food processing and consumer perishables),<sup>71</sup> Sapó is targeting a 17.5% levered IRR over the investment period under the base-case assumptions, with significant upside potential should stocks recover and/or show greater harvest potential beyond the base-case as the science improves. Figure 25 outlines the Sapó Strategy’s base case exit valuation metrics.

<sup>70</sup> Base case TAC is based on the limited studies that have been undertaken on the stock and could be revised as stock assessments provide additional information on the biomass of the species. Wahrlich et al. “Structure and Dynamics of the Monkfish *Lophius gastrophysus* Fishery of Southern and Southeastern Brazil,” Boletim do Instituto do Pesca, Sao Paulo, 2002.

<sup>71</sup> American Appraisal, 2014. “Global M&A Valuation Outlook, 2014”, p. 21.

FIGURE 25: The Sapo Strategy Year-11 Exit Valuation Metrics

SALE OF CONSOLIDATED COMPANY		
Closing Date		Year 11
Year 11 EBITDA		\$9,242,372
EBITDA Multiple		6.0x
<b>Enterprise Value</b>		<b>\$55,454,234</b>
Less: Total Debt		179,814
Plus: Excess Cash Balance		3,730,590
Less: Transaction Fees (3%)		1,663,627
<b>Equity Value</b>		<b>\$57,341,384</b>
Equity to Sponsor	75.0%	\$43,006,038
Equity to CatchCo	10.0%	\$5,734,138
Equity to Management Team	15.0%	\$8,601,208

## SUMMARY OF RETURNS

Figure 26 summarizes relevant base case financial, social, and environmental impact metrics of Sapo:

FIGURE 26: Base Case Impact and Financial Returns

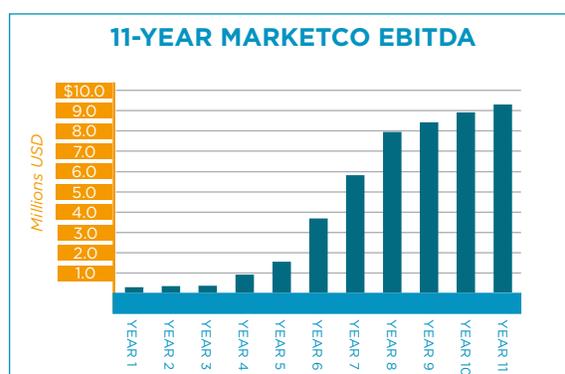
Values in millions USD

### SUMMARY OF BASE CASE FINANCIAL RETURNS

Total Equity Investment (\$ mil)	\$9.5
Time Horizon	11.0
Total Leverage Level	17.4%
Equity IRR	17.5%

### SUMMARY OF BASE CASE IMPACT RETURNS

Total Marketable Landings Increase (mt)	19,823
Total Avoided Bycatch (mt)	6,478
Total Income Increase to Fishers (%)	331.6%
Total Income Increase to Sapo Fishers (11 Years)	\$7,923,133
Total Fishers Incorporated	90
Additional Meals-to-Market (run-rate meals/yr)	7,498,847



### PRIVATE CAPITAL FUNDING

	AMOUNT	%	RATE
Foundation PRI	2.0	32.0%	2.5%
Sponsor Equity	9.5	68.0%	-
<b>Total Private Capital</b>	<b>\$11.5</b>		

## SENSITIVITY ANALYSIS

Several key inputs will have a particularly pronounced effect on project financial returns. As such, the model has been forecasted under multiple scenarios that flex the following key variables:

### Increasing and Decreasing Total Allowable

**Catch (TAC) Regimes for Monkfish:** The annual total allowable catch of monkfish has a significant impact on the raw material availability to MarketCo. Because the current condition and future potential of the stock status is uncertain, this variable presents a significant area of uncertainty and a potentially wide range of values. The current TAC (gillnet-only) of 1,500 mt is just 2.4% of the estimated total pristine biomass ( $B_0$ ) of approximately 63,000 mt, and 4.5% of pristine spawning biomass ( $SSB_0$ ) estimates of 33,000 mt, which is a highly conservative level set for recovery after the extensive overfishing of the early 2000s. Based on an analysis of monkfish fisheries elsewhere, scientists believe that a reasonable TAC of up to 6% of  $B_0$  could be achieved once the fishery has stabilized, which is the ~3,800 mt that Sapó assumes as the long-term run rate TAC for the entire stock in the base case. However, other monkfish fisheries currently appear to be managed with stable, healthy stocks at TACs set at 8%–9% of  $B_0$ , which when translated to the Brazilian context would be 5,000–6,000 mt. Since the variables affecting any individual fishery are extremely complex, and it is not possible to make such a general extrapolation as a matter of policy, this suggests an indicative TAC “ceiling” at up to 4x current levels.

The Sapó base case model projects maximum landings of 3,800 mt by year 8, assuming that current estimates of  $B_0$  are correct and using the 6% TAC ceiling estimated by local fisheries biologists from UNIVALI, the preeminent local fisheries scientists in Itajaí. The downside case assumes a precautionary TAC for the entire stock of 2,500 mt, or 4% of  $B_0$ , which was recommended following the last stock assessment as a conservative number to stabilize the stock.<sup>72</sup> In the upside scenario, Sapó assumes a TAC of 8%  $B_0$ ,

or 5,000 mt. In the downside case, the lower TAC causes the equity IRR to fall by 6.1% to 11.4%, while the upside case pushes returns up by 2.1% to 19.6%.

**Premium Paid to Fishers:** Sapó proposes to pay a premium to fishers on top of the prevailing market ex-vessel price of \$0.90/kg gutted weight, which is held constant given the absence of forward pricing and forecast estimates. The base case sets that premium at 25%, while the downside scenario assumes a 45% premium and the upside a 5% premium. While paying higher premiums may increase social impact returns, it does increase the cost of raw materials to MarketCo, thereby reducing financial returns to the investors. In the downside scenario, the project IRR falls by 2.1% to 15.4%, while in the upside scenario the IRR increases by 1.8% to 19.3%.

**Annual Changes in Real Sales Prices:** As with any processing and distribution business, profitability is highly sensitive to changes in the sales price of the finished goods. The sales prices used in the model are based on thorough diligence into the market segments into which MarketCo would sell. The changes in these prices over time, particularly in an 11-year model, prove to be particularly impactful on the IRR. The base case scenario assumes no real growth in current market prices, with price inflation equal to the rate of baseline inflation. In the upside case, real price appreciation is 2.0%, which increases equity IRR by 4.9% to 22.4%. In the downside case, Sapó assumes that real prices decline by 2.0% each year, which pushes equity returns down by 6.6% to 10.9%, holding all else equal.

**Annual Changes in Real Raw Materials Cost:** The profitability of a vertically integrated processing and distribution business will be significantly influenced by changes to the cost of raw material inputs. The raw materials costs assumed in the base case are based on current raw materials plus a 25% price premium paid to fishers under the Sapó Strategy, which were obtained through market due diligence.

<sup>72</sup> Perez et al. “A bycatch assessment of the gillnet monkfish *Lophius gastrophysus* fishery of Southern Brazil,” *Fisheries Research* 72, 2005.

The base case scenario assumes no real growth in assumed Sapo Strategy raw materials costs, with cost inflation equal to the rate of baseline inflation. In the upside case, real costs are assumed to decrease by 2.0% each year, which increases equity IRR by 1.9% to 19.4%. In the downside case, the model assumes an annual increase in real costs of 2.0%, which depresses equity returns by 2.7%, to 14.8%, holding all else equal.

**Working Capital:** One of the challenges of a seafood business is the need to pay cash at the time of raw material purchase while having to wait for long periods of time to be paid by buyers. Moreover, the volatility in seafood supply relative to the need to fulfill constant supply agreements requires holding significant inventory. Both scenarios create substantial working capital demand, and as working capital needs grow, they must be funded out of cash returns, decreasing levered equity IRR.

In the base case, the model assumes a cash conversion cycle<sup>73</sup> of 40 days for fresh product, and 90 days for frozen product. This yields a weighted average cash conversion cycle of 59.4 days, with 49.4 inventory days. In the downside scenario, inventory days are increased by 100%, resulting in a weighted average cash conversion cycle of 118.9 days (with 108.9 inventory days), which decreases the equity IRR by 0.2% to 17.3%.

In the upside case, inventory days are decreased by 50%, yielding a weighted average cash conversion cycle of 29.7 days (19.7 inventory days) and increasing IRR by 0.1% to 17.6%.

**EBITDA Exit Multiple:** In Year 11, the company is sold at a multiple of EBITDA, determined by current comparable sales multiples of similar companies. A fleet of strong assets with healthy fish stock can support a stable revenue stream over time, while the integrated supply chain provides the commercialization network to monetize the availability of raw resources. Additionally, this model can be replicated in other fisheries that fit a similar profile of high value, as well as some level of distress with strong long-term sustainability potential, which would make this an attractive target for a strategic buyer. Relative to similar company precedent transaction and public trading comparables for Latin American food processing and consumer perishables companies of between 7.5x and 10.0x,<sup>74</sup> a base-case multiple of 6.0x EBITDA is relatively conservative. The downside case assumes a multiple of 4.0x EBITDA, in the event that buyers do not view growth potential in the business, which reduces equity IRR by 3.0%, to 14.5%. In the upside case, an 8.0x multiple is assumed, indicating a growth-orientation, which increases the sponsor equity IRR by 2.4% to 19.9%.

**BASE CASE LEVERED IRR 17.5%**

SENSITIVITY ANALYSIS	SCENARIOS			IRR (%)		IRR IMPACT (percentage point Δ)	
	Base	Downside	Upside	Downside	Upside	Downside	Upside
Monkfish Max. Sustainable TAC	3,800	2,500	5,000	11.4%	19.6%	- 6.1%	2.1%
Price Premium Fishers (%)	25.0%	45.0%	5.0%	15.4%	19.3%	- 2.1%	1.8%
Annual Δ Real Product Prices (%)	-	- 2.0%	2.0%	10.9%	22.4%	- 6.6%	4.9%
Annual Δ in Real Raw Material Cost (%)	-	2.0%	- 2.0%	14.8%	19.4%	- 2.7%	1.9%
Inventory Days (# days)	49.4	108.9	19.7	17.3%	17.6%	- 0.2%	0.1%
EBITDA Exit Multiple (x)	6.0x	4.0x	8.0x	14.5%	19.9%	- 3.0%	2.4%

<sup>73</sup> The number of days that it takes a company to convert its investment in inventory and other resource inputs into cash - it's a function of inventory days, accounts payable days, and accounts receivable days.

<sup>74</sup> American Appraisal, 2014. "Global M&A Valuation Outlook, 2014", p. 21.

## KEY RISKS AND MITIGANTS

The Sapo Strategy presents a range of potential risks that require mitigation or incorporation into the valuation analysis, as shown below:

RISK	DESCRIPTION	MITIGANTS
<b>Key Risks Impacting Operations &amp; Execution</b>		
Partnership Risk	The Sapo Strategy depends on the negotiation of actionable agreements with the government, and on durable partnerships with a leading international marine conservation policy NGO. In addition, the strategy relies on strong communication and effective collaboration between the partners and other key fishery stakeholders in order to align interests and resources towards the impact goals of Sapo.	Strong agreements with fisheries authorities and with leaders within the fishery on the industry side should stabilize negotiations. Control over strategic assets affords leverage in terms of policymaking and supply chain.
Competitive Risk	Other local gillnet vessels or vertically integrated companies could enter the market before Sapo has an opportunity to consolidate control.	Sapo anticipates the right-of-first-offer for license acquisition and will focus on development of local and regional market for which Sapo will have cost and freshness advantages vis-à-vis product from Asia, Africa, Europe, and North America.
FMI Implementation Risk	Complexity, range of stakeholders, and sequencing of activities could prove difficult or impossible.	No major investment undertaken or operating risk assumed until FMI strategy is reasonably assured through feasibility study and implementation is successfully under way.  Initial capital outlays for fleet upgrades may be largely recouped through asset sales, leasing arrangements, or application of assets to other fisheries
<b>Key Risks Impacting Raw Material Sourcing Volume</b>		
Assessment and Quota	Stock status is uncertain, and further study / assessment could suggest a smaller resource and/or cap to the growth of Sapo, or even a stock incapable of supporting commercial fishing. MSY estimates and resulting TAC levels may be lower than originally assumed, limiting the scale and economics of the commercial opportunity	Sapo would undertake an initial detailed feasibility study, including stock assessments and bycatch assessments, to better understand fishery, recovery and production potential, before making significant capital investments.

RISK	DESCRIPTION	MITIGANTS
Threat From Trawl Fishery	Continued high levels of exploitation by the trawl fishery, if unmanaged, may pressure the stock and reduce catch volumes for the sustainably managed gillnet fleet.	Sapo will work to ensure agreements by fisheries authorities to enact and enforce regulations on the trawl fleet. The purchase and retirement of trawl vessels with strict limits on new entrants should reduce pressure on the monkfish stock.
Natural Disaster and Exogenous Environmental Impacts	Climate change or natural disasters could impact stock health.	Vessel insurance, revolving loan facility to smooth cash flow, and eventual diversification to other, uncorrelated fisheries in other parts of the country.

#### Key Risks Impacting Revenue

Excess Asset Capacity	The strategy proposes acquiring underutilized assets (both hard infrastructure and fishing rights) from existing commercial players. Assets running at low capacity utilization could result in lower profit margins in the short term, and delay in increasing or failure to increase landings in the fishery could impair cash flow and terminal asset values for the strategy.	Phased investment, with no initial investment in processing facilities will provide more time for cautious acquisitions. Investment in processing facilities only takes place when more is known about stock, regulatory progress, trawl license transfer/retirement, MarketCo's ability to expand harvest capacity, and other developments.
Market Risk	Risk that adequate supply can't be assured, or that oversupply will flood the market. Tastes may change so the product is no longer desirable— Monkfish prices are currently set by the European (particularly French) market, so anything affecting the demand in this key market would have repercussions in Brazil.	Market fundamentals don't support an oversupply, as demand is exceeding supply with significant growth potential, while supply is capped. Development of local market will offer a potentially large source of additional demand that will be low-cost to supply at very high quality. Fresh product is in extremely short supply, and Sapo's focus on fresh will meet a high value and currently unserved segment of the market.

#### Key Risks Affecting General Business Environment

Legal Risk	It may prove more difficult or costly than anticipated to acquire the trawl vessel monkfish permits and vessels. Sapo's strategy depends on securing all, or nearly all, of the available gillnet fishing licenses in order to ensure that sustainability standards are met and sufficient volumes of raw material can be sourced.	Sapo will work with policymakers and fisheries authorities up front to ensure that the proper legal framework is in place before capital investment is made. Because the trawl fishery is under duress currently, there is an opportunity for trawl fishers to transition fishing effort and associated quota to better practices under the Sapo framework.
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RISK	DESCRIPTION	MITIGANTS
Government and Regulatory Enforcement Risks	<p>Securing commitments and regulatory action from Brazilian fisheries authorities could take longer than expected, and these may not be adequately durable.</p> <p>Brazil has a track record of ignoring, overriding, changing, and inconsistently applying enforcement and prosecution of existing laws; any commitment from the Brazilian government could result in the same outcome. If additional vessels are allowed to illegally fish the resource, or new licenses are issued to non-participating vessels before agreed time limits have passed, it could impair stock restoration and bycatch reduction, and affect the commercial viability of the production and processing businesses.</p>	<p>Legally binding contracts with authorities and stakeholders, as well as aligned incentives will be needed so that this is a “win-win” outcome for industry, authorities, politicians, and the conservation community.</p>
Credit Risk	<p>Brazil was recently downgraded to junk (below investment grade) status, which could affect market stability and access to capital.</p> <p>The strategy also depends on local operating partners to manage harvest &amp; production (“CatchCo”), which have poor credit quality and little to no recourse in the event that they don’t fulfill commitments.</p> <p>Other financial / credit difficulties could affect partners’ abilities to operate, despite viability of Sapo.</p>	<p>Sapo would seek to secure loan guarantees from DFIs. PRI debt and possibly first loss high impact capital will also mitigate credit risk.</p>
Currency Risk	<p>While the value of the Brazilian Real has declined by about 35% and 50% against the Euro and U.S. Dollar, respectively, since 2011, this situation could reverse, which could affect the ability of Brazilian producers to compete on price.</p>	<p>Current falling currency is a boost to exports, and Sapo would develop local markets to mitigate negative impacts from a possible strengthening of the currency. Also, export and import sales act to diversify currency risk.</p>

## APPENDIX

### FINANCIAL PROJECTIONS

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10	YEAR 11
# of Fishers	18	18	18	27	36	54	72	90	90	90	90
# of Vessels	2	2	2	3	4	6	8	10	10	10	10
<b>SALES VOLUME (mt)</b>											
Monkfish - Live Weight	774	774	774	1,160	1,547	2,321	3,094	3,868	3,868	3,868	3,868
Monkfish - Gutted	650	650	650	975	1,300	1,950	2,600	3,250	3,250	3,250	3,250
Monkfish	317	317	317	476	634	951	1,269	1,586	1,586	1,586	1,586
Other Catch	46	46	46	69	92	139	185	231	231	231	231
Fishmeal	484	484	484	726	967	1,451	1,935	2,419	2,419	2,419	2,419
<b>REVENUES</b>											
Monkfish											
Frozen	1,129,408	1,180,232	1,233,342	1,933,264	2,693,681	4,644,579	6,471,446	8,453,327	8,833,726	9,231,244	9,646,650
Fresh	1,666,479	1,741,471	1,819,837	2,852,594	3,974,614	6,853,229	9,548,832	12,473,162	13,034,454	13,621,005	14,233,950
Other											
Frozen	84,991	88,816	92,813	145,484	202,707	317,744	442,723	578,307	604,330	631,525	659,944
Fresh	228,060	238,323	249,047	390,381	543,931	852,612	1,187,973	1,551,790	1,621,620	1,694,593	1,770,850
Fishmeal											
Monkfish	46,398	48,486	50,668	79,423	110,662	173,463	241,692	315,710	329,917	344,763	360,277
Other	4,151	4,338	4,533	7,105	9,900	15,519	21,623	28,244	29,516	30,844	32,232
CatchCo Admin. Fee (2.75%)	15,640	16,344	17,079	26,772	37,302	58,471	81,469	106,419	111,208	116,213	121,442
<b>Total</b>	<b>\$3,175,128</b>	<b>\$3,318,008</b>	<b>\$3,467,319</b>	<b>\$5,435,022</b>	<b>\$7,572,798</b>	<b>\$12,915,616</b>	<b>\$17,995,758</b>	<b>\$23,506,959</b>	<b>\$24,564,772</b>	<b>\$25,670,187</b>	<b>\$26,825,345</b>
YoY Growth in Sales		4.5%	4.5%	56.7%	39.3%	70.6%	39.3%	30.6%	4.5%	4.5%	4.5%
<b>OPERATING EXPENSES</b>											
Cost of Goods Sold	\$1,547,957	\$1,608,398	\$1,671,145	\$2,604,422	\$3,607,792	\$5,816,775	\$7,699,070	\$9,991,613	\$10,373,000	\$10,768,479	\$11,253,060
SG&A	767,881	785,845	821,208	966,653	1,105,556	1,322,978	1,589,394	1,821,789	1,903,770	1,989,439	2,078,964
O&M	585,302	606,111	627,607	974,715	1,345,482	2,132,811	2,941,723	3,803,448	3,933,662	4,067,893	4,250,948
<b>EBITDA</b>	<b>273,988</b>	<b>317,654</b>	<b>347,359</b>	<b>889,232</b>	<b>1,513,968</b>	<b>3,643,052</b>	<b>5,765,570</b>	<b>7,890,109</b>	<b>8,354,340</b>	<b>8,844,375</b>	<b>9,242,372</b>
EBITDA Margin	8.6%	9.6%	10.0%	16.4%	20.0%	28.2%	32.0%	33.6%	34.0%	34.5%	34.5%
<b>CAPITAL EXPENDITURES</b>											
FMI Capex - Buybacks	-	\$2,560,250	-	-	-	-	-	-	-	-	-
Fleet Capacity	-	-	1,370,770	1,432,455	2,993,830	3,128,553	3,269,338	-	-	-	-
Processing Capacity	-	-	-	-	6,420,329	-	-	-	-	-	-
Logistics Infrastructure	-	382,209	-	1,908,030	-	-	-	-	-	-	-
<b>Total CAPEX</b>	<b>\$ -</b>	<b>\$2,942,459</b>	<b>\$1,370,770</b>	<b>\$3,340,485</b>	<b>\$9,414,160</b>	<b>\$3,128,553</b>	<b>\$3,269,338</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>



## BALANCE SHEET

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10	YEAR 11
<b>ASSETS</b>											
Current Assets	9,421,019	9,454,930	8,928,397	7,802,140	3,656,204	2,246,064	2,900,977	5,274,079	9,079,599	10,061,837	6,635,270
Non-Current Assets											
Property, Plant & Equipment	2,560,250	363,098	1,646,219	4,970,535	13,670,529	15,928,489	18,163,766	17,129,706	16,095,646	15,061,586	14,027,526
<b>Total Assets</b>	<b>11,981,269</b>	<b>9,818,028</b>	<b>10,574,617</b>	<b>12,772,675</b>	<b>17,326,732</b>	<b>18,174,552</b>	<b>21,064,744</b>	<b>22,403,785</b>	<b>25,175,245</b>	<b>25,123,423</b>	<b>20,662,796</b>
<b>LIABILITIES</b>											
<b>Current Liabilities</b>											
Current Portion LT Debt	-	49,687	173,056	585,797	1,417,227	1,558,012	1,688,138	1,564,769	1,152,029	2,320,598	-
Other Current Liabilities	283,581	205,759	321,073	370,262	643,173	920,644	1,343,986	1,644,070	1,748,278	1,792,560	1,893,435
<b>Non-Current Liabilities</b>											
Revolving Loan Balance	-	-	-	-	1,000,000	1,000,000	1,000,000	-	-	-	-
Long-Term PRI Debt	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	-
Commercial Mortgage Loans	-	248,436	815,595	2,706,240	6,277,595	5,564,293	4,905,348	3,217,210	1,652,441	500,412	179,814
Total Long-Term Debt (Less Current)	2,000,000	2,198,749	2,642,539	4,120,444	7,860,368	7,006,281	6,217,210	3,652,441	2,500,412	179,814	179,814
Other Long-Term Liabilities	-	(793,510)	(768,311)	(680,515)	(779,186)	(342,744)	720,025	2,611,387	4,758,980	4,963,582	4,612,001
<b>Total Liabilities</b>	<b>2,283,581</b>	<b>1,660,684</b>	<b>2,368,357</b>	<b>4,395,987</b>	<b>9,141,582</b>	<b>9,142,192</b>	<b>9,969,360</b>	<b>9,472,667</b>	<b>10,159,699</b>	<b>9,256,553</b>	<b>6,685,250</b>
<b>SHAREHOLDER'S EQUITY</b>											
Common Stock	9,500,000	9,500,000	9,500,000	9,500,000	9,500,000	9,500,000	9,500,000	9,500,000	9,500,000	9,500,000	9,500,000
Retained Earnings	197,688	(1,342,656)	(1,293,740)	(1,123,312)	(1,314,850)	(467,639)	1,595,384	3,431,118	5,515,546	6,366,870	4,477,546
<b>Total Shareholder's Equity</b>	<b>9,697,688</b>	<b>8,157,344</b>	<b>8,206,260</b>	<b>8,376,688</b>	<b>8,185,150</b>	<b>9,032,361</b>	<b>11,095,384</b>	<b>12,931,118</b>	<b>15,015,546</b>	<b>15,866,870</b>	<b>13,977,546</b>
<b>LIABILITIES &amp; SHAREHOLDER'S EQUITY</b>	<b>\$11,981,269</b>	<b>\$9,818,028</b>	<b>\$10,574,617</b>	<b>\$12,772,675</b>	<b>\$17,326,732</b>	<b>\$18,174,552</b>	<b>\$21,064,744</b>	<b>\$22,403,785</b>	<b>\$25,175,245</b>	<b>\$25,123,423</b>	<b>\$20,662,796</b>

## CASH FLOW STATEMENT

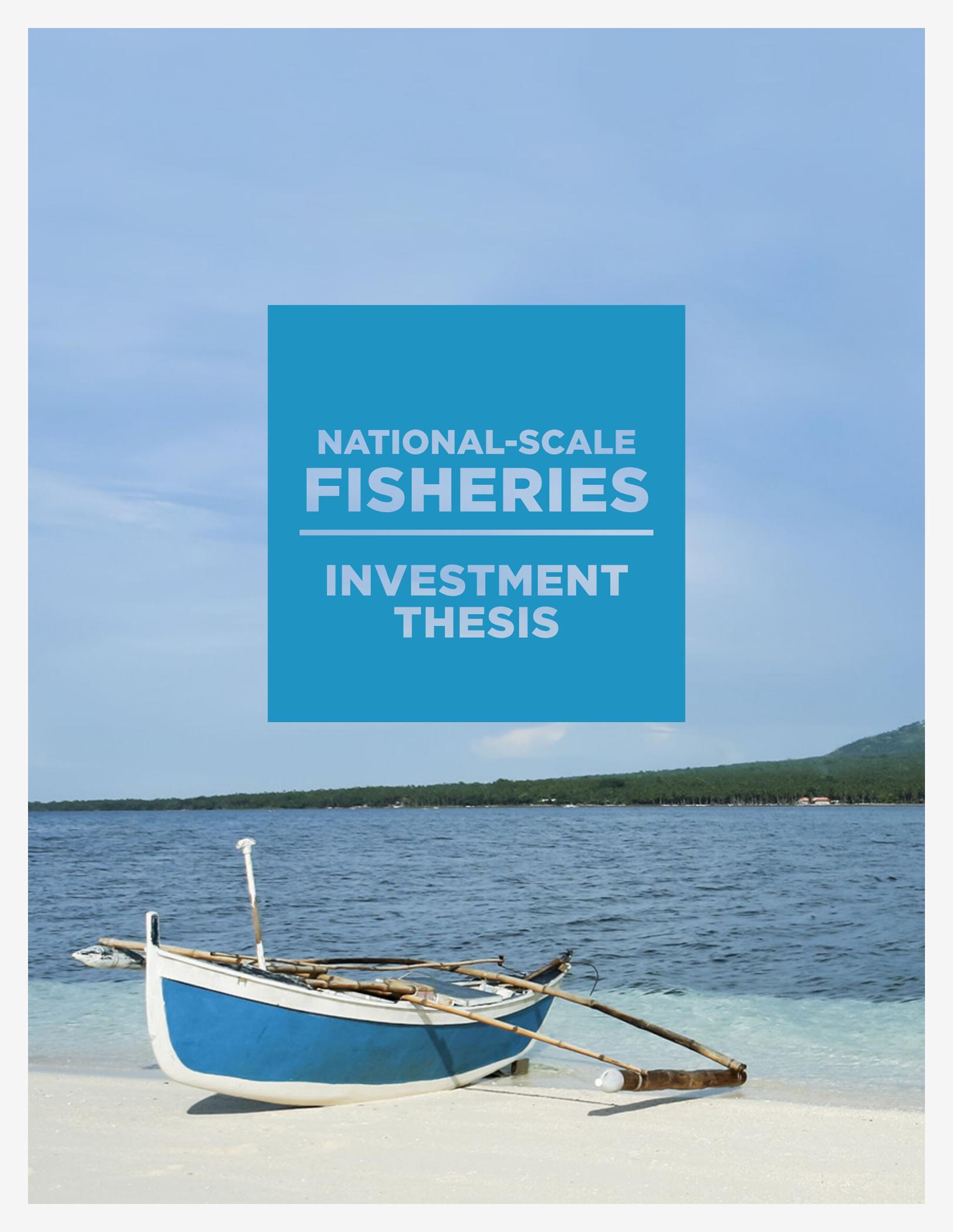
	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10	YEAR 11
<b>OPERATING ACTIVITIES</b>											
Net Income	197,688	(1,540,344)	48,916	170,428	(191,538)	847,210	2,063,023	3,671,468	4,168,856	4,738,399	4,961,063
Income Statement Adjustments	-	2,579,360	87,649	254,673	714,166	870,593	1,034,060	1,034,060	1,034,060	1,034,060	1,034,060
Balance Sheet Adjustments	(189,985)	(515,279)	(291,846)	244,658	(338,915)	337,522	946,923	1,724,916	2,397,153	(90,642)	(123,748)
<b>Cash Flow from Operating Activities</b>	<b>7,703</b>	<b>523,737</b>	<b>(155,281)</b>	<b>669,759</b>	<b>183,712</b>	<b>2,055,326</b>	<b>4,044,007</b>	<b>6,430,444</b>	<b>7,600,069</b>	<b>5,681,817</b>	<b>5,871,375</b>
<b>INVESTING ACTIVITIES</b>											
MarketCo Property, Plant & Equipment	-	(382,209)	(1,370,770)	(3,578,988)	(9,414,160)	(3,128,553)	(3,269,338)	-	-	-	-
FMI Capex (Trawl Buyback)	(2,560,250)	-	-	-	-	-	-	-	-	-	-
<b>Cash Flow from Investing Activities</b>	<b>(2,560,250)</b>	<b>(382,209)</b>	<b>(1,370,770)</b>	<b>(3,578,988)</b>	<b>(9,414,160)</b>	<b>(3,128,553)</b>	<b>(3,269,338)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>FINANCING ACTIVITIES</b>											
Revolving Loan	-	-	-	-	1,000,000	-	-	(1,000,000)	-	-	-
Total Commercial Loans	-	248,436	567,159	1,890,645	3,571,355	(713,303)	(658,944)	(1,688,138)	(1,564,769)	(1,152,029)	(320,598)
PRI Debt	2,000,000	-	-	-	-	-	-	-	-	-	(2,000,000)
Common Equity	9,500,000	-	-	-	-	-	-	-	-	-	-
Common Dividend	-	-	-	-	-	-	-	(1,835,734)	(2,084,428)	(3,887,075)	(6,850,387)
<b>Cash Flow from Financing Activities</b>	<b>11,500,000</b>	<b>248,436</b>	<b>567,159</b>	<b>1,890,645</b>	<b>4,571,355</b>	<b>(713,303)</b>	<b>(658,944)</b>	<b>(4,523,872)</b>	<b>(3,649,197)</b>	<b>(5,039,104)</b>	<b>(9,170,985)</b>
<b>NET CASH FLOW</b>	<b>(2,552,547)</b>	<b>389,964</b>	<b>(958,892)</b>	<b>(1,018,584)</b>	<b>(4,659,092)</b>	<b>(1,786,530)</b>	<b>115,725</b>	<b>1,906,572</b>	<b>3,950,872</b>	<b>642,713</b>	<b>(3,299,610)</b>

## FINANCING

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10	YEAR 11
<b>DEBT FINANCING</b>											
Beginning Debt Balance	2,000,000	2,000,000	2,248,436	2,815,595	4,706,240	9,277,595	8,564,293	7,905,348	5,217,210	3,652,441	2,500,412
Net Debt Issued / (Repaid)											
Revolving Credit Facility	-	-	-	-	1,000,000	-	-	(1,000,000)	-	-	-
Commercial Loans	-	248,436	567,159	1,890,645	3,571,355	(713,303)	(658,944)	(1,688,138)	(1,564,769)	(1,152,029)	(320,598)
PRI Debt	-	-	-	-	-	-	-	-	-	-	(2,000,000)
Ending Debt Balance	2,000,000	2,248,436	2,815,595	4,706,240	9,277,595	8,564,293	7,905,348	5,217,210	3,652,441	2,500,412	179,814
<b>EQUITY FINANCING</b>											
Beginning Equity Balance	9,500,000	9,500,000	9,500,000	9,500,000	9,500,000	9,500,000	9,500,000	9,500,000	9,500,000	9,500,000	9,500,000
Change in Equity	-	-	-	-	-	-	-	-	-	-	-
Ending Equity Balance	9,500,000	9,500,000	9,500,000	9,500,000	9,500,000	9,500,000	9,500,000	9,500,000	9,500,000	9,500,000	9,500,000

## VALUATION ANALYSIS

		YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10	YEAR 11
Opening Equity Investment	9,500,000											
Opening Debt	2,000,000											
<b>Total Initial Investment</b>	<b>11,500,000</b>											
Project FreeCash Flow (Unlevered)		(2,844,936)	(973,495)	(1,723,514)	(2,960,978)	(8,910,935)	(487,911)	1,326,790	6,815,697	7,712,784	5,591,418	5,731,943
Cash Flow to Equity (Levered)		-	-	-	-	-	-	-	1,376,800	1,563,321	2,915,306	5,137,790
Year 11 EBITDA												9,242,372
Terminal EBITDA Multiple												6.0x
<b>Terminal Enterprise Value</b>												<b>55,454,234</b>
Net Debt												(3,550,777)
Transaction Fees												1,663,627
<b>Terminal Equity Value</b>												<b>57,341,384</b>
% Equity to Sponsor	75.0%											
<b>Sponsor Equity Value</b>												<b>\$43,006,038</b>
<b>Project IRR (Unlevered)</b>												<b>13.2%</b>
<b>Equity IRR (Levered)</b>												<b>20.7%</b>
<b>Sponsor Equity IRR (Levered)</b>												<b>17.5%</b>

A blue and white boat is beached on a sandy shore. The boat has a white hull and a blue upper section. It is equipped with several wooden oars and a white outboard motor. The background shows a calm blue sea, a distant forested coastline, and a clear blue sky.

