



Business plan to support the improvement of the yellowfin tuna (*Thunnus albacares*) small-scale fishery in the Galapagos Marine Reserve, Ecuador

Developed as part of the GEF-funded, World Bank-implemented Ocean Partnerships for Sustainable Fisheries and Biodiversity Conservation (OPP), a sub-project of the Common Oceans ABNJ Program led by UN-FAO

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INVESTMENT OVERVIEW

This business plan proposes four main and complementary strategies to support the improvement of the yellowfin tuna (*Thunnus albacares*) small-scale fishery in the Galapagos Marine Reserve, Ecuador, as summarized below:

1. **Galapagos Seafood Company:** Involves the creation of a new vertically-integrated commercialization and distribution entity that will, in partnership with the COPROPAG fishery cooperative, address many of the supply-chain inefficiencies that erode value and/or that disproportionately disperse revenues among supply-chain middlemen in Galapagos.
2. **Blue Incentives:** Involves the establishment of a fisheries-specific credit-line that promotes financial inclusion and creates incentives and business opportunities for hand-line fishers, supply-chain middlemen, local seafood stores (locally known as “marisquerías”) and entrepreneurs. The ultimate objective is to help local fishers and entrepreneurs take advantage of the business opportunities offered by the Galapagos tuna fishery with principles of sustainability and social responsibility.
3. **Galapagos Seafood Innovation Lab:** The strategy proposes the creation of an inter-institutional program called “Galapagos Seafood Innovation Lab”, whose objective is to create high value market opportunities by product differentiation, traceability, fair-trade, and collaborative approaches. Furthermore, it will provide technical and financial advice, both to existing fishing cooperatives and to independent fishers or entrepreneurs, to improve their capacity either as suppliers of services and/or as seafood traders at local or international level. The Lab represents the institutional platform required to facilitate the application of the Blue Incentives strategies, and can also help support the new Galapagos Seafood Company.
4. **Governability and Sustainability of Galapagos Tuna Fishery,** by implementation of the Community-based Fishery Improvement Project (C-FIP) agreed upon for the Galapagos tuna fishery. The proposed interventions are expected to support the creation of enabling conditions for the holistic improvement of the fishery, including actions to maintain sustainable harvest levels for the target stock, to increase the efficiency of the Galapagos National Park’s monitoring, control and surveillance (MCS) system, to reduce the ecological impact of the fishery over secondary and endangered, threatened and protected (ETP) species, to reform the tenure rights regime to align economic incentives to resource conservation, and to enhance the adaptive capacity of local institutions to cope with the social-ecological impacts of external climate and human drivers, including climate change and globalizations of markets.

These four strategies complement each other, aiming to aggregate most of the supply of tuna in the archipelago, which will enhance quality, sustainability, and fairness within the supply chain without displacing the existing or potential individual suppliers in Galapagos. These strategies will address value drivers and sources of differentiation in the Galapagos tuna, such as a higher product quality and prices, and will increase supply consistency and sustainability, as well as product branding and storytelling. Furthermore, this business plan proposes mechanisms that allow fishers capture a greater share of the value created in the supply chain, thereby promoting more fair trading in the Galapagos tuna fishery.

The whole strategy requires a total investment of \$2,326,475 made up of two segments, including a non-reimbursable component of \$1,056,475 (45.4%), and a reimbursable component of \$1,270,000 (54.6%). The non-reimbursable component aimed at multi-lateral, government and philanthropic sources of funding, whereas the reimbursable component is aimed at traditional for-profit and impact investors, since one of the

sub-segments shows an Internal Rate of Return (IRR) of almost 40% and a Return on Investment (ROI) of 116%. Aside from the expected positive financial outcomes, the proposal also generates positive socio-economic and environmental impacts aligned with the guiding principles defined by the WB-OPP Project Appraisal Document proposal; these demonstrate that biodiversity conservation and fisheries management are complementary rather than conflicting objectives, through the promotion of economic efficiency, social equity and biodiversity conservation. The expected outcomes of the proposal also positively impact the Sustainable Development Goals, specifically SDG2: food security and nutrition; SDG8: Decent work and economic growth; SDG10: Reduce inequality within countries; SDG12: Responsible consumption and production; and, SDG14: Conservation and sustainable use of marine resources.

The following table provides a summary of the business plan to support the improvement of the yellowfin tuna (*Thunnus albacares*) small-scale fishery in the Galapagos Marine Reserve, Ecuador.

Location	Galápagos Marine Reserve (GMR = 138,000 km ²), Ecuador	
Species	Target: Yellowfin tuna (<i>Thunnus albacares</i>) Secondary: Swordfish (<i>Xiphias gladius</i>), wahoo (<i>Acanthocybium solandri</i>), Mahi-Mahi (<i>Coryphaena hippurus</i>), billfish (<i>Makaira nigricans</i>), black skipjack tuna (<i>Euthynnus lineatus</i>).	
Proposed Investment(s)	Strategy 1: Galapagos Seafood Company	
	Investment Amount:	\$270,000
	Use of Proceeds:	<ul style="list-style-type: none"> Supply-chain interventions to achieve better operational efficiency. Improved commercialization that enables better market access/prices. Management and fishing gear improvements that drive fish stock protection
	Financing/Security Type:	Loan
	Pricing Terms:	15% Interest Rate
	Exit/Repayment Terms:	Loan repayment in year 6
	Strategy 2: Blue Incentives	
	Investment Amount:	\$ 1,000,000
	Use of Proceeds:	<ul style="list-style-type: none"> Credit line for fish commercialization upgrading (existing or new seafood stores). Small credit up to \$40,000 (Max 25 operations per year/ break-even: 17 operations). Annual Interest: 17.3%. Small loans allocated by a local savings/credit cooperative.

Financing/Security Type:	<ul style="list-style-type: none"> Note/Certificate of deposit issued by national bank, and bought by social impact investor. Payable annually. Renewable every year up to 4 years.
Pricing Terms:	<ul style="list-style-type: none"> Note/certificate has a rate of return of 5.25% for the impact investor. Local savings/credit coop. pays 8.06% to fund the credit line. Small loans pay 17.3%. It is estimated that a typical seafood store benefited by a \$40K loan for upgrading will get an IRR of 31% and ROI of 116% in its investment in a period of 10 years.
Exit/Repayment Terms:	<ul style="list-style-type: none"> Small Loan repayment 4 years.
<u>Strategy 3:</u> Galapagos Seafood Innovation Lab	
Investment Amount:	\$ 486,475
Use of Proceeds:	<ul style="list-style-type: none"> Market and brand development. Capacity building to improve tuna fishing, handling & quality assessment. Advising and supporting implementation of fish commercialization improvement measures. Social marketing campaigns. Local and export marketing support. Monitoring of agreement compliance.
Financing/Security Type:	Grant
Pricing Terms:	N/A
Exit/Repayment Terms:	N/A
<u>Strategy 4:</u> Governability and Sustainability of Galapagos Tuna Fishery	
Investment Amount	\$ 570,000
Use of Proceeds:	<ul style="list-style-type: none"> Keep harvesting of target stock in sustainable levels. Increase the efficiency of Monitoring, Control and Surveillance (MCS) system. Reduce ecological impact on secondary and endangered, threatened and protected (ETP) species. Improve the effectiveness of tenure rights system. Enhance institutional adaptive capacity against external drivers of change

Investment & Impact Thesis	<p>Protection and recovery of target fish stocks Supporting sustainable and more profitable tuna fishing in Galapagos will alleviate pressure on locally threatened species (i.e. <i>brujo</i>, <i>bacalao</i>, <i>sea-cucumber</i> and other <i>bycatch species</i>), while expanding market opportunities for local fishers.</p> <p>Improved livelihoods for fishers Improvements of on-board and shore-based seafood handling, storage and quality management will improve product quality and increase catch value, enabling potential price premiums of ~28% for higher quality tuna.</p> <p>Enhanced food and nutritional security and local seafood access A more sustainable and profitable tuna fishery can help achieve better food security in the islands by strengthening the local supply chain of high-quality protein. The proposal can also help reduce the environmental impacts of increased tourism by reducing the threat of invasive species-introduction through seafood imports.</p> <p>Protect a traditional livelihood and culture associated to it Fishing activities, along with farming, are the most traditional economic activities of the archipelago, dating back to the very first settlers in the archipelago. Furthermore, the commercialization of Galapagos fish products, particularly during “holy week”, is one of the strongest linkages of the Galapagos culture to the mainland. Ensuring the profitability of the fishing activity will guarantee the long-term preservation of the fishery for future generations.</p> <p>Financial inclusion and entrepreneurial capacity Credit demand for production is largely unsatisfied in Galapagos. As a result, producers are subject to informal sources of credit at very high interest rates. Including in the fishing sector. The project proposes to pilot a small loan credit line for the fishing /seafood sector consisting of at least 17 credit operations. Furthermore, it will provide training and advisory services around marketing, management, and seafood quality best-practices.</p>
Business Case Execution	<p>Strategy 1: Galapagos Seafood Company</p> <ul style="list-style-type: none"> • Manager: Oversee execution of activities and socialize program with fishers and buyers: \$45,600 USD/year. • Tuna quality assurance specialist: Responsible for grading large volumes of sustainable Galapagos tuna: \$30,000 USD/year. • Client relationship specialist: Responsible for purchasing tuna from fishers, as well as creating and maintaining relationships with buyers (i.e. fish shops, restaurants, hotels, and cruise boats: \$30,000 USD/year. • Operations: Two employees responsible for fish processing, packing and delivery: \$12,600 USD/year each = \$25,200 USD/year. • Office rent: \$12,000 USD/year. • Refrigerated truck: \$15,000 USD. • Start-up working capital to support price-premium paid to fishers: \$83,000 USD. • Total investment¹: \$270,000 USD <p>Strategy 2: Blue Incentives</p> <ul style="list-style-type: none"> • Support establishment of a credit-line (i.e. loans) for fishery intermediaries or new entrepreneurs to support the implementation of good practices in the

¹ Includes payroll taxes and other miscellaneous costs

	<p>commercialization of fish and enhance the demand for tuna caught and handle complying all regulations, Galapagos seal guidelines, and Eco-Gourmet commitments. This strategy will allow to amplify and accelerate the change of practices within the value/supply chain.</p> <ul style="list-style-type: none"> • Total investment: \$ 1 M USD (Reimbursable loan). <p>Strategy 3: Galapagos Seafood innovation Lab</p> <ul style="list-style-type: none"> • Local market coordinator: Coordinator responsible for over-seeing program and advice/train participants: \$23,400 USD in first year, then \$11,700 USD/year (four years). • Export market coordinator: Two coordinators responsible for over-seeing program and advice/ train participants: \$46,800 USD in first year, then \$23,400 USD/year (four years). • Tuna quality assessor: \$35,000 USD/year. • Social marketing campaign: \$ 50,000 US for first year; \$25,000 for each subsequent year (three years) • Total investment: \$486,475 USD for four years (Grant). This amount includes a 45% extra on administrative and other direct costs. <p>Strategy 4: Governability and Sustainability of Galapagos Tuna Fishery</p> <ul style="list-style-type: none"> • To implement a set of interventions to strength the enabling condition for the integral improvement of the fishery including action to keep catch at sustainable levels; increase efficiency of monitoring, control and surveillance; reduce impact over secondary and protected species; tune in tenure rights regime to align economic incentives and conservation and strengthen adaptive capacity of local institutions. • Total investment: \$570,000 (Grant / Government resources) 																						
Fishery Stakeholders Benefited:	<p>Approximately, 94 vessels and 308 fishers participate in the Galapagos tuna small-scale fishery (Ramírez and Reyes, 2015). Under strategy 1, price premiums of 26%, 45%, and 58% could be received for up to 308 fishers in months 1, 13, and 72, with an estimated \$863,214 USD of value expected to be created for Galapagos stakeholders in year 4, as illustrated below:</p> <table border="1"> <thead> <tr> <th>Stakeholder</th><th>\$/year</th></tr> </thead> <tbody> <tr> <td>Fishermen</td><td>\$404,825 USD</td></tr> <tr> <td>Employees</td><td>\$218,317 USD</td></tr> <tr> <td>COPROPAG</td><td>\$67,677 USD</td></tr> <tr> <td>Government</td><td>\$172,395 USD</td></tr> <tr> <td>Total</td><td>\$863,214 USD</td></tr> </tbody> </table> <div> <p>Value-add percentage per sector:</p> <table border="1"> <caption>Value-add percentage per sector data</caption> <thead> <tr> <th>Sector</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Fishermen</td> <td>47%</td> </tr> <tr> <td>Employees</td> <td>25%</td> </tr> <tr> <td>Government</td> <td>20%</td> </tr> <tr> <td>COPROPAG</td> <td>8%</td> </tr> </tbody> </table> </div> <p>Under strategy 2, around 17 supply chain stakeholders (fishers, middlepersons seafood stores), would benefit from small loans to upgrade tuna/fish commercialization business. In all cases, approximately 30,000 residents and more than 240,000 tourists per year would benefit from higher quality local Galapagos tuna.</p>	Stakeholder	\$/year	Fishermen	\$404,825 USD	Employees	\$218,317 USD	COPROPAG	\$67,677 USD	Government	\$172,395 USD	Total	\$863,214 USD	Sector	Percentage	Fishermen	47%	Employees	25%	Government	20%	COPROPAG	8%
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1. INTRODUCTION

The objective of the "Ocean Partnership for Sustainable Fisheries and Biodiversity Conservation (OPP)" project was to *"identify and design a series of investment proposals for transformational pilot projects for well managed fisheries based on shared highly migratory stocks (...). The investment proposals resulting from the project should demonstrate a strong value proposition to enable downstream investments and contribute to wider regional interests in improved management of these stocks"*².

As part of the OPP, Conservation International initiated efforts in September 2017 to develop a business case for comprehensive improvement of the Galapagos tuna small-scale fishery. The business case was developed over a 1.5-year period with the explicit objective to maximize the socio-economic benefits generated by this fishery to incentivize greater environmental sustainability in Galapagos. To fulfill this objective, CI and the Galapagos National Park led in the development of a Community-based Coastal Fishery Improvement Project (C-FIP) for the Galapagos tuna fishery, as well as the drafting of an investment plan to attract the necessary financing to implement the fishery improvements.


A C-FIP is defined as an alliance of diverse actors and institutions, including fishers, managers, traders, scientists, private sector, and non-governmental organizations, who join efforts to define and agree on an action plan, which specifies the activities that are required to create ecologically sustainable, economically profitable, and socially fair fisheries within a certain time frame (See Box 1 below).

As part of the C-FIP development process, Conservation International and partners executed the following actions:

1. **Multi-stakeholder coordination workshop:**

The business case development efforts in Galapagos began with the convening of a multi-stakeholder coordination workshop on November 28th, 2017 led by the Galapagos National Park and Conservation International in order to agree on the scope and methodology to be followed in developing the Galapagos tuna business case (see Moreno et al. 2017).



 **Parque Nacional Galápagos** added 3 new photos. November 29, 2017 · 🌐

Instituciones y sector pesquero se unen para mejorar pesquería de atún en la RMG

La Dirección del Parque Nacional Galápagos será el coordinador del Comité interinstitucional que dará seguimiento al proyecto que permitirá mejorar la pesquería de atún en la Reserva Marina de Galápagos, este fue uno de los resultados del taller organizado por Conservación Internacional en Puerto Ayora, que contó con la participación de varias instituciones, ONG's y dirigentes del sector pesquero de Galápagos.

Danny Rueda, director de Ecosistemas, explicó que con esta iniciativa se espera fortalecer la comercialización de productos pesqueros, esto sumado a otras herramientas de manejo ya establecidas como los Dispositivos Agregadores de Peces, calendario pesquero y sello de origen.

"El Parque (Nacional Galápagos) continuará impulsando mejoras en la comercialización de productos pesqueros, lo cual permitirá que el pescador artesanal pueda obtener mayores ingresos económicos, con una mejor comercialización de atún a nivel de exportación", afirmó.

Mauricio Castrejón, gerente regional del programa de pesquerías de CI, precisó que tras el taller iniciarán con la fase de diagnóstico, un estudio de mercado de la cadena de valor realizado por estudiantes de la universidad de California; para continuar con el plan de inversión.

Dionisio Zapata, presidente de la cooperativa de pescadores de Santa Cruz, reconoció su interés en el proyecto y recomendó abordar el tema de fortalecimiento de las cooperativas, para que todas se encuentren al mismo nivel, antes de avanzar a las siguientes fases.

² OPP Project Appraisal Document (PAD) by the World Bank. August 6th 2014. Report No: PAD962

See: <http://www.fao.org/in-action/commonoceans/news/detail-events/en/c/1100430/>

The workshop garnered broad support from government representatives and fishery stakeholder around following the C-FIP approach to identify management and tuna supply-chain improvements that would sustainably enhance local livelihoods and food security.

2. **Comprehensive assessment of the Galapagos tuna fishery:**

As part of the work plan agreed during the workshop (see Section 6.4 in Moreno et al. 2017), Conservation International carried out a comprehensive assessment of the Galapagos tuna fishery following the fishery diagnostic tool developed by Castrejón et al. 2015, known as MSC+ (see Castrejón and Moreno, 2018). The MSC+ follows an ecosystem and human rights approach to management that is largely based on the "FAO Voluntary Guidelines for ensuring sustainable small-scale fisheries" and on the Marine Stewardship Council (MSC) standard. C-FIPs promote the adoption of fishing and management practices that contribute toward improving the fish stock status of the target populations, reducing the ecological impact of the fishery, and promoting effective management. However, it also promotes the implementation of actions to achieve secure tenure, equity of opportunities and fairness along the value chain, and strengthening the social capital of fishers' organizations.

As a complement to the comprehensive assessment of the Galapagos tuna fishery, Conservation International and students from the Anderson School of Management of the University of California Los Angeles (UCLA), conducted a value chain analysis of the Galapagos tuna fishery to identify business opportunities to improve the profitability of the fishery (see Berman et al. 2018). The research methodology involved over 200 hours of primary and secondary research across all project phases. The methodology used by Berman et al. (2018) is described in Figure 1.1.



Figure 1.1. Galapagos Tuna Value-Chain Assessment Methodology (Berman et al. 2018).

The diagnostic assessments above shed light on the socio-ecological sustainability and profitability of the fishery, including the identification of management and supply-chain deficiencies that must be solved to achieve triple bottom-line outcomes for the fishery; these results were used as key inputs to draft a C-FIP Action Plan for the Galapagos tuna fishery, which reflects the point of view and interests of all participants.

3. **Drafting of a C-FIP Action Plan:**

The Galapagos National Park and Conservation International organized two multi-stakeholder workshops in May and November 2018 to develop an Action Plan for the holistic improvement of the Galapagos tuna fishery through a community-based approach (see: Workshop Reports: Castrejón and Moreno 2018). A total of 38 participants from 12 different institutions participated in both workshops, including representatives of the Cooperativa de Producción Pesquera Artesanal de Galápagos (COPROPAG), Federación Nacional de Cooperativas Pesqueras del Ecuador (FENACOPEC), Consejo de Gobierno de Régimen Especial de Galápagos (CGREG), Ministerio de Acuacultura y Pesca (MAP), Instituto Nacional de Pesca (INP), Gobierno Autónomo Descentralizado de Santa Cruz (GAD-Santa Cruz), ELECGALAPAGOS, Fundación Charles Darwin, and WildAid.

The second workshop concluded with the signing of a Memorandum of Understanding (MOU) to implement the C-FIP Action Plan co-developed by the participants (see Annex 1). Execution of the full set of interventions identified in the C-FIP Action Plan will create the enabling conditions to transition the Galapagos tuna fishery toward greater ecological sustainability, economic profitability, and social fairness.



See: <http://www.fao.org/in-action/commonoceans/news/detail-events/en/c/1138057/>

4. **Business plan:**

The C-FIP action plan was used as the basis for the development of the business plan, whose objective is to attract the financing required to comprehensively improve the sustainability and profitability of the Galapagos artisanal tuna fishery. The project also leveraged work on the recently completed Bankable Business Case Guidelines to guide the development of the Galapagos Tuna Business Case, as well as the OPP-Minimum Criteria, which the World Bank will use to assess all OPP business cases (See Box 2). The current document presents the business plan that was developed through a participatory approach with fishery stakeholders, which is structured according to the OPP Minimum Criteria. The business plan is therefore composed of six sections, including: (1) Introduction, (2) Contextual Analysis, (3) Value chain & Market Analysis, (4) Value Proposition & Business Model, (5) Financial Analysis, and (6) Risk Analysis.

The Contextual Analysis and Value-Chain/Market Analysis sections identify the main problems faced by the Galapagos tuna fishery, whereas the Value Proposition section identifies potential solutions to those problems, including the value to be generated from specific fishery improvements. The Financial Analysis section describes the investment required and financial feasibility of the fishery improvements. Finally, the Risk Analysis section identifies the potential risks and key assumptions that could adversely impact the viability of the fishery business case and describes a set of mitigation strategies to address those key risks.

Box 1. Community-based Fisheries Improvement Project (C-FIP) model

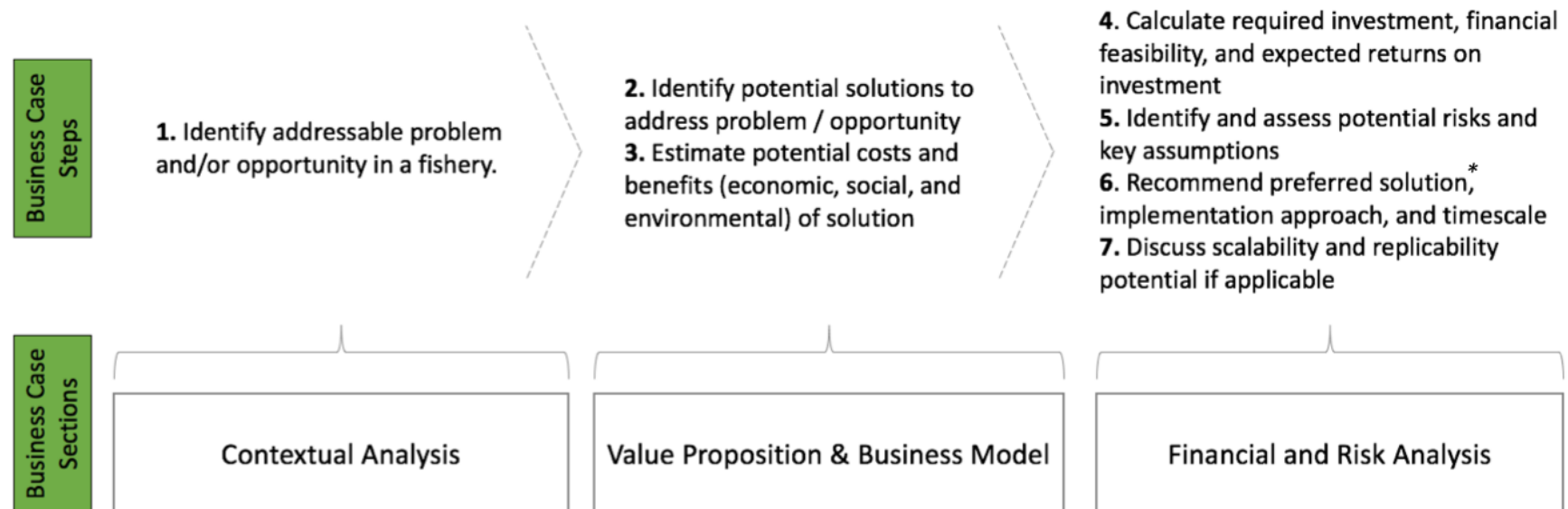
The C-FIP and business plan are key components of a community-based coastal fisheries improvement model developed by Conservation International to enhance human well-being and environmental sustainability through public-private partnerships, the co-responsibility capacity of coastal fishing communities, and effective governance reform. This human based-approach for the improvement of community-based coastal fisheries combines globally recognized ecosystem-based and human rights-based approaches, including the UN FAO's Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries and the Marine Stewardship Council Standard (MSC), in combination with blue finance principles, to promote sustainability of coastal community-based fisheries, and to guarantee the flow of benefits they provide to humankind. Such model has six components:

1. Fishery diagnostic: The fishery is evaluated using a fishery diagnostic framework developed by Conservation International known as MSC+ (see Castrejón et al. 2015). This tool is used to conduct a "Needs Assessment". A needs assessment is an evaluation of a fishery to determine environmental and socioeconomic challenges and improvements needed in the fishery. The results are used to define cost-effective intervention strategies to improve the fishery under assessment by designing and implementing a C-FIP action plan and an investment proposal, or any other type of blue finance mechanism, that helps to attract the investment required for fishery improvement.
2. C-FIP action plan: A clear and measurable action plan to improve the fishery is agreed upon by management authorities, fishers, private sector and other relevant actors, using as inputs the results and recommendations provided by the C-FIP Scorecard and other relevant sources of information (e.g., value chain analysis).
3. Investment proposal: Once a C-FIP action plan is agreed upon, a key challenge for its implementation is generating the long-term financing required to ensure an effective fishery intervention and reform. Financial capital from diverse philanthropic, public and private sources is required to invest in the transition to more sustainable and profitable fisheries. Thus, the next step is developing an investment proposal, or other type of blue finance mechanism, to inform investors and donors about the potential financial and non-financial benefits produced by C-FIP implementation, including information about the return and risk levels associated to such type of investment. Investors, in turn, can use such information to identify those fisheries with the potential for relatively rapid transformation towards sustainable and profitable fisheries.
4. Investable entity: In this phase, the investable entity (i.e., the counterparty that will receive and manage funding, and will be responsible for repayment of the investment (Holmes et al. 2014), receive technical assistance by FIP implementers to improve its organizational capacity to have an active role in C-FIP implementation. The investable entity may include, but may not be limited to, fishing cooperatives, associations, federations, processors, distributors or exporters. In cases where a private, independent investable entity does not exist and subject to applicable laws and regulations, a local, regional or national government entity, or a non-governmental organization (NGO) may assume the role of investable entity.
5. Public-private partnerships: A public-private partnership is created to ensure the funding and collaboration required to implement the C-FIP action plan.
6. Enabling conditions for fishery recovery: The investment provided by diverse philanthropic, public and private sources is finally directed toward C-FIP implementation. This imply taking concrete actions to create the enabling conditions to improve status of target species, preventing or mitigating ecological impacts produced by fishing activities, improving management effectiveness, secure tenure rights, promote equality and equitable opportunities along value chains, and improve fishers' organization social capital. These factors are key to move coastal fisheries toward sustainability, and all of them are consistent with the principles and guidance provided by the FAO guidelines for small-scale fisheries.

*Note that the ultimate goal of a C-FIP is not necessarily to obtain fishery certification, which depends to a large extent on market conditions and the costs associated with a certification process, but to improve the fishery in a coordinated and planned way.

OPP - Business Case Minimum Criteria

Fishery business cases should describe an attractive business opportunity for investment that inherently improves the environmental, economic and/or social performance of the fishery:



**Note that the business cases should describe a clear potential to generate acceptable financial, environmental and/or social returns over the project time horizon, including mechanisms for generating project cash flows and capturing investment returns.*

2. CONTEXTUAL ANALYSIS

2.1 OVERVIEW AND BACKGROUND OF THE GALAPAGOS ISLANDS

The Galapagos Islands are located about 1240 km west of mainland Ecuador (DPNG 2014a). The archipelago is composed of 234 islands, islets and rocks of volcanic origin, with a total emerged land area of 7,985 km², including 1,667 km of coastline (Fig. 2.1; DPNG 2014a). The main economic driver of the archipelago is tourism, which employs 40% of local residents, and produces approximately 65.4% of the Galapagos' gross domestic income (Taylor et al. 2007). The latter increased 9.6% per year between 1999 and 2005, which has placed the Galapagos Islands among the fastest-growing economies in the world.

The local population increased from 1200 to 25 244 inhabitants between 1940 and 2015 (Castrejón 2011; INEC, 2015); meanwhile the total number of tourists per year has increased exponentially between 1960 and 2017 from approximately 2,000 to 241,800 (Epler 2007; Galapagos' Tourism Observatory³). Galapagos residents inhabiting only 4% of the total land area. They are distributed in five islands (Santa Cruz, Baltra, San Cristobal, Isabela, and Floreana; Fig. 2). The most populated island is Santa Cruz (15,701), followed by San Cristóbal (7,199) and Isabela (2,344).

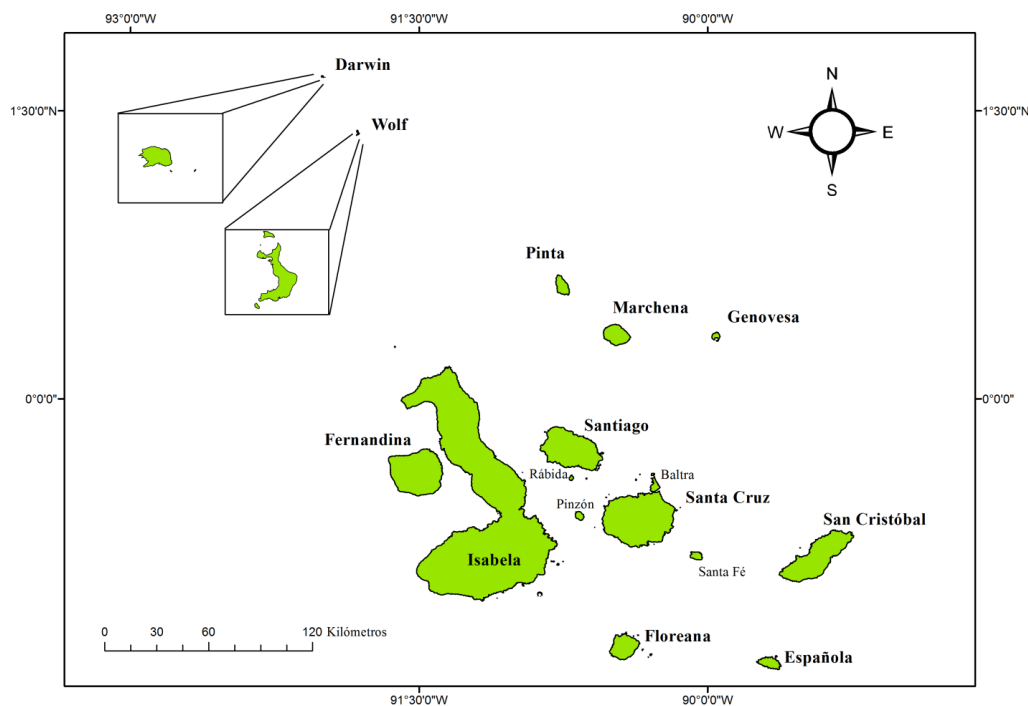


Figure 2.1. The Galapagos Islands, Ecuador.

³ <https://www.observatoriogalapagos.gob.ec/>

2.2 GOVERNANCE AND MANAGEMENT OF THE GALAPAGOS MARINE RESERVE

During the mid-1990's, management of marine resources in Galapagos faced several political and socio-economic challenges, including small scale fleet overcapitalization as result of the unregulated expansion of the sea cucumber fishery, and the exponential growth of the touristic sector (Castrejón 2011). Increasing social conflicts and ecological degradation associated to these activities triggered a participatory process that led to the enacting of the Galapagos Special Law (GSL) in 1998 (Heylings and Bravo 2007; Castrejón and Charles 2013). A key element of the GSL was the designation of the Galapagos archipelago and its surrounding open ocean as a multiple-use marine reserve of nearly 138,000 km², known as the Galapagos Marine Reserve (GMR).

Several management measures were gradually implemented between 1998 and 2002 to control access and exploitation levels of Galapagos fishery resources, thus shifting from an open-access to a common property regime, including: (a) extension of the boundaries of the reserve from 28 to 74 km from the “baseline” (i.e. an imaginary line joining the outer islands of the archipelago); (b) prohibition of industrial fishing; (c) establishment of a moratorium on new entrants to all fisheries; and (d) allocation of fishing permits exclusively to local artisanal fishers. However, the following two measure are the most relevant:

- 1) The institutional shift from a hierarchical (top-down) management to a co-management regime (Castrejón and Charles 2013). Co-management was institutionalized through two nested decision-making bodies: the Participatory Management Board (PMB) and the Institutional Management Authority (IMA). Under this new regime, the Galapagos National Park (GNP) was designated as the entity responsible for implementing the decisions agreed-to by consensus.
- 2) The adoption of an ecosystem-based spatial management (EBSM) approach for the Galapagos marine environment (Castrejón and Charles 2013) through a consensus-based participatory process between 1999 and 2006 (Heylings et al. 2002; Castrejón and Charles 2013). The process concluded with the designation of 130 management zones with different levels of protection, including 18% of the Galapagos shoreline being set aside as no-take zones (Fig. 2.2). Since no offshore boundaries were established, the total protected marine area for each zone was not legally agreed. (Castrejón and Charles 2013).

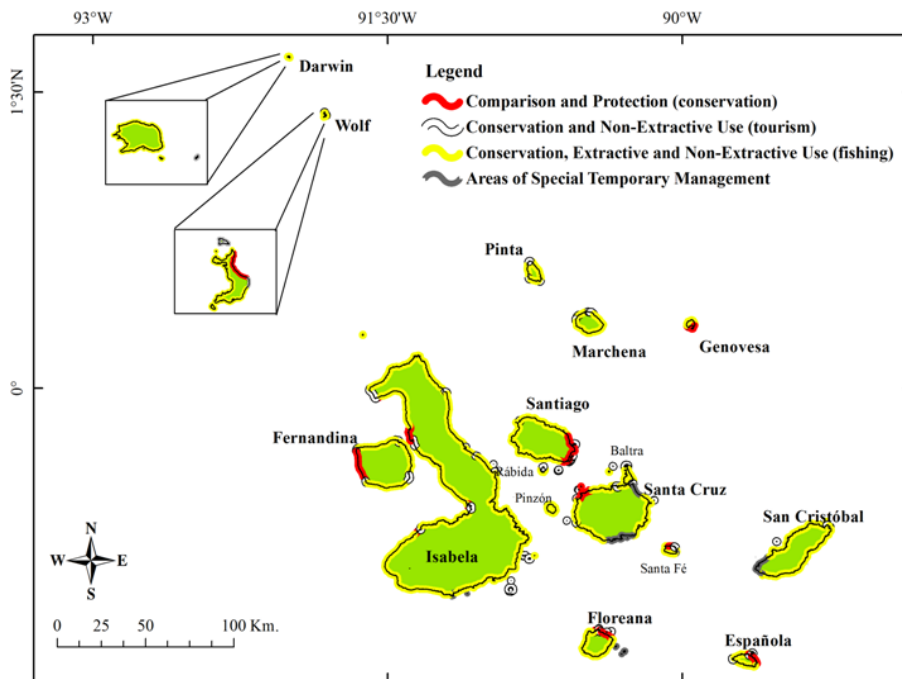


Figure 2.2. The marine zoning of the Galapagos Marine Reserve created in 2000. Source: Castrejón & Charles 2013.

The latter changes in governance systems in Galapagos have occurred in parallel with a decreasing trend in the number of active fishers, which are due to a number of reasons, including: (1) increasing livelihood diversification, (2) an aging local fishing sector since 2000 (Castrejón 2011), and (3) a reduction in the influence of Asian middlemen (i.e., roving bandits) in the Galapagos fishery supply-chain since the collapse of the sea cucumber fishery in 2006.

2.3 THE YELLOWFIN TUNA FISHERY

A high diversity of marine species is commercially harvested in Galapagos. The most relevant target species since the closure of the sea cucumber fishery are spiny lobsters (*Panulirus penicillatus* and *P. gracilis*), and Galapagos groupers (*Mycteroperca olfax*). However, the socioeconomic importance of yellowfin tuna (*Thunnus albacares*) shows an increasing trend in recent years due to the increasing number of tourists and restaurants in the archipelago (Ramírez y Reyes, 2015). According to Berman et al. (2018), the annual demand for fish in Galapagos, including yellowfin tuna, is approximately 871.3 t, of which 31% is consumed by the local community (271.8 t), while the remaining 69% is consumed by tourists (599.5 t). It is estimated that 14% of the fish consumed is yellowfin tuna (122 t), while the remaining 86% (749.3 t) corresponds to the fish species that make up the finfish fishery, locally known as “pesca blanca”. The grouper (*Mycteroperca olfax*), locally known as Galapagos cod, is the most demanded finfish species, particularly during the Easter season.

According to Bucaram et al. 2018, the fishing effort of the industrial tuna fleet between 1990 and 1997 was concentrated within the limits of the area that would be designated as part of the GMR in March 1998. Since then, the fishing effort gradually shifted towards the outer limits of the reserve, generating a concentration of fishing effort in the southwest border of the GMR between 2006-2009, a fishing pattern known as “fishing the line effect” (Figure 2.4).