# NATIONAL-SCALE FISHERIES

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## INVESTMENT THESIS



## THE NATIONAL-SCALE FISHERIES INVESTMENT THESIS

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**T**he National Scale Fisheries Strategy employs a public-private partnership (PPP) model to finance, develop, implement, and operate the targeted infrastructure and services to address critical information gaps. Through a PPP model, private partners with sector expertise can develop and operate information and enforcement infrastructure, such as vessel monitoring systems (VMS) and electronic catch accounting, which the public sector has in many cases struggled to deliver. This data in turn can catalyze the system-wide management reforms required across the supply chain in order to protect and restore seafood resources, and offers transparency to end buyers in order to ensure that market actors as well as authorities are able to punish violators while recognizing and rewarding best practices.

These solutions are directly focused on removing key barriers to effective fisheries management at the public-sector level in order to optimize the existing resources and capabilities of governments and regional fisheries management authorities (RFMOs). The national-scale strategy looks to the key leverage points in the supply chain system where relatively small, targeted investments in infrastructure can yield significant benefits for fisheries regulators, and in turn, offer meaningful positive social and environmental impacts.

However, these public infrastructure, management, and social benefits are not easily monetized through traditional, private investment models, which in turn can deter innovative, entrepreneurial, market-based solutions. Fortunately, there is a successful precedent investment structure employed across the world to attract private capital, innovation, and operating expertise to public assets and services, such as mass transit, that would otherwise not be commercially investible. That structure is the public-private partnership, also referred to as “PPP” or “P3” investments (for those not familiar with the PPP framework, please refer to Annex C for more detail). The National-Scale Fisheries Strategy proposes adapting the PPP framework to fisheries management interventions, specifically through bundled investments in two categories:

1. Comprehensive fisheries information management systems (FIMS) packages including shore-based and on-the-water tools such as monitoring, control, and surveillance (MCS) systems, traceability systems, and electronic catch accounting;
2. The assets and operations of “brick and mortar” fishing port infrastructure at key landing and market access points.

By bundling a FIMS data management investment together with an infrastructure and operating PPP, we have identified a revenue stream to support the public good provided by information access and transparency. In the case of a port, port user fees and ancillary services generate revenue at a “natural monopoly” in the supply chain, providing revenue streams necessary to structure an attractive investment.

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### NATIONAL-SCALE FISHERY CHALLENGES

The Encourage Capital team evaluated numerous cases of fisheries with well-intentioned regulators and a robust framework on paper. Yet these fisheries suffer from a lack of infrastructure, data, institutional capacity, and political will to empower management authorities to deliver on regulatory enforcement and other public commitments. In many cases, these infrastructure, data, governance and institutional capacity deficiencies are a fundamental barrier to implementing fisheries management policies at the national or supranational-scale. These barriers distort market incentives and are at the root cause of illegal, unregulated, and unreported (IUU) fishing. Ineffective governance infrastructure prevents effective legal enforcement of regulations of any sort. The result is a persistent “governance gap” across the world’s oceans, with an especially pernicious effect in emerging market regions with large maritime resources, such as Southeast Asia.

At the supranational level, which involves cooperation between national authorities, the challenge becomes even more pervasive and

complex, and making the management of highly migratory, border-crossing fish stocks like tuna especially difficult. The result of this difficulty is the growth of IUU fishing, which threatens to undermine the efforts of the best-formed management policies, puts excessive pressure on resources, enables human rights abuses such as slave labor, and punishes compliant fishers who face declining catch volumes despite following the letter of the law.

Ultimately, information asymmetry lies at the heart of IUU fishing in many national and supranational fisheries. A lack of data and transparency prevents authorities, seafood buyers, and other well-intentioned stakeholders to access timely data on who is fishing illegally, where they are fishing, how much they are catching, and where that product is being sold. Greater control of information offers significant potential to tip this system in a positive direction, for which the growth in low-cost data collection and analytics technologies, and the ubiquitous “big data” trend, offer particularly promising solutions.

# **THE NEXUS BLUE STRATEGY**

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**A NATIONAL-SCALE  
FISHERIES INVESTMENT  
IN THE PHILIPPINES**

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## THE NEXUS BLUE STRATEGY: A NATIONAL-SCALE FISHERIES INVESTMENT IN THE PHILIPPINES

Encourage Capital has worked with support from Bloomberg Philanthropies and The Rockefeller Foundation to develop the first sustainable fisheries public-private partnership (or “PPP”) impact investment strategy. The Nexus Blue Strategy (Nexus Blue) is a hypothetical \$34.0 million PPP impact investment to improve IUU (illegal, unreported, and unregulated) enforcement and facilitate transparency and information sharing across the supply chains of these high-value products. This investment will pay for the deployment of hard and soft infrastructure to combat IUU fishing and to facilitate transparency and information sharing across the supply chains of high-value fish species. Private capital proceeds will be used to refurbish and operate the General Santos Fish Port Complex (GenSan), the largest tuna port in the Philippines, and invest in data collection and monitoring of the relevant fisheries. Proceeds will pay for hard infrastructure as well as the deployment of IT infrastructure to virtually link the downstream buyers, upstream (on-the-water) harvesters, port market actors, dockside catch accountants, national and regional fisheries authorities, and independent researchers. This “soft” infrastructure will leverage constrained fisheries management and enforcement resources far more effectively by integrating digital capabilities and applying “big data” analytics. By using the analytics and traceability tools common across nearly every other product supply chain, regulators can also harness the power of the market by arming buyers with the knowledge to punish violators while rewarding sustainable practices. Integrated PPP investments of this nature promise to eliminate the long standing information and cost barriers to strong, coordinated, multi-stakeholder fisheries management facing the “highly-migratory pelagic” fisheries of the Western and Central Pacific Ocean (WCPO).

### COMMERCIAL HIGHLY MIGRATORY PELAGIC SPECIES OF THE WESTERN AND CENTRAL PACIFIC OCEAN



Bigeye Tuna  
(*Thunnus obesus*)



Black Marlin  
(*Makaira indica*)



Yellowfin Tuna  
(*Thunnus albacares*)



Skipjack  
(*Katsuwonus pelamis*)



Albacore  
(*Thunnus alalunga*)



Frigate Tuna  
(*Auxis thazard thazard*)

Nexus Blue intends to achieve these objectives by upgrading strategic port infrastructure and post-harvest facilities, installing 2.4 MW in solar PV capacity, and deploying the IT hardware and software to fight IUU fishing while informing better resource management across the 429 vessel fleet actively using the port. Investors would be compensated through the ongoing collection of port fees and rental revenues under a 30-year PPP concession with the Philippine government.

These measures will also ensure compliance with EU and U.S. demands for monitoring, control and surveillance (MCS) and chain-of-custody to address the scourge of IUU fishing in the region. The poor, highly-vulnerable nearshore fishers who are directly harmed by the illegal fishing operations that poach fish from their local waters stand to benefit from a share of the \$620 million that IUU fishing costs the Philippines alone each year<sup>1</sup>. The Nexus Blue Strategy targets a 15.0% blended IRR and 22.3% equity IRR<sup>2</sup> for investors over a 33-year term (including a 3-year construction & implementation period in addition to the 30-year concession.)

<sup>1</sup> Southeast Asian Fisheries Development Center, Fish for the People, Vol. 8, No.1, 2010, page 11.

<sup>2</sup> The sponsor IRR (internal rate of return) of a SPV under a PPP structure considers that the sponsors are generally expected to commit junior or mezzanine debt to the capital structure in addition to their equity investment; the “blended” IRR accounts for the multiple types of securities that project sponsors invest into an SPV such as NexusCo, and the interest, repayment and dividends received by sponsors after servicing the Senior commercial bank project loans.

## THE NEXUS BLUE STRATEGY

The Nexus Blue Partnership Strategy (Nexus Blue) is a hypothetical \$34.0 million public-private partnership investment structure to finance and implement targeted infrastructure and IT solutions that enable management reforms throughout the supply chain of the Philippines' high-value regional tuna fisheries. This strategy targets the operations and infrastructure of the General Santos Fish Port Complex (GenSan), which serves as a platform for investment in a comprehensive fisheries information management system (FIMS) PPP. The GenSan port functions as a "bridge" between on-the-water production and high value export markets, and offers a natural leverage point in the otherwise complex and diffuse supply chain.

Over 90% of total fish landings at GenSan are sourced from highly migratory, regional tuna populations. Strong national, regional and international regulations and standards do exist to govern these stocks, at least on paper. Fisheries authorities, however, are often unable to implement and enforce existing laws. The reasons for this vary, but include budgetary constraints, industry opposition, the common-resource nature of the sea, and limited data.

However, for the first time, this lack of effective regulation is beginning to have an impact on industry as well, and governments are taking notice. Top international market destinations, led by the European Union, are demanding fisheries management reform, compliance with international IUU commitments, and transparency across the supply chain. In April of 2014, the European Community issued a 'yellow-card' warning to the Philippines because of the high incidence of IUU fishing and lack of regulatory control over fisheries, which threatened to restrict access to the EU, a \$164 million annual export market for Philippine tuna products. The Philippines government quickly took action and passed legislation to address its fishery management deficiencies, and as a result, the European Commission lifted the Yellow-Card

warning in April 2015. However, serious questions remain as to how to implement these new legislative requirements.

Nexus Blue's FIMS component would integrate with the Philippine National Stock Assessment Program (NSAP), and deliver critical data to the Western Central Pacific Fisheries Commission (WCPFC), which manages highly migratory fish stocks across the region. The GenSan port modernization component would restore the facility while making improvements to sanitation, markets, and post-harvest facilities. The modernization initiative would also install solar power generation capable of meeting over 50% of the upgraded port's power needs and build 3,000 tons of new cold storage capacity, while increasing operational efficiencies and building shore-based governance capabilities. As the only port certified to export product to the EU and U.S., GenSan represents a critical path to market that the Philippine commercial fishing industry cannot ignore, and that buyers can look to with confidence and transparency.

While the Nexus Blue Strategy alone cannot expect to directly cause fish stock recoveries, especially in the short-term, it would aim to catalyze positive reform momentum and provide the foundation for sustainable fisheries management. This would include an effort to secure the commitment of Philippine fisheries authorities to complete implementation of fishery-wide vessel registration and establish maximum catch limits for the tuna and sardine fisheries as a part of the PPP process. Nexus Blue has the potential to generate stable and attractive financial returns, targeting a 15.0% blended sponsor IRR in the base case, with equity returns of 22.3% over an assumed 33-year total investment term. Finally, Nexus Blue can provide a novel, replicable model for public-private partnerships focused on national scale fisheries management improvements across the region and beyond.

### Direct Impact and Financial Returns

- Creates a best-in-class data collection and management system in partnership with the Philippines government capable of electronic monitoring and reporting, traceability, and near real-time data transmission covering 429 vessels.
- Addresses EU requirements for Vessel Monitoring Systems (VMS), traceability, and reporting, while informing regional stock assessments with improved catch accounting.
- Ensures that 100% of the product passing through GenSan is legally sourced and accounted for.
- Increases crew welfare by providing electronic communications and internet access.
- Targets a 15.3% blended IRR and a 22.3% levered equity IRR over a 33-year investment period.

### Indirect Impact Returns

- Provides the foundation necessary to establish and implement science-based catch limits across Philippine fisheries.
- Benefits vulnerable small-scale fishers by protecting their local fisheries resources from outside poachers.
- Offers authorities the tools to stamp out slavery and child labor practices.
- Removes key barriers to migratory fish stock restoration and management improvements in the Philippines.
- Serves as a model for replication throughout the region and broader ecosystem.

## KEY VALUE DRIVERS

The Nexus Blue Strategy's value proposition centers on a public sector concession to a private sector partner to renovate, build, operate and maintain key strategic public assets in the seafood supply chain and support monitoring and enforcement of fisheries regulations. The key drivers of cash flow would be user fees, increased product throughput, operating efficiencies,

novel technologies and enhanced value provided by post-harvest infrastructure upgrades. Data infrastructure both onsite and deployed across vessels using the port will satisfy currently unmet governance needs and will be funded through revenue generated at the port. The table below summarizes the key value drivers supporting the Nexus Blue investment thesis:

HIGHLIGHT	DETAILS
<b>Incentive alignment with industry</b>	<ul style="list-style-type: none"><li>• Nexus Blue endeavors to finance the on-the-water IT and monitoring infrastructure for industry, while providing improved port landings, market and post-harvest infrastructure.</li><li>• Port renovations and improved operations will enhance product value, with the ultimate goal of developing a "brand" around GenSan via product validation and differentiation for seafood producers sourcing raw materials from GenSan.</li></ul>
<b>Leverages strong regulatory enabling conditions</b>	<ul style="list-style-type: none"><li>• Nexus Blue will significantly enhance the Philippine fisheries management framework and lay a foundation to catalyze management improvements in other threatened national fisheries.</li></ul>
<b>Uses innovations to increase fisher compliance</b>	<ul style="list-style-type: none"><li>• The use of on-board data capture technologies, dockside catch accounting, and other data systems in combination with financial market incentives to reward fishers for sustainable practices can increase fisher compliance with fisheries management improvements.</li></ul>
<b>Establishes best-in-class partnerships</b>	<ul style="list-style-type: none"><li>• The project links FIMS solutions to regional partners and fisheries management organizations, and partners with existing initiatives such as the USAID OCEANS Project to expand the fisheries data management platform across the region.</li></ul>
<b>Leverages natural monopoly for access to high value export markets</b>	<ul style="list-style-type: none"><li>• GenSan is the only Philippine port certified for EU and U.S. export, providing important market access.</li></ul>
<b>Positive investment climate</b>	<ul style="list-style-type: none"><li>• The Philippines is currently considered one of the most attractive foreign investment destinations in the region, and its sovereign credit rating by all three major rating agencies has been steadily improving.</li></ul>

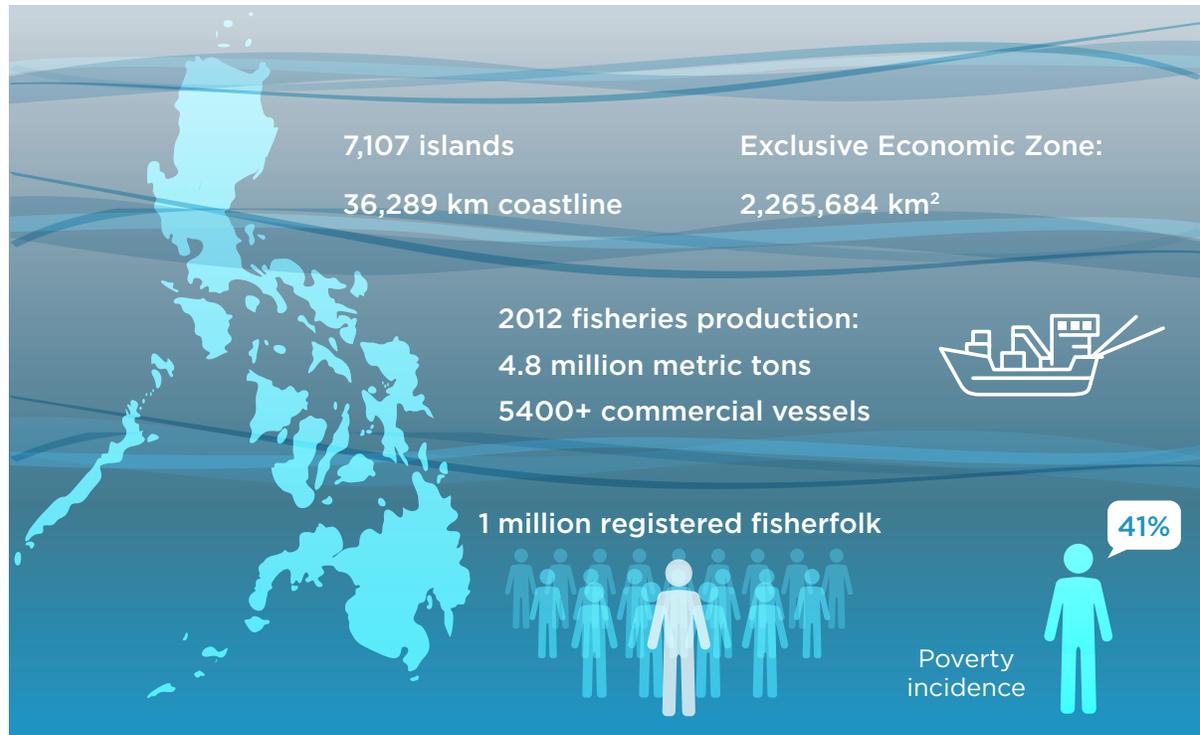


## PROFILE OF THE NEXUS BLUE STRATEGY FISHERY

The Philippines is an island nation in the heart of Southeast Asia populated by 100 million people and composed of over 7,000 islands situated in the western Pacific Ocean. Located at the apex of the Coral Triangle and encompassing most of the Sulu-Celebes Sea Large Marine Ecosystem, the Philippines' seas are a hotspot of marine biodiversity spanning over 2 million square kilometers and containing nearly 60,000 square kilometers of coral reef habitat (Figure 1).<sup>3,4</sup>

Fishing is culturally, economically, socially, and ecologically important to the Philippines. Millions of Filipinos depend on the health and productivity of the coastal and marine environments for their livelihoods and food security, where seafood accounts for more than 56% of the total animal protein consumed in the country. Philippine citizens consume 30 to 60 g per day of seafood,<sup>5</sup> significantly higher than the global average of 17 g per day.<sup>6</sup> In 2013, the Philippines reported 2.3 million tons of total marine fish capture, ranking second after Indonesia in the Southeast Asia region, and 11th worldwide.<sup>7</sup>

FIGURE 1: Philippines Fisheries Snapshot



<sup>3</sup> Ibid. pg. 2

<sup>4</sup> Burke et al. "Reefs at Risk Revisited," World Resources Institute, 2011.

<sup>5</sup> Daniel Pauly and MLD Palomares, "Philippine Marine Fisheries Catches: A Bottom-Up Reconstruction, 1950-2010," Research Report, UBC Fisheries Center, 2010.

<sup>6</sup> Food and Agriculture Organization of the United Nations, "The State of World Fisheries and Aquaculture," 2014.

<sup>7</sup> Daniel Pauly and MLD Palomares, "Philippine Marine Fisheries Catches: A Bottom-Up Reconstruction, 1950-2010," Research Report, UBC Fisheries Center, 2010.



In spite of well-formulated fisheries management policies, stocks have been declining overall within Philippines waters.<sup>8</sup> The reasons for this vary, but all illustrate the need to effectively manage this critical resource and enable more consistent, more accurate, and lower-cost long-term data capture to better monitor the status of the stock and the actors harvesting it. Given the importance of the country's fishing industry, declining fish stocks pose a significant challenge. Literature on Philippines fisheries cites a number of common reasons for overfishing and stock collapse, including:

- Open access fishing with a lack of management, regulation, and enforcement
- Technological advances (e.g., more efficient gear; larger nets; electronic fishing devices)
- Increase fishing efficiency and capture potential
- Economic development policies of governments
- Growing human population
- Increase in fish prices for a growing global market<sup>9</sup>
- Overfishing and excessive fishing pressure
- Inappropriate exploitation; post-harvest losses
- Habitat degradation
- Lack of technical/human resources, including monitoring and data collection and management<sup>10</sup>
- Environmental conditions (e.g., climate change, poor water quality)

### STOCK PROFILE AND CURRENT STATUS

The Philippines is strategically located along the so-called “tuna highway” (see Figure 2), a corridor for highly migratory pelagic<sup>11</sup> species that runs from the Indian Ocean to the Western and Central Pacific Ocean (WCPO). Because the stocks are highly migratory and do not fall within the jurisdiction of a single state, they are managed by the Western and Central Pacific

Fisheries Commission (WCPFC). The WCPFC is a regional fisheries management organization (RFMO) established by the “Convention for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean” (WCPF Convention), which was implemented on June 19, 2004.

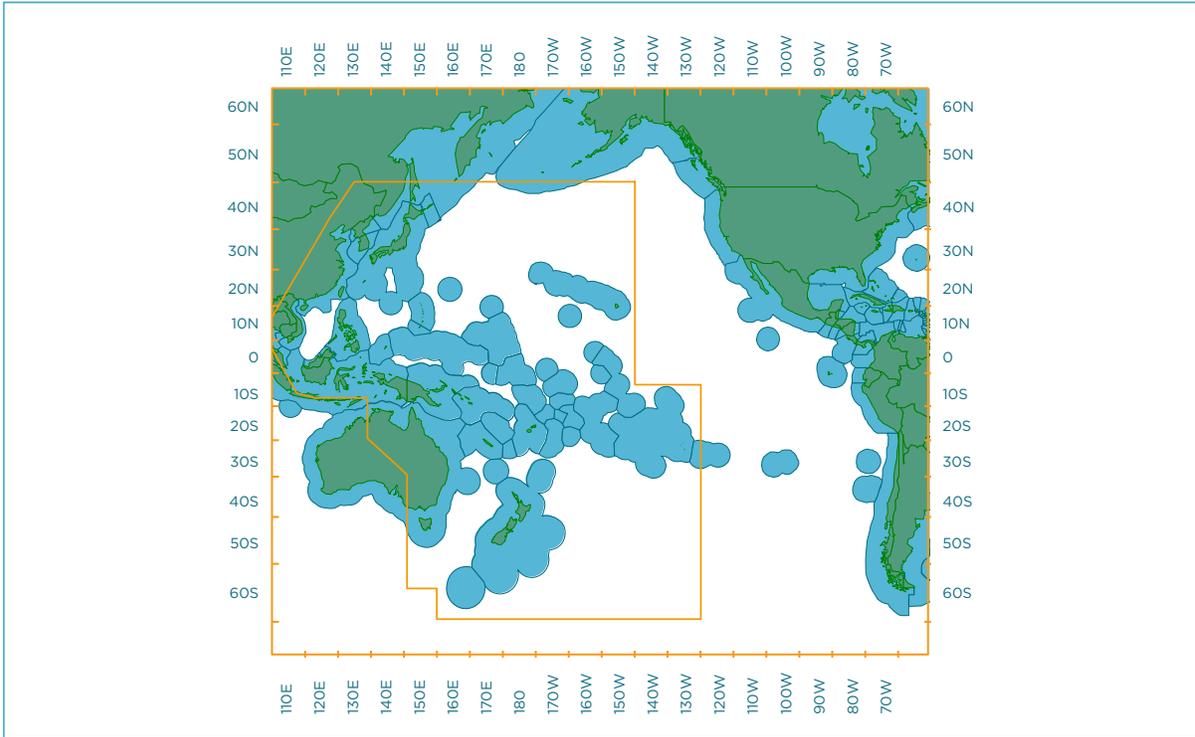
<sup>8</sup> The Fish Site, Philippines Reports Agriculture, Fisheries Growth Despite Typhoon Yolanda, May 27, 2014, available at <http://www.thefishsite.com/fishnews/23255/philippines-reports-agriculture-fisheries-growth-despite-typhoon-yolanda>.

<sup>9</sup> Ibid.

<sup>10</sup> Ibid.

<sup>11</sup> Pelagic fish are those that live within the water column of coastal, ocean, and lake waters, but not on or near the bottom.

Figure 2: The Tuna Highway and WCPFC Statistical Area



The species of particular concern to this strategy are primarily the commercial tuna, specifically Yellowfin (*Thunnus albacares*), Bigeye (*Thunnus obesus*), Albacore (*Thunnus alalunga*), Skipjack (*Katsuwonus pelamis*), Frigate Tuna (*Auxis thazard thazard*) (Figure 3). Other commercial fish caught in these waters include billfish such as Black Marlin (*Makaira indica*), Striped Marlin (*Tetrapturus*

*audax*), Blue Marlin (*Makaira nigricans*), and Swordfish (*Xiphias gladius*) (Figure 4). All of these species are highly migratory, and travel thousands of miles spanning the waters of multiple countries to feed and reproduce. As a result, stocks cover a wide geographic distribution at any given time, and do not remain within the Philippines' 200-mile national exclusive economic zone (EEZ).