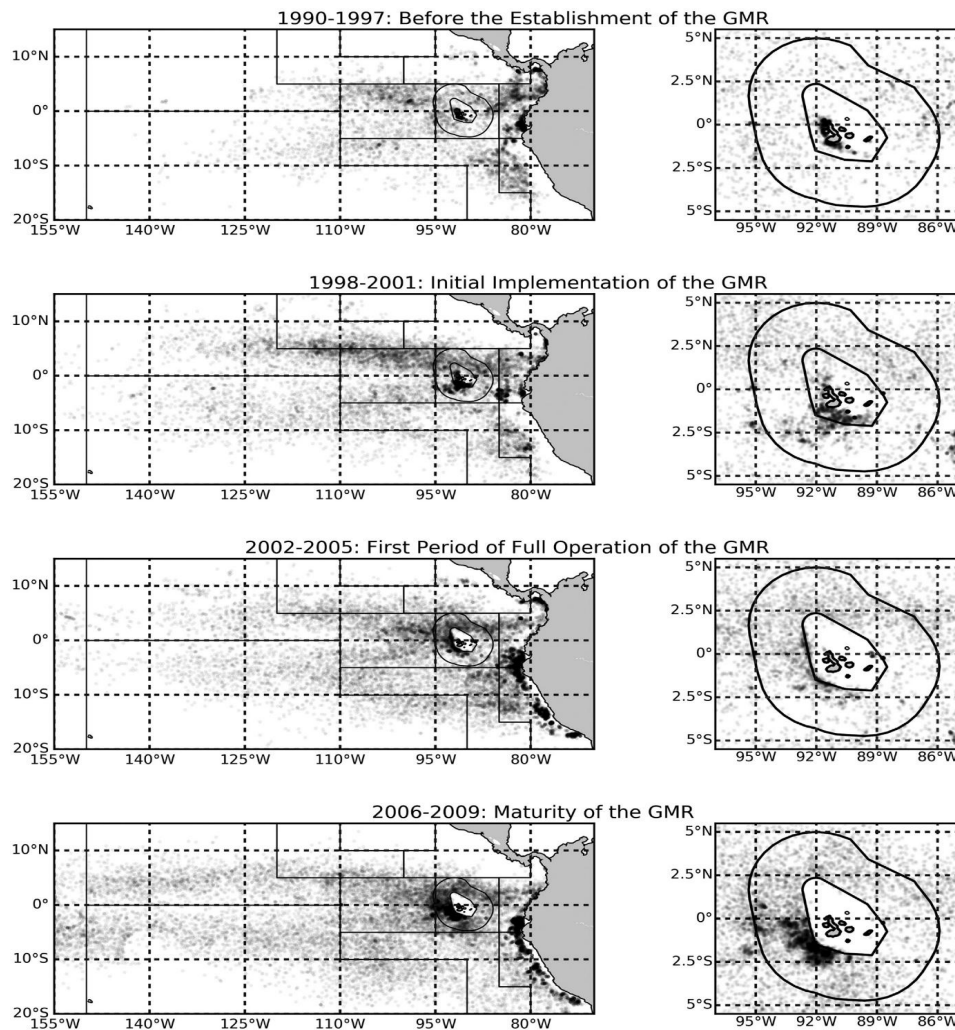


Figure 2.4. Intensity of fishing effort (i.e., number of sets) throughout the Eastern Tropical Pacific (panels on the left), and within the GMR and Exclusive Economic Zone (EEZ, panels on the right), from 1990 to 2009. This analysis is divided into four periods: 1) before the establishment of the GMR (1990-1997), 2) initial implementation of the GMR (1998-2001), 3) first period of full operation of the GMR (2002- 2005), and 4) maturity of the GMR (2006-2009). In all the maps, each gray point is a set made by Ecuadorian class 6 purse seiners. Data source: Bucaram et al. (2018).

Before the industrial fishing fleet was prohibited in the GMR, the contribution of Galapagos tuna landings to the Ecuadorian tuna industry was approximately 24.3% (Bustamante, 1999). Between 1995 and 1997, it is estimated that at the Ecuadorean tuna industrial fleet captured a total of 12,410 MT of yellowfin tuna, 11,428 MT of bigeye tuna and 5,872 MT of skipjack tuna in Galapagos. These catches represented, respectively, 28%, 38% and 7% of the total catch per species registered at national level (Bustamante, 1999). In contrast, the total landing of yellowfin tuna recorded in Galapagos during 2016 (131.3 t) contributed only 0.002% to the total catch of this species recorded in Ecuador (57,747 t) during that same year (Castrejón and Moreno 2018).

Galapagos yellowfin tuna landings have increased from 41.1 t to 196.8 t between 1997 and 2017, with a production peak of 222 t in 2013 (Castrejón and Moreno 2018). In 2017, only 30% of yellowfin tuna landings (58.3 t) were transported to mainland Ecuador while the remaining 70% was consumed in Galapagos (138.5 t), according to GNPS statistics. Total landings fluctuations are attributed to variations in the coverage of fishery monitoring, which has improved significantly in recent years. However, total landings are probably underestimated because some of them are not monitored by the GNPS, particularly the ones that are traded and consumed at the local level (Ramírez and Reyes, 2015).

The most recent assessment of catch composition in the Galapagos tuna fishery, known locally as large pelagic fishery (*pesca de altura*), was conducted by Ramírez and Reyes (2015), who made a diagnosis of landings based on catch and effort data collected in 2012 and 2013. According to these authors, the species with the highest percentage in total catch (in t) is the yellowfin tuna (73.9%), followed by swordfish (15.3%), wahoo (6.5%), miramelindo (4.1%), mahi-mahi (0.3%) and sailfish (0.05%) (Table 2.1).

Table 2.1. Catch composition in the Galapagos tuna artisanal fishery (in tons) during 2012 and 2013 (Ramírez and Reyes 2015). Note that this study did not disaggregate the catch composition by fishing gear (i.e. cane, trolling, or hand line).

Species	Scientific name	2012	2013	Percentage
Yellowfin tuna	<i>Thunnus albacares</i>	163.7	220.7	73.9%
Swordfish	<i>Xiphias gladius</i>	5.3	21.1	15.3%
Wahoo	<i>Acanthocybium solandri</i>	9.4	24.5	6.5%
Miramelindo	<i>Lepidocybium flavobrunneum</i>	11.7	9.4	4.1%
Mahi-mahi	<i>Coryphaena hippurus</i>	0.9	0.5	0.3%
Sailfish	<i>Istiophorus sp.</i>	0	0.2	0.0%
Total		243.9	276.4	100%

According to Ramírez and Reyes (2015), the total number of fishers and vessels that actively participated in the Galapagos tuna fishery in 2013 was, respectively, 308 and 94. These numbers represented 27.4% and 22.6% of the total number of fishers and vessels registered by the GNPS during that same year. The Galapagos tuna fishery generated an estimated gross income of US \$ 1,180,319 in 2013, with a contribution of yellowfin tuna of 81.7% (US \$ 964 483) to this value.

Currently, the Galapagos artisanal fishing fleet is made up of two types of vessels: (1) mother vessels up to 18 m in length and 50 gross registered tons; and (2) small vessels up to 12.5 m in length. According to the current legal framework, the only fishing gears allowed for the fishing of large pelagic fish include the trawl line with lure or bait, locally called trolling; rod with or without reel, and hand-line.

The Galapagos tuna fishing is an activity carried out throughout the year. However, it has a peak of activity from October to April (Berman et al. 2018). In Isabela, fishing trips last from one to three days due to their proximity to the most productive areas of tuna, located in the southwestern zone of the archipelago (Fig. 2.4). On the other hand, tuna fishing trips in Puerto Ayora and Puerto Baquerizo Moreno last three to five days if the fishing is done in a small-vessel, or for up to 15 days if the fishing is done with the help of a mother boat, which has the capacity to tow up to five smaller boats (Berman et al. 2018).

2.3.1 STOCK STATUS

The Inter-American Tropical Tuna Commission (IATTC) is the regional fisheries management organization (RFMO) responsible for the conservation and management of the marine resources in the Eastern Pacific Ocean (EPO). Its objective is to coordinate management actions among member states that share populations of highly migratory species in different regions of the world. The population status of yellowfin tuna is stable and consistent with previous assessments done by the IATTC, although there is uncertainty about the current and future level of recruitment and biomass. More detail about the last assessment of the population status of the Yellowfin tuna is presented in Box 3, by the IATTC (Minte-Vera et al., 2017).

BOX 3: STATUS OF YELLOWFIN TUNA IN THE EASTERN PACIFIC OCEAN IN 2017 AND OUTLOOK FOR THE FUTURE

Executive Summary

1. The evaluation of yellowfin tuna in the Eastern Pacific Ocean (EPO) in 2016 is similar to the previous assessment with the inclusion of updated data.
2. There is uncertainty about recent and future levels of recruitment and biomass. There have possibly been three different productivity regimes since 1975, and the levels of maximum sustainable yield (MSY) and the biomasses corresponding to the MSY may differ among the regimes. The recruitment was below average until 1982, mostly above average from 1983 to 2002, and then mostly below average until 2014. The annual recruitments for 2015 and 2016 were estimated to be above average. The spawning biomass ratio (SBR) has been average or below average since 2006, except during 2008-2010. Under the current (2014-2016 average) fishing mortality, the SBR is predicted to increase in the next two years because of the large recent recruitments, and level off at about MSY level if recruitment is average.
3. The recent fishing mortality (F) is slightly below the MSY level (F multiplier = 1.03), and the current spawning biomass (S) is estimated to be below that level ($S_{\text{recent}}/S_{\text{MSY}} = 0.86$; Fig. 5). The recent biomass offish aged 3 quarters and older (B), however, is higher than that corresponding to the MSY level ($B_{\text{recent}}/B_{\text{MSY}} = 1.30$), because of the high recruitments of 2015 and 2016. These interpretations are uncertain, and highly sensitive to the assumptions made about the steepness parameter (h) of the stock-recruitment relationship, the average size of the oldest fish (L₂), and the assumed levels of natural mortality (M). The results are more pessimistic if a stock-recruitment relationship is assumed, if a higher value is assumed for L₂, and if lower rates of M are assumed for adult yellowfin. Previous assessments reported that the data components diverge on their information about abundance levels: results are more pessimistic if the weighting assigned to length-frequency data is decreased, and more optimistic if the model is fitted more closely to the index of relative abundance based on the catch per unit of effort (CPUE) of the northern dolphin-associated purse-seine fishery rather than of the southern longline fishery.
4. The highest fishing mortality (F) has been on fish aged 11-20 quarters (2.75-5 years). The average annual F has been increasing for all age classes since 2009, but in 2016 it showed a slight decline for the 11-20 quarter age group.
5. Increasing the average weight of the yellowfin caught could increase the MSY

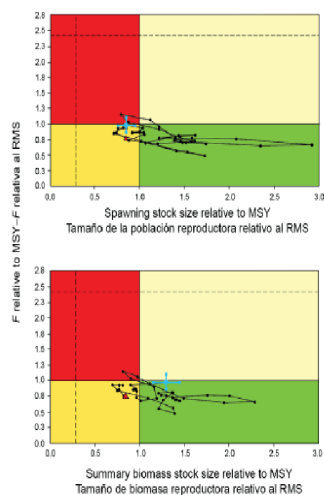


Figure 2.5. Kobe (phase) plot of the time series of estimates of stock size (top: spawning biomass; bottom: total biomass of fish aged 3 quarters and older) and fishing mortality relative to their MSY reference points. The panels represent target reference points (S_{MSY} and F_{MSY}). The solid lines represent the interim limit reference points of $0.28 * S_{\text{MSY}}$ and $2.42 * F_{\text{MSY}}$, which correspond to a 50% reduction in recruitment from its average unexploited level based on a conservative steepness value ($h = 0.75$) for the Beverton-Holt stock-recruitment relationship. Each dot is based on the average exploitation rate over three years; the large red dot indicates the most recent estimate. The squares around the most recent estimate represent its approximate 95% confidence interval. The triangle is the first estimate (1975)

Source: Carolina V. Minte-Vera, Mark N. Maunder, and Alexandre Aires-da-Silva. (2017). STATUS OF YELLOWFIN TUNA IN THE EASTERN PACIFIC OCEAN IN 2017 AND OUTLOOK FOR THE FUTURE. DOCUMENT SAC-09-06. IATTC Scientific Advisory Committee 9th Meeting (La Jolla, CA, May 2018).

Although there is no information available on the status of yellowfin tuna within the GMR, recent studies suggest that the creation of the GMR contributed to increasing fishing productivity both within and beyond the reserve (see Bucaram et al. 2018). However, this effect was heterogeneous for the tuna species. The creation

of the GMR had a positive impact on the productivity of the yellowfin and skipjack tuna fisheries but did not have a significant effect on the bigeye tuna fishery, probably due to tuna overexploitation by fishing aggregating devices around the GMR and along the Eastern Pacific Ocean (Bucaram et al. 2018).

2.3.2 GOVERNANCE AND MANAGEMENT OF THE GALAPAGOS TUNA FISHERY

The artisanal Galapagos tuna fishery operates exclusively within the limits of the GMR, and is managed entirely by the Galapagos National Park, according to the Organic Law of the Special Regime of Galapagos (LOREG) reformed on 2015. The GNP director in-turn reports directly to the Ministry of Environment, the national environmental authority in Ecuador.

Management objectives

The LOREG states that artisanal fishing should be subject to *the precautionary principle and follow conservation and adaptive management regulations* (Art. 56). The LOREG also states that artisanal fishing will be governed by the provisions of the regulation issued by the national environmental authority and is subject to a corresponding management plan (Art. 58). However, neither the Fishing Regulations, the Good-Living Management Plan of the GNPS, the Galapagos Plan of the CGREG nor the Fishing Calendar 2017-2021, establish a specific state policy for the integral management of the Galápagos artisanal fisheries. As a result, there are no operational management objectives for the Galapagos tuna fishery. The absence of a State policy for the Galapagos artisanal fishing sector, as well as the lack of definition of specific operational management objectives for the tuna fishery have therefore generated user insecurity with respect to their rights and obligations. A theoretically mature and viable legal framework has therefore been transformed into a somewhat erratic system (Castrejón 2011; Defeo and Gianelli, 2016).

The strengthening of the GMR's fisheries co-management system will therefore require the co-development of a long-term policy and planning that reflects the interest of the authorities and users. The latter should also explicitly consider the principles and guidelines suggested by the "Voluntary guidelines to achieve the sustainability of small-scale fisheries in the context of food security and the eradication of poverty" (FAO, 2015). The management plans should become a dynamic and adaptive planning tool, created through a participatory process that describes the policy, objectives and management strategies that will be used to ensure the sustainable development of fisheries and the fishing sector in the GMR (Castrejón 2011).

Management measures in place

The Galapagos tuna fishery is managed through fishing effort control measures and fishing gear regulations, including:

1. A moratorium on the entry of new license holders and vessels established since 2003. As fishing license and permits are not resource-specific, the moratorium applies to all Galapagos fisheries, including the tuna fishery.
2. Hooks for trolling, fishing rods and hand-lines must not exceed 70 mm in length.
3. The use of steel leaders is not allowed, as well as the use of fishing gears, methods, operating implements and/or winches powered by motorized power sources.
4. The use of any type of longline is prohibited.
5. Mother boats and small vessels must not exceed 18m and 12.5m in length, respectively.

6. Each vessel will have a maximum of two four-stroke engines of up to 250 HP for stationary engines, and of up to 225 HP for outboards.

Tenure rights

In Galapagos, tenure rights are represented by a "limited entry program". Access to fishery resources has been allocated exclusively to a limited number of local fishers in the form of fishing licenses and permits, known as PARMA (Pescador Artesanal de la Reserva Marina de Galápagos). The PARMA licensing system was adopted in the GMR since the enactment of the LOREG (March 1998), as was the prohibition of industrial fishing within the reserve and the establishment of a moratorium for the registration of new fishers and vessels. The main attributes of the PARMA licensing system are the following (Castrejón 2013; Orensanz et al., 2013):

1. Fishing licenses are granted exclusively and individually to artisanal fishers, who are permanent residents of the Galapagos, and who must exercise the activity directly, and for whom fishing is the main source of income. Fishers and vessels must be registered by the GNP, and vessels are required to hold a fishing permit.
2. Each fishing license provides its owner access to all fishing resources allowed in Galapagos (i.e., sea cucumber, lobster, tuna, etc.).
3. The fishing license is valid for two years with an annual cost of US \$10, while the fishing permits granted to the vessels are annual.
4. PARMA fishing license is not transferable, while fishing permits can be transferred to another license holder along with the vessel.
5. PARMA license holders must follow the regulations established for the fishery. The fishing zones are restricted by a marine zoning implemented in the RMG since 2000, which was recently modified.

According to Art. 69 of the fishing regulations, the GNPS will allow the entry of new fishers into the artisanal fishing register, as long as there is an available place. It is understood that there is a place available when an artisanal fisher has been withdrawn from the artisanal fishing register, in accordance with the provisions of article 23 of these regulations. New fishers will also be allowed to enter, as long as they are children of fishers who are registered.

Monitoring, control and surveillance

Landings and fishing effort data for the Galapagos tuna fishery is monitored in the three main ports of the archipelago since 2010 through the issuing of landing monitoring certificates. In addition, the GNP keeps records of the landings transported to mainland Ecuador since 2004, by issuing mobilization guides certificates. In recent years, the GNP has developed a new database to systematize fishery monitoring data. This database is integrated into the Unique Environmental Information System (SUIA), which seeks to integrate all existing environmental information at the national level in order to generate geographic and statistical indicators, and to facilitate the automation of institutional processes by the Ministry of the Environment.

Despite the efforts made by the GNP to improve the monitoring of the tuna fishery, there is still no systematic monitoring of bycatch levels produced by the fishery. Monitoring efforts on bycatch have been sporadic and have been concentrated mostly in specific studies about the ecological impact of experimental fishing gear (i.e. longline, banned at the GMR by current regulations). In addition, the Charles Darwin Foundation, in collaboration with the GNP, Conservation International and other NGOs, has conducted a submareal ecological monitoring of the marine zoning of the GMR since 2004, to collect information on the state of the

biota associated with hard rocky bottoms, and to find evidence of spatio-temporal fluctuations (Banks et al., 2016). This subtidal ecological monitoring program has been complemented by the implementation of a tagging program for several shark species and a census of pelagic fish, including tunas, billfishes and oceanic jacks.

Enforcement is carried out by the GNP in coordination with the Ecuadorian Navy. In recent years, important management measures have been instituted to improve the surveillance and control capacity of both institutions, including the adoption of a vessel satellite monitoring system (VMS) and an Automatic Identification System (AIS). This last monitoring system uses radio waves and has been operational since 2017. Both systems enable the continuous monitoring of fishing and tourist vessels that operate within and around the GMR. These systems have contributed to the capture of vessels that attempt to fish commercial and protected species within the boundaries of the GMR. Additional efforts are nonetheless required to significantly penalize the fishing and tourism infractions detected through the VMS and AIS systems, while also ensuring that all fishing vessels actually use the AIS system (Jones 2013).

2.3.3 ORGANIZATION AND ENTREPRENEURIAL CAPACITY OF THE SMALL-SCALE FISHING SECTOR:

Small-scale fishers from the Galapagos Islands are organized into four fishing cooperatives: COPROPAG, COPESAN, COPESPROMAR, and COPAHISA. A description of the membership, location and year of foundation of these four cooperatives is available in Table 2.2. Fishing cooperatives are regulated at the national level by the Law of Cooperatives⁵ and its associated regulations. The maximum decision-making authority within a cooperative is the General Assembly, which is composed of all its members.

Table 2.2. Number and percentage of fishers per port and fishing cooperative, including year of foundation (Source: Castrejón 2011; Velasco and Anastacio 2014).

Port	Co-op	Membership	%	Year of foundation
Baquerizo Moreno	COPESAN	341	33.8	1983
Baquerizo Moreno	COPESPROMAR	167	16.5	1996
Puerto Villamil	COPAHISA	223	22.1	1992
Puerto Ayora	COPROPAG	279	27.6	1993
Total		1010	100.00	

The following section focuses exclusively on COPROPAG, the most active and economically viable cooperative. COPROPAG was established in 1993 in Puerto Ayora, Santa Cruz Island, and it currently has 279 members (271 males and 8 females). Only 127 members (46%) remain active however, and only 76 members (27%) participate regularly in the General Assembly meetings. Most members are originally from Galapagos, Guayas and Manabí (Avendaño 2007; Castrejón 2011), but they are all permanent residents of Galapagos. COPROPAG members participate in different shellfish and finfish fisheries, including the tuna, lobster and sea cucumber fisheries. COPROPAG is governed by a General Assembly, an Administrative Council and a Surveillance

⁵ According to Article 41 of this law, a cooperative is defined as “societies of private right formed by natural persons or legal entities who, without pursuing profit purposes, have as an objective the planning and implementation of activities and works for social and collective benefits through a business managed in common agreement and formed by the economic, intellectual and moral participation of its membership”.

Council⁶. The cooperative membership fee is US\$3/month. Women have the right to be elected as president or members of the Administration or Surveillance Councils, but no women have ever been president of this coop since its inception. However, at time of writing these reports, two women were members of the Surveillance Council.

COPROPAG has facilities (4600 m²) that host administrative offices and a processing plant. This is the only cooperative with a fully operational processing plant. The latter was built in 2002 with the support of several governmental institutions, with the explicit objective to improve seafood trading, to promote cooperation between fishers, and to develop the tuna fishery as a strategy to reduce fishing effort in the coastal area, while enhancing local fishing communities' wellbeing. COPROPAG is estimated to have assets valued at US\$2 million (Kleber López, pers. comm., April 2015). The processing plant is certified by the Fishing National Institute since 2014, and it holds a score of 90/100, meaning the plant fulfills all requirements needed to process seafood with high quality and innocuity, including international standards for hygiene and waste management.

Before the collapse of the sea cucumber fishery in 2006, COPROPAG showed a deficient capacity to carry out collaborative actions to adapt its capture and commercialization strategies to by-pass Asian and local intermediaries in the value chain (Castrejón and Defeo 2015). Currently, this coop is gradually acquiring the technical capacity, equipment and infrastructure necessary to process and market value-added products, such as live and frozen whole lobsters, and fish fillets. However, it remains strongly dependent on middle-men to trade tuna, whether locally, nationally or internationally.

COPROPAG in collaboration with World Wildlife Fund, Conservation International, GNP and CGREG is designing and implementing of a local certification program called "Galápagos Seal", which is intended to help ensure seafood traceability, sanitary quality, respect for environmental regulations in the Galapagos Marine Reserve (RMG), and social responsibility of those involved in the extraction and processing of fishery products in the RMG. It is expected that this seal will contribute to developing a sustainable seafood market, although the Seal has not yet been awarded due to deficiencies in all Galapagos fishing cooperatives. Furthermore, COPROPAG aims to obtain the HACCP certification, which is a management system in which food safety is verified through the analysis and control of biological, chemical and physical hazards from the production of raw materials, and from the handling, manufacturing, distribution and consumption of the finished product. The HACCP certification is required in order to obtain an export license from the National Fisheries Institute. The possibility of exporting directly by the cooperative will significantly reduce the influence of intermediaries along the value chain.

All the achievements and initiatives described above suggest that COPROPAG leadership has been able to create strategic alliances and partnerships with the government, NGOs and other actors. As a result, they have produced concrete results in alignment with the interest of the cooperative members and the sustainability of its organization. This is reflected in the gradual restructuring of the spiny lobster value chain and the diversification of the products sold by this coop. The latter trend has been recognized by other cooperatives and by local and national intermediaries, who consider COPROPAG as a role model in Galapagos.

⁶ The General Assembly is the maximum decision-making authority. It is formed by all members, who take decision by majority of votes. The Administrative Council is responsible for the management of the co-op. It is formed by a president, a manager, and an administrative staff. Its members are elected by the General Assembly. Finally, the Surveillance Council is responsible for auditing the activities of the Administrative Council, manager, and administrative staff. The presidents of the Administrative and Surveillance Councils are elected by their own members. The manager is the co-op's legal representative and the main responsible for its management. He/she is designated by the Administrative Council. The decision-making process to elect presidents and members of the Administration and Surveillance Councils is established by the Law of Cooperatives.

However, COPROPAG continues to face organizational challenges that hinder its capacity to offer economic benefits to its members, and to guarantee their long-term financial viability. It has a basic financial structure, and a deficiency in systems that prevent the elaboration of financial statements in a timely manner⁷. It also lacks a commercial department, and the general manager has several duties that only covers basic commercial activities. Most of its staff lacks formal education and experience, except the general manager. This aspect hinders the potential growth of the coop's revenues and sales. As a result, the coop continues to be highly dependent on intermediaries for trading its products.

COPROPAG's Administrative Council has the potential to fulfill its role as a strategic management body. However, the following problems limit their management capacity: (1) Conflicts of interest due to the fact that the coop's internal statutes do not prohibit the allocation of memberships to those people with conflicting commercial interests; (2) Administrative Council's members have a poor understanding of their role in the management of the coop. As a result, they focus their attention mostly on political issues related to the fishery sector or in the micro-management of issues, rather than focusing on strategic management issues relevant to the long-term sustainable development of the organization; (3) The Administrative Council structure is completely renewed every two years, which inhibits the long-term stability of the Council, and results in the loss of institutional memory, and (4) The Administrative Council's members lack formal business education or business experience.

⁷ COPROPAG does not have financial statements since 2012.

3. VALUE CHAIN AND MARKET ANALYSIS

3.1 OVERVIEW

Three recent studies have analyzed the supply and value chain of the tuna fisheries in Galapagos within the last five years with the support of local NGOs and government agencies. The first one, Velasco et al (2014) provides an overview of the profitability of the Galapagos fishery value chain (demersal, pelagic, lobster and sea cucumber fisheries), describing the revenues of the main stakeholders participating in the supply chain, such as boat owners and fishers. This study also highlights the differences among stakeholders specialized in one or several fish products. The second study, Haro-Bilbao y Salinas 2014, estimates the demand of fish products by the tourist cruise ship fleet in Galapagos, based on surveys applied to a sample equivalent to 80.2% of the passenger capacity of the whole cruise ship fleet. The third study by Berman et al. (2018), is based on an in-depth analysis of the local tuna market, and on interviews of numerous stakeholders of the GMR, such as fishers, boat owners, seafood stores, restaurants, and cruise ships (see Figure 1). The study identifies several inefficiencies in the supply chain that hinders the creation of additional value within the tuna fishery and identifies a set of potential business opportunities that could increase the profitability of the Galapagos tuna fishery. Based on the findings of these studies, it is possible to describe the supply and value chain of the tuna fishery in Santa Cruz, which operates in the local and export markets (See Fig. 3.1).

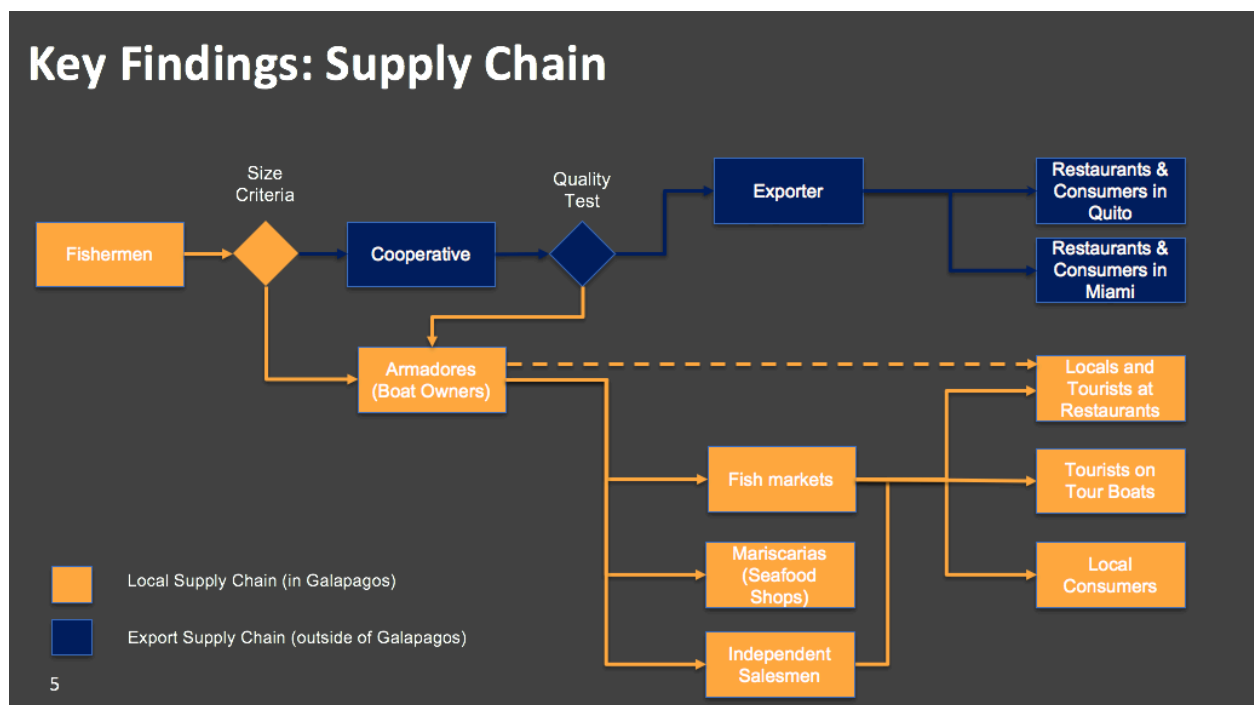


Figure 3.1. Key Findings of the Galapagos Tuna Value-Chain Assessment (Source: Berman et al. 2018).

Tuna is landed by fishers, mainly by the “*armadores*” (boat owners)⁸, and the catch then reaches the final consumer in the local market through: (1) intermediaries that participate in a local fish market, (2) seafood stores (*marisquerías*) and independent salesmen.

Galapagos tuna for the export market is sent to the final consumer through the local cooperative in Santa Cruz (i.e. COPROPAG) and one middleman. The intermediary imposes a set of criteria in order for the tuna to be exported: The tuna has to weigh over 40 pounds and pass a quality test carried out by an expert of COPROPAG. All fishers who focused solely on catching tuna preferred to sell their tuna in the “export market” because there is less waiting time to receive their cash, and it is easier than selling the product themselves in the local market. Fishers determine if tuna caught is export size upon catching it, and they will handle export size tuna differently than tuna for the local market. The cooperative is responsible for picking up the export-size tuna at the dock, and will in-turn carry out tests to determine if the fish meets the export quality requirements. Some fishers catch all types of fish (i.e. tuna, bacalao, brujo, etc...) and have agreements with a single buyer to purchase all fish caught; these fishers also prefer to export tuna when possible but will also sell it to local partners.

Note that fishers and boat-owners in Galapagos have unique supply chains, with varying levels of integration, and there are also major differences in the value chain based on location. Santa Cruz, for instance, is the only island where tuna is exported, and the local market is supplied by middlemen and COPROPAG. Fishing in Isabela and San Cristobal on the other hand are focused on local consumption, which in the latter case is dominated exclusively by middlemen (Haro-Bilbao and Salinas, 2014).

3.2 VALUE CHAIN INNEFICIENCIES

Based on the above analyses, the most pressing value chain inefficiencies associated with the Galapagos tuna fishery are highlighted below:

- The market for Galapagos tuna is unsophisticated and poorly coordinated. As in many fishery supply chains, the movement of tuna in Galapagos relies on long standing personal and disparate business relationships between many boat-owners and distributors, particularly in the early stages of the supply chain.
- The lack of coordination between fishers has led to the emergence of numerous middlemen in the local market who extract significant value from the tuna fishery. Fishers and COPROPAG also have limited negotiating power relative to the single export market buyer. The latter is due to limited buyer competition, as well as to the fact that COPROPAG does not thoroughly check the quality of their tuna, but instead rely on the exporter for the quality assessments. The latter factors, as well as those highlighted below, result in a situation in which fishers in Galapagos currently only capture 27% of the value created in the local market, and just 21% of the value in the export market (Berman et al. 2018).
- The lack of coordination between fishers limits their ability to set higher prices for their products in the highly fragmented local market. The prices for local and exported tuna are also low due to a lack of product differentiation based on quality (i.e. grade), origin, and sustainability. In other words, Galapagos tuna is devoid of many differentiating attributes, and is easily substituted for other cheap seafood products, therefore falling into a “*commodity market trap*”. The lower market prices caused by this *commodity trap*, coupled with higher fishery production costs in Galapagos due to the remoteness of the islands and less efficient (and arguably more sustainable) fishing practices, is a significant barrier to increasing the socio-economic performance of the Galapagos tuna fishery.

⁸ Most of the times the boat owners or *armadores* are the responsible of marketing the fish landings. Later they split the total revenue among the crew members.

- Deficiencies in the cold-chain at various points in the supply-chain, including at the boat-level as well as at the airport, is another factor that lowers Galapagos tuna quality, and therefore limits further product differentiation and higher prices (Figure 7; Berman *et al.* 2018):

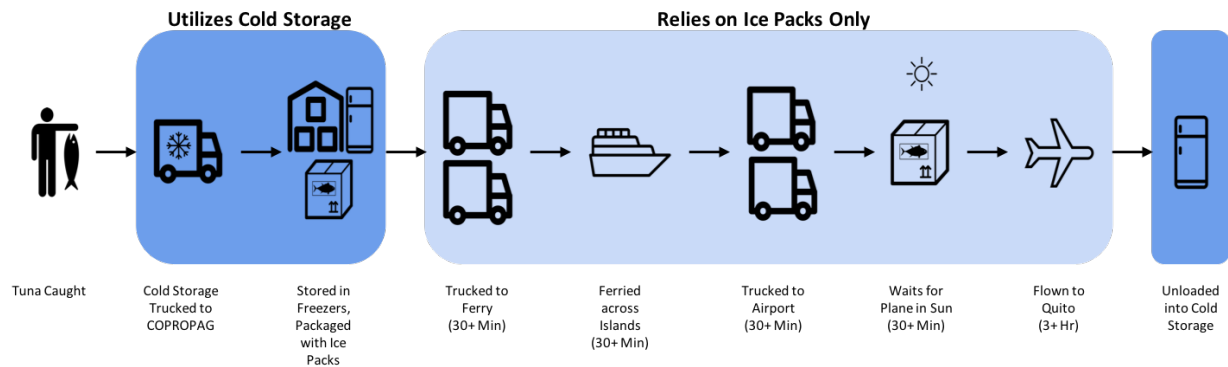


Figure 3.2 Galapagos Tuna supply-chain and cold-storage gaps

- As a result of these factors, the price at which fishers sell tuna on Santa Cruz is low, and primarily determined by market prices in Quito. The latter represents a missed opportunity given that 96% of the higher-paying tourist operators in Galapagos are willing to include fish products with a Galapagos Seal of Origin in their cruise ship's operations (Haro-Bilbao and Salinas, 2014).
- The lack of coordination between fishers also results in cyclical under and over-supply of Galapagos tuna, which inhibits the widespread and consistent sale of tuna to higher-end tourism operations in Galapagos. The over-supply is primarily caused by fishers in Galapagos landing their catch at the same time, which lowers prices of tuna in the local market. As a result, fishers seek alternative employment while tuna prices recover, which in-turn creates an under-supply that is unable to meet the demand of tour operators.
- Low tuna prices in Galapagos are also the result of fishers trying to sell their tuna as fast as possible, since the value of fresh tuna in the local market falls quickly over time. Fishers therefore tend to exit the fishery value chain very quickly, and as a result are unable to capture higher prices resulting from vertical integration, or by selling their product directly to higher-end customers like tourist cruise operators that require greater operational coordination (see below).
- Tourists cruise operators cater to higher-end and more exigent customers, and therefore require a consistent supply of high quality seafood to meet customer demands. The current lack of coordination between Galapagos tuna fishers however is not conducive to a stable supply that can meet this higher-end demand. Tourist cruise operators also have long deferred payment policies, meaning that they can take up to one month to pay fishers or middlemen for their fish (Haro-Bilbao and Salinas, 2014). Deferred payments however are not compatible with the need for immediate payments by fishers who pay upfront for all the supplies needed on each fishing trip. The deferred payment policies, as well as credit/savings constraints (see below), leaves fishers without working capital. The latter forces fishers to quickly exit the fishery value chain, and limits their capacity to sell their tuna products in higher-end markets, including increasing their local market participation relative to other species and seafood imports. Even COPROPAG's market share participation is restricted at 10.5% due to its limited credit capacity, and resulting inability to withstand long deferred payments.