FIGURE 3: WCPFC Tuna Species Landed in the Philippines

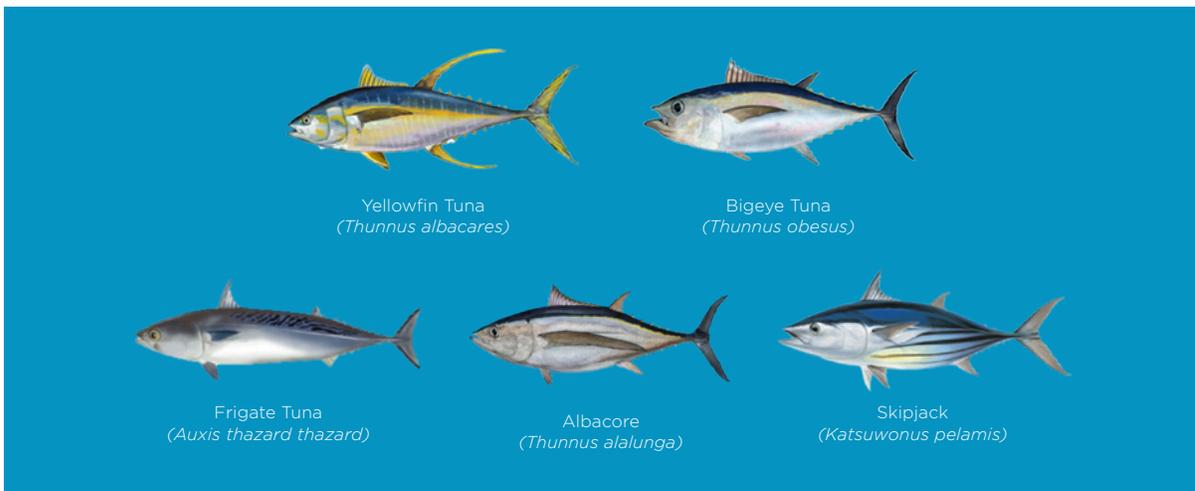
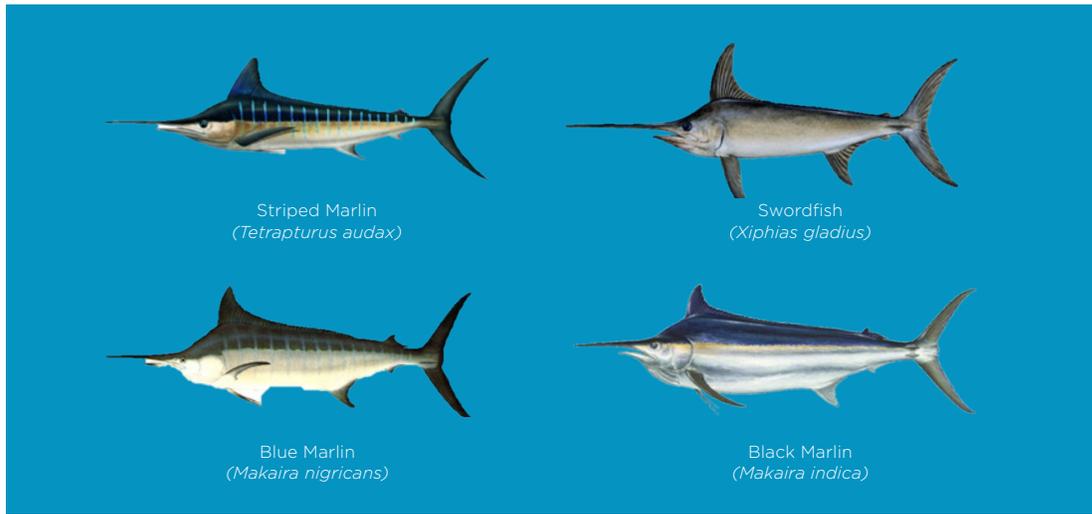


FIGURE 4: WCPFC Billfish Species Landed in the Philippines



The WCPFC oversees the world's largest tuna fisheries, with over 2.8 million metric tons (mt) of commercial tuna landed in 2014. This is over 30% greater than the entire volume of landings in the Indian Ocean, Atlantic Ocean and Eastern Pacific Ocean combined. The landings sourced from

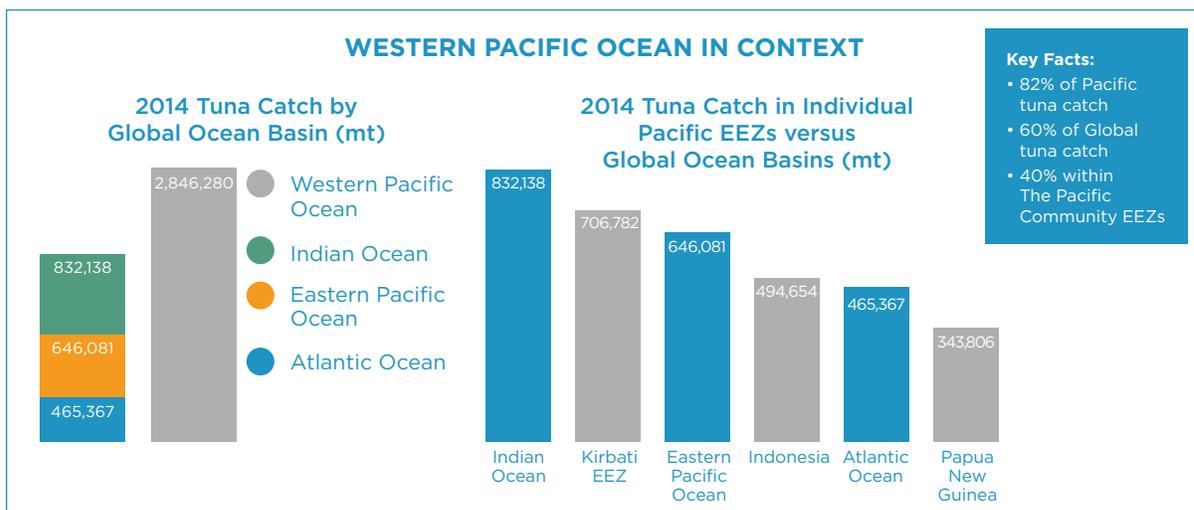
within just the exclusive economic zones (EEZs)<sup>12</sup> of island nations in the WCPFC such as Kiribati, Papua New Guinea, and Indonesia are nearly as large, or larger, than the entire volumes landed from the world's other major tuna-producing oceans (Figure 5).

#### WCPFC STOCK STATUS

The status of key tuna stocks in the WCPO is relatively robust, with the exception of bigeye, which is widely recognized as overexploited

relative to its stock size (see Figure 6). In addition to bigeye overfishing, there are serious problems of IUU fishing, juvenile catch, and bycatch.<sup>13</sup>

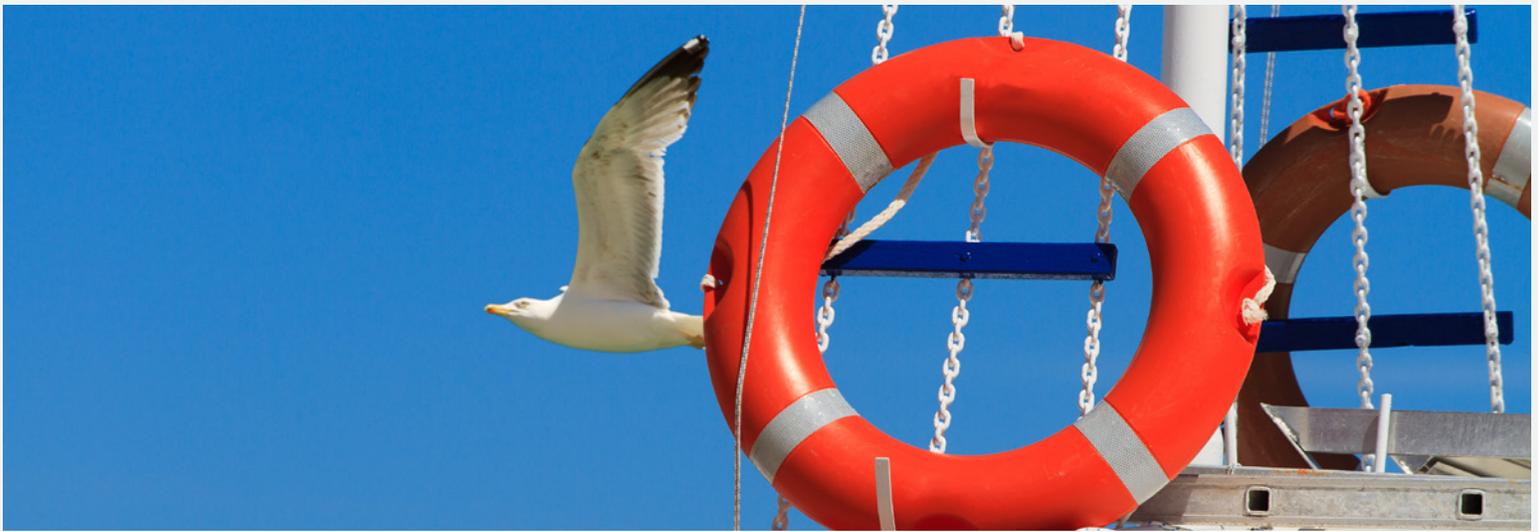
FIGURE 5: Relative Size of the WCPFC Tuna Fisheries



Source: SPC (Secretariat of the Pacific Community), 2015.

<sup>12</sup> An exclusive economic zone (EEZ) is a maritime zone defined under the United Nations Convention on the Law of the Sea (UNCLOS) as that which a state has rights over regarding the exploration and use of marine resources, stretched perpendicular to the coastline out to 200 nautical miles from the coast.

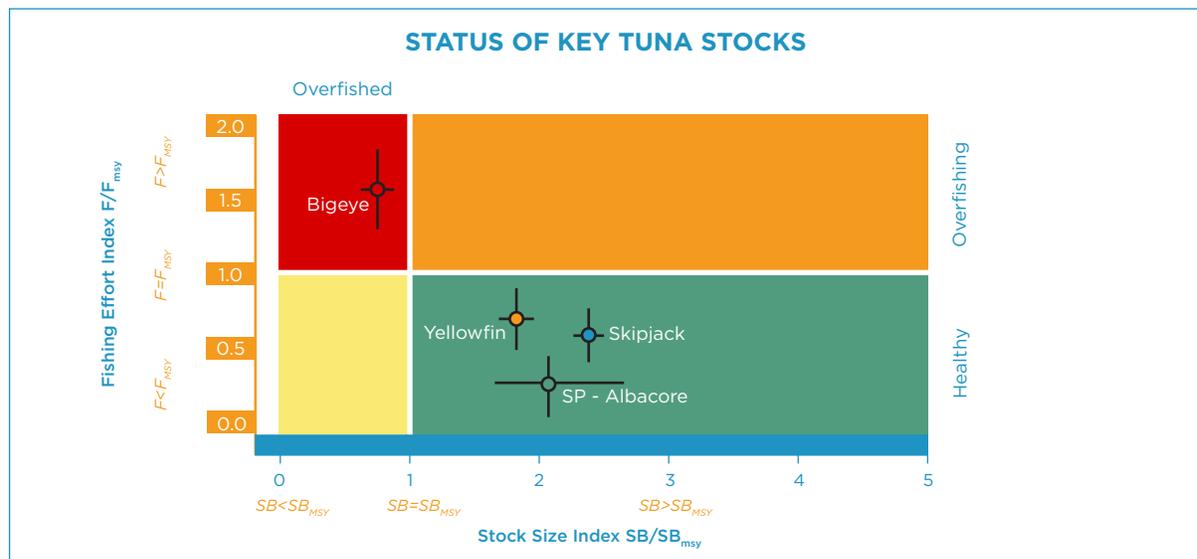
<sup>13</sup> Food and Agriculture Organization of the United Nations, "The State of World Fisheries and Aquaculture," 2014.



While the primary tuna species, including the yellowfin, albacore, frigate, and skipjack tunas, are not overexploited within the WCPFC region as a whole, localized overfishing is occurring in areas across the region, including within the Philippines EEZ. Bigeye stocks, however, are threatened throughout the WCPFC waters, largely a result of juvenile harvest by purse seine and ring net gear (Figure 6). Moreover, with landings increasing

substantially over the past several decades, the spawning stock biomass<sup>14</sup> of yellowfin, albacore, and bigeye has declined (Figure 7). At the global level, a recent report found that the global index for *Scrombidae*, the family of mackerels, tunas, and bonitos, declined by 74% between 1970 and 2010, and many tuna fisheries worldwide are under threat (Figure 8).<sup>15</sup>

FIGURE 6: The Status of Key Tuna Stocks in the WCPO<sup>16</sup>



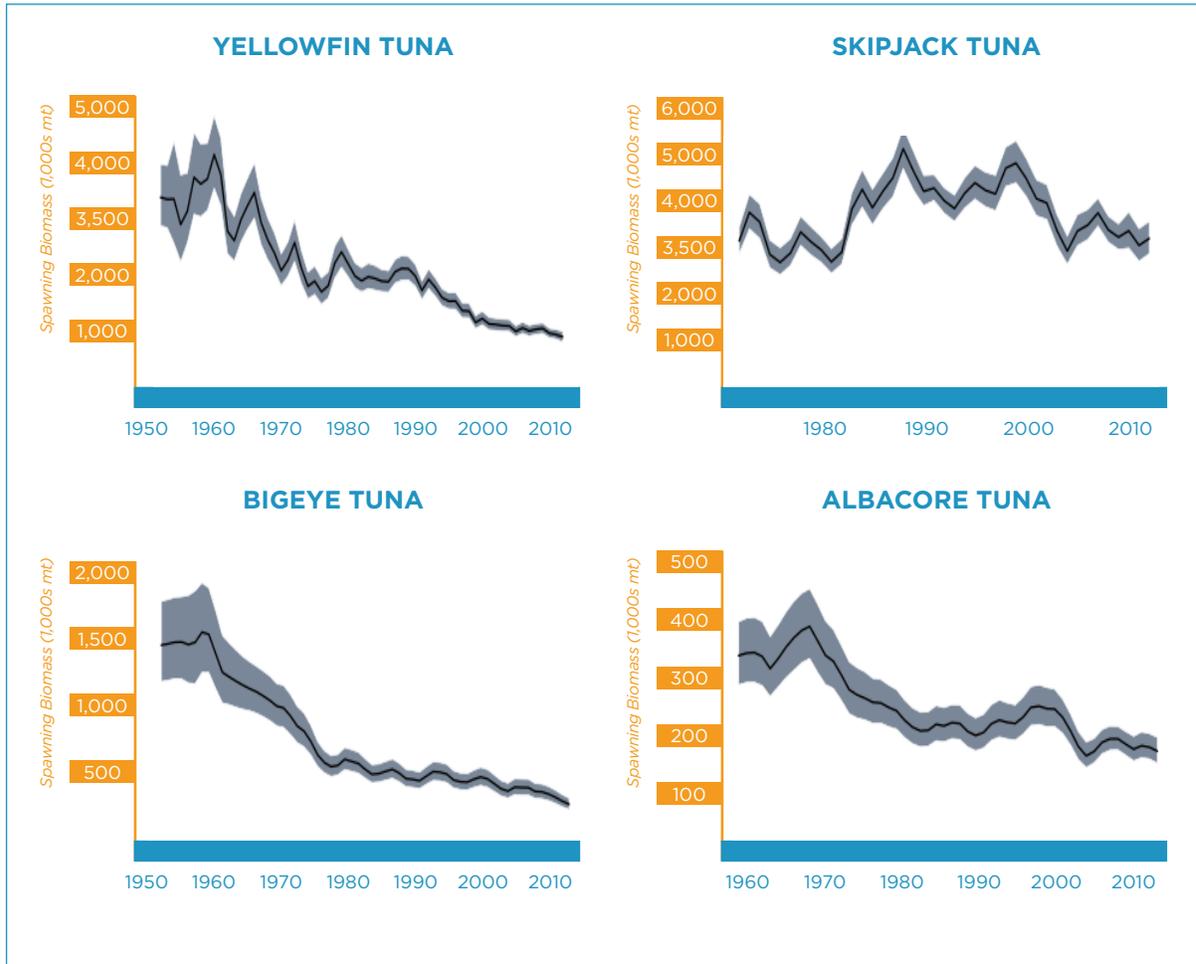
Source: SPC (Secretariat of the Pacific Community), 2015.

<sup>14</sup> Spawning Stock Biomass (SSB) is the biomass of mature, reproductive individuals in the population.

<sup>15</sup> Living Blue Planet Report, "Species, Habitats and Human Well-Being," WWF [J. Tanzer, et al., eds., WWF, Gland, Switzerland, 2015, pp. 7 and 27, available at: [http://d2ouvy59p0dg6k.cloudfront.net/downloads/living\\_blue\\_planet\\_report\\_1.pdf](http://d2ouvy59p0dg6k.cloudfront.net/downloads/living_blue_planet_report_1.pdf).

<sup>16</sup> The health of a fish stock is primarily a function of two components: 1) the current size of the stock's biomass relative to a theoretical sustainable maximum or minimum stock size (shown here as the ratio of current spawning stock biomass to the spawning stock biomass at maximum sustainable yield, or  $SB/SB_{MSY}$ ); and 2) the current fishing effort relative to the maximum sustainable yield ( $F/F_{MSY}$ ). The lower right-hand quadrant of Figure 6 indicates sustainable stock size and fishing effort at or below MSY, suggesting favorable long-term outcomes, while the upper left-hand quadrant indicates depleted stock size and fishing effort above MSY, which suggests that the stock has either collapsed or is at risk of collapse.

FIGURE 7: Time Series of Commercial Tuna Species Spawning Biomass in the WCPFC



Source: SPC, 2015.

FIGURE 8: Stock Status of Selected Global Tuna Fisheries as of 2014<sup>17</sup>

OCEAN	RFMO	BIGEYE	YELLOWFIN	SKIPJACK	ALBACORE
Indian	ITOC	Moderately Exploited	Moderately Exploited	Moderately Exploited	Moderately Exploited
Eastern Pacific	IATTC	Overfished	Fully Exploited	Moderately Exploited	Moderately Exploited
Western & Central Pacific	WCPFC	Overfished	Moderately Exploited	Moderately Exploited	Moderately Exploited
Atlantic	ICCAT	Moderately Exploited	Overfished	Moderately Exploited	Overfished

Source: www.atuna.com

<sup>17</sup> "Moderately Exploited" – stock is being fished below MSY (replacement level), not currently in danger of overfishing;  
 "Fully Exploited" – stocks are being fished up to MSY and cannot withstand any additional fishing pressure;  
 "Overfished" – stocks are being fished at levels above MSY, leading to short-term stock depletion and the possibility of stock collapse.

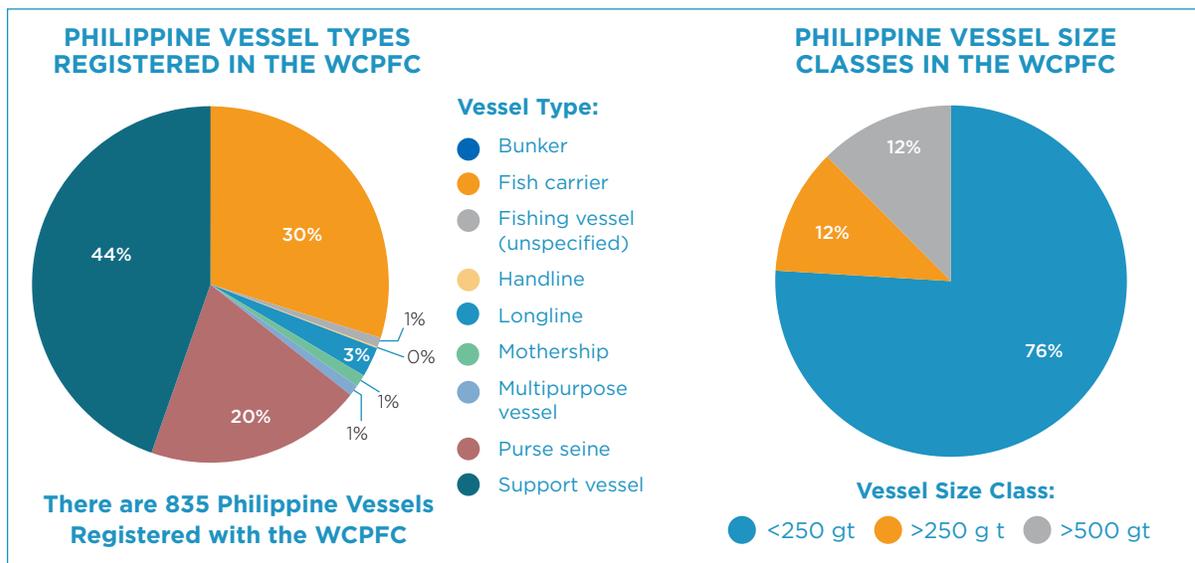


### THE PHILIPPINES' ROLE IN THE WCPO

As of 2015, WCPFC reported 835 vessels registered under the Philippine flag, which is 14.7% of the regional total. The Secretariat of the Pacific Community (SPC) Regional Tuna Fishery Database registered 29 Philippine flag purse seine vessels in other Pacific Island countries' waters in 2014.<sup>18</sup>

Philippines vessels registered under the WCPFC include bunker vessels, fish carrier vessels, handline vessels, longline vessels, "mothership" aggregating vessels, purse seine vessels, multipurpose vessels, and support vessels, with over 75% falling under 250 gross ton (gt) in weight, and 12% exceeding 500 gt (Figure 9).<sup>19, 20</sup>

FIGURE 9: Classification of Philippine Registered Commercial Vessels of the Western and Central Pacific Fisheries Commission (WCPFC)



Source: Annual Report to the WCPFC, Part 1: Information on Fisheries, Research and Statistics, Philippine Annual Fishery Report Update, August 6-14, 2014.

The Philippines is among the world's top tuna producers, representing approximately 10% of total landings in within the WCPO, landing nearly 16% of yellowfin tuna in the region by volume.

Among Philippines regulatory agencies, the Bureau of Fisheries and Aquatic Resources (BFAR) is the

primary organization for designing, implementing, and collating catch accounting systems in the Philippines, and is the national counterpart to the WCPFC when inputting to regional stock assessments.

<sup>18</sup> Annual Report to the Western and Central Pacific Fisheries Commission (WCPFC), Part 1: Information on Fisheries, Research, and Statistics, Philippine Annual Fishery Report Update, June 2015, p. 7, available at: [https://www.wcpfc.int/system/files/AR-CCM-20%20Philippines%20AR%20Part%201\\_0.pdf](https://www.wcpfc.int/system/files/AR-CCM-20%20Philippines%20AR%20Part%201_0.pdf).

<sup>19</sup> Ibid.

<sup>20</sup> Annual Report to the WCPFC, Part 1: Information on Fisheries, Research, and Statistics, Philippine Annual Fishery Report Update, August 6-14, 2014

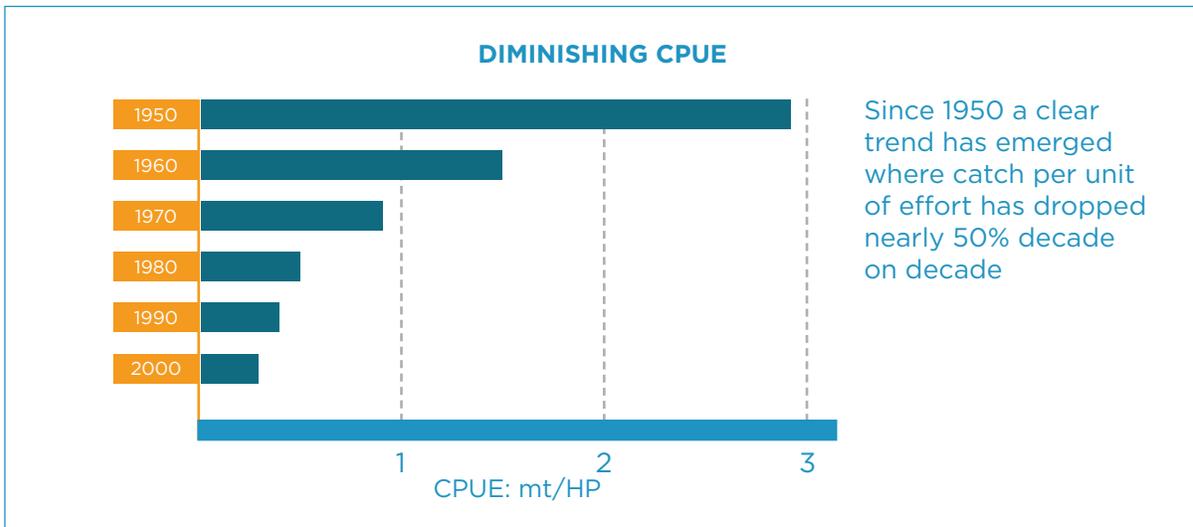


### STOCK STATUS AND THREATS WITHIN PHILIPPINES WATERS

While regional fish stocks across the WCPFC are currently not considered overfished (with the exception of bigeye tuna), the state of these species within Philippines waters is indicating signs of strain. Yellowfin tuna is considered fully exploited<sup>21</sup> and skipjack tuna moderately to fully exploited, while Catch-Per-Unit-Effort (CPUE) has been falling over time (See Figure 10).<sup>22</sup>

Since 1950, the catch per unit effort of Philippines fisheries has fallen dramatically. Recent data suggests current CPUE levels are nearly 1/10th the levels they were prior to 1950. This indicates overexploitation of fish populations by increasing number of fishers, despite dramatic improvements in technology.

FIGURE 10: Trend of Catch Per Unit Effort (Tons Per Horsepower (mt/Hp)) for Municipal Small Pelagic Fisheries in the Philippines Since 1948



Source: S.J. Green, A.T. White, J.O. Flores, M.F. Carreon III, A.E. Sia, Philippine Fisheries in Crisis: A Framework for Management, 2003, Philippines, p 6-7. Note: Data interpolated from graph published in above report.

<sup>21</sup> Gross ton is a unit of a ship's internal-storage capacity, equal to 100 cubic feet (2.83 cubic meters).

<sup>22</sup> Blue Earth Report to Oceana, "Understanding Fisheries, Fisheries Governance, Policy-Making, the Stakeholders Landscape, and Organizational Operation in the Philippines," September 28, 2012, p. 14.

## STOCK MANAGEMENT APPROACH AND CHALLENGES

### REGIONAL REGULATORY CONTEXT FOR HIGHLY MIGRATORY STOCKS

The Western and Central Pacific Fisheries Commission's (WCPFC) mandate is to address challenges to the sustainable management of high seas and regional fisheries. The Commission's specific responsibilities include developing and managing a framework that legally binds participating private fishing entities to fisheries management compliance, secures multilateral state participation, adapts to the unique needs of developing countries and enables cooperation with other Regional Fisheries Management Organizations (RFMOs) whose work and/or species under management overlap with those of the WCPFC.

The species covered under the WCPF Convention are albacore bigeye, skipjack, yellowfin, black marlin, blue marlin, striped marlin, and swordfish. In partnership with member states, the WCPFC also collects data on certain shark species. Catches and discards of other species are not considered under the WCPFC framework.<sup>23</sup> The industrial fishing gear types used in the WCPFC region primarily include pole and line, longline, purse seine, and trawl, and those vessels that are either flagged to participating nations or "chartered" foreign vessels fall under the WCPF Convention.<sup>24</sup>

### PHILIPPINE NATIONAL FISHERIES REGULATORY CONTEXT

Philippine fisheries are governed at both the national and local levels, and national regulators collaborate with regional fisheries management organizations (RFMOs) in the case of highly migratory species like tuna.

At the national level, fisheries management and enforcement falls under the jurisdiction of the Department of Agriculture's (DA) Bureau of Fisheries and Aquatic Resources (BFAR). The BFAR's mandate includes issuing licenses and permits according to the principle of Maximum Sustainable Yield (MSY), establishing strategies with the private sector to ensure sustainable use of fishery resources, establishing and maintaining a fishery information system, coordinating marketing activities, and formulating rules to conserve highly migratory, multi-jurisdictional species. The BFAR and the National Fisheries Research and Development Institute (NFRDI) are the main organizations responsible for designing, implementing and collating catch accounting

systems within country's EEZ, as well as activities involving domestic-flagged vessels product landed in the Philippines. The DA's Philippine Fisheries Development Authority (PFDA) is tasked with promoting the fishing industry's growth and managing critical public supply chain and logistics infrastructure. The PFDA's responsibilities consist primarily of operating and investing in the construction and maintenance of regional commercial fishing ports and post-harvest facilities to improve handling, storage, marketing, and distribution of seafood products. The PFDA currently owns and operates GenSan and seven other regional fish port complexes across the country.

Further layers of governance fall at the provincial, municipal (called Local Government Units, or LGUs), and "barangay" (village) level. Management efforts at these levels are supported by key research agencies including the NFRDI, the NSAP, and the Bureau of Agricultural Statistics (BAS).

<sup>23</sup> "Coastal Governance Index 2015." The Economist Intelligence Unit, 2015.

<sup>24</sup> "Tuna Fishery Handbook, 2014," WCPFC, 2014.

## THE PRINCIPAL OF TOTAL ALLOWABLE CATCH

In theory, the Philippines Fisheries Code 1998 operates on a principle of a Total Allowable Catch (TAC) ceiling set below the Maximum Sustainable Yield (MSY) for the species. These benchmarks were established through robust data collection and stock assessments, in accordance with regional and international fisheries laws such as the UN Convention on the Law of the Sea (UNCLOS), the UN Fish Stocks Agreement (UNFSA) and the FAOs International Plan of Action on IUU Fishing (IPOA-IUU). BFAR and the NFRDI cooperate with RFMOs such as the WCPFC to inform the regional stock status of highly migratory species, set TAC levels, and manage effort limits.

Fisheries data for use in the stock assessment process is collected primarily through regular port sampling conducted under the National Stock Assessment Program in major landing sites. Currently, BFAR is using paper-based log sheets which results in significant delays in data transmission (between three months and a year), input errors, added labor and administrative costs, and poor data integrity. However, 20 purse seine vessels in the Philippines are now using the Collected Localization Satellites (CLS) and Marine Logbook Information (MARLIN) electronic logbook system, and BFAR has prioritized building its digital data collection capabilities.<sup>25</sup>

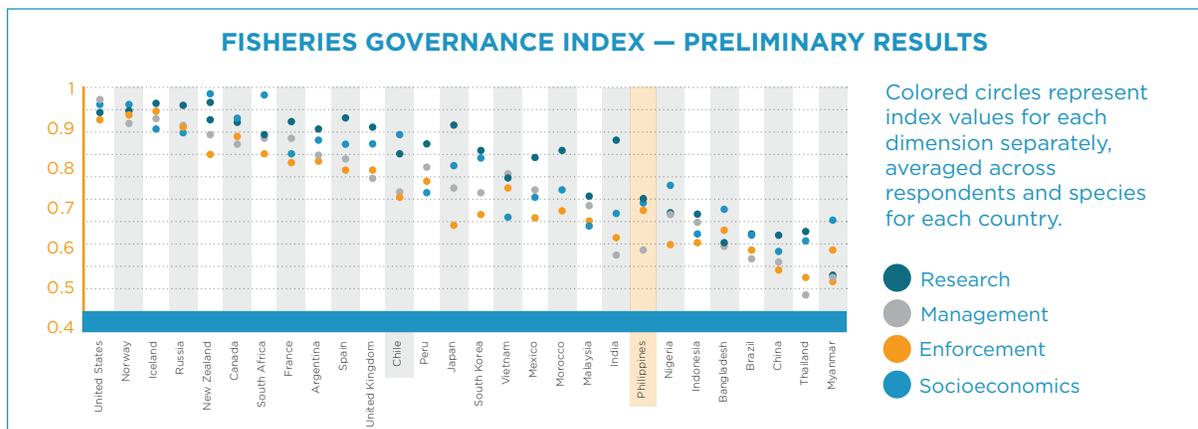
## FISHERIES MANAGEMENT CHALLENGES

### GOVERNANCE LIMITATIONS

Despite long-standing and recent efforts to improve fisheries management, the Philippines fisheries governance system ranks 21st out of the top 28 fish-producing countries that deliver 80% of global seafood supplies. Recent research published by the Ocean Prosperity Roadmap ranks countries

across four critical aspects of effective fisheries management: research capability, management capacity, and enforcement.<sup>26</sup> Nearly in the bottom quartile, the Philippines scores low on the index relative to other developing country peers such as Vietnam or Mexico (Figure 11).

FIGURE 11: Fisheries Governance Index



Source: Oceans Prosperity Roadmap.