- A brief review of key metrics of the credit market in Galapagos reveals that the demand for credit is severely under-served by about ten times the current volume of credit. The total credit granted by private banks in the Galapagos Islands reached \$4.3 M in 2017, which is equivalent to 2.5% of the provincial GNP, whereas at the national level, private credit reaches about 23% of GDP (ASOBANCA, 2017). Furthermore, most of the credit is directed to the retail and consumption sectors, with only 1% of the credit being directed to micro-enterprises. Credit granted by credit & saving cooperatives totals less than \$1 M, with only 2.7% of the total being allocated to productive activities in the agriculture and fisheries sector (SEPS, 2018). The current unmet demand for formal credit is therefore partially served by (1) middlemen who impose steep pricing conditions, (2) small loans from family or friends, and (3) other informal sources such as “loan-sharks”.

3.3 MARKET ANALYSIS

3.3.1 LOCAL MARKET SIZE & SEGMENTS

The annual demand for fish in Galapagos was estimated to be 871 Mg in 2017, with 272 Mg consumed by locals, and 599 Mg consumed by tourists (Berman et al. 2018). The large and growing high-end tourism market in Galapagos (218,365 tourists in 2017) also provides ample opportunity to increase tuna prices and consumption, particularly through product differentiation and branding (Restaurant Surveys; Schep et al. 2014). Galapagos tourists have a high degree of awareness to environmental issues, with over 50% of visitors having master’s degree or higher, as well as high incomes (40% made over \$60,000 per year in 2014; Berman et al. 2018).

The local market serves local consumers and tourists at restaurants and on tour boats. The total market is divided between locals (31%) and tourists (69%), with the largest local customer segment being local restaurants (Fig. 3.3; Berman et al. 2018).

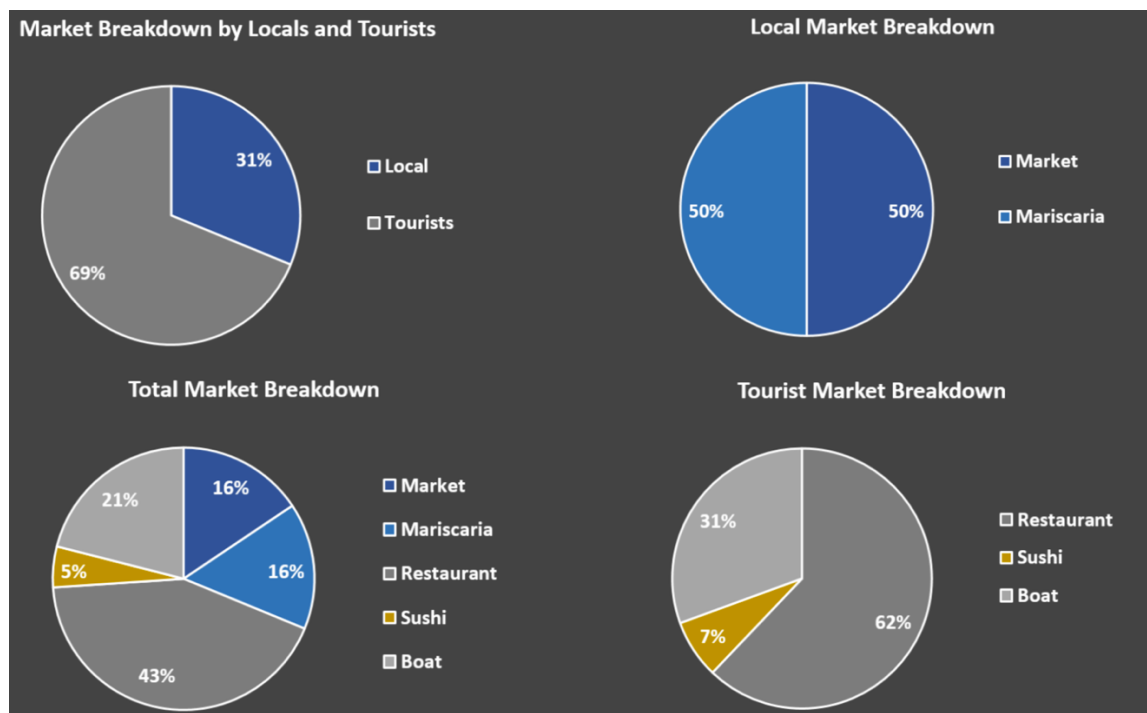


Figure 3.3. Market breakdown by local and tourist. Source: Berman et al. (2018)

All local restaurant surveyed (n=17), accounting for 25% of formal restaurants in Santa Cruz, offered seafood, but 41% of them did not offer any tuna dishes (Berman et al. 2018). Restaurants that did sell tuna in Galapagos however received an average price of \$16.97 per dish, 4% higher price compared to other seafood dishes. Both locals and tourists however demonstrated a preference for consuming white fish (86%) instead of tuna (14%) in Galapagos⁴¹.

The authors of Haro-Bilbao y Salinas 2014 also identified that the potential demand from the entire cruise ship fleet in Galapagos is 326.7 Mg (Fish: 257.9 Mg / Other seafood: 68.8 Mg), which is based on an average consumption of fish and shellfish in cruise ships 2.4 kg / week (1.9 kg of fish and 0.5 kg of shellfish). The percentage of seafood demanded by the tourism vessels, which is sourced locally, varies depending on the product; for instance, fish is mainly purchased in Galapagos (75.3%), while other seafood is mostly purchased from the mainland (91.9%). To achieve local and tourism food security, an estimated 119 Mg of fish is derived from threatened coastal fisheries and from imports.

According to Berman et al. (2018), 100% of tuna retailer survey respondents in Galapagos (n=4) indicated interest in purchasing tuna with credible sustainability attributes, with 50% of respondents affirming that they would pay price premiums for sustainable high-quality tuna.

3.3.2 EXPORT MARKET SEGMENTS

- A total of 260,000 lbs of tuna are exported annually, generating around \$750,000 USD in revenues (Berman et al. 2018). The export⁹ market serves consumers in Quito and Guayaquil, as well as consumers in Miami.
- Galapagos tuna prices for the export market are currently very low relative to the global tuna market, receiving a mere \$4USD/lb for *perceived*¹⁰ Grade 1 tuna compared to an average \$9.22USD/lb price in the global market. Similarly, Grade 2 tuna receives \$3.50USD/lb for perceived Grade 2+ tuna compared to an average \$6.85USD/lb price in the global market (Fig. 3.4).

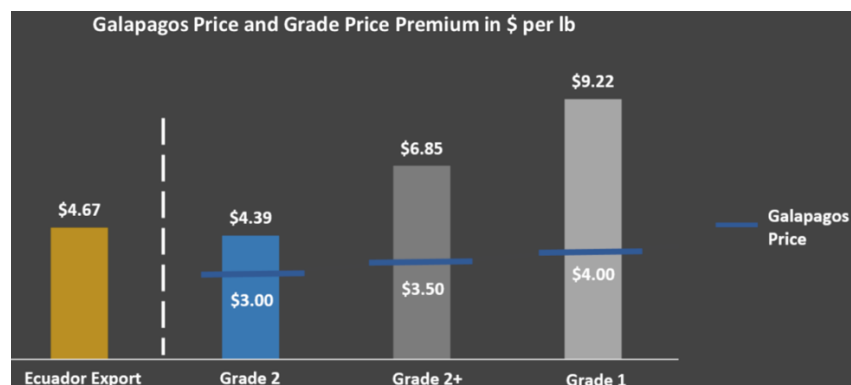


Figure 3.4. Galapagos price and grade price premiums in USD per pound (lb).

⁹ In the Galapagos context, the term “export” is understood as the sales of product outside Galapagos. Sales to the Ecuador’s mainland (i.e. Quito) are considered an export even though the sale happen within Ecuador.

¹⁰ Perceived, since formal quality assessments are not currently performed by COPROPAG, resulting in uncertainty about the tuna grade being exported.

- An estimated 90% of tuna retailer survey respondents in Quito and Guayaquil (n=11) indicated interest in purchasing tuna with credible sustainability attributes, with 80% of respondents affirming that they would pay price premiums for sustainable high-quality tuna (Berman et al. 2018).
- Additional details about tuna market prices paid, and tuna amounts bought in Guayaquil and Quito are available in Berman et al. (2018), which was carried out as part of the OPP project.

4. VALUE PROPOSITION & BUSINESS MODEL

The ability to address the key drivers of value in fisheries is a core element in the development of “bankable” business cases. These key drivers, according to Holmes et al. (2014), include:

1. *Increasing supply-chain operational efficiency to improve product quality and prices, while generating less waste*
2. *Gaining access to higher-value ‘eco-friendly’ markets*
3. *Increasing fishery yield by recovering stocks to MSY/MEY*

The strategies for enhancing the profitability of the Galapagos tuna fishery, which are outlined herein, rely primarily on the key drivers #1 and #2, while ensuring that the key enablers of sustainability (i.e., Secure Tenure, Sustainable Harvests, and Robust Monitoring/Enforcement) are established and/or maintained (Fig. 4.1).

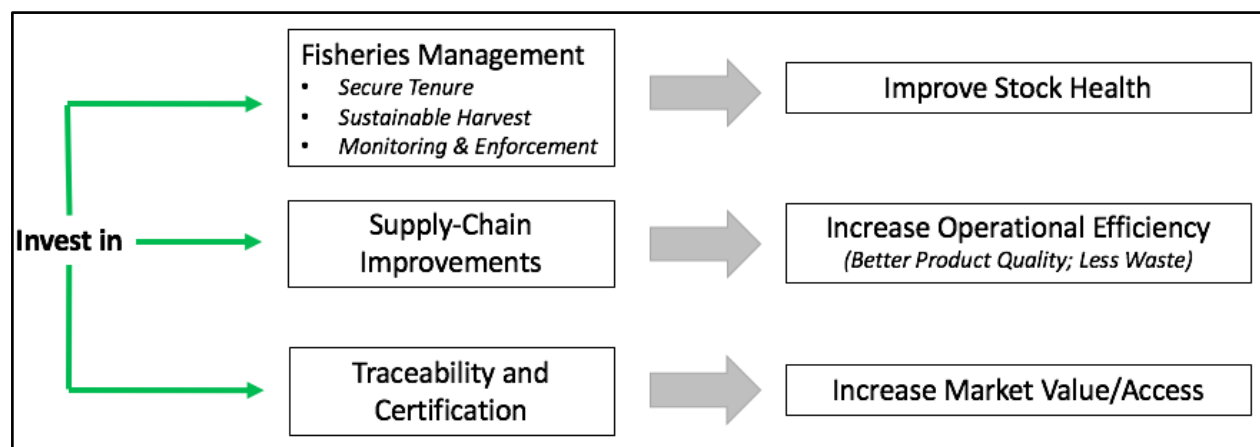


Figure 4.1. Value drivers in fisheries (adapted from Holmes et al. 2014).

The priority interventions identified during multiple stakeholder engagement workshops in Galapagos respond directly to stated issues about inefficiencies in the local tuna fishery, as well as to high market-demand for high-quality “storied” seafood among certain market segments in the local and export market. The specific value drivers and sources of differentiation in the Galapagos tuna case includes higher product quality and prices, increased supply consistency and sustainability, and product branding and storytelling, as described in the following sections.

4.1 PROBLEM STATEMENT AND KEY PAIN-POINTS

As coastal fisheries in Galapagos have become increasingly over-exploited (e.g., Galapagos, bacalao, brujo, and sea-cucumber), local fishing pressure has shifted toward tuna stocks with limited accompanying fisheries management measures to ensure sustainability of the fishery (i.e. no catch limits, no species-specific licenses, limited data collection, etc.). There has also been significant lobbying by fishers to allow the use of longline, a fishing gear prohibited within the Galapagos Marine Reserve, according to the current legal framework. As a result, there is a dire need to implement strategies that support effective ecosystem-based fisheries management for the Galapagos tuna fishery.

The inefficiencies described in section 3.2 a 3.3 can be summarized in the following key pain-points:

Key Pain-Point 1: The market for Galapagos tuna is unsophisticated and poorly coordinated, leading to the emergence of numerous middlemen in the local market, as well as a single monopolistic middleman for the export market who extract significant value from the fishery (see Section 3.2). Cyclical Galapagos tuna oversupply due to an uncoordinated fishing schedules also lowers local market prices.

Fishers' long waiting time to receive tuna payments from high-value end-buyers, such as large tourism operators, also makes fishers "price-takers" and limits the amount of working capital available to invest in the improvement of fishing and fish-handling practices. This characteristic of the value chain opens opportunities for the financial market to serve these needs. Although due to the shallowness of financial market in the Galapagos, the credit needs of the productive sector of the islands are largely unsatisfied, it is estimated that the demand for credit is about ten times the current volume of credit available. In fact the fishers have been marginalized from the financial markets (See Section 3.2).

Key Pain-Point 2: The price at which fishers sell tuna on Santa Cruz is determined by the market in Quito. Prices for Galapagos tuna are therefore low and undifferentiated due to a failure to promote sustainable "storied fish", which in-turn prevents price-premium rewards for locally-sourced, sustainable Galapagos tuna. As a result, fishers perceive few financial incentives to maintain high sustainability standards.

Key Pain-Point 3: Substandard tuna handling practices lowers prices for Galapagos tuna. Incomplete cold-chain transport and storage decreases product quality and lowers prices for Galapagos tuna. For instance, fishing vessels currently use ice on-board to keep tuna chilled, but the latter is sometimes insufficient given hold limitations (i.e. as more tuna is caught, ice is discarded to make room for more fish on-board). Cold-chain infrastructure at the airport however is an issue, since ice-packed tuna sometimes sits on the tarmac for up to five hours while the plane arrives

Key Pain-Point 4: Industrial fishing inside the Galapagos Marine Reserve is prohibited, which has resulted in increased fishery sustainability, but has also raised the cost of fishing for artisanal fishers in Galapagos. Fishing gear restrictions in Galapagos include the following:

1. Hooks for trolling, fishing rods and hand-lines cannot exceed 70 mm in length.
2. The use of steel leaders is not allowed, as well as the use of fishing gears, methods, operating implements and/or winches powered by motorized power sources.
3. The use of any type of longline is prohibited.
4. Mother boats and small vessels cannot exceed 18m and 12.5m in length, respectively.
5. Each vessel will have a maximum of two four-stroke engines of up to 250 HP for stationary engines, and of up to 225 HP for outboards.

The above restrictions place Galapagos fishers at a commercial disadvantage relative to fishers outside of the reserve, thereby highlighting the need to improve the value of the catch by pointing out to the final consumer all the measures taken to prevent an impact on the biodiversity of the reserve and to reduce costs by optimizing the catching/handling process.

The four key-pain points identified erode value, fragment the market, and disproportionately disperse revenues among supply-chain middlemen. For instance, artisanal fishers from Galapagos are currently capturing a very small fraction of the value associated with the tuna fishery in Galapagos (27% and 21% for tuna sold in local and export markets respectively).

4.2 INTERVENTION STRATEGIES

4.2.1 OVERVIEW

Given the convergence of environmental threats and socio-economic deficiencies associated with the Galapagos tuna fishery, there are significant opportunities for improvement, including using market-based interventions and impact investment to improve the performance of the Galapagos tuna fishery.

Based on the comprehensive assessment and value chain analysis of the Galapagos tuna small-scale fishery, and considering the results and recommendations of Haro-Bilbao and Salinas (2014), Velasco et al. (2014), Berman et al. (2018), and the many insights provided by multi-stakeholder workshops (see Moreno and Castrejon, 2018), we have identified five main areas of intervention to improve the socio-economic and environmental performance of the Galapagos tuna fishery:

1. Increasing local business capacity to improve the commercialization of Galapagos tuna at local and international level with principles of sustainability and social responsibility.
2. Differentiate sustainable Galapagos tuna products, leading to improved market access and value.
3. Improve Galapagos tuna fishery post-harvest handling and cold-chain to improve tuna quality and prices.
4. Increase operational efficiency in the Galapagos tuna fishery to reduce operative costs.
5. Reduce the ecological impact of the Galapagos tuna fishery over endangered, threatened and protected species by promoting selective fishing gears and methods, such as hand-line and FADs.

The execution of these interventions will be carried out through the four main strategies described in the following sections.

4.2.2 GALAPAGOS SEAFOOD COMPANY

The first strategy involves the creation of a new vertically-integrated commercialization and distribution entity that will, in partnership with the COPROPAG fishery cooperative, address many of the supply-chain inefficiencies described in Section 3.2 that erode value and/or that disproportionately disperse revenues among supply-chain middlemen in Galapagos (Table 4.1). The Galapagos Seafood Company would be one of the main investable entities responsible for receiving the investment loan to execute the specific interventions described in this section. It would be responsible for the application of, and compliance with sustainability and operational best-practices, and subsequently capturing the returns on investment, monitoring compliance and achievement of sustainability metrics, and finally paying back investors for the loan with interests.

Consolidation of the local market by creation of a new centralized commercialization and distribution company, would enable such an entity to better coordinate the catch and sale of Galapagos tuna, exerting greater market power. Maintaining sufficient working capital to immediately purchase larger volumes of Galapagos tuna will limit fishers' waiting time and will also help the company to achieve greater economies of scale. Specifically, the establishment of purchase agreements between fishers and a single entity that better coordinates fishing schedule among Galapagos fishers, will prevent cyclical over-supply in local markets and secure a stable supply for end-buyers.

The Galapagos Seafood Company will also contribute to improve tuna quality and prices by improving post-harvest handling and cold-chain in the tuna fishery. Part of this strategy rests on the ability of fishers to improve the proportion of Grade 1 (GR1) quality tuna exports in comparison to Grade 2 (GR2). Securing higher proportions of GR1 tuna, without increasing the volume of overall landings, is a central part of the operational efforts by innovative firms in the tuna industry, most notably Anova Seafood and Bali Seafood International in Indonesia, and Artesmar in the Philippines. Achieving a higher proportion requires improved slaughter, bleeding and cold storage on board vessels, timely return to shore, and prompt dispatch into the supply chain.

These measures are achievable, as has been demonstrated in other tuna fisheries, by hiring dedicated staff member to lead and/or oversee the capacity-building (see Table 4.1).

Table 4.1. Summary of the Galapagos Seafood Company strategy.

Area of intervention	Core Investment	Funding Required	Expected Returns
Increasing business capacity to improve commercialization of sustainable Galapagos tuna	Start-up working capital to support consolidation of the Galapagos tuna market, including price-premiums paid to fishers.	\$83,000 USD	15% Interest Rate
	Hiring a local manager to oversee execution of activities and socialize program with fishers and buyers.	\$45,600 USD/year	
	Hiring a client relationship specialist responsible for purchasing tuna from fishers, as well as creating and maintaining relationships with buyers (i.e. fish shops, restaurants, hotels, and cruise boats).	\$30,000 USD/year	
	Office Rent	\$12,000 USD/year	
Improve Galapagos tuna fishery post-harvest handling and cold-chain to improve tuna quality and prices	Hiring a Tuna Quality Assurance Specialist responsible for grading large volumes of sustainable Galapagos tuna	\$30,000 USD/year.	
	Hiring two Operations employees responsible for fish processing, packing and delivery:	\$25,200 USD/year (\$12,600 USD/year each employee)	
	Refrigerated truck to transport tuna from the dock to the cooperative for processing, and/or then from the cooperative to the airport.	\$15,000 USD	
	Other cost*	\$29,200 USD	
Total cost		\$270,000	

4.2.3 BLUE INCENTIVES

The second strategy involves by the establishment of a fisheries-specific credit-line that promotes financial inclusion and creates incentives and business opportunities for hand-line fishers, supply-chain middlemen, local seafood stores (locally known as “marisquerías”) and entrepreneurs (Table 4.2). This strategy is a decentralized approach relative to the Galapagos Seafood Company, which could result in potentially higher profit margins for fishers and entrepreneurs, but which also carries more risk and implementation complexity. The ultimate objective is to help local fishers and entrepreneurs to take advantage of the business opportunities offered by the Galapagos tuna fishery with principles of sustainability and social responsibility.

Small loans will be made available to individual Galapagos fishers and supply-chain partners, in partnership with a local financial institution. Preference will be given to local fishers and their relatives (women and children), as well as local entrepreneurs. These loans will facilitate local fishery stakeholders to implement the fishery improvement measures themselves resulting in a rapid escalation of demand for tuna/fish complying the regulations. Such loans will also help fishers overcome usury conditions faced by a sector historically marginalized by the financial market in Galapagos and will enable fishers to remain in the value-chain beyond the point of fish landing, promoting a fair trade.

The Blue Incentives strategy will be accompanied by a complementary strategy called “Galapagos Innovation Lab” (see Section 4.2.4), which will provide ancillary services to individual small-loan holders to support the distribution and commercialization improvements. The latter will also include a commitment of small-loan holders to commercialize tuna/fish complying with principles of sustainability and social responsibility. Financial inclusion on the condition of sustainability and better coordination will also help amplify the demand and supply of sustainably-caught tuna from Galapagos, such as by optimizing the programming of fishing trips to avoid tuna supply saturation in the local market.

The credit line will be financed through a credit note/deposit certificate issued by a national bank in Ecuador and bought by social impact investors. The resulting financing will then flow to local financial institutions in Galapagos (i.e. Cooperativa de Ahorro y Crédito) in the form of a loan to fund the local credit line (\$1,000,000 USD; Interest rate: 8.06%; reference lending rate for the corporate sector in Ecuador according to BCE, 2018). The local financial institution will then be responsible for disbursing smaller individual loans to interested Galapagos fishers and supply-chain participants to support the improved commercialization of sustainable Galapagos tuna (\$40,000 USD; interest rate: 17.30%; maximum interest rate for consumption loans in Ecuador according to BCE, 2018; See Table 4.2).

The allocation of smaller loans will be conditioned on the credit granting policies and risk provisions of the respective financial institutions, such as collateral requirements (i.e. real estate/asset pledge; convertible bonds, others) and triple-bottom line performance-based disbursement schemes. Specifically, local financial institutions will provide more favorable terms to women entrepreneurs in Galapagos to promote more gender-balance participation in the Galapagos tuna fishery and will set sustainability requirements that are in-line with principles of sustainability and social responsibility (see Section 4.2.4). A pre-feasibility analysis indicates the break-even point for the operation of the credit line is 17 loans placed (See Table 5.7).

The small loans could also contribute to improve post-harvest handling and cold-chain to raise tuna quality and prices. For example, fishers could use their loans to purchase chillers on vessels to improve tuna quality, leading to higher revenues. Additional investments in the Galapagos tuna cold-chain to address the gaps identified in Section 3.2 will also help raise tuna quality and prices.

Table 4.2. Summary of Blue Incentives strategy.

Area of intervention	Core Investment	Funding Required	Expected Returns
<ul style="list-style-type: none"> Increasing business capacity to improve commercialization of sustainable Galapagos tuna Improve Galapagos tuna fishery post-harvest handling and cold-chain to improve tuna quality and prices 	Loan to fund the local credit line	\$1,000,000 USD	<ul style="list-style-type: none"> Note/certificate has a rate of return of 5.25% for the impact investor. Local savings/credit coop. pays 8.06% to fund the credit line. Small loans pay 17.3%. It is estimated that a typical seafood store benefited by a \$40K loan for upgrading will get an IRR of 31% and ROI of 116% in its investment in a period of 10 years.
	Total Cost	\$1,000,000 US	

4.2.4 GALAPAGOS SEAFOOD INNOVATION LAB

The Galapagos Seafood Innovation Lab strategy proposes the creation of an inter-institutional program called "Galapagos Seafood Innovation Lab", whose objective is to provide technical and financial advice, both to existing fishing cooperatives and to independent fishers or entrepreneurs, to improve their capacity either as suppliers of services (e.g., ice and ecopacking) and/or as seafood traders at local or international level (Table 4.3). The Lab will become an innovation platform to support the implementation of the Galapagos Seafood Company and the Blue Incentives strategies.

This Lab has three specific objectives:

1. Strengthening the organizational and business capacity of local fishers and entrepreneurs with principles of sustainability and social responsibility. This include the four existing fishing cooperatives, provided there is a genuine interest and willingness of the membership to take the necessary measures to make effective use of this type of support (e.g., reform and implementation of internal regulations, elimination of conflicts of interest, audits and payment of taxes, debugging of cooperatives, etc.).
2. Providing technical assistance to local fishers and entrepreneurs for the creation or consolidation of new ventures, including "the Galapagos Seafood Company" described in Section 4.2.2, and marisquerías.
3. Ensuring the effective compliance of management regulations through the implementation of a local certification scheme (Galapagos Seal) and the development of a brand that highlights the origin of the product and the social and environmental practices involved in its production process. It comprises

implementing a traceability system that guarantees final consumers that their tuna was caught in the Galapagos in an environmentally sustainable and socially responsible manner.

The “Galapagos Seafood Innovation Lab” would be operated by the Galapagos Program of Conservation International-Ecuador in close collaboration with the Minister of Aquaculture and Fishing and the Galapagos National Park. The Lab would promote the generation, implementation and dissemination of innovations within the Galapagos seafood sector by helping local fishers and entrepreneurs to acquire the knowledge, skills, tools and funding required to diversify their products and markets with principles of sustainability and social responsibility. Funding will be provided by the fisheries-specific credit-line described in Section 4.2.3 exclusively to those individuals capacitated by the Lab, which develop and propose innovative and bankable business plans. Preference will be given to local fishers and their relatives (women and children), as well as local entrepreneurs.

The Lab will focus on five main areas:

1. **Galapagos Seal and Eco-Gourmet programs:** Providing capacity building of entrepreneurs to catalyze innovation around the application of better practices for fishing, handling and marketing tuna, including training and advising on how best to implement and comply with the “Galapagos Seal” and “Eco-Gourmet” programs.

The Galapagos Seal is a local certification program created by the Galapagos National Park in collaboration with World Wildlife Fund and Conservation International, whose objective is creating market incentives to promote the adoption of responsible fishing practices and fair trading. Implementation of the “Galapagos Seal” will help ensure traceability, sanitary quality, respect for environmental regulations, and social responsibility of those involved in the extraction and processing of fishery products in the Galapagos Marine Reserve (RMG). The Galapagos Seal, has not been put in practice yet due to fishery sustainability concerns that will be resolved by the C-FIP action plan (see Section 4.2.5).

The Eco-Gourmet is a program created by Conservation International-Colombia to bring together fishers and final consumers into a new beneficial and fair relationship. The program will connect Galapagos fishers with high-end restaurants and tourist cruises in Galapagos, Quito and Guayaquil. The program will establish responsible and fair relationships between fishers and end-buyers, whereby fishers participating in the program will have to commit to utilizing sustainable fishing practices, such as hand-line gears that reduce bycatch, whereas end-buyers will agree to pay price premiums for sustainable Galapagos tuna. It will provide technical assistance and facilitate commercialization channels in a collaborative manner to the Galapagos Seafood Company described in Section 4.2.2, marisquerías, and fish commercialization entrepreneurs. As part of this strategy, it is expected that the Galapagos Seafood Company works with fishers participating in the Eco-Gourmet program and committed to abide the improved fisheries management measures outlined in the C-FIP action plan (see Section 4.2.5), and in-return will receive price-premiums. Eco-Gourmet is also a branding collaborative strategy that aggregates supply behind of a brand to exert market power in a consumer segment demanding for an experiential consumption.

The Galapagos Seal and Eco-Gourmet programs are specifically designed to help solve the Galapagos Tuna commodity trap (see Section 3.2 above), and increase product differentiation and prices based on quality, origin, and sustainability attributes (see analogous business model for the West Coast Groundfish Fishery: Changing Tastes et al. 2018). Both programs will be implemented through a de-centralized approach consisting primarily of explicit new relationships between participating fishers, the Galapagos National Park, and restaurants, tour cruise ships, seafood

stores and retailers. The latter relationships will be under-pinned by “Conservation Incentive Agreements (CIA)”. Such incentive program has been successfully implemented by Conservation International in Colombia and Perú. Its objective is ensuring credible and auditable commitments to a sustainable and secure supply by fishers, as well as to ensure price-premium rewards to fishers by end-buyers. In one side these agreements will help the adoption of practices consistently with the protection of the marine ecosystem in the islands, and in the other side it help fishers and entrepreneurs to secure access to higher-value markets. The CIA for the Galapagos tuna fishery will also provide additional incentives to participant fishers, such as technical assistance provided by the Lab to improve marketing and financial/operational management.

2. **Operational efficiency:** Increasing operational efficiency in the Galapagos tuna fishery supply-chain in order to reduce the cost of fishing and of delivering fish through the supply-chain, which would improve profit margins and overall returns from the tuna fishery. The objective is supporting the existing Fish Aggregating Devices (FAD) project implemented by the Galapagos National Park and the Charles Darwin Foundation, whose objective is to increase tuna catch rate, reduce operative cost (fuel and searching time), and mitigate the impact of tuna fishery over endangered, threatened and protected species by encouraging the use of hand-lines rather than long-lines.
3. **Post-harvest handling and cold-chain improvements:** Providing training of fishery participants in formal tuna quality assessments would enable fishers to sell their catches in a more differentiated manner based on the quality, leading to higher prices and revenues. This type of training would be provided by the technical staff hired for the Galapagos Seafood Company (see Section 4.2.2).
4. **Seafood Innovation:** Providing capacity building of entrepreneurs to catalyze innovation around the creation of new value-added products, such as dried tuna snacks and burgers, or applying new cooking techniques to raise the visibility of tuna as a premium dish in Galapagos restaurants, as many restaurants currently over-cook tuna in Galapagos. Thereby lowering the perceived value of the product (Berman et al. 2018).
5. **Social marketing campaigns:** Put in practice social marketing campaigns to enhance the market for sustainable tuna by local restaurant, cruises ships and consumers. The objective is promoting the consumption of tuna instead of demersal finfish species that shows signs of overexploitation, such as the Galapagos balacao (*Mycteroperca olfax*), and promote the adoption of the “Galapagos Seal” and “Eco-Gourmet” programs. Social marketing campaigns will inform about socio-cultural aspects associated to the Galapagos tuna fishery, including information about the relevance of the small-scale fishing sector to the local and national economy. These campaigns will be executed by Conservation International in collaboration with fishers, restaurants, cruise ships, sea food stores, retailers and government agencies, and will help raise awareness among consumers about the value of Galapagos tuna for the local community.

The Galapagos Seafood Innovation Lab will be built on the successful experience of Conservation International implementing Eco-Gourmet programs along the Pacific and Caribbean coasts of Colombia, and on the experience of the pilot plant created in San Mateo, Manabí Province, by the Minister of Aquaculture and Fishing from Ecuador in 2013, to help fishers’ organizations to add value to their seafood products and to diversify their markets. The estimated cost to establish the Galapagos Seafood Innovation Lab is around \$486,475 USD for a period of four years (Table 4.3). This strategy will be complementary to the Galapagos Seafood Company and Financial Inclusion and Incentives strategies described in Section 4.2.2 and 4.2.3, respectively.

Table 4.3. Summary of Galapagos Seafood Innovation Lab.

Area of intervention	Core Investment	Funding Required
<ul style="list-style-type: none"> Increasing local business capacity to improve the commercialization of Galapagos tuna at local and international level with principles of sustainability and social responsibility. Differentiate sustainable Galapagos tuna products, leading to improved market access and value. Improve Galapagos tuna fishery post-harvest handling and cold-chain to improve tuna quality and prices. Increase operational efficiency in the Galapagos tuna fishery to reduce costs. Reduce the ecological impact of the Galapagos tuna fishery over endangered, threatened and protected species. 	Galapagos Seal, Eco-Gourmet and innovation programs	\$305,225 USD/ 4 yrs.
	Social marketing campaigns	\$181,250 USD / 4 yrs.
	Total Cost	\$486,475 USD/4 yrs

4.2.5 GOVERNABILITY AND SUSTAINABILITY OF GALAPAGOS TUNA FISHERY

The agreed upon C-FIP action plan for the Galapagos tuna fishery mentioned in Section 1 defines the actions by management authorities and stakeholders to improve the fishery value chain and marketing system. However, it also defines a set of actions to improve the governance and sustainability of the fishery. The proposed interventions are expected to support the creation of enabling conditions for the holistic improvement of the fishery, including actions to maintain sustainable harvest levels for the target stock, to increase the efficiency of the GNP's monitoring, control and surveillance (MCS) system, to reduce the ecological impact of the fishery over secondary and endangered, threatened and protected (ETP) species, to reform the tenure rights regime in order to align economic incentives to resource conservation, and to enhance the adaptive capacity of local institutions to cope with the social-ecological impacts of external climate and human drivers, including climate change and globalizations of markets. A summary of the most relevant actions will put in place to improve the governance and sustainability of the Galapagos tuna fishery are described in Table 4.4.

Table 4.4. Summary of Governability and Sustainability Galapagos tuna fishery.

Objective	Actions	Estimated cost
Keep harvesting of target stock in sustainable levels	<ul style="list-style-type: none"> Establish a MOU between the GNPS, IATTC and Ecuadorian National Fishing to standardized monitoring and stock assessment methods for yellowfin tuna at regional level. Design and implement a fishery monitoring protocol for the tuna fishery that strength the collection of biological data. Determine the genetic and population structure of yellowfin tuna in the GMR. 	<ul style="list-style-type: none"> \$20,000 USD \$10,000 USD \$80,000 USD
Increase the efficiency of MCS system	<ul style="list-style-type: none"> Implement a digital monitoring system for commercial fishing. Implement an innovative digital surveillance system at the three main docks of the GMR to conduct a 24-hour monitoring 7 days a week, thus ensuring the monitoring of all landings and enforcement of management regulations. 	<ul style="list-style-type: none"> Ongoing with the support of WildAid and CI \$USD100,000
Reduce ecological impact over secondary and ETP species	<ul style="list-style-type: none"> Design and implement a fishery monitoring protocol for secondary and ETPS species. Experimental testing of an electronic monitoring system and/or observers onboard program that allows the cost-efficient collection of catch data <i>in situ</i>, both target, secondary and ETP species. Implementation of electronic monitoring or observer onboard program Determine exploitation status of populations of secondary species based on the estimation of appropriate biological reference points. Determine the impact generated by illegal and incidental fishing of sharks, and other ETP species, generated by the industrial and artisanal fishing fleet, both domestic and foreign, that takes place inside and outside the boundaries of the GMR, taking into consideration the impact of the climatic variability on catch composition. Define and implement a management strategy for secondary and ETP species. 	<ul style="list-style-type: none"> \$10,000 USD \$100,000 USD TBD pending experimental testing. \$20,000 USD \$80,000 USD \$10,000 USD

	<ul style="list-style-type: none"> • Design, publish and implement a code of good fishing practices and a manual of best practice handling techniques for target and ETP species. • Determine the level of impact of ghost fishing and illegal fishing aggregating devices (FADs) on habitats of vulnerable marine ecosystems. 	<ul style="list-style-type: none"> • \$15,000 USD • \$25,000 USD
Improve the effectiveness of tenure rights system	<ul style="list-style-type: none"> • Reform fishing license system and fishing permit expiry conditions. • Allocate fishing licenses and permits according licenses, if necessary, depending on the status of each fishery and manpower needs per port. 	<ul style="list-style-type: none"> • Process ongoing with the support of CI and funding of Blue Action Fund
Enhance institutional adaptive capacity against external drivers of change	<ul style="list-style-type: none"> • Determine the potential impact of climate change, globalization of markets, and other drivers, on the tuna fishery of the GMR. • Develop a plan, strategy or measure to prevent, mitigate or take advantage of the potential socio-ecological impacts generated by drivers of change. 	<ul style="list-style-type: none"> • \$80,000 USD • \$20,000 USD
Total		\$570,000 USD

The management actions described above are not explicitly included in the business case budget but could nonetheless be partially funded through the increased revenues that the Galapagos National Park and fishers would be receiving from the fishery improvements described in Sections 4.2.2 and 4.2.3 above. The Galapagos Seafood Company for instance is expected to generate \$860,000 USD in revenues in year 4, with \$404,825 USD going to fishers, \$67,677 going to COPROPAG, and \$172,395 USD going to the government (Berman *et al.* 2018).

4.3 BUSINESS MODEL

The Galapagos Seafood Company and the Blue Incentives strategies complement each other as it allows to escalate the application of new practices in the sea food commercialization within the supply chain, and it will provide the opportunities to collaborate and aggregate the supply of tuna around the Eco-Gourmet and Galapagos seal concept.

The primary source of revenues for the Galapagos Seafood Company will be from the sale of higher quality sustainable and “storied” Galapagos tuna to end buyers who are willing to pay a price-premium for such differentiated products. The new entity will therefore be a more transparent and vertically-integrated intermediary between fishers, the fishery cooperative, and high-value buyers, and will act as a “*monopolistic player, with enough power to implement a differentiation strategy and to absorb margins currently taken by intermediaries. Focusing on quality and product differentiation will be a significant driver of value creation for the fishers*” (Berman *et al.* 2018).

The money and service flows between the Galapagos Seafood Company and its customers are summarized in Figure 4.2.