Likewise, the Economist Intelligence Unit’s 2015 Coastal Governance Index’s “Living Resources” category, which is heavily weighted toward

fisheries management and conservation, ranked the Philippines tied for second to last of 20 countries surveyed (see Figure 12).<sup>27</sup>

<sup>25</sup> N. C. Barut and E. G. Garvilles, WCPFC, Annual Report to the Commission, Part 1: Information on Fisheries, Research and Statistics, Scientific Committee Eleventh Regular Session, Pohnpei, Federated States of Micronesia, August 5–13, 2015, p. 10.

<sup>26</sup> Oceans Prosperity Roadmap, 2014. “Governance & Marine Fisheries.”

<sup>27</sup> “Coastal Governance Index 2015.” The Economist Intelligence Unit, 2015.

FIGURE 12: EIU 2015 Coastal Governance Index - Living Resources Category Rankings

**CATEGORY RANKING, LIVING RESOURCES**

RANK/20	COUNTRY	SCORE/100	RANK/20	COUNTRY	SCORE/100
1	United States	97	-10	Russia	62
2	New Zealand	94	12	South Africa	60
3	France	91	13	Mexico	51
4	Spain	83	-14	Indonesia	37
5	Norway	79	-14	Peru	37
6	Brazil	78	16	Vietnam	34
7	Canada	77	-17	India	31
8	Chile	71	-17	Nigeria	31
9	South Korea	70	-17	Philippines	31
-10	Japan	62	20	China	25

**ILLEGAL, UNREPORTED, AND UNREGULATED (IUU) FISHING ACTIVITY**

IUU fishing in Philippine and regional waters is considered a serious problem, especially as related to the catch of migratory pelagic species like tuna.<sup>28</sup> In the Philippines alone, an estimated 460,000 mt of fish are illegally harvested each year, translating to annual economic losses of up to \$620 million, or between 3% and 6% of the estimated \$10 to \$20 billion in annual global IUU costs.<sup>29,30</sup>

The Philippines is party to a number of international agreements committed to countering IUU activity through better MCS, better data capture, and better traceability across the supply chain, including the UNCLOS, UNFSA and the IPOA-IUU, among others. In spite of these commitments, the Philippines has been identified as one of the nations most affected by IUU fishing, particularly related to high-value and restricted species such as tuna, reef fish, sharks, and turtles.<sup>31</sup>

**THREAT OF EUROPEAN COMMISSION TRADE SANCTIONS AND THE “YELLOW CARD”**

Due to the Philippines’ failure to meet international standards on the restraint of IUU fishing, in June 2014, the European Commission (EC) identified the Philippines as a non-cooperating Third Country. This identification is referred to as the “yellow card,” and it functions as an official warning to the Philippines to take action to improve the situation, such as amending its fisheries law or taking a more proactive approach against IUU fishing within

the term of six months in order to avoid further consequence.<sup>32</sup> In April 2015, the EC lifted the yellow card in recognition of the Philippines’ progress in taking steps to limit IUU fishing.<sup>33</sup> However, without significant reforms in the long term, the country is liable to receive a more severe “red card” that bans all Philippines fishery exports to the European Union. This action has been taken against Guinea, Belize, and Cambodia as recently as 2014.

<sup>28</sup> M. Lack, Shellack Pty Ltd., Impacts of IUU fishing in the Asia-Pacific Region, available at: <http://www.slideshare.net/fishersforum/impacts-iuu-fishingasiapacificregionmarylacktffday1>.

<sup>29</sup> European Commission, 2015. “Question and Answers on the EU’s fight against illegal, unreported and unregulated (IUU) fishing” Fact Sheet.

<sup>30</sup> Fish for the People, Vol. 8, No. 1, 2010, Southeast Asian Fisheries Development Center, p. 11, available at: <http://www.havocscope.com/amount-of-illegal-catches-in-the-philippines-each-year/>.

<sup>31</sup> M. Lack, Shellack Pty Ltd., Impacts of IUU fishing in the Asia-Pacific Region, available at: <http://www.slideshare.net/fishersforum/impacts-iuu-fishingasiapacificregionmarylacktffday1>.

<sup>32</sup> European Commission, Commission warns Philippines and Papua New Guinea over insufficient action to fight illegal fishing, 10 June 2014, available at: [http://europa.eu/rapid/press-release\\_IP-14-653\\_en.htm](http://europa.eu/rapid/press-release_IP-14-653_en.htm).

<sup>33</sup> Official Gazette, PH gets green card on IUUF from the European Union, available at: <http://www.gov.ph/2015/04/22/ph-gets-green-card-on-iuuf-from-the-european-union/>



## THE PHILIPPINES AMENDED FISHERIES LAW OF 2015

In response to growing pressure from the EU, as well as new measures proposed by the U.S. regarding IUU vessels and product in Philippines waters, the Philippine government amended its primary fisheries regulatory legislation, the “Fisheries Code of 1998”.<sup>34</sup> The Philippines government passed the “Amended Fisheries Law” in April 2015,<sup>35</sup> aimed at preventing, detecting and eliminating IUU fishing by addressing specific areas of deficiency and signaling its commitment to rectifying the issue.

A primary amendment was a requirement that all Philippine fishing vessels install monitoring, control, and surveillance (MCS) systems, regardless of fishing area and the final catch destination, and BFAR issued a law requiring all tuna fishing vessels

to install VMS. The European Commission removed the yellow card in April of 2015, following the passage of the *Amended Fisheries Law*, but has said that it will carefully monitor the law’s implementation.

However, implementing the amendments will be a significant challenge for the Philippines government, which faces substantial industry opposition. In fact, the legal basis for VMS installation has existed for nearly 20 years, yet implementation and enforcement has been politically difficult. Given its inability to fulfill its MCS/VMS obligations for over nearly two decades, observers question whether it can effectively implement and enforce the recent amendments, which carry even stricter requirements for VMS compliance.

## ONGOING CHALLENGES

Such strong trade sanctions as those threatened by the EU would greatly affect the country’s economy, particularly in the General Santos region. As the second largest importer of Philippines fishery products in 2013, the EU imported \$190 million of primarily prepared and preserved tuna. In 2012, EU exports of a single product—canned tuna—reached \$123 million, representing 45% of the Philippines’ total tuna exports and over 10% of all national fisheries exports.

Other significant impacts of a failure to address the IUU situation, and threats to its ability to do so effectively, include:

### Threats to U.S. and Japanese Market Access

The U.S. and Japan are adopting the EU’s IUU fishing stance, which aim to close their markets to IUU products. In 2012, the U.S. was the largest importer of fishery products from the Philippines,

with a total imported value of \$270 million, while Japan imported \$123 million worth in the same year.

### Social Unrest from Commercial Fishing Community

The Amended Fisheries Law faces mounting opposition from the fishing industry due to its strict prohibitions, including a fishing ban within 15 kilometers of Philippines municipal waters, prohibition on use of destructive gear, limits to total allowable catch, and the mandatory MCS requirement. In September 2015, more than 1,000 fishers protested against BFAR’s decision to implement the Amended Fisheries Law, and in July 2015, some 5,000 fishers and traders staged a “fishing holiday” protest in Manila Bay. In addition to concerns about MCS system installation costs’ potentially reducing fishing income, the protesters feared the risk of receiving heavy penalties from violations.

<sup>34</sup> Republic Act (RA) No. 8550, The Philippines Fisheries Code of 1998, An act providing for the development, management and conservation of the fisheries and aquatic resources, integrating all laws pertinent thereto, and for other purposes.

<sup>35</sup> RA 10654, An Act to prevent, deter and eliminate illegal, unreported and unregulated fishing, amending Republic Act No. 8550, otherwise known as “The Philippines Fisheries Code of 1998” and for other purposes; RA 10654 was issued on July 28, 2015, and lapsed into law on February 27, 2015.

## GENERAL SANTOS FISH PORT COMPLEX

The City of General Santos was incorporated in 1968 on the island of Mindanao at the southern extreme of the archipelago (Figure 13). The region is strategically located along major global shipping lanes, with short access to markets in Malaysia, Indonesia, Brunei, and Singapore; and benefits from a deep, natural harbor; a lack of typhoons<sup>36</sup>; a favorable climate with moderate rainfall and abundant sunshine; fertile volcanic soil; and proximity to high-value tuna fishing grounds. As a result, the agro-industrial sector drives the city's economy, and this region is the country's largest producer of agricultural commodities. The city is also home to the General Santos Fish Port Complex (GenSan), which is the country's second largest port by daily landings volume, leading producer of sashimi-grade tuna, and is among the world's largest tuna ports and a major hub in the regional supply chain.<sup>37</sup>

There were 15,936 vessel landings at GenSan in 2014; an average of 1,328 vessels/month and 44 vessels/day. GenSan is a primary landing destination and a transshipment hub for accessing export markets including the U.S., Europe, Japan, and Australia.

### CURRENT SUPPLY CHAIN AND FISH PORT THROUGHPUT

The species landed at GenSan from the regional WCPO stocks to which the Philippines has access are tunas—namely skipjack, yellowfin, albacore, and big-eye, as well as other pelagic, “tuna-like” species including marlin, swordfish, mahi-mahi, mackerels, and scad. However, tuna dominates production, earning GenSan the moniker of “Tuna Capital of the Philippines”. In 2014, 287,000 mt of tuna was landed in the Philippines, of which nearly 180,000 mt, or 63%, passed through GenSan.<sup>38</sup>

The catch is dominated by three gear types—64% caught by purse seine, 16% by ringnets, and 16% by hand line—with the remainder landed by a small longline fleet of just four vessels registered by the Western and Central Pacific Fisheries Commission (WCPFC). As catch has declined within the Philippines EEZ over the

FIGURE 13: Map of the Philippines and General Santos City



<sup>36</sup> General Santos City lies outside of the Typhoon Belt, and is surrounded by high mountains that shelter the area from storms.

<sup>37</sup> WCPFC, Annual Report, p 8, available at: <http://www.wcpfc.int/system/files/AR-CCM-20%20Philippines%20AR%20Part%201.pdf>.

<sup>38</sup> T. Huntington, Data capture opportunities to improve fisheries management in selected commercial fisheries in the Philippines - Draft Report, Poseidon Aquatic Resource Management Ltd., Windrush, Warborne Lane, Portmore, Lynton, Hampshire SO41 5RJ, U.K., 2015, p. 5.

past decade, Philippine vessels are traveling farther afield to find new fishing grounds. In recent years, the share of GenSan landings from the Philippines EEZ has been about 60%, while the share from Papua New Guinea's EEZ is 36%. However, an increasing amount now comes from the "High Seas Pocket 1" (HSP1) zone, outside of any country's EEZ.<sup>39</sup> There are four main sources of fish landed at GenSan (see Figure 14):

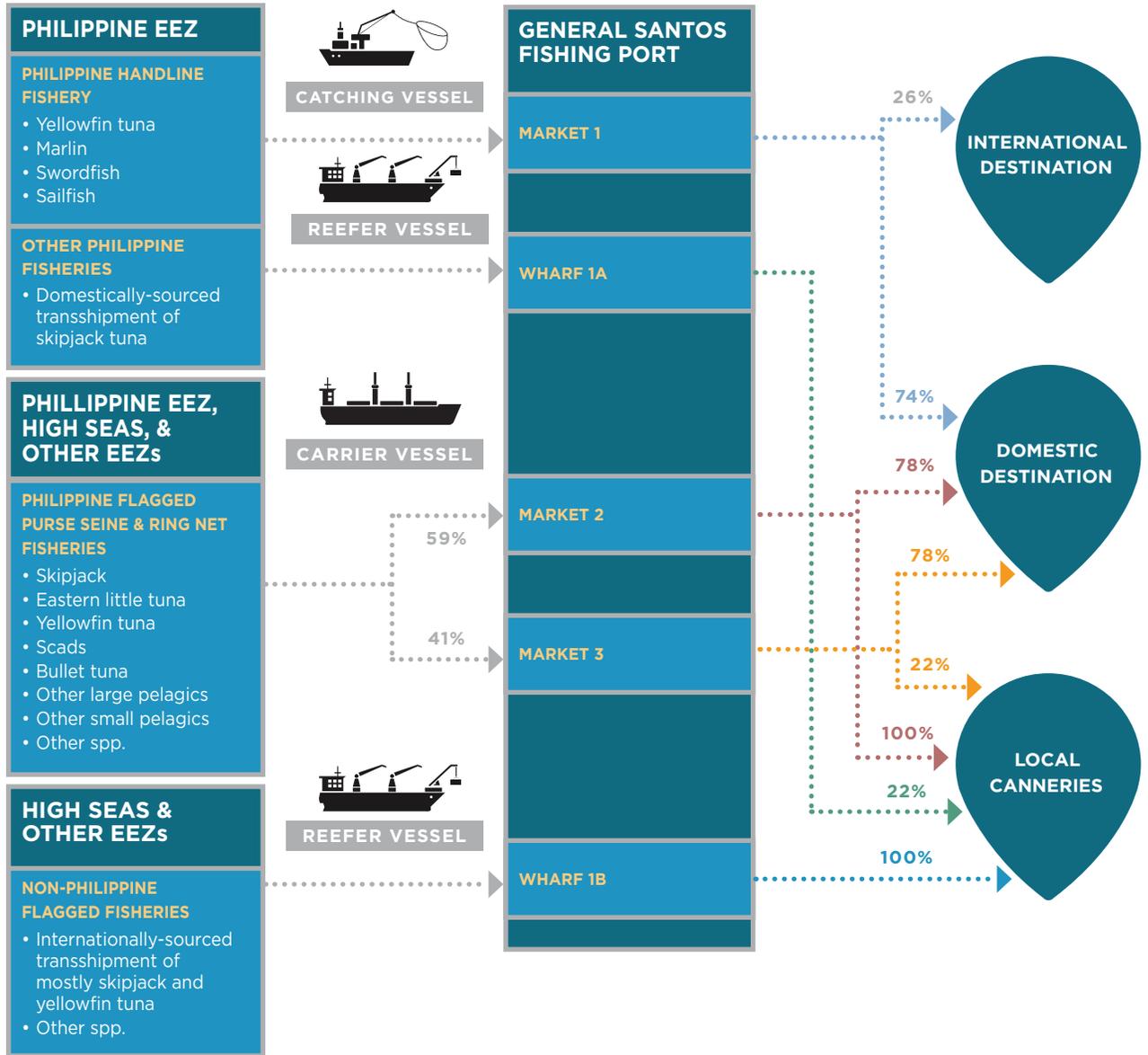
1. **GenSan-Based handline fisheries:** Traditional bancas of 8 gt with trips of up to 15 days, landing an average of 1.5 mt of primarily large yellowfin and billfish per trip. There are issues over handling, long trip length, and chilling; and only 20% of landed catch is export-quality, and very little are sashimi-quality.
2. **GenSan-Based domestic purse seine and ring-net (chilled) fisheries:** Fish aggregating devices (FADs) fisheries catching small juvenile pelagic tunas, neritic tuna, and small pelagic fish. Fishing vessels operate for up to eight months at sea, transferring catch to carrier vessels of approximately 35 gt, which land an average of 16 mt of primarily skipjack, juvenile yellow fin, neritic tuna, and scad. The key sustainability threat from this fleet is the very small size of the juvenile yellowfin tuna caught using FADs, with 50% of individuals weighing less than 500 g (1.1 lb). The product quality is also quite variable, with considerable scope for improvement.
3. **Domestic transshipments from Philippines purse seine and ring-net (frozen) fisheries:** Refrigerated transport (reefer) vessels collect product from purse seine or ring-net vessels operating out of Manila and other Philippines ports and transport it to GenSan for processing. The fishery profile is the same as that described above for the GenSan-based domestic purse seine and ring-net vessels, and the frozen product collected from catch vessels or aggregating "mother ships" primarily include skipjack and yellowfin destined for local canneries.
4. **International transshipments of Non-Philippines purse seine catch (frozen):** Refrigerated transport (reefer) vessels collect product from purse seine or ring-net vessels operating out of international ports throughout the Western and Central Pacific Ocean (WCPO), including Papua New Guinea, Taiwan, Japan, Marshall Islands and Korea, and import skipjack and yellowfin to GenSan for processing. The fishery profile is equivalent to that described above for domestic purse seine and ring-net vessels, and the imported product is primarily skipjack and yellowfin sent to local canneries in General Santos City.<sup>40</sup>

As catch has declined within the Philippines EEZ over the past decade, Philippine vessels are traveling farther afield to find new fishing grounds.

<sup>39</sup> HSP 1 is an area between the regional EEZs, and borders the national waters of Palau, Micronesia, Papua New Guinea, and Indonesia, areas closest to the Philippines where local tuna fishing companies frequently operate.

<sup>40</sup> T. Huntington, Data capture opportunities to improve fisheries management in selected commercial fisheries in the Philippines – Draft Report. Poseidon Aquatic Resource Management Ltd, Windrush, Warborne Lane, Portmore, Lymington, Hampshire SO41 5RJ, U.K., 2015.

FIGURE 14: Current Supply Chain at the General Santos Fish Port Complex

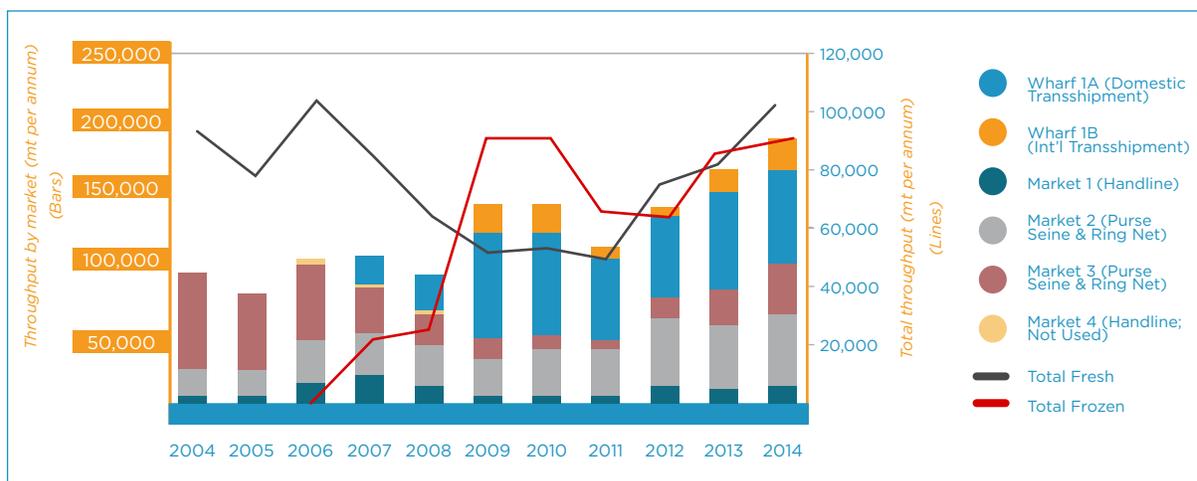


Total landings at GenSan nearly doubled during the ten years after 2004, from 94,000 mt to 193,000 mt in 2014. However, Government statistics show that throughout the Philippines, the contribution of tuna to total seafood exports has dropped, as has the total value of Philippines tuna exports, which fell from \$665 million in 2013 to \$460 million in 2014, a 31% year-on-year decline. Since 2010, total Philippine tuna volumes have dropped nearly 20%.<sup>41</sup> The share of tuna landings sourced by the GenSan

fishing fleet (excluding frozen transshipments) has fallen as well in recent years (Figure 15).

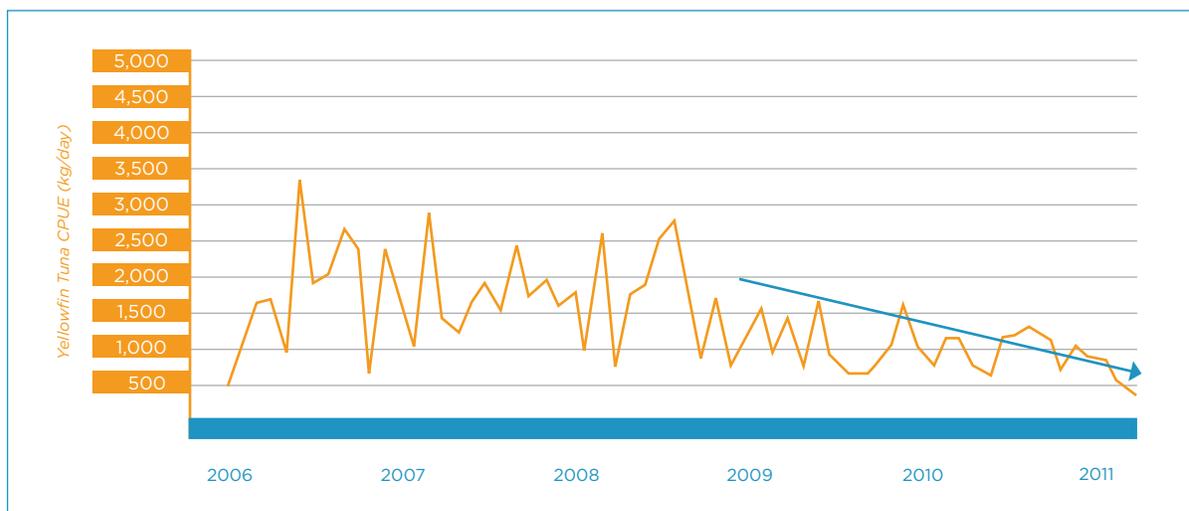
These declines are widely considered to be the result of two interrelated factors: 1) overfishing and stock decline within the Philippines EEZ, leading to decreases in catch-per-unit effort (CPUE) (Figure 16); and 2) increased restrictions placed on the ability of Philippine-flagged vessels to fish within neighboring countries' EEZs. Indonesia in particular has been cracking down on Philippine

FIGURE 15: Throughput by Market Location at the General Santos Fish Port Complex (2004–2014)



Source: PFDA in General Santos (unpublished data).

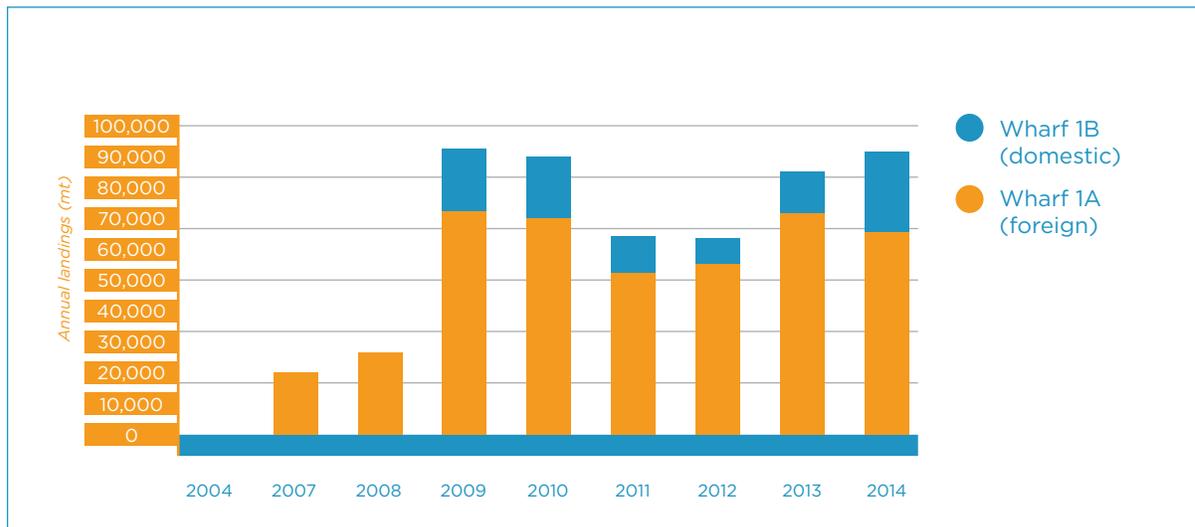
FIGURE 16: Catch Per Unit Effort for Purse Seiners Landing at GenSan (2006–2011)



Source: BFAR, 2012; T. Huntington, Data capture opportunities to improve fisheries management in selected commercial fisheries in the Philippines - Draft Report. Poseidon Aquatic Resource Management Ltd, Windrush, Warborne Lane, Portmore, Lymington, Hampshire SO41 5RJ, U.K., 2015, p. 13.

<sup>41</sup> Asian Correspondent, 2015. Philippine 2014 tuna export value down despite 51% hike in production.

FIGURE 17: Frozen Fish Landings into General Santos (2004–2014)



Source: PFDA in General Santos (unpublished data); T. Huntington, Daa capture opportunities to improve fisheries management in selected commercial fisheries in the Philippines – Draft Report. Poseidon Aquatic Resource Management Ltd, Windrush, Warborne Lane, Portmore, Lymington, Hampshire, U.K., 2015, p. 14.

vessels encroaching in its waters, and Indonesian authorities captured and sank 11 Philippine vessels originating from General Santos in 2015.

The Philippines’ role in the supply chain of WCPFC fisheries is significant, and the country is currently the second largest canned and processed tuna manufacturer in Asia, behind Thailand.<sup>42</sup> The country’s tuna catch of 229,393 in 2013 comprised 33% of the country’s catch in that year, with 88,928 mt of exports worth \$665 million. The primary source of export revenues came from 58,660 mt of canned tuna, while fresh, chilled and frozen tuna

products were the second largest category with 2013 volumes totaling 28,808 mt.<sup>43</sup>

Of the 180,000 mt in total tuna landings at GenSan in 2014, the GenSan-based fishing fleet (chilled handline, purse seine and ring-net fisheries) landed only 48% of this total. The remaining 92,400 mt consisted of frozen transshipments from refrigerated “reefer” vessels carrying frozen purse seine and ring-net sourced yellowfin and skipjack sourced from other ports in the Philippines (12%) and regional imports (40%) (Figure 17). This frozen product supplies the local canneries, as the city of General Santos is home to six of the country’s seven canneries.

### HARVEST LOGISTICS

The large commercial vessels that fish both within the Philippines EEZ and outside it will often remain at sea for several months at a time, up to as much as two years in some cases. Product is delivered to port by faster transporter, or “carrier” vessels, which can quickly bring fresh product back to port. In the case of the very large “mothership” vessels, product smaller “catch” vessels harvest product and return it to the mothership, which

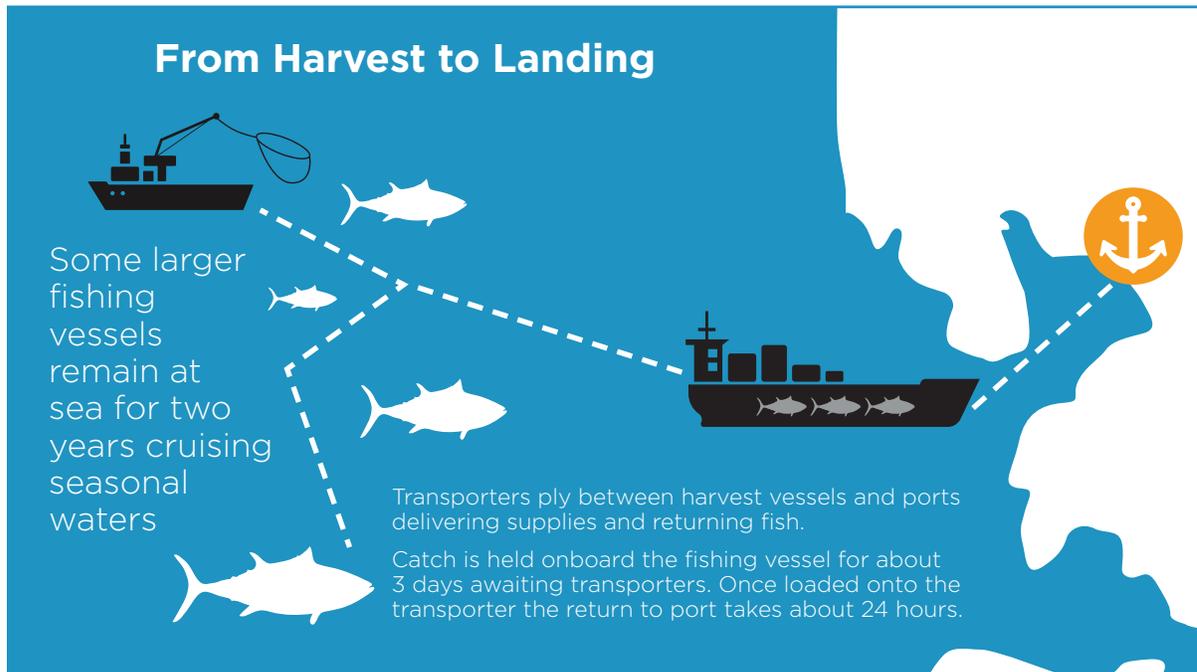
acts as a floating port. The mothership aggregates the product and distributes it to the carrier vessels that bring the product to land (see Figure 18). The multiple transfers of product between vessels makes traceability a challenge, and the practice is used by vessels operating illegally to effectively “launder” their product by having it aggregated at sea with legitimate catch and transported to port using legal vessels.<sup>44</sup>

<sup>42</sup> Asian Correspondent, Philippine tuna in 2015: Facing the new threat, January 28, 2015, available at: <http://asiancorrespondent.com/130121/philippine-tuna-in-2015-facing-the-new-threat/>

<sup>43</sup> Intrafish Media, 2015. Philippine tuna export value drops despite 51% hike in production.

<sup>44</sup> Intrafish Media, 2015. Philippine tuna export value drops despite 51% hike in production.

FIGURE 18: On-the-Water Logistics and Transport



### EXPORT DESTINATIONS

Fresh chilled and frozen tuna products are shipped mostly to Japan, the U.S., Indonesia, Thailand, Hong Kong, and France; prepared and preserved tuna products are mainly exported to the U.S., Canada, Japan, South Africa, and Germany; and dried and smoked tuna is shipped to Australia and New Zealand. The main destinations of “super-

frozen” tuna are Taiwan, Korea, and, recently, China, Japan, and Vietnam. In December 2010, National Statistics Office reports showed tuna billings being \$46.2 million, an increase of 51.9% compared to the same month in 2011. In 2012, tuna export increased by 2% in volume and 3% in value compared with 2011.

### PORT INFRASTRUCTURE AND CHALLENGES

The entire land surface area of GenSan is 35.8 hectares (ha), which is used for a combination of public and private sector services and of which approximately 11.5 ha are vacant lots. There are two large wharfs for very large reefer vessels, and four harbor basins with the total berth space of about 1,485 m long, which is where the smaller vessels dock. Each harbor basin has an affiliated market

hall, with a total footprint of 6,000 sqm across the three markets. GenSan has two cold storage facilities with a combined capacity of 3,000 mt of storage, as well as ice-making capabilities (see Figure 19).<sup>45</sup> There are 26 lots identified for agro-industrial purposes at the port, but only 16 are presently under lease, and of these just seven commercial lots appear to be in active use.

<sup>45</sup> GSFPC Brochure. UK.

FIGURE 19: General Santos Fish Port Current Facilities



## HARBOR BASINS

Each harbor has two types of landing facilities: a stair landing and a quay. Each basin also has different depths, or “draft,” to accommodate different-size vessels. The use of the harbor facilities is divided into sections according to the gross tonnage (gt) of vessels landed there, the

type of fishing gear used, and the origin of the fishing boats’ port of call, such as Manila, other Philippines ports, or “high seas” vessels that fish virtually year-round in international waters outside of the national EEZs.<sup>46</sup>

## WHARFS

Extending beyond the harbor basins are two wharves reserved for the very large foreign and local reefer transshipment vessels of 3,000 to 4,000 gt that land the frozen skipjack and yellowfin land transshipped. Wharf 1A is where foreign reefer

vessels unload imported frozen tuna for local canneries, while Wharf 1B is the unloading point for reefer transshipments from vessels based out of other Philippine ports.

## COLD STORAGE

There are two refrigeration plants owned and operated by GenSan. Plant A is the original refrigeration facility, built concurrently with the port under the Overseas Economic Cooperation Fund (OECF), which has been in operation since 1998 and includes an ice making plant (60 mt/day

production capacity), ice storage (30 mt capacity), an ice crusher, cold storage (1,500 mt capacity at -35 °C), a contact freezer, an air-blast freezer, and a 700 m<sup>2</sup> processing area. Plant B was financed by a Chinese loan facility, beginning operations in 2007 and features cold storage (1,500 mt

<sup>46</sup> Often, vessels from other ports will use GenSan instead of their port of call because of its relatively better and more hygienic facilities, better prices for sale of catch, and shorter trip to port from fishing grounds.



capacity at -35 °C), a contact freezer, an air-blast freezer, and a 1,800 m<sup>2</sup> processing area. The main clients of the refrigeration building are the fish

processors, fish car operators, and refrigerated fish carrier vessels. Four companies, two in each plant, currently rent processing space.

### PORT GOVERNANCE STRUCTURE

Presently the Philippines Fisheries Development Authority (PFDA) owns and operates GenSan. The PFDA falls under the Department of Agriculture, and is mandated to promote the fishing industry's growth and improve efficiency of the handling, preserving, marketing, and distribution of seafood products through the establishment of fish ports, fish markets, and other public supply chain infrastructure.<sup>47</sup> At GenSan, the PFDA assigns a Port Manager (PM) to oversee four divisions managing the daily operations of the port:

**1. Market and Harbor Operations Division:**

Provides landing and marketing services to users; formulates policies and procedures for effective Harbor and Market Operations; manages market and harbor operations revenues.

**2. Administrative and Finance Division:**

Manages all administrative and financial responsibilities such as accounting, record-keeping, budgeting, and human resources.

**3. Engineering and Ice Plant Operations Division:**

Manages ice plant and refrigeration operations, port infrastructure management and maintenance, and capital projects.

**4. Food Safety Compliance Unit:** Responsible for developing and implementing a food safety management system with the assistance of and coordination with the Post-Harvest Division of the Bureau of Fisheries and Aquatic Resources to ensure compliance with U.S.-FDA and EU food safety standards.

<sup>47</sup> PFDA, DA, available at: <http://www.pfda.da.gov.ph/>

## THREATS TO PORT VIABILITY

GenSan cannot afford to undertake urgently needed repairs or upgrades under the current operating regime. Continuing with business as usual, GenSan is likely to follow the same path as Navotas, the country's largest fish port, which fails to comply with international standards, cannot export product to high-value international markets, and is so far degraded as to be effectively beyond repair. Improvements to GenSan would undoubtedly have a positive impact on General Santos City's local economy, improve livelihoods, and may help alleviate the poverty situation in Mindanao.

The operating regime for Philippines regional fishing ports has proven to be unsustainable. Insufficient income derived through port operation fees means the ports are unable to cover their growing costs as the infrastructure and buildings deteriorate with use and age. In the case of GenSan, we found revenue generation has not been maximized, and a significant portion of

available land within the port boundary fence that can be leased is presently unoccupied. Furthermore, some of the area's leased land is severely behind on receipt of payments. Perhaps the most significant revenue concern to be identified at the port is the failure to increase port user fees. Since the port started operating in 1998, most user fees have remained unchanged while others have increased very few times. Inflation from 1998 to 2014 has seen prices in the general economy increase by 119%, and several user fees are under half the rate they would be if inflationary increases had been applied them.

The upgrade of the fishing ports into an internationally recognized standard is expected to significantly increase operational performance and sustainability; improve health, safety, hygiene, and welfare; and provide a regulatory compliant platform for export of trade.

## THREATS TO PORT ECONOMIC MODEL

As indicated by the decline in the other large fishing ports in the Philippines, such as Navotas Fish Port, which have degraded beyond repair and will likely need to be replaced, the current Philippine fish port economic model has not proven to be financially sustainable over the long term. The current regime underprices the use of public infrastructure and services by not indexing all port fees to inflation. As the financial model becomes more difficult to maintain over time, costs are cut, often in the form of reduced maintenance and capital spending. This scenario can lead to a public utility "death spiral," whereby the degradation of facilities drives users away, which further reduces the fee base and revenues, while the capital and operating costs of holding a long-lived infrastructure asset hold steady. The result is that fewer users must support the high-cost base, which leads to either continued cost cutting on maintenance and infrastructure decline, or to an increase in prices (absent an improvement in the value of services and port facilities provided

to the industry), both of which may drive even more users away. This same pattern is seen with electric and gas utilities, hospitals, schools, roads, and other public-user-funded infrastructure. A public-private partnership may offer an alternative, especially with a well-structured concession that ensures that the private operator meet certain performance and upkeep requirements. Existing Environmental Infrastructure and Waste Management Issues

The Department of Natural Resources and Environment (DENR) penalized GenSan in 2012 for violating antipollution provisions under the Philippine Clean Water Act of 2004, due to inadequate wastewater treatment and fish waste disposal. To date, rehabilitation and upgrading of the wastewater treatment plant (WWTP) is ongoing and servicing of wastewater treatment has resumed. However, discussions related to the penalty charge are ongoing, and the current deficiencies must be resolved.



Management is considering imposing fees on ships unloading wastewater to generate funds needed for maintenance and improvement of the site facility. Currently, such unloading and processing of ships' liquid waste is free of charge.

The facility also lacks a proper disposal facility for used oil and associated wastes generated from

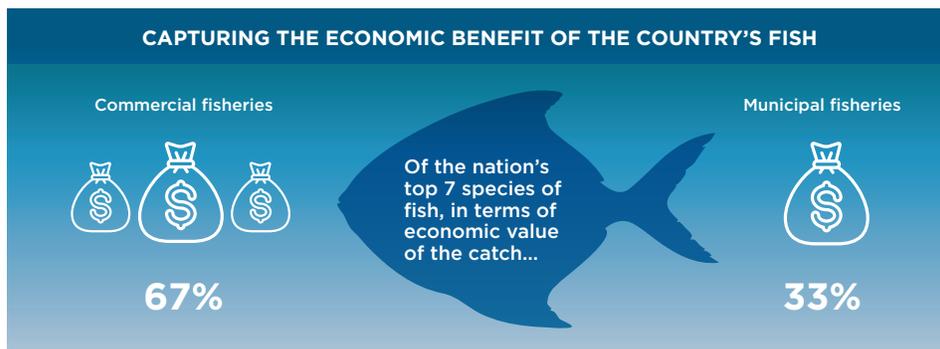
regular maintenance operations, and since the port was first constructed these used oils and other non-biodegradable materials have been housed within the complex awaiting proper disposal. However, there is currently no plan for how to move forward.

### CURRENT FISHERIES DATA COLLECTION AND MANAGEMENT DEFICIENCIES

The Philippines, like most of the countries in the WCPFC, collects fisheries information by hand using paper logbooks and reporting forms. Onboard observers do not submit these forms until the vessel returns to port after being at sea for three or more months at a time. This significantly delays the receipt of this vital information by fisheries managers by anywhere from six months to up to a years in some cases. It also provides leeway for *ex-post facto* changes to or manipulation of the data during the before it reaches authorities.

Because manual data must be re-entered as it is passed up the chain of authorities and to the WCPFC, sometimes as many as four times, error levels are likely very high and the quality of the data significantly degraded. The current system also hinders port-based catch accounting, and only an estimated 10% of landings at GenSan are properly enumerated. This is exacerbated by inefficient landing logistics, inadequate process management and a limited number of enumerators. Besides leading to inaccurate reporting of landings by species, these factors also compromise the quality of key biological data used in stock assessments, such as length-frequency information.

FIGURE 20: Comparison Between Municipal and Industrial Sectors



### SOCIOECONOMIC CONTEXT

In 2012 approximately 22% of Philippine families lived below the poverty line, and fishers are among the poorest, with a poverty incidence of roughly 40%, up from 35% in 2003.<sup>48</sup> Commercial fishers and aquaculture farmers receive the majority of the economic benefits from the country's fish production, while small-scale nearshore fishers are the most disadvantaged. The commercial sector, which includes the vessels landing product at GenSan, has grown as a proportion of total catch over time, and commercial and aquaculture fisheries production has surpassed that of municipal fisheries, which averaged 70% of total Philippine production in the 1950s.<sup>49</sup> Today, commercial fishers harvest 67%, of landings among the seven top species caught by both sectors, while municipal fishers account just for 33% (Figure 20).<sup>50</sup>

With the rapid growth of its agriculture and fishing industry, General Santos City grew from a population of 86,000 in 1970 to nearly 600,000 in 2015. The demographic that makes up this population is skewed very young, with 92% under the age of 55, and 40% between the ages of 20 and 44. Half of the population is younger than 19.<sup>51</sup>

Approximately 36% of the General Santos City and Sarangani region's population lives in coastal areas. Some 52% of these coastal families engage directly in fishing (evenly split between commercial and small-scale), while another 40% are involved in related occupations such as fish vending, boat making and bait gathering.<sup>52</sup>

While roughly 22% of Philippine families live below the poverty line, fishers are among the society's poorest, with a poverty incidence of over 40%.<sup>43</sup> General Santos City is relatively prosperous, with the second lowest poverty incidence in Mindanao at 14%; however, the greater Sarangani region falls well below the national average, with 39% of families living in poverty, and 19% living at subsistence levels.

The literacy rate in General Santos City grew from just 31% in 1960 to 96% in 1990, and almost 44% of the labor force holds at least a secondary level of education.<sup>44</sup> While being among the poorest segment of the population, most municipal fishers are literate and 67% have achieved at least a primary education, 13% have at least some secondary education, and 9% have graduated high school.<sup>45</sup>

<sup>48</sup> Rosal, Riza. "Fisheries, Coastal Resources and Livelihoods Project (FishCORAL), Design Completion Report." (n.d.): n. pag. 30 July 2014. Web.

<sup>49</sup> S. J. Green, et al., "Philippine Fisheries in Crisis: A Framework for Management," 2003, Philippines, p. 33 [hereinafter Green], available at: [http://oneocean.org/download/db\\_files/philippine\\_fisheries\\_in\\_crisis.pdf](http://oneocean.org/download/db_files/philippine_fisheries_in_crisis.pdf).

<sup>50</sup> S. J. Green, et al., "Philippine Fisheries in Crisis: A Framework for Management," 2003, Philippines, p. 33 [hereinafter Green], available at: [http://oneocean.org/download/db\\_files/philippine\\_fisheries\\_in\\_crisis.pdf](http://oneocean.org/download/db_files/philippine_fisheries_in_crisis.pdf).

<sup>51</sup> Philippine Statistics Authority, General Santos City: Annual Population Growth Rate Remained at Five Percent, June 20, 2002.

<sup>52</sup> C. R. D. Cadiz and Rasid Bani, Impact of Coastal Resource Management Initiatives to the Community: The Sarangani Bangsa Moro Affiliates (SBMA) Experience. Nature Exploitation and Protection in Mindanao. Social Watch Philippines, pp. 98-104.

<sup>53</sup> Riza Rosal, "Fisheries, Coastal Resources and Livelihoods Project (FishCORAL), Design Completion Report" (n.d.): n. pag., July 30, 2014, Web.

<sup>54</sup> C. R. D. Cadiz and Rasid Bani, Impact of Coastal Resource Management Initiatives to the Community: The Sarangani Bangsa Moro Affiliates (SBMA) Experience. Nature Exploitation and Protection in Mindanao. Social Watch Philippines, pp. 98-104.

<sup>55</sup> Riza Rosal, "Fisheries, Coastal Resources and Livelihoods Project (FishCORAL), Design Completion Report" (n.d.): n. pag., July 30, 2014, Web.

## THE NEXUS BLUE IMPACT STRATEGY

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The Nexus Blue Strategy's fundamental objective is to dramatically improve the Fisheries Information Management System (FIMS) utilized in the Philippines' tuna fishery to better track fishing activity, landings, bycatch, and discards, creating a rich data set for use in fisheries management activities such as stock assessment modeling, IUU enforcement, and policy development, and providing the necessary foundation for protecting and restoring stocks of globally important fisheries. Nexus Blue proposes to achieve this goal by attracting private investors to support a public-private partnership project that combines an investment into the FIMS with investment into the operation and rehabilitation of the General Santos Fish Port Complex.

The high quality data stream provided by the FIMS would support Philippine fisheries authorities in the provision of more accurate and timely data to the Western and Central Pacific Fisheries Commission (WCPFC) to inform its regulation and management of tuna stocks across the region. Moreover, a robust information management infrastructure, initially financed by the high value tuna trade at the GenSan, can serve as a platform for the expansion of the system to support other important fisheries in the Philippines. With the core system in place, the addition of incremental monitoring and data collection for other vessels and stocks such as the sardines, mackerels, and scads, can achieve implementation at lower cost.

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### IMPACT INVESTMENT THESIS

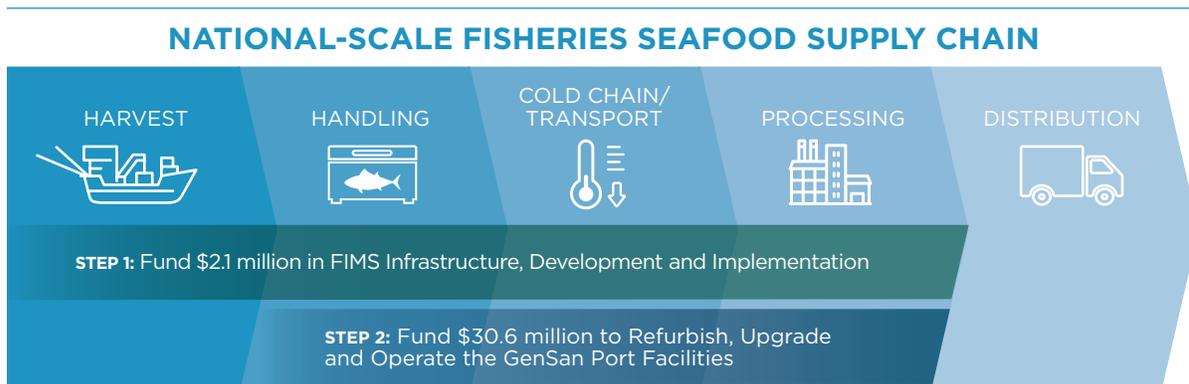
By combining the two complementary components of a FIMS and fish port investments into a single PPP program, Nexus Blue can generate relatively stable, predictable cash flows to support investor returns, while enabling the management improvements required to improve the long-term health of the fish stocks and landings that drive product throughput, and revenue. In turn, the strategy aims to catalyze better fisheries management in the Philippines and across the region, as the innovative financing structure for a high-quality data management solution offers a replicable model for fisheries management improvements, and economies of scale will drive down adoption costs for subsequent, commercially less valuable fisheries. In addition, the positive network effects of including more vessels and fisheries will increase the quality and value of the system for all users.

To accomplish these objectives, Nexus Blue proposes a PPP with the Philippines government with the following two components:

**Step 1:** Upon establishing a project company SPV (NexusCo), invest \$2.1 million into a subsidiary of NexusCo (referred to hereafter as "FIMSCo"), which will be dedicated to the development and implementation of a comprehensive FIMS. The FIMS will have two interdependent components: (1) At sea, "On-the-Water" IT infrastructure and tools for data collection, monitoring, traceability, and enforcement; and (2) Port-Based IT Infrastructure and tools for catch accounting, market transparency/efficiency, traceability, and enforcement.

**Step 2:** Simultaneously invest \$30.6 million into a second subsidiary of NexusCo, referred to as "PortCo", which will be responsible for port infrastructure renovations and long-term operations of the General Santos Fish Port Complex. Specifically, this will restore the port to the environmental, safety, sanitation and food safety standards that it was originally designed to meet, increase the efficiency and quality of operations, logistics, post-harvest services (processing and cold storage facilities) and market activities, to the benefit of GenSan's users. In addition, management and operational efficiencies promise to put GenSan back on a path to financial viability, and establish it as a world-class operation that can serve as a model throughout the region.

FIGURE 21: The Nexus Blue Strategy's Investments



By bundling the FIMSCo activities and investments with the PortCo as a port-based PPP, the operator is positioned at a key gateway in the supply chain between the regulators and the regulated as a neutral intermediary. The complementary nature of hard infrastructure and fisheries IT investments will address the needs of the Philippines Amended Fisheries Law, while simultaneously: (1) shifting the financial compliance burden of VMS requirements from fishers; (2) adding value to industry by improving and maintaining high-quality industry

operations and supply chain efficiency; and (3) promoting the rapid deployment of EM/ER technology to capture the data needed by regulators for monitoring, control and surveillance (MCS) and fisheries science. The combination of technology deployment and value-added improvements at GenSan will in turn build support for, or at least acceptance of activities required under the Amended Fisheries Law on the part of industry, which to date has represented a key barrier to reform.

### TARGETED SOCIAL AND ENVIRONMENTAL IMPACTS

The table below sets forth selected impact targets for the Nexus Blue Strategy:

<b>Fisheries Management Improvement Outcomes and Impacts</b>	<ul style="list-style-type: none"> <li>• Provide monitoring and data collection for 429 vessels in the tuna fleet, covering 100% of General Santos based vessels of greater than 3 gt, and covering approximately 60% of tuna landings in the Philippine tuna fisheries.</li> <li>• Reduce time of data transmission from onboard observers and vessel logs to the BFAR and WCPFC within minutes and hours as opposed to several months to up to a year currently.</li> <li>• Improve catch accounting coverage from the current 10% to over 70%, and increase the quality of data provided.</li> <li>• Achieve electronic monitoring and reporting coverage on 7.5% of vessels registered in the WCPFC, representing -5.0% of tuna landings and -12.5% of total tuna product throughput in the WCPFC (including frozen imports delivered to GenSan).</li> <li>• By covering upfront software development and testing costs, catalyze the expansion of the FIMS framework to other commercially important stocks such as sardines, as costs will continue to fall system achieves larger scale.</li> <li>• Provide the data required for development and ongoing evaluation of science based catch limits.</li> </ul>
<b>Support Fisher Livelihoods</b>	<ul style="list-style-type: none"> <li>• Improve fisher productivity by saving an average of 2.5 to 4 days of labor annually per vessel due to easier data entry, representing between 1,100 and 1,700 days saved per year among GenSan vessels.</li> <li>• Achieve higher value for product through traceability and improved market access.</li> <li>• Improved crew welfare by enabling email communication and internet access while at sea for months at a time.</li> <li>• Improved enforcement of slave fishing and child labor practices.</li> <li>• Protect small-scale, nearshore community fisheries by encroachment and poaching by illegal vessels.</li> </ul>

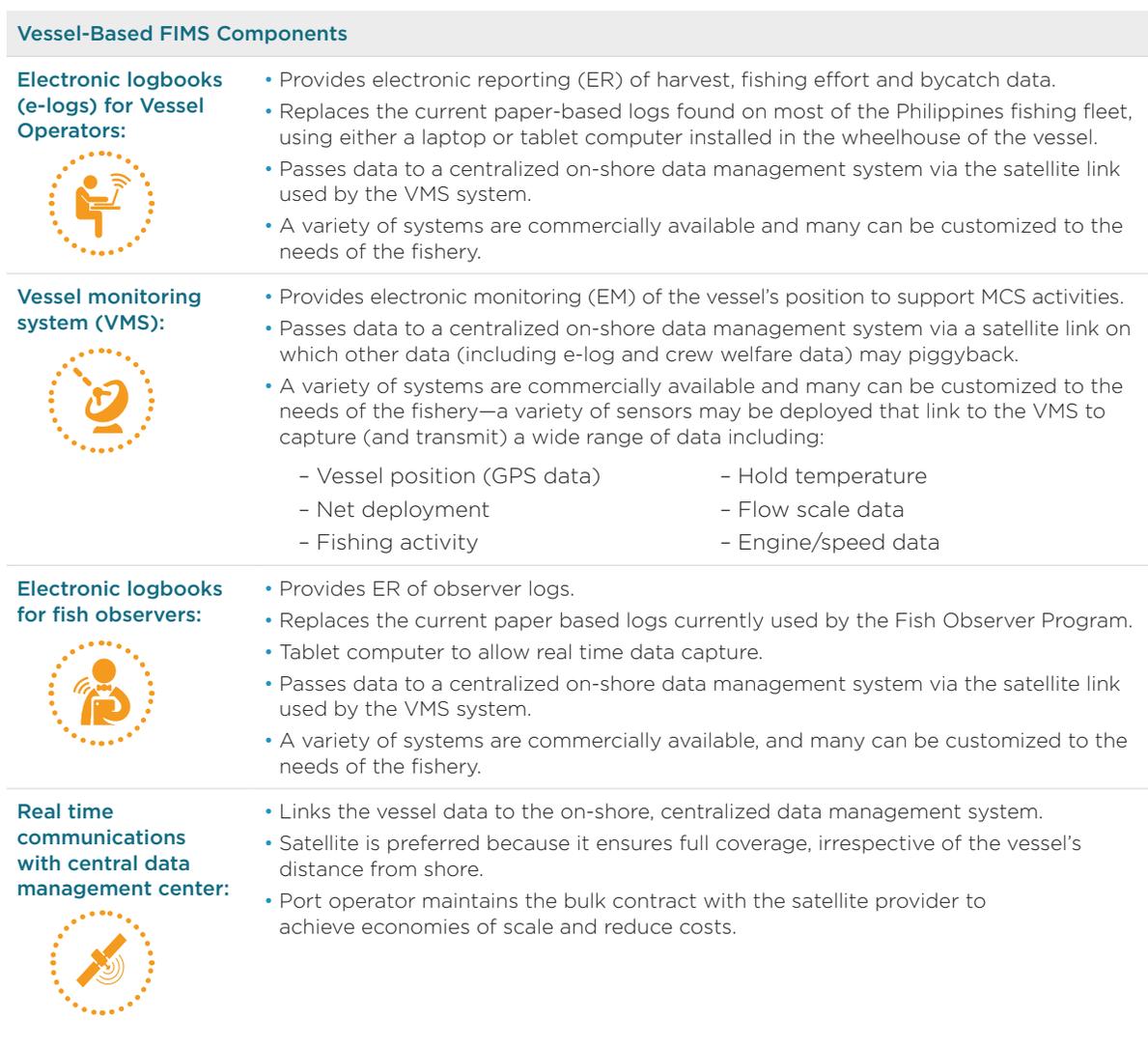
## STEP 1: THE FISHERY INFORMATION MANAGEMENT SYSTEM (FIMS)

We first engaged with subject matter experts to research international best-practices in fisheries information technology, regional and international standards on IUU, VMS, traceability and catch reporting, state-of-the-art technologies and trends, and recommendations made in the European Commission's yellow card report. Based on these findings, we analyzed various combinations of data management interventions across a range of scale and scope in order to (at a minimum) achieve compliance with the EU requirements to avoid trade sanctions and the Amended Fisheries Law, while also weighing the costs and benefits of even more robust, comprehensive and technologically advanced options.

We finally compared these possible combinations of features to NexusCo's financial model and revenue streams to select the strongest possible financially viable option for a Fishery Information Management System (FIMS) for the GenSan tuna fisheries.

The selected FIMS model includes both a vessel-based and portside component to deploy electronic monitoring and reporting technology (e.g., VMS and e-logs) on 429 vessels,<sup>56</sup> and creates a data management center located at GenSan, with increased dockside monitoring, e-reporting and data management at the port. Figure 22 outlines the core technical sub-components of the NexusBlue FIMS PPP Component.

FIGURE 22: Components of a comprehensive FIMS PPP component under the Nexus Blue strategy



<sup>56</sup> This is the total number of vessels for which VMS is required (over 3 gt in size) that currently do not have systems installed.

## Port-Based FIMS Components

### Installation of central data management system:



- A data center located at the port (or possibly off-site) including a server, data terminals, software and internet connection.
- A cloud database to back up the data center and support integration with government third-party databases, as well as public access.
- Receives real-time data directly from vessels and other data capture technologies deployed.
- We would use existing technology, and the data center can be constructed using off-the-shelf components.

### Real time communications w/ vessels and fishery managers:



- Data center receives and stores all transmitted data from vessel e-logs and VMS.
- Each vessel has unique identification number that stays with all records managed in the system.

### Full time data managers:



- Full-time port staff in charge of ensuring that data from vessels and port activities is received and input into the system.
- Oversee the various monitoring and auditing activities to ensure data integrity.
- Report results to fishery managers in Manila.
- Oversee team of enumerators and monitors (including video catch data auditors) to increase the polling of catch.

### Port-based enumerators, video auditors, and e-catch accounting tools:



- A cadre of full-time enumerators poll landings to provide landing data that is used to verify vessel e-logs.
- Independent subset of enumerators are charged with auditing and monitoring video recordings of catch offloadings from vessels
- In place of the current paper-based system, enumerators use tablets (in waterproof casing) to gather data, which is transmitted via wi-fi to the data center as landings are polled.

### Connectivity to key gov't databases:



- Data center feeds information to relevant government databases in real-time.
- VMS position data is provided to BFAR, MARINA and the Coast Guard in real-time to support MCS activities.
- Data should be encrypted, and the system designed to protect commercially sensitive information.
- Data management standards (e.g. data fields and reporting standards). Must be tailored to feed into the recipient database.

### Connectivity to RFMOs:



- Data center feeds information to relevant RFMO databases in real time.
- Data should be encrypted, and the system designed to protect commercially sensitive information.
- Data management standards (e.g. data fields and reporting standards). Must be tailored to feed into the recipient database.

### Public access of non-confidential fisheries data:



- Data center feeds non-confidential information to a publicly accessible database maintained by the port operator or a third party.
- Data should be encrypted, and the system designed to protect commercially sensitive information.

This solution offers standalone eLog electronic reporting (ER) software deployed using various devices onboard vessels to collect required fisheries data. Unlike a web-based solution, standalone software does not require the user to be online to use the system, which is a major advantage of this technology. However, the device will transmit data in real-time while at sea when the device is connected to the internet via a satellite link or GSM Network.

The eLog application allows users to enter data through a device interface, and to generate reports for submission. The software is customizable to meet the requirements of the FMC for a particular fishery: for example, the FMC can specify the fields that are mandatory, if any fields are optional, the transmission system(s) to be used, the data format, and so on. Reports generated by eLogs can include vessel-tracking data that specifies the location and time/date stamps of the fishing activities. Tracking data is collected through the existing mandatory VMS equipment installed

onboard or alternatively from a standalone GPS capable device.

This option can replace or complement existing catch and effort reporting paper forms in digital format, saving a significant amount of time for users and fisheries managers, and ensuring timely sharing of data with relevant authorities. Studies of eLog solutions in the Hawaiian longline fleet have shown that eLog reporting can save up to 4 days per year in labor per vessel. In addition, studies have shown that paper-based data from vessel logs, onboard observers, and catch enumerators must be re-entered up to four different times before it is received by BFAR, and the process can take from several months to a year. This places a significant limit on the ability of fishery managers to actively manage the resource, and in many cases the data is so degraded that it is not useful. Figures 23 and 24 provide a visual representation of how vessel-based monitoring and reporting links to port-based data management.