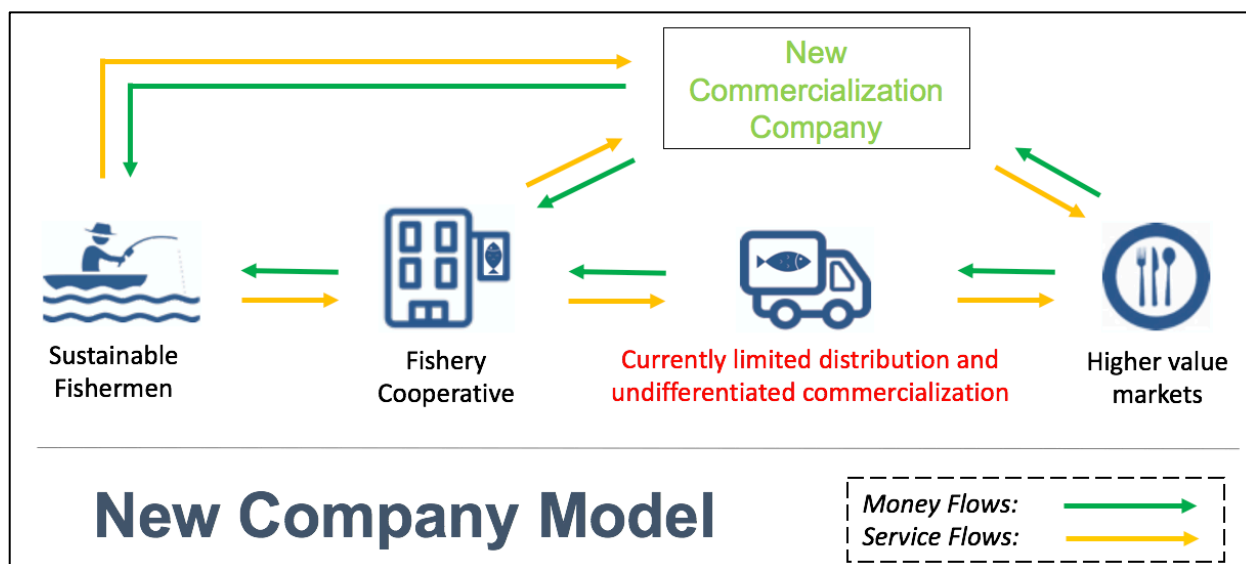


Figure 4.2. Simplified diagram of the Galapagos tuna fishery improvement model via the Galapagos Seafood Company.

The inclusion of conservation covenants within new commercial agreements with fishers and COPROPAG will enable the new company to support the holistic improvement of the Galapagos tuna fishery by leveraging market-based interventions and impact investment to improve the environmental and socio-economic performance of the local tuna fishery. Note that COPROPAG will continue to act as a service provider with an exclusive license to export tuna, but will not be responsible for commercialization, since this is not their strength. These key partnerships, as well as the other components of the Business Model for the Galapagos Seafood Company, are further detailed in Figure 4.3, including how the company creates, delivers and captures value.








Key Partners  <p><u>For both Customer Segments:</u></p> <p>Sustainably-minded Fishermen</p> <p>Conservation International</p> <p>Galapagos National Park</p> <p>New centralized commercialization company</p> <p>Key Actors within tourism sector</p> <p><u>For each Customer Segments:</u></p> <p>2. COPROPAG, strictly as a service provider of packing, and distribution to airport in Quito and/or Guayaquil</p>	Key Activities  <p><u>For both Customer Segments:</u></p> <p>Ensure tuna quality and food safety control</p> <p>Ensure sustainability of tuna (i.e. Galapagos Seal)</p> <p>Social Marketing campaign to create 'storied-fish' (Eco-Gourmet Program)</p>	Value Proposition  <p>High-quality, sustainable and fully traceable tuna from Galapagos ('Storied Fish').</p> <p>Differentiated Products</p> <p>Responding to the following customer problems for the two Segments:</p> <p>1. Limited availability of a reliable supply of local sustainable tuna; not a well develop 'storied fish', so can't capitalize on price premium.</p> <p>2. Mainland restaurants are not capitalizing on 'storied fish' (i.e. Eco-Gourmet model)</p>	Customer Relationships  <p>New commercialization company employees:</p> <p>Company Manager</p> <p>Client Relationship Specialist</p>	Customer Segments  <p><u>2-Segments:</u></p> <p>1. Galapagos local seafood markets, including live-aboard cruises, local restaurants and hotels.</p> <p>2. High-end seafood restaurants in Quito and Guayaquil.</p>
Cost Structure  <p>Employees / Salary</p> <p>Infrastructure / Equipment / Rent</p> <p>Working Capital</p>	Revenue Streams  <p><u>From both Customer Segments:</u></p> <p>Profit margins between fair-trade tuna prices paid to sustainably-minded fishermen, and price premium received from sustainable 'storied fish'.</p>			

Figure 4.3. Canvas summarizing the individual elements of the Business Model for the Galapagos Seafood Company.

On the other hand, the Blue Incentives strategy involves the opening a soft credit line for fishers, current fish middlemen integrated with fishers, and new entrepreneurs willing to adopt new practices in the seafood business with principles of sustainability and social responsibility. Therefore, this strategy require that credit holders participate in the training process and be active parties on the Eco-Gourmet program.

The implementation of a soft credit line for the fishing sector requires of new actors participating in the value chain. They are a local financial institution (credit/savings cooperative), a national bank, and a social impact investor. Local financial institutions in Galapagos currently have a very restricted pool of customers, with the right directives and incentives a local financial institution could allocate small loans (30K – 40K) to responsible fishers or entrepreneurs who wants to run a seafood distribution business for facilitating the link among responsible fishers and conscious consumers. Preference will be given to fishers and women, in fact currently there are some female relatives of fishers commercializing fish in a successful manner. All loan recipients will be participating in the Eco-Gourmet model and commercialize their products carrying the Galapagos seal. This local financial institution (credit/savings cooperative) will assess the risk of each fishers interested to apply for a loan, give the loan, handle the paperwork, and recover it plus an interest.

The national financial institution and the social impact investor provide the required funding to implement the small-loan credit line; this work in two stages:

1. The national bank issues a note/certificate of deposit payable each year (renewable each year up to 4 years) yielding a 5.25% interest rate (Max deposit yield for corporate customers, BCE, 2018), this certificate is bought by a social impact investor interesting to fund the credit line
2. The national bank grants a loan (max \$1,000,000) to a local financial institution (credit/savings institution) at an interest rate of 8.06% (reference lending rate for the corporate sector, BCE, 2018) this loan will be devoted to fund the small-loan credit line.

This complex operation (three levels) for allocating the financial resources takes advantage of the experience and knowledge the credit/saving cooperative and national bank have of the respective levels where they are operating. This strategy helps to spread the risk among these three levels thanks to the information held by each institution.

It is estimated that 20 to 30 boats participate currently in the tuna fishery in Santa Cruz and about 15 boats from both islands San Cristóbal and Isabela, then the potential total allocation of funding on the fishers could be close to \$1,000,000 USD, assuming about 50% boat owners will be willing to integrate vertically the supply chain. We are not counting current seafood stores “marisquerias”, which could also participate in the program, and increase the funding allocation. Furthermore, this credit line will be offering a very competitive interest rate for their credits. It is estimated that it will charge a 17.3% interest rate (Max consumer lending rate. BCE, 2018), thanks it will be sourced with a low interest repayable funds. Currently financial institutions in Ecuador are allowed to charge up to 28.5% to credit directed to the microenterprise sector (BCE, 2018).

The application of both strategies generates a new model that creates both value for the fishery value chain actors and new opportunities for capturing this value especially for fishers in the following way:

- Fishers: They sell their product following the Galapagos seal and Eco-Gourmet guidelines, this will allow them to receive a higher value for their catch. If they integrate to both programs, they will have the potential to capture almost the whole value created in the value chain (e.g., margin on trading tuna can increase up to 80% from current margin).
- Consumers: The implementation of an Eco-Gourmet program and the creation of awareness about the fish that is consumed in Galapagos enhance the consumption experience for the visitor and local consumer impacting positively on the consumer surplus; for instance, restaurant owners state that consumer will value the fact of knowing the fish served comes from a sustainable source (see Berman et al. 2018).
- Financial institutions: They will increase the financial inclusion in Galapagos, attracting new customers that traditionally have been excluded from the financial market. That will increase the business for financial institutions and will improve the social performance indicators of financial institutions.
- Environment: The implementation of responsible fishing practices thanks to the successful implementation of the Galapagos Seal and Eco-Gourmet programs will promote the sustainable exploitation of tuna stocks and other species that are marketable in Galapagos, and will contribute to reduce the impact of the tuna fishery over endangered, threatened and protected species. Furthermore, the application of the Galapagos seal will reduce the occurrence of IUU which facilitates the enforcement activities for the Galapagos National Park (it will impact positively on the financial resources devoted to enforcing regulations).

5. FINANCIAL ANALYSIS

5.1 OVERVIEW

The current financial model estimates the fishery's future cash flows for each year of the project based on the "Galapagos Seafood Company" and "Blue Incentives" strategies. These two strategies will require reimbursable funding and are designed to capture the value created by the "Galapagos Seafood Innovation Lab" and the "Governability and Sustainability of Galapagos Tuna Fishery" strategies. These two last strategies are not included in the financial analysis, as they will require non-reimbursable funding provided by philanthropist (grants) or from Government allocations.

The Galapagos Seafood Company strategy involves the creation of a new centralized commercialization and distribution company that will address many of the current inefficiencies associated with the Galapagos tuna fishery supply-chain (Table 5.1).

Table 5.1. Summary of Galapagos Seafood Company strategy.

<u>Strategy 1: Galapagos Seafood Company</u>	
Investment Amount	\$270,000
Use of Proceeds	<ul style="list-style-type: none">- Improved commercialization that enables better market access/prices- Supply-chain interventions to achieve better operational efficiency- Management and fishing gear improvements that drive fish stock protection
Financing Type	Loan
Pricing Terms	15% Interest Rate
Repayment Terms	Loan repayment in year 6

The Blue Incentives strategy aims to complement the first strategy in an attempt to upgrade quality of fish commercialized and to mainstream sustainable practices within the supply chain. The strategy provides incentives to accelerate the adoption of sustainable practices in the supply chain of fish by promoting the financial inclusion of stakeholders participating in the fishing supply chain for instance fishers, middle persons (independent fish traders) and seafood stores (marisquerias). The strategy will set a credit line for upgrading commercialization of fish directed to the stakeholders participating in the supply chain plus new entrepreneurs willing to participate in the commercialization of fish. Loan beneficiaries will invest the resources to apply and follow the guidelines of the Galapagos Seal and Eco-Gourmet Programs. Small loan will be at max \$40 K at 17.3 % annual lending interest to invest in equipment, facilities upgrading and work capital to improve commercialization of tuna/fish. Credits will be allocated by a local savings/credit cooperative funded by a loan provided by a national bank (corporate lending annual interest 8.06%). The national bank will fund the credit

line by issuing a note/certificate of deposit of \$1,000,000 payable annually and renewable every year up to 4 years, the annual return of this instrument will be 5.25% (annual saving interest for corporate sector). This note/certificate of deposit will be bought by a social impact investor (Table 5.2).

Table 5.2. Summary of Blue Incentives strategy.

Strategy 2: Blue Incentives	
Investment Amount	\$1,000,000
Use of Proceeds	<ul style="list-style-type: none"> - Credit line for small loans for fish commercialization upgrading. - Small loan will be allocated by a local credit/savings cooperative. - Loans will be used to upgrade facilities, new equipment, and work capital. - Implementing Galapagos seal and Eco-Gourmet guidelines.
Financing Type	Social Impact investing through a note/certificate of deposit issued by a national bank. National bank give a loan to a local credit/savings cooperative.
Pricing Terms	<p>Note/certificate of deposit 5.25% annual return.</p> <p>Loan to local credit/saving cooperative 8.06% annual lending interest rate.</p> <p>Small loans for beneficiaries 17.3% lending interest rate.:</p>
Repayment Terms	Note/certificate of deposit renewable each year up to 4 years.

5.2 GALAPAGOS SEAFOOD COMPANY

5.2.1 COST STRUCTURE

As illustrated above, a total loan amount of \$270,000 is requested to fund the creation and operations of a new commercialization and distribution entity that will partner with the COPROPAG fishery cooperative to create a more effective and equitable Galapagos tuna value-chain. The capital investment will be used primarily to fund staff personnel costs as well as to acquire sufficient start-up capital to purchase large volumes of tuna from fishers (Table 5.3).

Table 5.3. Proposed Investments and Associated Initial and Ongoing costs

Investments	One-Time Costs	Recurring Annual Costs
Hiring a Manager to oversee execution of firm activities, and socialize program with fishers and buyers.	-	\$45,600 USD
Hiring a Tuna Quality Assurance Specialist who is responsible for grading large volumes of sustainable Galapagos tuna	-	\$30,000 USD
Hiring a Client Relationship Specialist who is responsible for purchasing tuna from fishers, as well as creating and maintaining relationships with buyers (i.e. fish shops, restaurants, hotels, and cruise boats)	-	\$30,000 USD
Hiring two Operations specialists responsible for fish processing, packing and delivery.	-	\$25,200 USD (\$12,600 USD each)
Office Rent	-	\$12,000 USD
Refrigerated Truck	-	\$15,000 USD.
Start-up working capital to support price-premium paid to fishers	\$83,000 USD	-
Other Costs*	\$29,200 USD	-
Total Investment Needed	\$270,000 USD	

*The above estimates are based on a series of assumptions that can be found in Berman *et al.* 2018.

5.2.2 REVENUE STREAMS

A significant source of revenues for the current business case will come from the ability of the new entity to exert more purchasing and pricing negotiating power relative to tuna end-buyers and supply-chain middlemen, as described in Berman *et al.* 2018 below (Fig. 5.1):

“Purchasing a high volume and controlling a significant portion of the market is key for the success of (the new commercialization entity). Fishers currently receive a range of \$1.50 - \$2.00 per pound¹¹⁶ with an average of \$1.75. (the new commercialization entity) will buy all the fish it can buy for a base price of \$2.00 per pound in cash. This way the fishers will be guaranteed to receive the high end of its price in all operations. For the first year or until (the new commercialization entity) is able to purchase 10,800 pounds of tuna (50% of the local

supply), whichever comes first, the fishers will receive an additional \$0.20 per pound incentive if they sell all their weekly supply to (the new commercialization entity). In practice, by month 1 of operation, fishers will receive a 26% increase in price without any additional work. In the base case, (the new commercialization entity) will reach 40% of the market in 6 months, which may sound aggressive. However, fishers are rational players who want to maximize profit without compromising liquidity. We believe that fishers will react very positively and quickly to a 26% price increase in month one with less work. Fishers do not like to have to sell the fish, because they take the risk of not being able to sell them.¹¹⁸ Purchasing all of the fish from fishers at a higher price is a significant value proposition to them. We believe that the competition will not be able to match the price and conditions offered by (the new commercialization entity). The new cooperative will only be able to increase prices after it reaches 40% of the market and has significant monopolistic power. In practice, the middlemen would need to be willing and able to take a hit of 35 cents per pound of its margin to match the (the new commercialization entity) price to fishers”.

Another major source of revenues will come from the ability of the new entity to distribute and commercialize higher quality “storied” tuna, which will in-turn receive higher prices for these products. The latter strategy includes not only increasing the proportion of grade 1 vs. grade 2 tuna as a result of improved fish handling, cold-chain transport, and formal quality assessments, but also increasing the price premium amounts for each grade so as to capture premium market prices for tuna. The estimated price premiums for each grade are highlighted below, followed by cash flow analyses for the aggregate interventions:

<u>Grade</u>	<u>% of Overall Tuna</u>	<u>Global Market Price/lb</u>	<u>Current Export Price/lb</u>	<u>Prices/lb With Inspector</u>
1	6%	\$9.22	\$4.00	—————→ \$4.50
2+	15%	\$6.85	\$3.50	—————→ \$4.00
2	50%	\$4.39	\$3.00	—————→ \$3.50
≤3	29%	\$2.93	\$3.00	\$3.00

Figure 5.1. Quality grades and prices for Galapagos tuna, and projected price premium increases. Source: Berman et al. (2018).

5.2.3 PROJECT CASH FLOWS AND IRR INDICATORS

The following graph and table display the cash flows analysis for the new commercialization entity based on the previously described cost structures and revenue streams, and with varying degrees of market penetration (base, conservative and bear cases). Base case shows blue profits turn positive since the second year, while a conservative scenario where market penetration assumption is less optimistic, it delivers a cash flow where positive profits start since year three (see the following illustrations). Furthermore, internal return rate estimated for the base case is 37% (no perpetuity method) demonstrating a high level of profitability for this investment. This section reports other IRR considering less optimistic conditions in regard market penetration.

Scenario 1: Base Case

Cash Flow - Yearly								
Year	Non-cash cost	Profit	ΔWK	Capex	Incentives	Interest	Loan	Total Cash Flow
0	0	0	0	-15,000	0	0	45,613	30,613
1	3,377	-43,268	-63,552	0	-28,145	-14,924	146,512	0
2	7,827	63,898	-86,669	-10,000	0	-27,170	52,113	0
3	10,435	92,652	-27,437	0	0	-25,714	-49,936	0
4	10,435	92,652	0	0	0	-17,068	-86,020	0
5	10,435	92,652	0	0	0	-7,147	-95,941	0
6	10,435	92,652	0	0	0	-148	-12,342	90,597
7	10,435	92,652	0	0	0	0	0	103,087
8	10,435	92,652	0	0	0	0	0	103,087
9	10,435	92,652	0	0	0	0	0	103,087
10	10,435	92,652	0	0	0	0	0	103,087

Balance Sheet				
WK	Total Loan	Non WK Loan	Cash	Net Debt
0	45,613	45,613	30,613	15,000
63,552	192,124	128,572	30,613	161,512
150,221	244,238	94,017	30,613	213,625
177,658	194,302	16,644	30,613	163,690
177,658	108,283	-69,376	30,613	77,670
177,658	12,342	-165,316	30,613	-18,270
177,658	0	-177,658	121,210	-121,210
177,658	0	-177,658	224,297	-224,297
177,658	0	-177,658	327,384	-327,384
177,658	0	-177,658	430,471	-430,471
177,658	0	-177,658	533,558	-533,558

Figure 5.2 Base Case Cash Flows. Source: Berman et al. (2018).