FIGURE 23: Vessel-Based Electronic Monitoring (VMS) and Electronic Reporting (eLog)

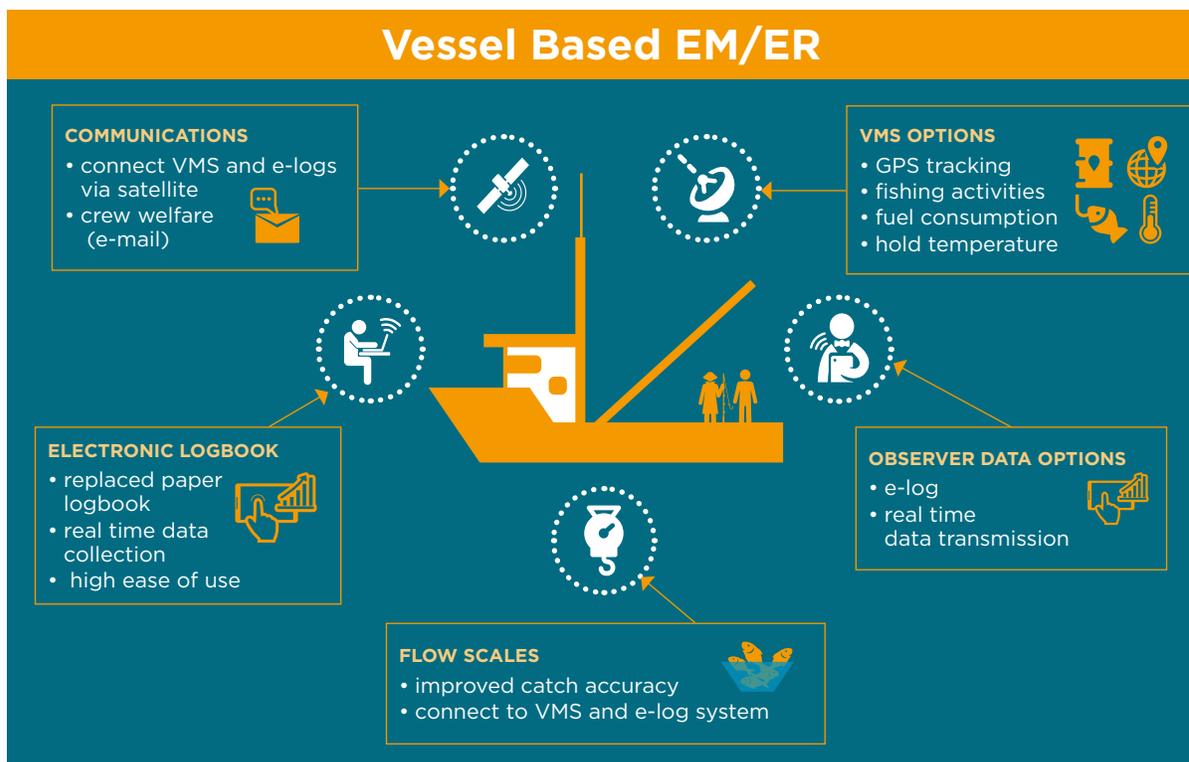
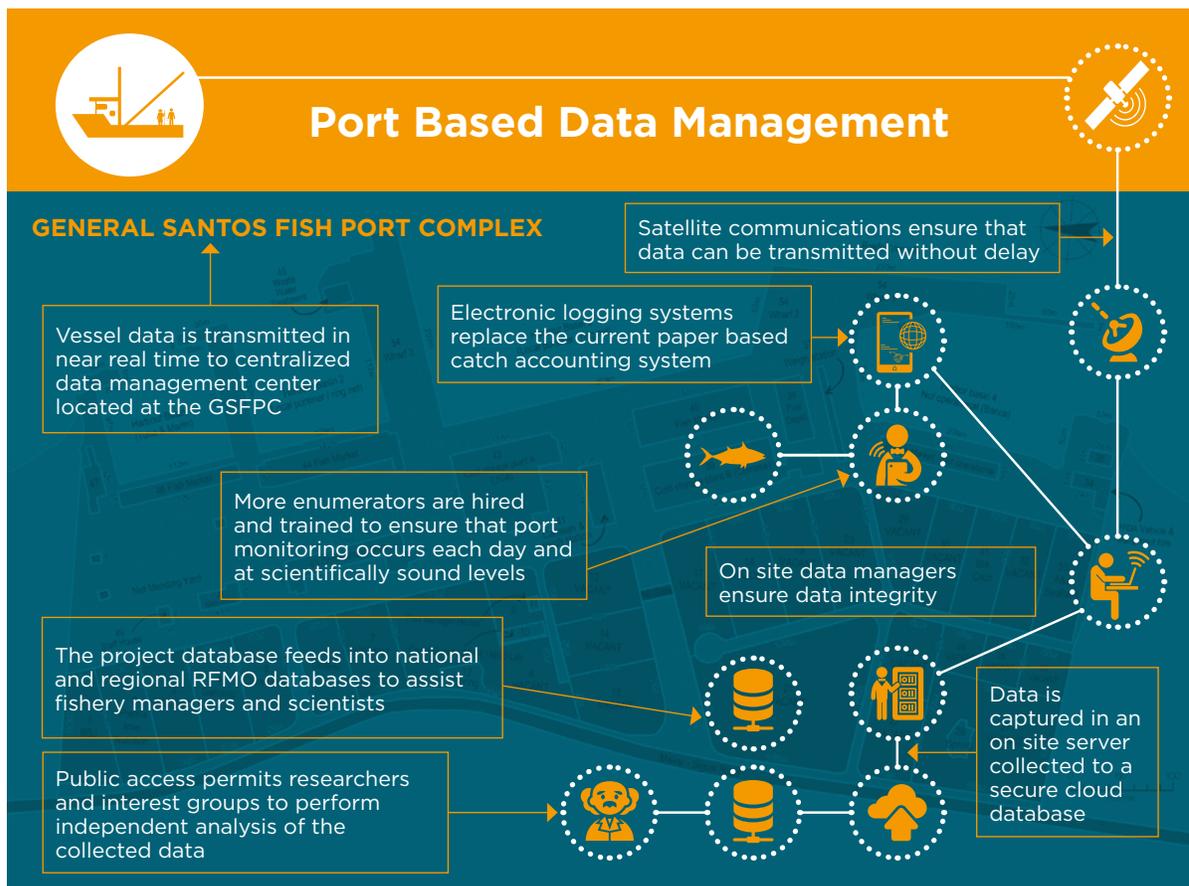


FIGURE 24: Port-Based Electronic Catch Accounting and Data Management



Source: Frontier Law and Advisory, 2015.

#### FISHERIES MANAGEMENT INFORMATION SYSTEM BUDGET

The FIMS budget is characterized by one-time capital investment in software development, development of a port-based data center, catch accounting tablets and other hardware, and vessel-based eLog and VMS hardware deployed on 429 vessels (Figure 25).

Operating expenses include 8 full-time enumerators hired to exclusively cover GenSan, as well as staff to train and oversee the deployment of technologies,

two full-time data managers, operating overhead, and maintenance of hardware and software components. The largest contributor to operating expenses, however, is the annual satellite data subscription per vessel and software licenses, which together comprise 84% of total operating costs. Projected operating costs remain relatively constant over the life of the project, increasing with inflation over time (Figures 26 and 27).



FIGURE 25: FIMS Capex Budget by Category

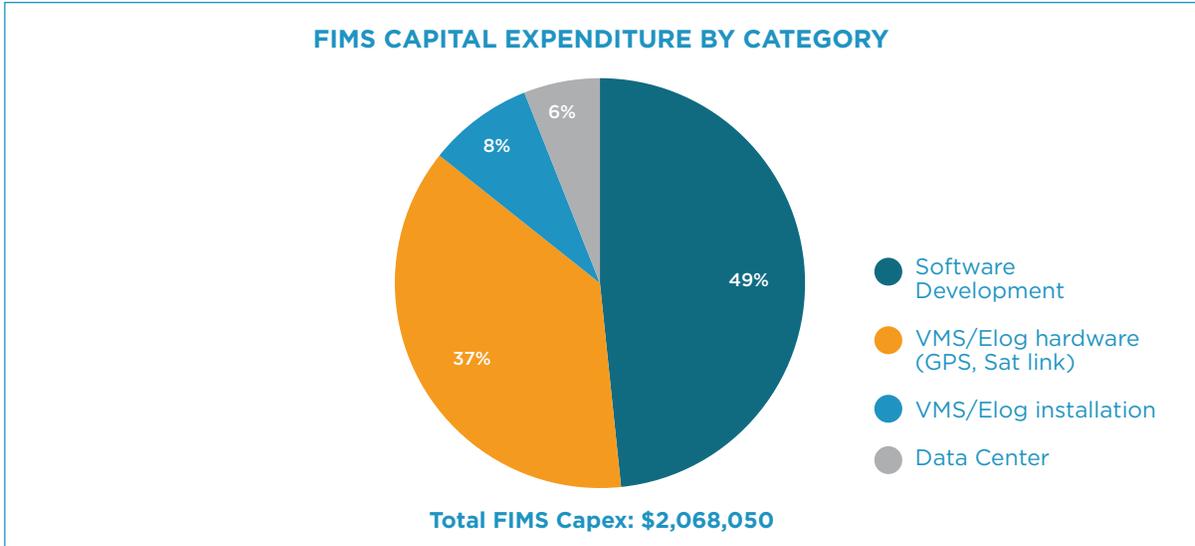


FIGURE 26: FIMS Total Operating Expense Contribution Over the Project Life

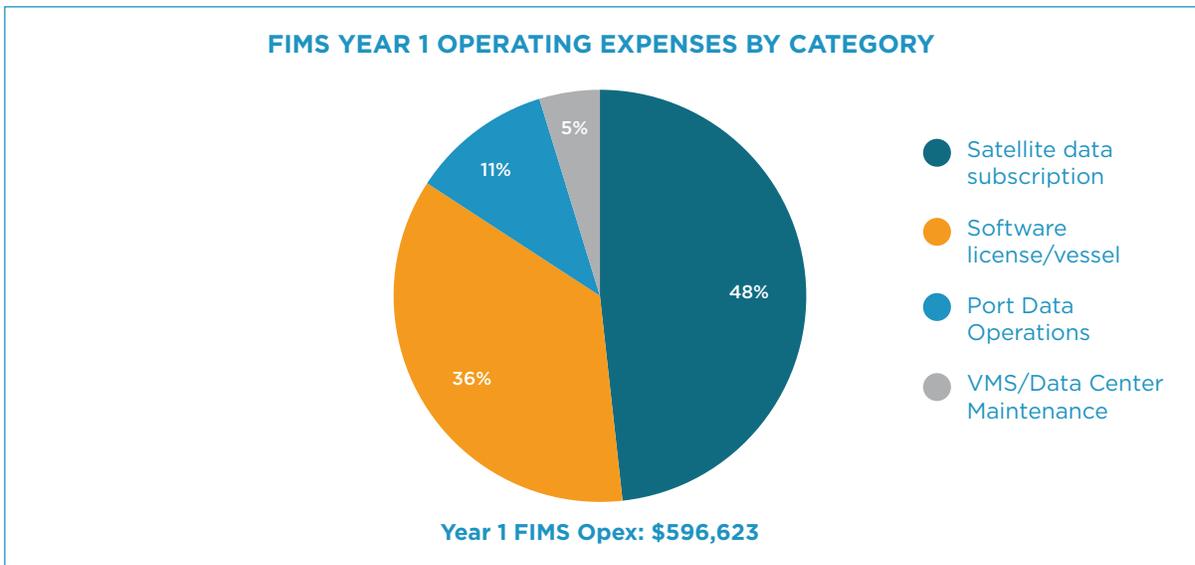
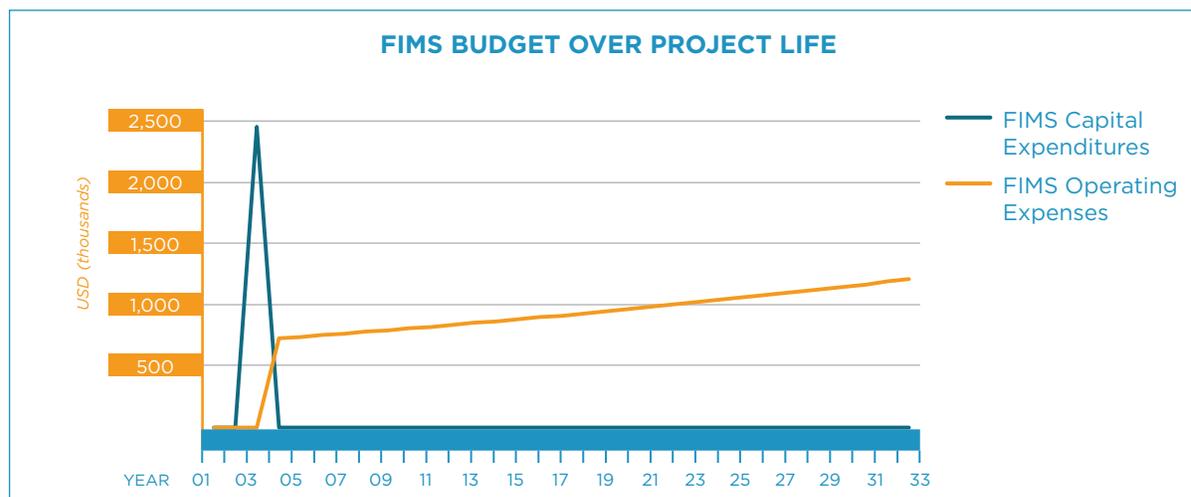


FIGURE 27: Capital Expenditures and Operating Expenses Over the Project's 35-Year Life



## STEP 2: PORT REFURBISHMENT AND OPERATIONS

The port component of the combined PPP provides a physical hub, around which the FIMS infrastructure can be deployed and managed. Because it serves as a natural gateway in the supply chain, the port represents a nexus for sustainable change that is literally embedded in a critical point in the infrastructure through which all products must pass. It therefore offers a platform to the fishing companies and fishers whose cooperation is needed to successfully deploy a data-based sustainability project. The port can provide a variety of services for fishers to garner such cooperation, including:

- Dissemination of information
- Access to social services
- Bearing the cost of VMS systems required by the Amended Fisheries Law
- Provision of more ice than is currently available (possibly even at lower prices)
- Better handling of fish to improve quality at time of sale and thus better pricing for the fishers
- Assistance in marketing GenSan branded fish to international markets, aimed at increasing the value of the catch

By structuring the Nexus Blue Strategy as a port-based PPP, actions needed for a transition to sustainability can be shifted from fishers—who may lack the resources and motivation to bear such obligations—onto port operators as “output specifications” required under the concession.

The port operation would assume the following obligations aimed to support the conservation goals of Nexus Blue:

- Educate fishers on the importance of data collection and management for achieving sustainable fish populations
- Finance, deploy, and maintain the FIMS technology on vessels and at the port
- Finance, install, and maintain a centralized data management system to handle all data recorded from the FIMS PPP Component, preserving commercially sensitive (confidential) data
- Give fishery managers (especially BFAR) accurate, timely, and verifiable data upon which to make better policy decisions
- Improve handling conditions on landing to reduce post-harvest loss and improve quality at time of sale—thus giving back to fishers more value for the same amount of catch
- Provide better cold storage at the port so that vessels with poorer handling conditions do not need to hold fish offshore awaiting better pricing (which is a contributor to post-harvest loss)
- Provide better information on market conditions and create a more transparent pricing system
- To engage them in the process of protecting their own fishing grounds, give feedback to fishers in the form of data and analysis of the information obtained through the FIMS PPP component

## FISHERIES PORT PPP FEATURES

FIGURE 28: Key Features of the Fishing Port Infrastructure Components of the PPP

<b>Project structure:</b>	<ul style="list-style-type: none"> <li>• Design and construction of new facilities</li> <li>• Upgrade existing facilities</li> <li>• Operation and maintenance of fishing port</li> <li>• Existing staff automatically transfer into PPP</li> <li>• Implementing Agency: Department of Transportation and Communications (DOTC)</li> <li>• Management Agency: Philippine Fisheries Development Authority (PFDA)</li> <li>• 33-year investment term (3-year construction period; 30-year operating concession)</li> <li>• The Port PPP will likely be implemented via a build-operate-transfer (BOT), a build-transfer-operate (BTO), or a develop-operate-transfer (DOT) contract</li> <li>• Contractual structure can be flexible depending on the needs of the program and linkage to future projects</li> </ul>
<b>Development areas:</b>	<ul style="list-style-type: none"> <li>• Landing</li> <li>• Storage</li> <li>• Marketing</li> <li>• Maintenance</li> <li>• Infrastructure</li> <li>• Distributed power generation</li> </ul>
<b>Methodology:</b>	<ul style="list-style-type: none"> <li>• Meet Philippines Fishing Port Design and Operation standards</li> <li>• Meet appropriate International Design and Operation standards</li> <li>• Use a methodology appropriate to the Philippines and easily replicable</li> </ul>
<b>Role of private sector:</b>	<ul style="list-style-type: none"> <li>• Design, build, finance, operate, and maintain the fishing port</li> <li>• Operator directly hires existing staff located at the port and recruits any additional staff for the duration of the PPP</li> </ul>
<b>Innovations:</b>	<ul style="list-style-type: none"> <li>• Solar power as an alternative energy source for the port</li> <li>• Modular freezing facilities</li> <li>• Upgrading facilities to internationally-recognized design standards</li> <li>• State-of-the-art catch accounting technologies deployed on all vessels and throughout port operations</li> </ul>
<b>Expansion, replicability, scale:</b>	<ul style="list-style-type: none"> <li>• The Nexus Blue Strategy is based on GenSan, but is not necessarily location or project specific; GenSan would serve as a template to allow replication in other ports both regionally and globally</li> </ul>
<b>Revenue source:</b>	<ul style="list-style-type: none"> <li>• Mainly from the operations revenue stream of the port</li> <li>• Alternative sources of funds (including grants, PRIs and guarantees) should be considered in case of the need for a minimum revenue guarantee or viability gap funding</li> </ul>
<b>Areas for further study and refinement:</b>	<ul style="list-style-type: none"> <li>• Full technical feasibility study is needed</li> <li>• A bottom up analysis of demand, cost, and revenue is needed</li> <li>• Interest level of BFAR, PFDA, potential partners, and the broader market must be assessed</li> </ul>

## GENERAL SANTOS PORT INFRASTRUCTURE AND OPERATIONS BUDGET

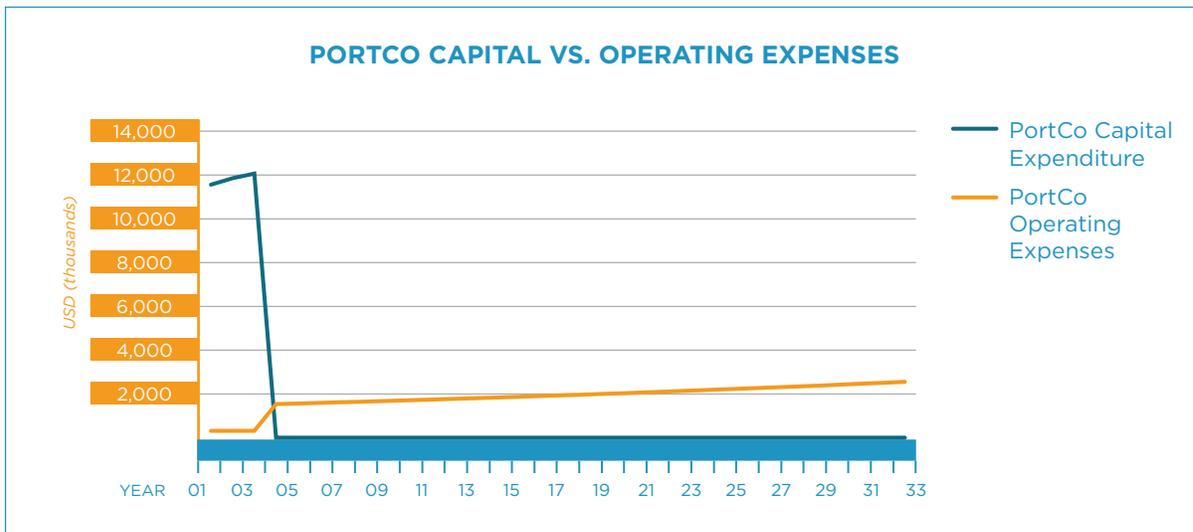
The PortCo budget includes an initial capital investment in cold storage and processing facilities, wastewater treatment, administrative infrastructure, general port repairs and upgrades, and 2.4 MW in installed solar power generating capacity (Figure 29). This initial capex would

be phased in during a development period of three years, with 33.3% of capex allocated in each year. Operations expenses are comprised of maintenance of port facilities, labor, supplies and equipment, and solar power operations.

FIGURE 29: Port Infrastructure Capital Expenditures

DESCRIPTION	ESTIMATED COST <sup>57</sup>
Replace and increase number of cold storage facilities	\$23,498,627
Replace main office building, port manager and staff house	223,160
Replace waste water treatment plants	2,613,831
Replace and / or repair existing port infrastructure <sup>58</sup>	1,019,667
Installation of solar panels (2.4 MW capacity)	3,249,678
<b>Total Port Infrastructure CapEx</b>	<b>\$30,604,963</b>

FIGURE 30: PortCo Capital Expenditures and Operating Expenses Over Project Life



<sup>57</sup> Cost estimates were provided by DCCD, a local engineering firm.

<sup>58</sup> These items include access roads, water supply distribution system, waste water and sewage, fire protection system, drainage, power and security system.



## THE NEXUS BLUE STRATEGY FINANCIAL ASSUMPTIONS AND DRIVERS

**N**exusCo's operating expenses are generated through its two primary investments into data management, through its FIMSCo subsidiary, and port operations at the General Santos Fish Port Complex through the PortCo subsidiary, over an assumed 33-year project life. Because governments generally require PPP revenue projections to be based on predictable, proven, relatively low-risk sources of revenue that can be built into a concession or partnership agreement, the only revenue source considered in the present analysis is derived from established port revenue streams.

### REVENUES

Revenues fall into the following categories:

**Port usage fee revenue:** The primary source of revenue from port user fees; fee streams include the current port user fee revenue across a number of categories such as royalties, wharfage, market operations, brokerage, ice sales, unloading, and other facilities. This is currently the primary source of revenue for GenSan, and will remain so under the assumed base case. However, this will also include the effects of tariff rebasing to compensate for the failure to account for inflation in pricing since the port was opened, as well as improvements to facilities justifying fee increases over time.

**Base rental revenue (market, agri-industrial /commercial and cold-storage):** These are the revenues currently being generated from the leasing of existing processing, cold storage, agri-industrial and market facilities. Under the base case, we assume an increase of 10% per year beginning in Year 4, after port infrastructure upgrades are completed and operations improved. This will continue to increase at 10% per year through Year 8 as a catch-up for the failure to index costs to inflation since the port was opened in 1998. This also assumes increased occupancy of the existing agri-industrial land to 90% of the available area and improved collection of lease revenues achieved through improved administrative and managerial operations.

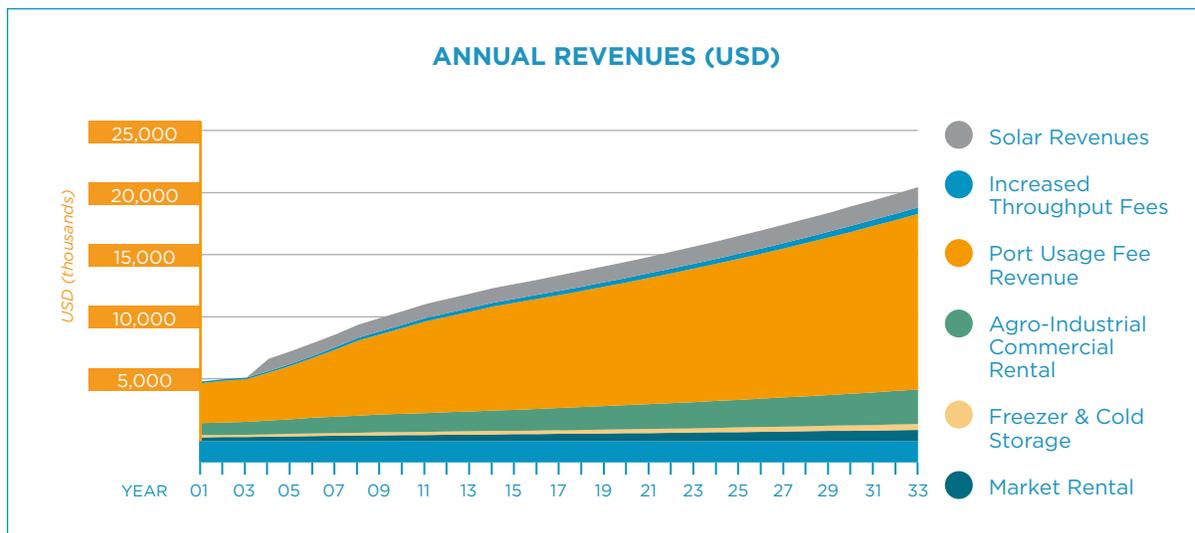
**Increased throughput:** Under the current system, there is likely significant underreporting of product throughput at GenSan, which depresses revenues to the port operators. With the investment in improved data capture and electronic reporting, this should improve significantly. In addition, we estimate that over the long run, FIMS will allow fish stocks to replenish through improved management interventions. While this analysis would need to be expanded as part of a full technical feasibility study, we have assumed here that these drivers would result in a 10% increase in reported landings compared with 2014. This category accounts for the incremental revenue generated by this increased product throughput.

**Solar revenues:** Revenues generated from the sale of power to the local utility from 2.4 MW installed solar panel capacity, assuming a capacity factor of 17% and a feed in tariff of \$0.19 per kWh.

On the following page, Figure 31 highlights the revenues generated over the 33-year life of the project, broken down by category.



FIGURE 31: NexusCo Revenues by Category Over 33-Year Project Life



### OPERATING EXPENSES

Operating expenses from both the PortCo and FIMSCO subsidiaries include:

**Equipment maintenance costs:** Assumed flat rate of 2.0% per annum on capex associated with machinery and equipment, principally cold storage and processing facilities, with inflation applied. The mechanical works are assumed to be approximately 48.0% of the total port upgrade capex. This 2.0% is a common rule-of-thumb applied to major infrastructure maintenance before detailed technical feasibility studies can be undertaken.

**Fixed infrastructure and buildings maintenance:** Based on a rule-of thumb for so-called civil maintenance of 0.8% per annum of the civil works component of the port upgrade capex with inflation applied. The civil works are assumed to be

52.4% of the port upgrade capex, and include all fixed infrastructure such as buildings, market halls, landing facilities and other fixtures.

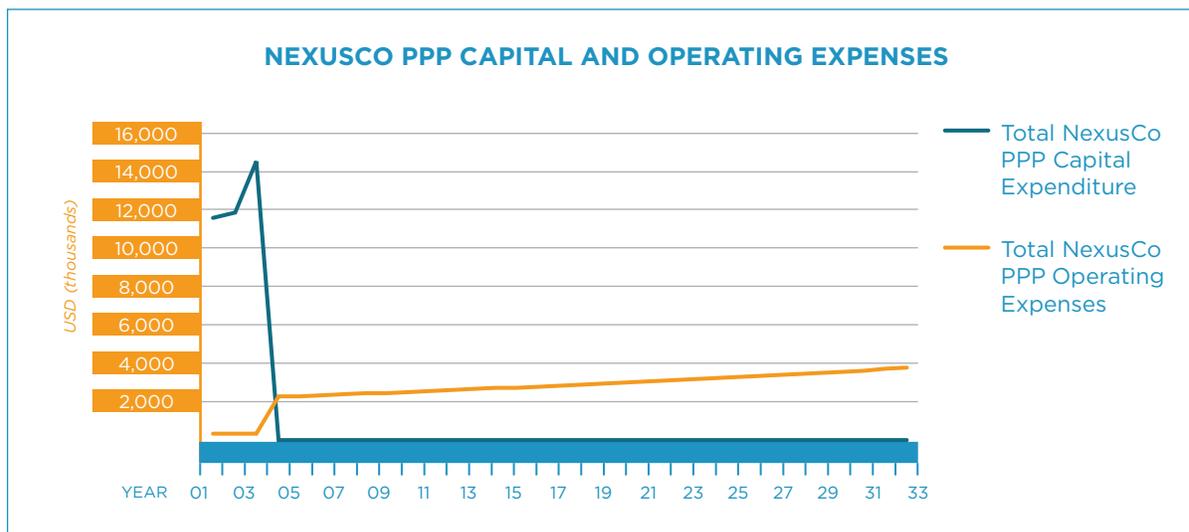
**Labor, supplies and materials costs:** 0.8% per annum of the current personnel costs (\$835,200 in 2014) with Inflation applied.

**Solar operating costs:** Based on a standard rule of thumb of 2.0% per annum of solar capex with inflation applied.

**Fisheries Information Management System:** Assumed to be 1.0% per annum of FIMS capex with inflation applied, based on interviews with subject matter experts.

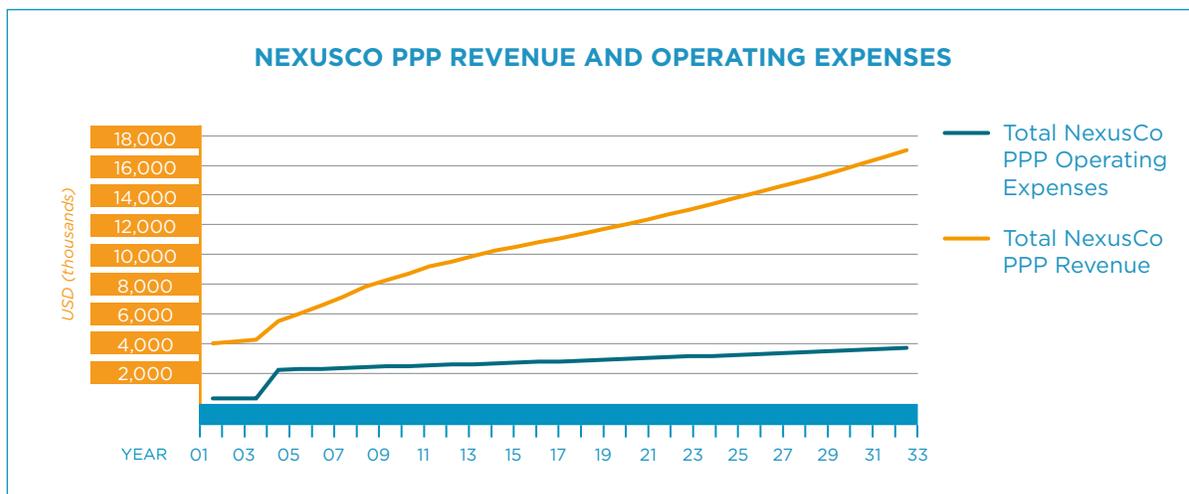
Figure 32 highlights the operating expenses generated over the 33-year life of the full project.

FIGURE 32: NexusCo Overall Operating Expenses and Capital Expenditure Over 33-Year Project Life



The previous assumptions yield the following profile of operating revenue and expenditures over the life of the project (Figure 33).

FIGURE 33: Operating Expenses and Revenues Over Nexus Blue Project Period



### BALANCE SHEET ASSUMPTIONS

This project entails an upgrade of an existing port and includes the transfer of the existing port operations, assets, and liabilities to the concessionaire. However, a major constraint at this point in the analysis is that we have not been able to receive the full, updated financial reporting from existing operations, including a balance sheet from the PFDA, which currently operates GenSan.

Due to this, we made a number of assumptions on the opening balance sheet. GenSan was upgraded in 2007, financed by a \$26.0 million loan from the Chinese government, for which debt service is forthcoming. This loan will be assumed by NexusCo and serviced from project cash flows. No other existing loan obligations are assumed in the model. As the \$26.0 million loan is the only indication of the value of existing assets we have on this port, we assumed a balance sheet with operating assets of \$26.0 million.



## THE NEXUS BLUE TRANSACTION STRUCTURE

### SOURCES AND USES OF FUNDS

The sources of funds for the Nexus Blue PPP investment under the base case include an assumed government subsidy of \$5.9 million, in order to achieve the 15.0% blended IRR hurdle required by the Philippines government for a PPP of this nature (Refer to Annex B for more detail on the Philippines PPP legislation and process). The base case assumes \$12.9 million in senior, non-recourse debt, denominated in the local currency, likely from a commercial bank. For PPPs with non-recourse project debt, the project sponsor generally contributes subordinated junior debt and/or hybrid equity (such as preferred shares). This is assumed to be \$7.1 million under the base case, with sponsors financing an additional \$1.8 million in common equity. Finally, excess cash generated from GenSan’s ongoing operations during the construction period is assumed to fund the remaining \$6.4 million under the base case. The uses of funds under the base case assume \$700,000 in transaction costs and financing fees, \$650,000 of interest during construction, \$2.1 million in FIMS capex, \$27.4 million in infrastructure upgrades to the existing port and \$3.2 million to fund the installation of 2.4 MW of solar power generation capacity. The sources and uses of funds are outlined in Figure 34.

FIGURE 34: Sources and Uses of Funds

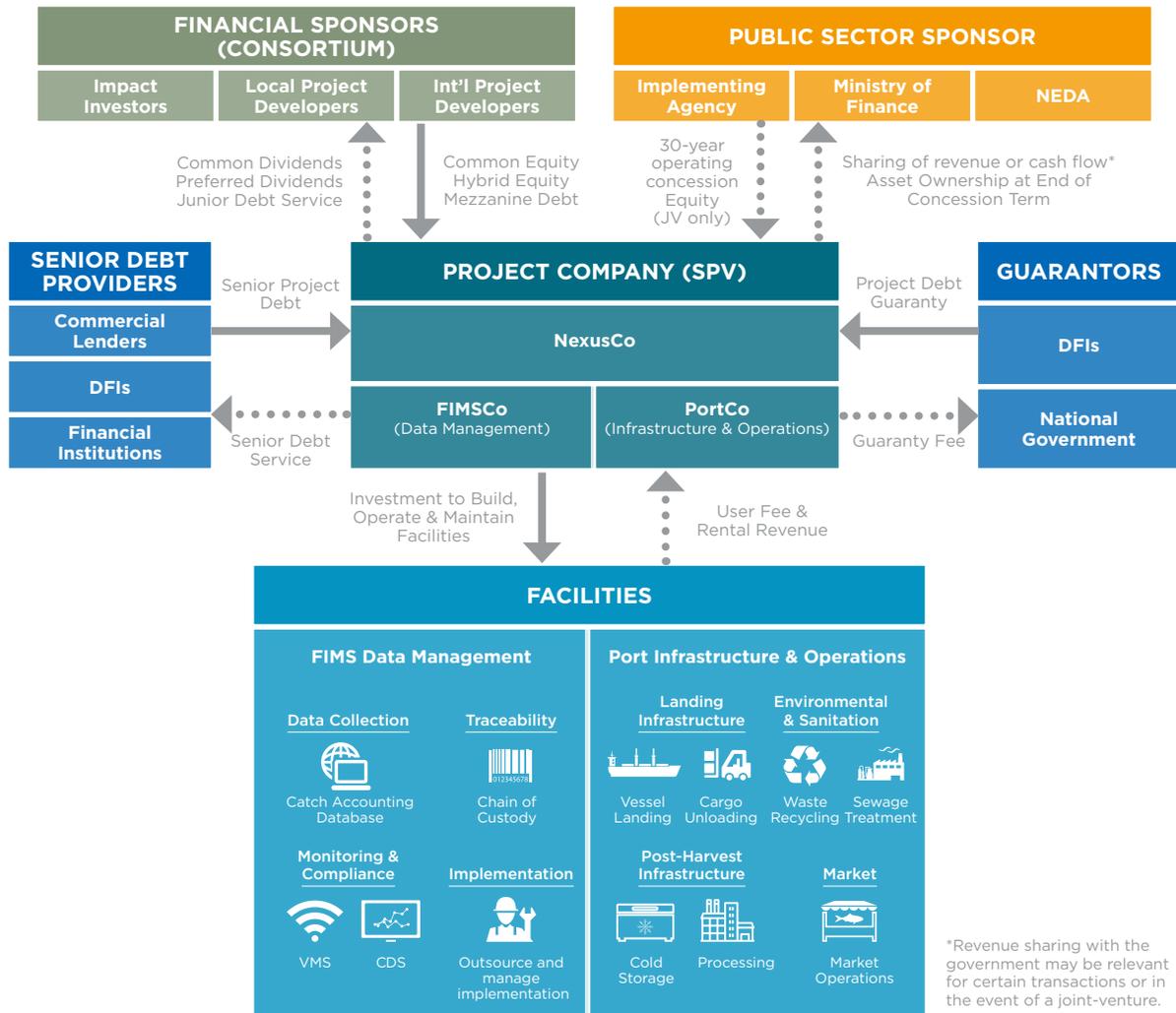
SOURCES OF INVESTMENT PROCEEDS	USD \$	%	USES OF INVESTMENT PROCEEDS	USD \$	%
Senior Project Debt	\$12,878,545	37.8%	Transaction Costs & Fees	\$712,207	2.1%
Junior Debt (Sponsor)	7,076,205	20.8%	Interest During Construction	\$648,666	1.9%
Common Equity (Sponsor)	1,769,051	5.2%	FIMS Capex	2,068,050	6.1%
Government Subsidy	5,871,899	17.3%	Port Infrastructure Upgrades	27,355,284	80.4%
Excess Cash from Operations	6,438,185	18.9%	2.4 MW Solar Generation Capacity	3,249,678	9.5%
<b>Total</b>	<b>\$34,033,885</b>	<b>100.0%</b>	<b>Total</b>	<b>\$34,033,885</b>	<b>100.0%</b>

## STRUCTURE AND GOVERNANCE

The Nexus Blue transaction structure follows an established PPP project finance arrangement, in which an SPV (NexusCo) is created as the project company, funded by equity investment and junior debt by the project sponsor. The sponsor is generally a consortium of investors and project developers. The government grants a concession to NexusCo to refurbish, build, operate and maintain the IT and port infrastructure in exchange for revenues in the form of fees, rentals, and services provided by the facility. In the case of a joint-venture-type PPP, the government will commit equity and share in the project cash flows, and ownership will transfer back to the

public sector at the end of the 30-year operating concession. NexusCo issues non-recourse project debt secured by the predictability and stability of long-term cash flows under the concession. The indicative transaction structure also assumes a loan guaranty provided by either a development finance institution (DFI) or the Philippine government. The NexusCo project company has two subsidiaries under the envisioned structure, PortCo and FIMSCo, to allow for the possibility of attracting grant capital or subsidies for the FIMS portion of the investment, as this does not generate revenue under the base-case model (Figure 35).

FIGURE 35: Nexus Blue Public-Private Partnership Transaction Structure





## ANALYSIS OF FINANCIAL RETURNS

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**T**o evaluate the project financial returns and viability as a PPP in the Philippines, we calculated the following return metrics:

**Project Internal Rate of Return (Unlevered IRR):** Project IRR on the basis of the total free cash flow, including returns to all capital providers including debt and equity.

**Sponsor IRR (Blended IRR):** The sponsor IRR of a SPV under a PPP structure considers that the sponsors are generally expected to commit junior or mezzanine debt to the capital structure in addition to their equity investment. The blended IRR accounts for the multiple types of securities that project sponsors invest into an SPV such as NexusCo, and the interest, repayment and dividends received by sponsors after repayment of senior commercial bank debt service.

**Viability Gap Funding (VGF):** A subsidy provided by the government to support infrastructure projects that are economically justified from a societal perspective, but fall short of the target sponsor blended IRR established by the government. In our model, the VGF is calculated as the capex subsidy that is required to yield a target sponsor IRR of 15.0%, which is the minimum threshold that the Philippines government generally requires before it will submit a project for public bidding (Refer to Annex B for more detail on the Philippines PPP legislation and process).

### SUMMARY OF RETURNS

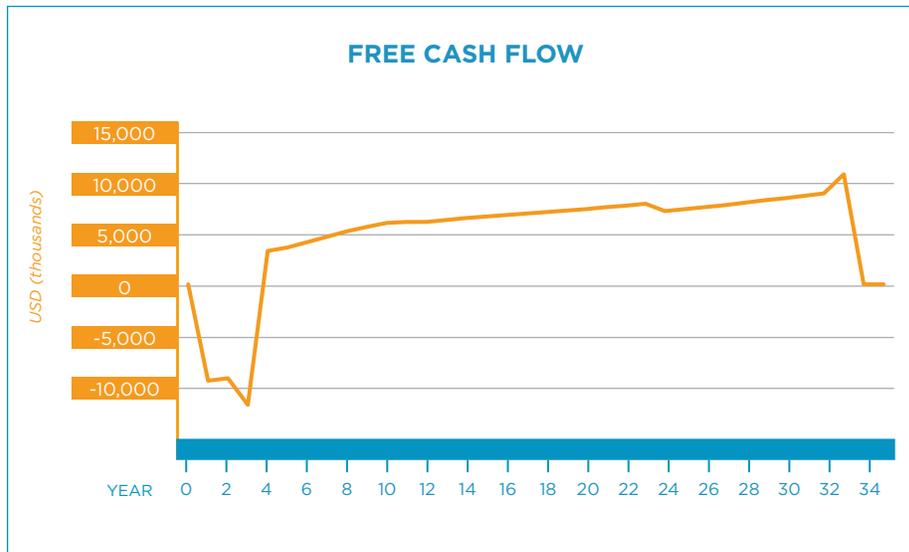
As indicated in Figure 36, the project currently yields a 12.4% blended return to sponsors, which falls below the unofficial government return hurdle of 15%. This means that under the current assumptions, the project will need to be structured with viability gap funding (VGF) from the government partner. This is an established structure used by many socially beneficial PPPs, but requires a social cost-benefit justification. A calculation of the required VGF indicates that a subsidy of \$5.9 million would be required to close

the gap to the 15.0% return hurdle. Therefore, PPP or JV structures that allow a VGF subsidy must be considered in order to ensure that the project is bankable. However, it is important to note that the assumptions made for the purposes of this analysis were quite conservative due to the high-level nature of the pre-feasibility study. We believe that a detailed technical feasibility study would likely indicate a more attractive return profile and achieve the 15.0% threshold without requiring a government subsidy or other VGF funding.

FIGURE 36: Summary of Returns

#### SUMMARY OF BASE CASE FINANCIAL RETURNS

Sponsor blended IRR (excluding gov't subsidy)	12.4%
Sponsor blended IRR (including gov't subsidy)	15.0%
Project unlevered after-tax IRR	15.1%
Required government subsidy to arrive at 15% sponsor IRR	\$5.9m



## SENSITIVITY ANALYSIS

The effects of several key inputs on the financial return of the project have been forecasted here in various sensitivity scenarios. Each illustrative scenario is generated by flexing one of the following key variables:

**Revenues:** The revenues of the project are generated in part based on contributions from equipment and facility rental, port user fees, unloading fees, and a range of other income generating activities for the port. If these revenues fluctuate from forecasted levels, there is a possibly significant effect on IRR and required subsidy. With base case revenue assumptions, sponsor IRR is 12.4%, with a required subsidy of \$5.9 million to achieve the 15.0% blended IRR hurdle. In the downside case, we assume a revenue haircut of -20.0% over the life of the project, and in this scenario the blended IRR falls to 8.2%, with a required government subsidy of \$15.8 million to achieve a 15.0% blended IRR. In the upside case, we assume that revenue is increased by 20.0%, and in this scenario, IRR is forecasted at 16.6% with with an implied “subsidy” of -\$3.9 million required to achieve a 15.0% blended IRR.

**Financing Costs:** Although a large portion of the proposed investments would be financed with senior debt, the assumed interest rate and cost of capital has a *de minimus* impact on the blended IRR. The strategy assumes an interest rate on senior debt of 6.1%, with a 20% increase in the downside

case, and a 20% decrease in the upside case. Under the downside scenario, IRR falls to 11.9%, with a required subsidy of \$6.4 million. In the upside case, IRR increases to 12.7%, and the subsidy required to achieve a 15.0% blended IRR is \$5.3 million.

**Capital Expenditures:** Capital expenditures in the strategy consist of facility restoration and construction, and solar panel installation. Costs of these expenditures may vary, and their increase or decrease affects the project’s IRR. Downside case capital expenditures are 20% higher than in the base case, and result in a 10.3% blended IRR, which translates to a required subsidy of \$12.0 million to meet the 15.0% threshold. Expenditures are assumed to be 20% lower in the upside case, which increases the blended IRR to 15.1%, which implies a “subsidy” of -\$0.2 million at the 15.0% blended IRR equivalent.

**Operating Expenses:** Operating expenses of PortCo and FIMSCo represent the ongoing costs of the project, including equipment maintenance, labor, and ongoing FIMS costs. These costs have a small but meaningful effect on IRR, and based on an downside assumption of 20% higher costs, blended IRR falls to 11.1%, with a required subsidy of \$8.5 million to achieve the 15.0% blended IRR hurdle. In the upside case, costs are scaled down by 20%, which drives the blended IRR up to 13.6%, requiring a subsidy of \$3.3 million.

**BASE CASE BLENDED IRR (excl. subsidy) 12.4%**

**BASE CASE GOV'T SUBSIDY TO ACHIEVE 15% TARGET IRR (millions)<sup>59</sup> \$5.9**

SENSITIVITY ANALYSIS	SCENARIOS			BLENDED IRR (%)		BLENDED IRR IMPACT (percentage point Δ)		GOV'T SUBSIDY @ 15% IRR (millions)	
	Base	Downside	Upside	Downside	Upside	Downside	Upside	Downside	Upside
<b>Revenue Variance</b>	-	-20.0%	20.0%	8.2%	16.6%	-4.1%	4.2%	\$15.8	- \$3.9
<b>Senior Debt Coupon</b>	6.1%	7.3%	4.9%	11.9%	12.7%	-0.4%	0.4%	\$7.5	\$6.2
<b>CAPEX Variance</b>	-	20.0%	-20.0%	10.3%	15.1%	-2.1%	2.8%	\$14.3	- \$0.3
<b>OPEX Variance</b>	-	20.0%	-20.0%	11.1%	13.6%	-1.3%	1.2%	\$9.9	\$3.8

<sup>59</sup> Present value of subsidy payments made during the development period

## NEXUS BLUE RISKS AND MITIGANTS

This section presents several of the leading risk elements that will potentially affect the development and implementation of the Nexus Blue Strategy. A robust risk identification and analysis is itself a critical part of the Philippines PPP implementation process. However, the risk factors included here are presented for the purpose of shaping and structuring the project to ensure that a wide spectrum of risk is considered from the outset.

**Project development risk** refers to the risk during the early stages of development that a viable PPP does not emerge from this study. These risks are generally of a third-party nature, and the key mitigation efforts should be focused on stronger stakeholder engagement, as shown below.

RISK	DESCRIPTION	MITIGANTS
<b>KEY PROJECT DEVELOPMENT RISKS</b>		
<b>Lack of BFAR buy-in</b>	BFAR may have another strategy or be supporting another approach to MCS that is incompatible with the Nexus Blue strategy.	Nexus Blue will launch an engagement plan in the early stages of the project. Also, preparations will be made to demonstrate the value of letting the PPP cover the cost of MCS at GenSan on a pilot basis for a greater MCS scheme, where the FIMS PPP seeks to pay for itself.
<b>Lack of PFDA buy-in</b>	PFDA may resist privatizing port operations and may not wish to relinquish control.	Nexus Blue will launch an engagement plan in the early stages of the project and will consider a joint venture approach to engage PFDA as an ongoing participant in the port operations.
<b>Resistance from fishers</b>	Fear of monitoring and surveillance may lead to resistance to participating in FIMS PPP scheme.	Nexus Blue will seek to engage fishers early with a campaign showing how FIMS PPP takes the direct financial burden of compliance with the Amended Fisheries Act off their shoulders. A parallel campaign can engage fishers in the conservation of fish stock (i.e., owning their waters).
<b>Failure to find funding for feasibility study costs</b>	Delay in commencing feasibility study to the point where the project is rendered irrelevant.	There are possible structures to incentivize a private sector developer to join the project earlier during the feasibility study phase, rather than wait for this project to be bid out. A funder and stakeholder engagement plan in the months following this study is also possible.
<b>BFAR develops a competing project with another partner</b>	Competing project renders the FIMS PPP Component irrelevant.	Engagement with BFAR immediately. Demonstrating the value of shifting FIMS and MCS costs off fishers or the government budget will also mitigate this risk.
<b>Decreased port demand</b>	Fewer fishers than expected may use the port, causing it to be financially unviable.	The project can be structured as a joint venture with government to incentivize support in the case of lower demand.

RISK	DESCRIPTION	MITIGANTS
<b>KEY OPERATING RISKS</b>		
<b>Decreased landings or leakage to other landing centers</b>	Fewer fishers participating in the EM/ER project, resulting in lower landing volumes – risk to cost recovery if performance-based charge system is adopted.	In addition to the above, multiple cost recovery schemes are possible and would prevent the success of the project being overly reliant on catch volume.
<b>Technology or data standards rendered irrelevant or obsolete by action of government</b>	After the project commences, government may release new MCS technology requirements or data reporting standards that do not match PPP technology choices.	Appropriate engagement with BFAR and WCPFC would enable setting the standards needed for Philippines MCS and reporting to RFMOs for foreseeable future. A concession contract with government would identify a change in technology or reporting standards as a change in law, leading to a compensation event.
<b>Technology choice does not hold up under actual fishing conditions</b>	Technology needs replacement due to failures.	The technology choice will be made on the basis of proven technologies.
<b>Fishers tamper with instruments and input false data</b>	Fishers may be tempted to turn off recording equipment, tamper with instruments, or input false data.	Experience in other global fisheries indicates that tampering and false data input can be reduced through proper technology selection and auditing procedures. The technology choice will be made on the basis of tamper-resistant technology (including rare event alerts).
<b>Portside enumerators face threats/resistance</b>	Enumerators may be unable to gather data freely due to security issues.	Deployment of full-time security at port would mitigate this.
<b>Vandalism and damage to data center</b>	Break-ins or other vandalism damage to the data center is possible.	Back up all information onto cloud database. In addition, the data center can be made more secure by being intentionally placed in the most secure location in the port and with the deployment of full-time security.
<b>LEGAL RISK</b>		
<b>Inconsistency with new rules on MCS</b>	Contents of forthcoming rules for the Amended Fisheries Act are unknown—it is possible that a specific MCS regime has been mandated and that the technology choice will be predetermined, reducing project flexibility and viability.	It is possible to restructure the project to become compliant. A FIMS PPP restructuring study may be required to reconsider the project structuring options.
<b>Deployment period for MCS compliance under new regulations set by BFAR does not match project construction schedule</b>	The FIMS PPP component of the proposed strategy cannot meet the government's need to deploy MCS.	During the feasibility study phase, the project can be sequenced such that the FIMS PPP activities begin deployment earlier while the port is under construction, if necessary.  Also, in-depth engagement with BFAR should be undertaken to get immediate buy-in of the FIMS PPP concept that can be used to pilot the MCS deployment.

## APPENDIX

Financial projections and returns analysis for Nexus Blue over the 3-year construction period and the first 10 years of the operating concession period:

### FINANCIAL PROJECTIONS

	Construction Period			Operational - Under Concession									
	Const. Year 1	Const. Year 2	Const. Year 3	Op. Year 1	Op. Year 2	Op. Year 3	Op. Year 4	Op. Year 5	Op. Year 6	Op. Year 7	Op. Year 8	Op. Year 9	Op. Year 10
<b>REVENUES</b>													
Market Rental	\$265,270	\$274,756	\$282,428	\$301,813	\$322,528	\$344,664	\$359,551	\$375,080	\$391,280	\$402,207	\$413,438	\$424,984	\$436,851
Freezer & Cold Storage	135,510	140,355	144,275	154,177	164,759	176,067	183,672	191,605	199,880	205,462	211,399	217,097	223,159
Agro-Industrial Commercial Rental	809,332	838,273	861,682	920,823	984,024	1,051,562	1,096,981	1,144,360	1,193,787	1,227,123	1,261,390	1,296,615	1,332,823
Port Usage Fee Revenue	2,690,997	2,787,225	2,865,059	3,207,497	3,590,864	4,020,052	4,500,537	5,038,452	5,384,265	5,753,813	6,148,725	6,414,296	6,691,337
Increased Throughput Fees	101,174	103,754	105,596	118,217	132,346	148,165	165,874	185,699	198,445	212,065	226,620	236,408	246,619
Solar Revenues	-	-	-	817,455	831,963	846,728	861,756	877,050	892,615	908,457	924,579	940,988	957,688
Local Business Tax Accrued & Paid	(33,074)	(34,246)	(35,192)	(45,595)	(49,773)	(54,400)	(59,194)	(64,506)	(68,202)	(71,905)	(75,839)	(78,681)	(81,635)
Net Revenues	3,969,209	4,110,118	4,223,847	5,474,387	5,976,710	6,532,839	7,109,175	7,747,739	8,192,069	8,637,221	9,110,114	9,451,707	9,806,842
YoY Growth in Sales					9.2%	9.3%	8.8%	9.0%	5.7%	5.4%	5.5%	3.7%	3.8%
<b>OPERATING EXPENSES</b>													
Port Operating Expenses	306,050	306,050	306,050	1,546,571	1,574,019	1,601,953	1,630,384	1,659,319	1,688,768	1,718,739	1,749,243	1,780,287	1,811,883
FIMS Operating Expenses	-	-	-	718,795	731,551	744,535	757,748	771,196	784,883	798,813	812,990	827,418	842,103
<b>Total Operating Expenses</b>	<b>306,050</b>	<b>306,050</b>	<b>306,050</b>	<b>2,265,365</b>	<b>2,305,570</b>	<b>2,346,488</b>	<b>2,388,132</b>	<b>2,430,516</b>	<b>2,473,651</b>	<b>2,517,552</b>	<b>2,562,232</b>	<b>2,607,705</b>	<b>2,653,986</b>
EBITDA	3,663,160	3,804,069	3,917,798	3,209,022	3,671,140	4,186,351	4,721,043	5,317,224	5,718,418	6,119,669	6,547,881	6,844,001	7,152,857
EBITDA Margin	92.3%	92.6%	92.8%	58.6%	61.4%	64.1%	66.4%	68.6%	69.8%	70.9%	71.9%	72.4%	72.9%
Depreciation	-	-	-	3,012,838	3,012,838	3,012,838	3,012,838	3,012,838	3,012,838	3,012,838	3,012,838	3,012,838	3,012,838
<b>Operating Income (EBIT)</b>	<b>3,663,160</b>	<b>3,804,069</b>	<b>3,917,798</b>	<b>196,184</b>	<b>658,302</b>	<b>1,173,513</b>	<b>1,708,205</b>	<b>2,304,386</b>	<b>2,705,581</b>	<b>3,106,831</b>	<b>3,535,043</b>	<b>3,831,163</b>	<b>4,140,019</b>
Interest	-	-	-	(2,602,309)	(2,590,582)	(2,558,346)	(2,491,564)	(2,386,684)	(2,240,242)	(2,067,298)	(1,867,360)	(1,651,984)	(1,424,071)
EBT	3,663,160	3,804,069	3,917,798	(2,406,125)	(1,932,279)	(1,384,833)	(783,359)	(82,298)	465,338	1,039,533	1,667,683	2,179,179	2,715,948
Taxes	(1,098,948)	(1,141,221)	(1,175,339)	-	-	-	-	(46,088)	(54,112)	(62,137)	(390,132)	(699,841)	(814,784)
Net Income	2,564,212	2,662,848	2,742,458	(2,406,125)	(1,932,279)	(1,384,833)	(783,359)	(128,386)	411,227	977,396	1,277,552	1,479,338	1,901,163
Dividends	-	-	-	-	-	-	-	-	117,419	230,363	256,846	258,251	2,198,056
<b>CAPITAL EXPENDITURES</b>													
PortCo	11,570,653	11,865,754	12,076,341	-	-	-	-	-	-	-	-	-	-
FIMSCo	-	-	2,448,081	-	-	-	-	-	-	-	-	-	-
<b>Total CAPEX</b>	<b>11,570,653</b>	<b>11,865,754</b>	<b>14,524,422</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>

### FINANCING

	Construction Period			Operational - Under Concession									
	Const. Year 1	Const. Year 2	Const. Year 3	Op. Year 1	Op. Year 2	Op. Year 3	Op. Year 4	Op. Year 5	Op. Year 6	Op. Year 7	Op. Year 8	Op. Year 9	Op. Year 10
<b>SENIOR DEBT FINANCING</b>													
Beginning Debt Balance	-	-	4,965,406	15,157,022	15,034,648	14,677,287	13,933,815	12,766,838	11,401,193	9,116,173	6,686,328	4,042,053	1,232,966
Net Debt Issued / (Repaid)	-	4,965,406	10,919,616	(122,375)	(357,360)	(743,472)	(1,166,976)	(1,626,645)	(2,024,020)	(2,429,845)	(2,644,275)	(2,809,087)	(1,232,966)
<b>Ending Debt Balance</b>	<b>-</b>	<b>4,965,406</b>	<b>15,157,022</b>	<b>15,034,648</b>	<b>14,677,287</b>	<b>13,933,815</b>	<b>12,766,838</b>	<b>11,401,193</b>	<b>9,116,173</b>	<b>6,686,328</b>	<b>4,042,053</b>	<b>1,232,966</b>	<b>-</b>
<b>JUNIOR DEBT FINANCING (PROJECT SPONSOR)</b>													
Beginning Debt Balance	-	5,983,470	8,885,773	9,596,635	9,945,584	10,231,441	10,394,442	10,419,221	10,290,590	10,149,827	9,997,804	9,833,618	9,656,298
Net Debt Issued / (Repaid)	5,983,470	2,902,303	710,862	348,949	285,857	163,001	24,780	(128,631)	(140,763)	(152,024)	(164,186)	(177,320)	(191,506)
<b>Ending Debt Balance</b>	<b>5,983,470</b>	<b>8,885,773</b>	<b>9,596,635</b>	<b>9,945,584</b>	<b>10,231,441</b>	<b>10,394,442</b>	<b>10,419,221</b>	<b>10,290,590</b>	<b>10,149,827</b>	<b>9,997,804</b>	<b>9,833,618</b>	<b>9,656,298</b>	<b>9,464,791</b>
<b>EQUITY FINANCING (PROJECT SPONSOR)</b>													
Beginning Equity Balance	-	1,438,334	2,020,936	2,020,936	2,020,936	2,020,936	2,020,936	2,020,936	2,020,936	2,020,936	2,020,936	2,020,936	2,020,936
Change in Equity	1,438,334	582,602	-	-	-	-	-	-	-	-	-	-	-
<b>Ending Equity Balance</b>	<b>1,438,334</b>	<b>2,020,936</b>	<b>2,020,936</b>	<b>2,020,936</b>	<b>2,020,936</b>	<b>2,020,936</b>	<b>2,020,936</b>	<b>2,020,936</b>	<b>2,020,936</b>	<b>2,020,936</b>	<b>2,020,936</b>	<b>2,020,936</b>	<b>2,020,936</b>

### VALUATION ANALYSIS

	Construction Period			Operational - Under Concession									
	Const. Year 1	Const. Year 2	Const. Year 3	Op. Year 1	Op. Year 2	Op. Year 3	Op. Year 4	Op. Year 5	Op. Year 6	Op. Year 7	Op. Year 8	Op. Year 9	Op. Year 10
<b>PROJECT FREE CASH FLOWS</b>													
Pre-Tax Project Free Cash Flow (Unlevered)	(8,363,194)	(8,077,909)	(10,622,055)	3,295,122	3,613,652	4,123,690	4,653,103	5,243,067	5,668,500	6,071,829	6,492,517	6,807,143	7,114,414
After-Tax Project Free Cash Flow (Unlevered)	(9,462,141)	(9,219,130)	(11,797,394)	3,295,122	3,613,652	4,123,690	4,653,103	5,204,566	5,621,975	6,017,279	6,429,403	6,738,106	7,037,764
<b>CASH FLOWS TO SPONSORS W/O SUBSIDY</b>													
Blended Cash Flow to Sponsors - w/o Subsidy	(9,462,141)	(3,499,285)	-	279,764	509,790	655,515	806,776	964,337	1,083,596	1,196,540	1,314,290	1,402,491	1,392,679
Equity Cash Flow to Sponsors - w/o Subsidy	(1,892,428)	(699,857)	-	-	-	-	-	-	-	-	-	-	-
<b>CASH FLOWS TO SPONSORS W/ SUBSIDY</b>													
Blended Cash Flow to Sponsors - w/ Subsidy	(7,191,671)	(2,913,011)	-	418,781	509,790	655,515	806,776	962,169	1,081,429	1,194,373	1,220,856	1,222,261	3,162,066
Equity Cash Flow to Sponsors - w/ Subsidy	(1,438,334)	(582,602)	-	-	-	-	-	-	117,419	230,363	256,846	258,251	2,198,056
<b>TOTAL PROJECT RETURNS</b>													
Project IRR (Pre-Tax)		<b>17.3%</b>											
Project IRR (After-Tax)		<b>15.1%</b>											
<b>SPONSOR RETURNS W/O SUBSIDY</b>													
Sponsor Blended IRR		<b>12.4%</b>											
Sponsor Equity IRR		<b>17.2%</b>											
<b>SPONSOR RETURNS W/ SUBSIDY</b>													
Sponsor Blended IRR		<b>15.0%</b>											
Sponsor Equity IRR		<b>22.3%</b>											

## ANNEX A: THE PUBLIC-PRIVATE PARTNERSHIP FRAMEWORK

The following section provides an overview of public-private partnerships for those without prior knowledge of PPP framework and variations.

### DEFINITION

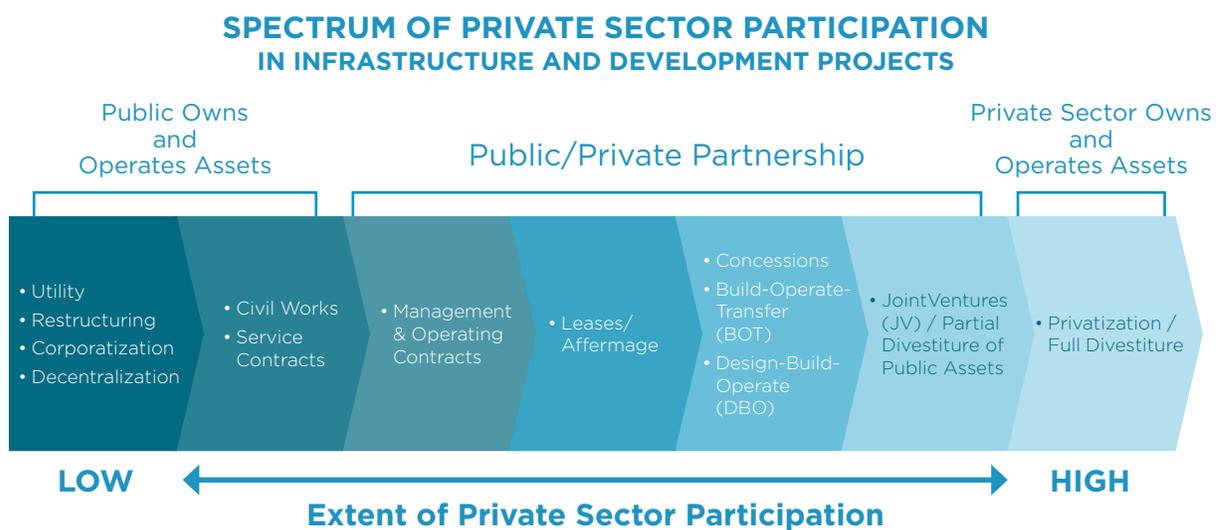
While definitions and interpretations of “public-private partnerships” are varied, ranging from corporate social responsibility initiatives to urban renewal projects, we conform here to the definition used by the World Bank. It defines a PPP as “a long-term contract between a private party and a government entity, for providing a public asset or service, in which the private party bears significant risk and management responsibility, and remuneration is linked to performance.”

This definition reflects the investment-driven, return-seeking framework that many national governments have adopted as a means to attract private capital, management skills, innovation, and efficiency in developing, constructing, and operating public infrastructure and services.

### Defining Characteristics of Successful Public-Private Partnerships

1. Binding legal contract between public and private sector
2. Used for the provision of public infrastructure or services on a project basis over a medium to long-term time frame
3. Private sector partner commits up-front capital investment and assumes associated development, implementation, and operating risks
4. Upon successful service delivery, the private party recovers investment via user fees or contracted government payments at a level specified in the contract
5. Risk and cost are allocated to party best able to manage them
6. Private sector partner is able to deliver greater efficiency and value for the money

FIGURE 37: The Public-Private Partnership Spectrum



Source: Delmon, Jeffery (2010) Understanding Options for Public-Private Partnerships in Infrastructure, World Bank

## PPP REVENUE MODELS

In exchange for financing, developing, and/or operating a public asset or service on a contracted basis, as well as meeting the performance

requirements defined in the contract, the private partner is entitled to compensation through one of two structures (or in some cases a hybrid).

## AVAILABILITY PAYMENTS

In an *Availability PPP*, the public partner pays predetermined, contracted fees, called “availability payments,” to the private partner in exchange for consistently providing the asset or service at the agreed level of quality. As a result, private investors

in Availability PPPs bear the performance risk for delivering the products or services at the agreed-upon quality and consistency, but do not typically assume commercial market risk.<sup>60</sup>

## CONCESSIONS

Under a *Concession PPP*, the government grants the private sector the right to build, operate, and charge users of the public infrastructure or service, at a regulated fee, toll, or tariff, under the oversight of regulators and in accordance with the concession agreement itself. Revenues are structured to cover debt service, fixed operating costs, and enable an appropriate return on equity (often capped by the regulators).<sup>61</sup> As there is no guarantee of payment under the concession, these projects assume the risk that the asset or service will be able to attract and maintain users over

the life of the project. For this reason, Concession PPPs are often granted for “natural monopolies” such as metro lines, where there are no direct competitors to steal market share.

The form that a particular project PPP takes will largely depend on the type of project, the specific government’s PPP protocols and preferences, the level of project priority, the nature of the project risks, the social benefits of the project, and the manner in which the project was solicited. In some cases, a project may utilize a combination of concession and availability payments.

## PROJECT DEVELOPMENT

Because of the high-profile and often politically sensitive nature of PPPs, governments work hard to ensure that projects are extremely well studied and fully vetted before any commitments are made. Public partners and other stakeholders want to make sure that on the one hand, the project does not fail financially, requiring the public sector to bail it out or leave a white elephant behind. On the other hand, government officials want to ensure that returns are not so attractive at the expense of either taxpayers or ratepayers that the arrangement will become politically unpopular. Therefore, the project development cycle is slow, laborious, and costly, often requiring commitments

of millions of dollars in high-risk development equity and/or public sector resources before a decision is even made on whether a project can proceed.

Only after the project has been officially awarded and contracts signed is the private sponsor in a position to secure project debt and move ahead with construction and/or implementation. Once the PPP is operational, sponsor risk is dramatically reduced and the equity assumes a profile more akin to fixed income. The entire development process, from concept to operation, spans several years. Figure 38 lays out an indicative project development cycle.

<sup>60</sup> While there are no usage fees in this type of project, an example is the PPP for School Infrastructure Project wherein the private sector is responsible for making available classrooms (consisting of design, financing, construction, and maintenance) for a contract fee with the Department of Education.

<sup>61</sup> An example of a Concession PPP is the Ninoy Aquino International Airport (NAIA) Expressway wherein the Department of Public Works and Highways (DPWH) granted the private sector the right to build and operate the expressway. Under the contract, the private sector was given the right to collect a toll (user charge) from the users of the expressway.

FIGURE 38: Indicative PPP Project Development Cycle



### PPP PROJECT CHARACTERISTICS

Due to the development cycle, detailed feasibility analysis, government vetting, and associated cost of these activities, PPPs are typically only feasible for large, complex, capital-intensive projects. Under PPP requirements defined by the government facilitating authorities, a mandated minimum investment size generally must be met before the government will even consider the proposal. While it depends on the project context and geography, stakeholders on both the public and the private side will often only take an interest in investments of over \$100 million for traditional infrastructure PPPs.

The long asset lives involved, together with the fundamental objective of the PPP construct to provide ongoing public goods and services, means that the contracts involved are usually quite long, often in excess of 20 years. As such, the investments are largely or entirely self-amortizing, and when there is a formal exit by way of a compensated transfer back to the public sector, this does not act as a meaningful driver of the overall return. This also means that PPPs are project investments with a defined project “life” established in the concession or availability contract.

### PPP STAKEHOLDERS

There are three categories of stakeholders in a typical PPP: (1) Private Sponsor(s); (2) Government Counterpart(s); and (3) Direct Beneficiaries/Ratepayers.<sup>62</sup> On the private side, particularly in large, multifaceted complex PPPs, the contracting party is often a consortium of complementary partners, each fulfilling a specific function. These roles include the original project developer(s) who identify the opportunity, undertake initial feasibility work, and assemble the consortium; the project operator(s) and/or asset manager(s) who provide the project implementation and ongoing operating

expertise; and the financial sponsor(s) who provide equity and pull together project financing. However, these roles may also be filled by the same party.

On the public side, the main counterpart is often the government agency responsible for the category of goods or service being provided, also known as the implementing agency. For example, in a toll road PPP, the implementing agency may be the Department of Transportation. Also on the public side, there is usually a dedicated PPP unit

<sup>62</sup> Where availability payments or government subsidies are utilized, taxpayers may be considered as a fourth stakeholder category.



responsible for promoting and managing the PPP development process, including procurement, bidding, upholding the country's PPP laws, and developing and implementing relevant policies. Where government financing is required, the

Ministry of Finance or equivalent may also be involved. Other relevant participants include lenders, legal and financial advisors, consultants, designers, and contractors.

### PPP INVESTOR LANDSCAPE

Private equity investors in PPPs include the early-stage, high-risk development equity provided by the project developer(s), and the lower-risk, later-stage project equity provided to fund the project company and initial capital requirements. This later-stage equity may be provided by the members of the private consortium themselves, or may be contributed by private or institutional real asset equity investors via a dedicated financial sponsor. While the development equity is high-risk venture investment with commensurate returns, the project equity is akin to yield-based investments in other real assets such as timber or Master-Limited Partnerships (MLPs), with predictable, inflation-hedged returns.

Global investor demand for infrastructure and PPP investments has grown in recent years, driven by a hunt for yield during a protracted period of low interest rates, and by increasing comfort with and access to the asset class. Infrastructure funds raised over \$31 billion globally in 2014, and \$21 billion was raised during the first half of 2015. PPPs have been utilized for projects in defense, environmental protection, government buildings, hospitals, information technology, municipal services, prisons, recreation, schools, solid waste, transport, tourism, and water. To date, no sustainable fisheries-focused public-private partnership has been implemented.

## ANNEX B: PUBLIC-PRIVATE PARTNERSHIPS IN THE PHILIPPINES

In cases where the public sector has limited experience, effectiveness, and ability to innovate around the delivery and management of social goods, Public-Private Partnerships provide an opportunity to combine the authority and oversight of the public sector with private sector project development and business acumen. In emerging markets especially, the PPP structure has been widely adopted, as countries struggle to close gaps in infrastructure and services for an increasingly mobile, urbanized population.

The Philippines pioneered the use of public-private partnerships in major government infrastructure projects in Asia and has a strong regulatory framework that facilitates the development and approval of projects. The PPP Build Operate Transfer (BOT) Law, or Republic Act (RA) 6957, passed in 1990, was the first of its kind in the region. Faced with public-sector budget constraints and limited capacity, PPPs have become a critical source of capital and of development and operating expertise for priority projects including electricity, public transportation, water distribution, toll roads, airports, and container ports.<sup>63</sup>

Administered by the National Economic Development Corporation (NEDA), the Philippines BOT law supports national growth and development by engaging the resources and capital of the private sector to achieve the country's priority development goals. The government may authorize a PPP for any sector, including nontraditional areas such as information technology (IT), housing, tourism, education, and health, as well as traditional sectors such as power plants, highways, ports, water supply, irrigation, reclamation, government buildings, slaughterhouses, warehouses, public markets, solid waste, drainage, and other projects that may be deemed appropriate.

### PHILIPPINES PRECEDENT PROJECTS AND TRACK RECORD

Since its implementation in 1990, the Philippine BOT program has generated total private capital investment in PPPs of over \$25 billion. During the past 5 years, the government established the approach as a priority pillar of economic growth and infrastructure development. It has awarded 10 projects since 2010, and there are currently 14 others in varying stages of procurement. Over the past year, the government awarded two PPP contracts for transportation projects costing \$1.3 billion, approved a railway PPP with an indicative cost of \$3.8 billion, rolled out a \$1.5 billion port modernization project, and approved a transportation IT project worth \$6 million.<sup>64</sup> In recognition of its regional leadership role in PPPs, the Philippines was awarded the U.K.'s award for "Best Central/Regional Government PPP Promoter," won the IJGlobal award for "Asia-Pacific Grantor of the Year," and was recognized as the most improved country in the Asia Pacific region for Public-Private Partnership readiness in a 2015 report commissioned by the Asian Development Bank.

### PPP ROUTE OPTIONS AND COMPARISONS

Depending on the nature of the project and the entity leading the development of the PPP, there are three core route options that developers and government agencies can follow. The most common path is for governments to initiate projects as a "solicited" PPP, which they first study and approve, and then put through a bidding process for interested private-sector consortia. As projects are put forth by the government, incentives such as guarantees and availability revenues are often available, whereby the government will directly pay the private partner for developing assets and providing services. However, solicited projects are subject to extensive private-sector competition, and development periods can be especially long and unpredictable, often spanning several years.

<sup>63</sup> Public-Private Partnerships: A Practical Guide for Business, Zambrano and Gruba Law Offices.

<sup>64</sup> PPP Talk January-June 2015.

In contrast, the “unsolicited” PPP route allows a private developer to conceive of and develop a specific project proposal based on NEDA’s economic development priorities, which it submits to NEDA for review and consider whether or not to accept. Upon acceptance, the government publicizes the proposal and puts out a limited competitive process in the format of a “Swiss Auction”. This allows other interested developers to put in a bid on the project during a 90-day window, and the competing proposal(s) are then weighed against the original project proponent’s proposal before a decision is made on which group to award the contract to. If no other groups bid during a period of 90 days, the project is automatically awarded to the original proponent.

The unsolicited process is streamlined, allowing the private project developer to more fully control the process and timing and tailor the proposal to their vision and strengths. Though faster and more efficient for the private sector, NEDA is very strict about the requirements for project acceptance,

and opportunities for government subsidies and availability payments are very limited. In addition, the project proponent must invest significant capital to develop the project, and there is no guarantee that the proposal will be accepted by NEDA, and competition for the project remains in the form of the abbreviated bidding process.

The newest structure option, established by NEDA in 2013, is the “Joint-Venture” (JV) PPP route, in which a government corporation may enter into either an equity or a contractual joint venture arrangement with the private sector to co-invest in the assets or services provided for public benefit. Unlike the other arrangements, where the government assigns a formal concession and monitors performance but otherwise has no direct participation, the JV route provides for a more fulsome government role.

Figure 39 identifies the main pros, cons, and mitigation steps to each pathway as applied to the project.

Figure 39: Pros and Cons of the Three PPP Pathway Options

ROUTE	PROS	CONS	MITIGATION
<b>Solicited PPP</b>	<ul style="list-style-type: none"> <li>Permits Government subsidization and guarantees</li> <li>Payment structure could include availability based payments if budget is available</li> <li>Investment incentives may be available</li> <li>Funds from project development facility may be available for project development costs</li> </ul>	<ul style="list-style-type: none"> <li>Unpredictable development period</li> <li>Will require significant investment to assist Government to get project on priority list</li> <li>Availability payment subject to willingness of implementing agency to allocate funds over the long term</li> <li>Subject to competition after project is listed</li> </ul>	<ul style="list-style-type: none"> <li>Garner full government stakeholder buy-in from BFAR, BAS, NEDA, and PFDA to fast track project</li> <li>Garner government stakeholder support of budget allocation for availability payment</li> <li>Align best participants and lenders early on to reduce strength of competitors</li> <li>Hold back a few innovations to surprise evaluators during bidding</li> </ul>

ROUTE	PROS	CONS	MITIGATION
<b>Unsolicited PPP</b>	<ul style="list-style-type: none"> <li>• Private sector may propose</li> <li>• Payment structure could include availability-based payments if budget is available</li> <li>• Process has averaged 14–15 months after approval of project proposal<sup>65</sup></li> </ul>	<ul style="list-style-type: none"> <li>• No government subsidy or guarantee (i.e., no Viability Gap Funding [VGF] support), which could provide a challenge to financing</li> <li>• No funds from project development facility are available for project development costs</li> <li>• Access to investment incentives is ambiguous, a project is not prioritized</li> <li>• Unpredictable development period</li> <li>• Will require proponent to bear full project development until tender</li> <li>• Availability payment subject to willingness of implementing agency to allocate funds over the long term; often difficult to obtain</li> <li>• Subject to competition in the end</li> </ul>	<ul style="list-style-type: none"> <li>• Structure project with sufficient revenue to not require subsidy</li> <li>• Garner government stakeholder support of budget allocation for availability payment</li> <li>• Find aid funding for components of project requiring subsidy or support</li> </ul>
<b>Joint Venture</b>	<ul style="list-style-type: none"> <li>• Private sector may propose</li> <li>• Possibility for direct negotiation</li> <li>• Subsidy permitted on approval of budget</li> <li>• Theoretically shorter development period</li> </ul>	<ul style="list-style-type: none"> <li>• Unpredictable development period</li> <li>• Subject to competition in the end</li> <li>• No funds from project development facility are available for project development costs</li> <li>• Largely untested and would require significant support of government to progress</li> <li>• May not be fully replicable in other countries where JV-type partnerships are not permitted</li> </ul>	<ul style="list-style-type: none"> <li>• Garner full government stakeholder buy-in from BFAR, BAS, NEDA, and PFDA to fast track project</li> </ul>

<sup>65</sup> GHD Pty. Ltd., comp. Policy Brief Unsolicited Proposals (2012): n. pag. Web.

## ANNEX C: PROPOSED INVESTMENT DESIGN METHODOLOGY FOR FISHERIES PPPS

### THE PPP INVESTMENT BLUEPRINT DEVELOPMENT PROCESS

Due to the unique structure and needs of the PPP framework, Encourage Capital undertook a 12-step PPP blueprint development process, split between a five-step project scoping exercise and a seven-step project pre-feasibility study. The full process required engaging in dialogue with a wide range of fisheries stakeholders, advisors, and consultants to develop and evaluate the challenges, opportunities, risks, and legal viability of a fisheries PPP strategy as profiled within the national-scale Investment Blueprint. To identify potential projects and evaluate their viability, Encourage Capital's 12-step review process sought to determine whether the project attributes conformed with the requirements of local PPP law, including the identification of a financially viable revenue model, while achieving national-scale (as well as regional-scale) management reform objectives with outsized impact.

### PROJECT SCOPING EXERCISE

The objective of the project scoping activity was to refine the goals of a potential Sustainable Fisheries Public-Private Partnership and to narrow the project alternatives for further technical evaluation. Scoping activities are summarized in the Figure 40 below:

FIGURE 40: The Five Steps Undertaken During the Project Scoping Exercise

OBJECTIVE	ACTIVITIES
<b>Stakeholder Analysis</b>	<ul style="list-style-type: none"> <li>• Interviews with government officials including DA, BFAR, NEDA, NSAP, LGUs, the PFDA, and others</li> <li>• Interview local and international NGO leaders</li> <li>• Interview industry participants including port personnel, vessel operators and fishers, seafood companies, and others</li> </ul>
<b>Initial Fisheries Assessment</b>	<ul style="list-style-type: none"> <li>• Develop profile of international, national, and local fisheries laws and requirements</li> <li>• Assess current fisheries management systems and processes, particularly focused on stock assessments, data capture, monitoring, and traceability</li> <li>• Evaluate candidate fisheries status and condition, with consideration of the fishery size and whether revenues are large enough to could justify costs</li> </ul>
<b>Preliminary Regulatory Analysis</b>	<ul style="list-style-type: none"> <li>• Evaluate the various PPP structuring options accepted by the government and requirements for each option</li> </ul>
<b>Identification of highest impact Intervention</b>	<ul style="list-style-type: none"> <li>• Narrow the list of potential management needs only the most critical, and those which the private sector would be uniquely suited to address</li> <li>• Undertake root cause analysis to identify the most impactful interventions</li> </ul>
<b>Evaluation of Revenue Potential</b>	<ul style="list-style-type: none"> <li>• Evaluate the various alternatives for revenue generation to support the project, including seafood processing, port facilities, and transport options</li> </ul>

## PRE-FEASIBILITY STUDY

The objective of this phase was to conduct a Preliminary Feasibility Study (PFS) of the identified strategy for inclusion in a potential PPP proposal. The PFS is a precursor to a full detailed Technical Feasibility Analysis to inform further development

or identify fatal flaws before committing to the high cost of a full Technical Feasibility Study. PFS activities are summarized in Figure 41:

FIGURE 41: The Seven Steps Undertaken During the Pre-Feasibility Study

OBJECTIVE	ACTIVITIES
<b>Initial Screen to Establish Suitability of Selected Project</b>	<ul style="list-style-type: none"> <li>• Put selected strategy through a Multi-Criteria Analysis (MCA) screen to identify any fatal flaws before undertaking full Pre-feasibility study</li> <li>• Is it strategic for the government? Is it of sufficient scale? Does it appear to have strong public support? Are there any major social safeguard concerns, such as mass relocation requirements, that cannot be easily mitigated? Does the project have a clearly defined objective and output specifications?</li> </ul>
<b>Analysis of Current Situation</b>	<ul style="list-style-type: none"> <li>• This review included combination of desktop research, stakeholder consultation and government documentation in order to answer the following key questions:               <ul style="list-style-type: none"> <li>- What are the key challenges and opportunities?</li> <li>- What are the fundamental needs and business case for a viable PPP proposal?</li> <li>- What are key datapoints and metrics under the business as usual case?</li> </ul> </li> </ul>
<b>Initial Financial Screen</b>	<ul style="list-style-type: none"> <li>• Perform high-level cost / revenue analysis to justify continued pursuit of the identified project; used as a as an initial sanity check</li> </ul>
<b>Collection of Cost and Revenue Data</b>	<ul style="list-style-type: none"> <li>• Gather formal cost and revenue data to feed into financial model</li> </ul>
<b>Detailed Financial and Social Cost-Benefit Analysis</b>	<ul style="list-style-type: none"> <li>• Input assumptions into a detailed project finance model to project financial returns to the overall project and equity investors</li> <li>• Run a social cost-benefit analysis, including returns to investors as well as quantifiable social benefits accruing to non-investors</li> </ul>
<b>Determination of the Appropriate Route Option</b>	<ul style="list-style-type: none"> <li>• Identify the most promising PPP route option</li> <li>• The two primary route options are the “unsolicited” proposal and a “solicited” approach, though there may be others depending on the jurisdiction</li> </ul>
<b>Environmental and Social Impact Assessment</b>	<ul style="list-style-type: none"> <li>• Undertake a preliminary environmental and social impact assessment for the preferred option to identify any negative impacts and potential mitigants</li> </ul>



### PROJECT CONSTRAINTS

Three sets of constraints bound this analysis, covering external requirements demanded by the country's PPP regulatory framework, bankability, and the requirements for positive fisheries management

impact that Encourage Capital identified to support the project's fundamental theory of change and ability to scale. The three primary constraints that we adhered to were the following:

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#### ADHERE TO THE PHILIPPINES PPP REGULATIONS AND PROJECT FINANCING REQUIREMENTS

The most fundamental requirement for a sustainable fisheries PPP is that it adheres to the national PPP framework and laws. While these requirements vary by jurisdiction, they are all concerned with ensuring

that the project meets the national priorities and fits within the legal and institutional framework, and is of sufficient scale and bankability to ensure consideration.

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#### DELIVER A COMPELLING VALUE PROPOSITION TO CRITICAL STAKEHOLDERS

Even the least controversial PPPs are often opposed on political or social grounds, and are highly scrutinized by elected officials and key stakeholders. Even well designed projects are destined to fail without an effective communications strategy

and the right political allies. It is therefore critical to identify the primary stakeholders most likely to oppose the project, and then to offer these groups a compelling value proposition within the project proposal.

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#### BE SCALABLE AND REPLICABLE IN ORDER TO ACHIEVE ECOSYSTEM-WIDE IMPACT

Part of the rationale in using a PPP approach to fisheries management is the ability for PPPs to catalyze significant amounts of capital to address large national or supranational public needs. The scale of fisheries management challenges requires large amounts of capital. Ecosystems don't adhere to state boundaries, so to address ecosystem-wide

challenges investment models must be replicable and highly scalable not only within a particular country but also across entire regions. Highly migratory fisheries resources fit this profile, as the sustainability of the resource is only as strong as the weakest link in the governance chain.

## ANNEX D: THE NATIONAL-SCALE FISHERIES INVESTMENT PROFILE

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### CORE VALUE DRIVERS

Despite their complexity, time and cost to develop, and the lack of specific sustainable fisheries precedents, public-private partnerships for national fisheries management can offer a number of benefits to governments and end users when appropriately structured the provision of public infrastructure, goods and services. Encourage Capital has identified several key value drivers that support a PPP-based national-scale fisheries impact investment strategy, including:

1. The infusion of private sector technologies, innovation, and expertise to provide higher quality, lower cost public services
2. The incentives to hold the private sector accountable for delivering projects on time and within budget
3. Greater budgetary certainty and visibility by identifying present and future infrastructure costs
4. Building of local capacity and transfer of technology through joint ventures and sub-contracts with large international firms
5. Diversification of the regional economy and increased competitiveness resulting from improved fish port landing and post-harvest infrastructure in conjunction with streamlined, cost effective fisheries management tools
6. Supplementing limited public sector capacity and expertise in order to meet growing infrastructure and information technology demands
7. Creating long-term value-for-money for the government partner through appropriate risk transfer to private sector experts best positioned to assume it at a lower cost

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### RISKS TO CONSIDER

Because of the size and scope of the Nexus Blue Strategy, there is a wide spectrum of risk involved in the execution and operations of the proposed PPP. Cooperation between private and government entities is a critical element of this strategy, and constitutes an additional set of risks as well. Risks to the successful implementation of the Nexus Blue strategy include (but are not limited to) the following:

- Government entities may not act favorably toward the strategy, or may support an incompatible approach to MCS that renders a FIMS infrastructure component irrelevant.
- Local fishers and vessel operators may reject infrastructure changes or refuse to comply with proposed management solutions.
- The project may not be approved or may need to be extensively modified after a formal feasibility study is conducted.
- A heavy reliance on field deployment of potentially fragile monitoring and communications technology may expose the strategy to a risk of various technology failures.
- The Port facility currently has some security concerns that could manifest as vandalism risks, or risks to data infrastructure or personnel.

## STRUCTURE AND TERMS

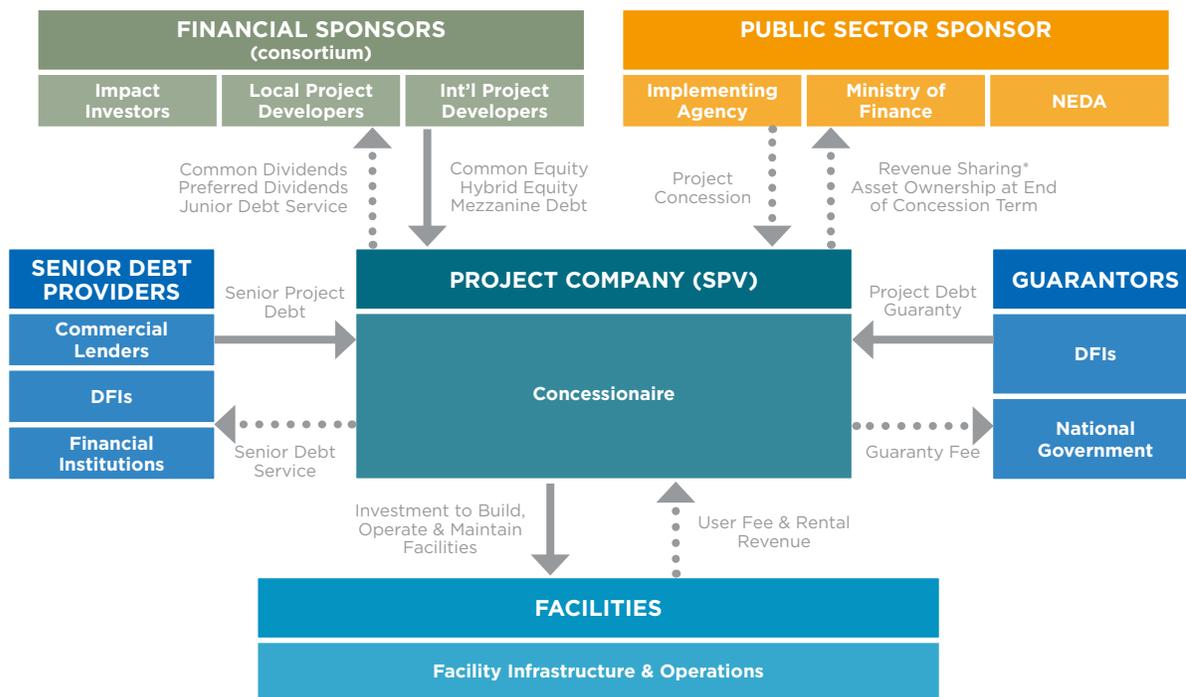
Although the specific structure and terms may vary by jurisdiction and project characteristics, a fisheries PPP will generally adhere to a standard project finance structure, in which equity is invested alongside non-recourse project debt supported by the stable, predictable cash flows required of a viable project. Because the structure is defined under the national PPP framework, it tends to be very standardized and must be acceptable to a wide range of potential bidders. (see Figure 42).

With long and bounded time horizons, contracted returns, a hard asset base, and project-specific investment, PPPs tend to be project financed with high levels of non-recourse project debt. In this model, a project company will be established as a special purpose vehicle (SPV), funded with equity from the private-sector partners, which would then

issue debt backed by the project's assets and cash flows, with no recourse to the partners behind the project company. The optimal capital structure will depend on a range of factors including the revenue type (concession vs. availability), project risks, credit of the public sector counterpart, but debt to equity ratios are rarely less than 1:1 and more commonly lie in the range of 70:30 to 80:20 (i.e., leverage ratios of 3.0x to 4.0x).<sup>66</sup>

PPP contracts are very long-term investments, with periods of up to 50 years in extreme cases. Investors must therefore have a long-term time horizon, and for this reason pension funds, endowments, and insurance companies are often investors, as they can match their long-term liabilities and outlook with a yield-based asset.

FIGURE 42: Indicative Public-Private Partnership Transaction Structure



<sup>66</sup> Asian Development Bank, Credit Rating Methods for Public-Private Partnership Infrastructure Projects and Small and Medium-Sized Enterprises in South Asia, 2014.

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