Scenario 2: Conservative Case

Cash Flow - Yearly								
Year	Non-cash cost	Profit	ΔWK	Capex	Incentives	Interest	Loan	Total Cash Flow
0	0	0	0	-15,000	0	0	45,613	30,613
1	1,941	-113,636	-25,997	0	-16,175	-14,430	168,297	0
2	3,277	-49,225	-37,555	0	-27,304	-31,559	142,366	0
3	5,461	27,050	-49,113	-10,000	-18,203	-44,268	89,073	0
4	7,645	61,694	-37,555	0	0	-49,929	18,145	0
5	9,586	83,784	-27,437	0	0	-50,174	-15,760	0
6	10,435	92,652	0	0	0	-46,297	-56,790	0
7	10,435	92,652	0	0	0	-39,747	-63,340	0
8	10,435	92,652	0	0	0	-32,442	-70,645	0
9	10,435	92,652	0	0	0	-24,294	-78,793	0
10	10,435	92,652	0	0	0	-15,207	-87,881	0

Balance Sheet				
WK	Total Loan	Non WK Loan	Cash	Net Debt
0	45,613	45,613	30,613	15,000
25,997	213,910	187,913	30,613	183,297
63,552	356,276	292,724	30,613	325,663
112,666	445,349	332,683	30,613	414,737
150,221	463,494	313,273	30,613	432,882
177,658	447,735	270,076	30,613	417,122
177,658	390,944	213,286	30,613	360,332
177,658	327,604	149,946	30,613	296,992
177,658	256,959	79,300	30,613	226,346
177,658	178,166	507	30,613	147,553
177,658	90,285	-87,373	30,613	59,672

Figure 5.3 Conservative Case Cash Flows. Source: Berman et al. (2018).

Scenario 3: Bear Case

Cash Flow - Yearly								
Year	Non-cash cost	Profit	ΔWK	Capex	Incentives	Interest	Loan	Total Cash Flow
0	0	0	0	-15,000	0	0	45,613	30,613
1	1,698	-123,194	-18,914	0	-14,147	-14,280	168,837	0
2	2,184	-104,079	-7,083	0	-18,203	-31,702	158,882	0
3	4,369	5,629	-37,555	0	-36,406	-48,378	112,341	0
4	4,369	5,629	0	0	-36,406	-57,383	83,790	0
5	6,553	48,471	-49,113	-10,000	0	-69,048	73,137	0
6	6,553	48,471	0	0	0	-71,262	16,238	0
7	6,553	48,471	0	0	0	-73,135	18,111	0
8	8,737	74,917	-37,555	0	0	-77,692	31,594	0
9	8,737	74,917	0	0	0	-77,384	-6,270	0
10	8,737	74,917	0	0	0	-76,661	-6,993	0

Balance Sheet				
WK	Total Loan	Non WK Loan	Cash	Net Debt
0	45,613	45,613	30,613	15,000
18,914	214,450	195,535	30,613	183,837
25,997	373,332	347,335	30,613	342,719
63,552	485,673	422,121	30,613	455,060
63,552	569,463	505,911	30,613	538,851
112,666	642,600	529,935	30,613	611,988
112,666	658,838	546,173	30,613	628,226
112,666	676,949	564,283	30,613	646,336
150,221	708,542	558,321	30,613	677,930
150,221	702,272	552,051	30,613	671,660
150,221	695,279	545,058	30,613	664,667

Figure 5.4. Bear Case Cash Flows. Source: Berman et al. (2018).

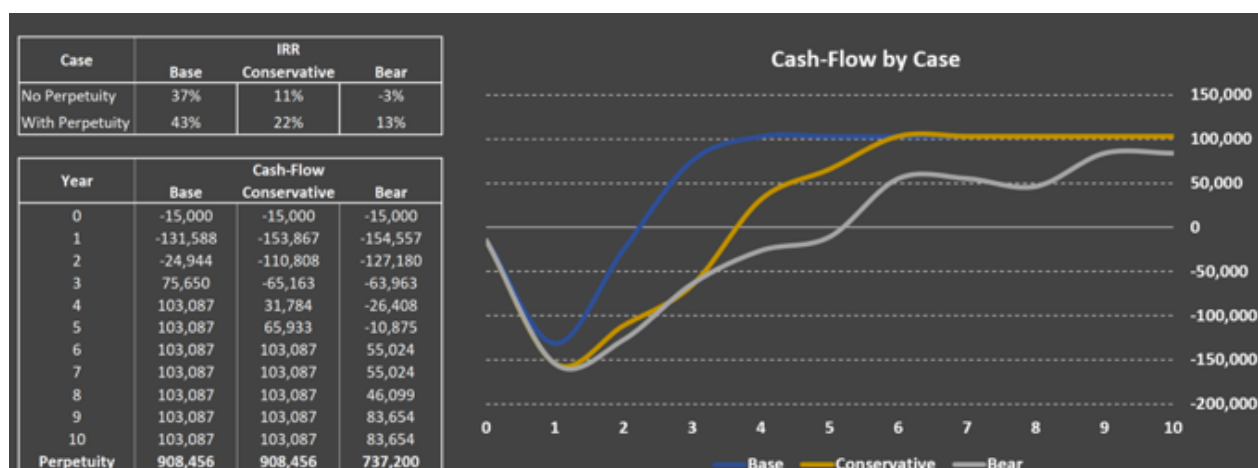


Figure 5.5. Cash Flows and IRR Comparison between Base, Conservative and Bear Case. Source: Berman et al. (2018).

5.2.4 SENSITIVITY ANALYSIS

The following illustrations present a sensitivity analysis where it is possible to observe the impact of different levels of the market penetration variable over the average costs and prices of the products offered by the company. For illustration a 90% market penetration results in a fish average cost of 2.52 \$/lb and an average price of 3.82 \$/lb (note that at high levels of penetration the company is able to exert market power). The analysis also presents the impact of market penetration on the company earnings.

Market Penetration		Volume - lb			Cost - \$ / Month			Cost - \$/lb	Price - \$ / lb		
Tuna	Other	Tuna	Other	Total	Fixed	Variable	Total		Tuna	White Fish	Avg
10%	10%	2,167	5,390	7,557	15,306	16,391	31,698	4.19	2.33	2.57	2.50
20%	10%	4,333	5,390	9,724	15,306	21,091	36,397	3.74	2.80	2.57	2.67
40%	20%	8,667	10,781	19,447	15,306	42,182	57,488	2.96	3.74	2.89	3.27
60%	30%	13,000	16,171	29,171	16,488	63,272	79,760	2.73	4.67	3.21	3.86
80%	40%	17,333	21,562	38,895	16,488	84,363	100,851	2.59	4.67	3.21	3.86
90%	50%	19,500	26,952	46,452	16,488	100,754	117,242	2.52	4.67	3.21	3.82

Figure 5.6. Cost and price per pound. Source: Berman et al. (2018).

Market Penetration		Revenue	VAT	EBIT	Fishermen Rebate	EBT	Income Tax	Net Profit	Employee Bonus	Newcoop Reserve
Tuna	Other									
10%	10%	18,914	-379	-13,162	0	-13,162	2,896	-10,266	0	-10,266
20%	10%	25,997	-720	-11,120	0	-11,120	2,446	-8,673	0	-8,673
40%	20%	63,552	-3,057	3,007	1,804	1,203	-265	938	469	469
60%	30%	112,666	-7,013	25,893	15,536	10,357	-2,279	8,079	4,039	4,039
80%	40%	150,221	-9,351	40,020	24,012	16,008	-3,522	12,486	6,243	6,243
90%	50%	177,658	-10,923	49,494	29,696	19,797	-4,355	15,442	7,721	7,721

Figure 5.7. Galapagos Seafood Company Operations. Source: Berman et al. (2018).

5.2.5 SCALABILITY AND REPLICABILITY POTENTIAL

The above model for fishery improvement is highly replicable, specifically in terms of improving supply-chain operational efficiency, market access and fish value, while allocating a portion of the financial returns toward

improved management and conservation of other overfished stocks. In Galapagos, Conservation International was able to leverage its proven track-record of work on the improvement of fisheries to cost-effectively (1) diagnose the overall performance of the tuna fishery, (2) identify the leverage points for reform, (3) design fishery intervention to address 'low-hanging fruit' improvements, and (4) garner partner/stakeholder buy-in, including from the pertinent government authorities.

With over 1,000 staff working in 30 countries, CI is well positioned to replicate this model in geographies with similar fisheries and socio-economic contexts. CI's proven track-record in the development of attractive business cases for fishery improvement, including for the Galapagos lobster and the Grenada tuna fishery, as well as our development of fishery business case development [tools](#), will enable the cost-effective replication of this model.

The scalability of Strategy 1 within Galapagos is limited however, since a majority of the local tuna supply is already contemplated within the above financial models.

5.6 BLUE INCENTIVES

5.6.1 COST STRUCTURE

As it is explained before, the strategy 2 involves the implementation of a credit line of \$1,000,000 that will be allocated by a local savings/credit cooperative (local financial institution) in small loans for fish commercialization upgrading. This process involves costs for the local financial institution, including the default risk of some small loans, and expected revenues from the interest generated by the loans. The following table presents a cost structure of the local financial institution assuming three different interest lending rates for the small loans. The lending interest rate impact the revenues expected by the local financial institution, the following analyses will consider a 17.3% interest lending rate.

This section also presents an example of how the small loan will be invested by the beneficiaries for upgrading the fish commercialization, maximum amount of the small loan will be \$40,000.

Table 5.4. Local Financial Institution Income Statement

Local Financial Institution Income Statement			
Max # Customers	25		
	Lending Interest Rates*		
	11.83%	17.30%	28.50%
Income	Year 1	Year 1	Year 1
Interest produce by principal small loans	\$ 107,269.5	\$ 158,424.5	\$ 265,656.2
Total income	\$ 107,269.5	\$ 158,424.5	\$ 265,656.2
Expenses			
Principal Interest paid (8.06%)**	\$ 80,600.0	\$ 80,600.0	\$ 80,600.0
Local Credit Agent/Advisor (25%)	\$ 4,800.0	\$ 4,800.0	\$ 4,800.0
Operative expenditures (office supplies, lease	\$ 4,800.0	\$ 4,800.0	\$ 4,800.0
Default credits (Galapagos default rate: 2%)	\$ 20,000.0	\$ 20,000.0	\$ 20,000.0
Total Expenses	\$ 110,200.0	\$ 110,200.0	\$ 110,200.0
Income - Expenses	\$ (2,930.5)	\$ 48,224.5	\$ 155,456.2
Revenue/Customer	\$ 4,290.78	\$ 6,336.98	\$ 10,626.25
Break-even point number of customers	26	17	10

*: 11.83% maximun reference lending rate for SMEs; 17.30% maximun lending rate for consumption loans; 28.50% maximun lending rate for micro-enterprises (BCE, 2018).

** : 8.06 % corresponds to the reference lending rate corporate sector; 9.33% is the maximun lending rate for the corporate sector; 10.21% is the maximun corporate lending rate for the corporate sector on the comercial segment; 11.83% maximun referece lending rate for the SMEs (BCE, 2018).

Table 5.5 Referential Investment for upgrading tuna marketing.

Referential Investment for upgrading tuna marketing (firm level)	
Items	USD \$
Facilities up-grade	\$ 10,000.0
Equipment (i.e. Fridges, backup power generator, utensils/table/displayers, and other materials)	\$ 10,000.0
Work Capital	\$ 20,000.0
Total	\$ 40,000.0

5.6.2 REVENUE STREAMS

Small loan beneficiaries (i.e. fishers, middlemen and new entrepreneurs) will invest resources on upgrading facilities, new equipment, and work capital to implement actions for upgrading fish commercialization. Beneficiaries will implement Galapagos Seal and Eco-Gourmet guidelines which will assure a steady demand and fair prices. It is estimated that the margin for participating in Eco-Gourmet is \$2.25 per pound of tuna, and in the case of other fish they could improve their revenues in about 10% of the price, that is \$ 0.35 per pound (Berman et al. 2018). In the following section, the document presents the cash flows and IRR of the investment done by a typical company beneficiary of the small loan.

5.6.3 PROJECT CASH FLOWS AND IRR INDICATORS

The cash flows of a typical firm beneficiary of a small loan (principal: \$40,000; interest rate 17.3%; 4 years) is presented in table 5.6. The cash flow assumes that the beneficiary is an existing firm in the fish commercialization business. The analysis shows the incremental revenues of the firm generated thanks to the investments done supported by the small loan, it also includes the burden of the loan repayment (principal plus interest) and other incremental costs due to the expansion of the business. The IRR and ROI analysis considers a ten-year period assuming investments will generate revenues a time period similar to the life time span of the equipment (fridges) and facilities upgrades.

Table 5.6. Typical Firm Cash Flow.

Typical firm cash flow*					
Items	Year 1	Year 2	Year 3	Year 4	Year 5
Incremental revenues from tuna	9966.2	11203.8	11334.1	11464.3	11594.6
Incremental revenues from other fish	9523.2	9618.5	9714.6	9811.8	9909.9
Total revenues	19489.4	20822.2	21048.7	21276.1	21504.5
Interests**	6337.0	4915.0	3226.5	1221.6	0.0
Principal payments	7588.1	9010.1	10698.5	12703.4	0.0
Other incremental costs	720.0	720.0	720.0	720.0	720.0
Total Costs	14645.0	14645.0	14645.0	14645.0	720.0
Revenues - Costs	4844.3	6177.2	6403.7	6631.1	20784.5
Investment	40,000.0				
IRR	31%				
NPV	86,262.5				
ROI	116%				
* Note 1: The period of analysis is six years considering that after the whole loan is repaid (48 months), the business can run two extra year without major investments.					
** Note 2: The firm pays an annual rate of 17.3% for a loan.					

5.6.4 SENSITIVITY ANALYSIS

There are two key variables which could impact the results of this strategy, they are the price of the capital paid by the local credit/saving cooperative (lending interest rate paid), and the price charge to the capital lent to beneficiaries (interest rate for small loans). They are going to influence in the cost and revenues of the resources to be used in the credit line and could compromise the feasibility of the credit line. The following table shows the number of loans (# of customers) that should be allocated to make the credit line operation feasible, the data shown is the result of varying the interest rates paid by the local credit/saving cooperative (rows) and the interest rate paid for (charge to) the small loans (columns). The results suggest, small loans should be lent at 17.3% interest rate, and the interest rate for funding the credit line should be 8.06%; the feasibility of the credit line is very sensitive to this interest rate.

Table 5.7. Local financial institution's break-even point.

Local financial institution's break-even point (# of customers)				
	Interest rate for small loans			
		11.83%**	17.30%	28.50%
Interest rate paid by local financial institution	8.06%*	26	17	10
	9.33%	29	19	12
	10.21%	31	21	12
	12%	34	23	14
*: 8.06 % corresponds to the reference lending rate corporate sector; 9.33% is the maximum lending rate for the corporate sector; 10.21% is the maximum corporate lending rate for the corporate sector on the commercial segment; 11.83% maximum reference lending rate for the SMEs (BCE, 2018).				
**: 11.83% maximum reference lending rate for SMEs; 17.30% maximum lending rate for consumption loans; 28.50% maximum lending rate for micro-enterprises (BCE, 2018).				
Source: Banco Central del Ecuador (2018). Tasas de Interes Octubre 2018. Download in october 30th, 2018, from: https://contenido.bce.fin.ec/docs.php?path=/documentos/Estadisticas/SectorMonFin/TasasInteres/Indice.htm .				

5.6.5 SCALABILITY AND REPLICABILITY POTENTIAL

Strategy 2 for fishery improvement is highly replicable, specifically in terms of promoting financial inclusion, improving supply-chain operational efficiency, market access and fish value, while capturing some of the value created thanks to strategy 3 and 4. The scalability is quite limited due to the size of the market in the island, but this model could be replicated in other places.

5.7 FINANCIAL NEEDS

The improvement of the fishery depends on three areas of intervention:

1. Increasing operational efficiency in the Galapagos tuna fishery supply-chain, in order to reduce the cost of fishing and of delivering fish through the supply-chain, thereby improving profit margins and overall returns from fishing.
2. Improving commercialization of Galapagos tuna, including through improved market access, certification, branding and product differentiation.
3. Ensuring the protection of these pelagic fisheries against increasing exploitation pressure, including of secondary non-target and endangered species like sharks and turtles.

Intervention areas 1 and 2 are addressed by two complementary strategies: the creation of a new distribution and commercialization company of tuna, and the promotion of financial inclusion of supply chain stakeholders and provide incentives to improve commercialization of sustainable tuna. Both strategies require an investment of \$1,270,000; the creation of the new company will require a \$270,000 loan (6 years, 15% interest lending rate) from a private investor or private financial institution. The other segment \$1,000,000 will be devoted to promote financial inclusion and incentivizing better practices on tuna commercialization among supply chain stakeholders, funding to this initiative is expected from a social impact investor and it will yield annually 5.25% for a time period of 4 years.

Additional funding will be required as non-reimbursable funding to support ancillary services for small-loan holders (i.e. technical training, marketing mentoring and business advising); and market development through Eco-Gourmet program implementation. It is estimated that a total grant of \$486,475 will be required for a period of four years, the execution of the grant will accompany the application of the credit line. Investments include

supporting a small team of professionals to implement the Eco-Gourmet program by: setting conservation agreements among fishers & restaurant/cruise ships/ seafood stores agreements, providing training and advising in the application of fish commercialization measures; supporting market and brand development, and executing social marketing campaigns. Strategy 4 is also supported by non-reimbursable funding (i.e. philanthropic grants or government resources) to support the improvement of the governance and sustainability of the fishery; most of the activities provides support to Government Agencies in their role of manager of the fishery. The estimated amount to execute this strategy is \$570,000 (4 yrs).

5.8 FINANCIAL STRUCTURE

The total investment is \$2,326,475 to be executed in 4 years. It comprises two main segments (Fig. 5.8).

A first segment is a grant of \$ 1,056,475 to be executed in 4 years and supports complementary activities to develop the market and brand of Eco-Gourmet by executing social marketing strategies, creating market partnerships that reduce the distance between fishers and consumers, and provide training and advising to improve commercialization of sustainable fish. It will look for philanthropist investors willing to support the development of this market in favor to the sustainable management of the Galapagos fisheries and the economic improving of fishers.

A second segment of the investment is a reimbursable fund of \$1,270,000; it comprises two sub-segments, a commercial loan of \$270,000 (15% annual lending rate; 6 years) for supporting a startup, this is a new commercialization company that will become the leader in the market for implementing new practices in the commercialization of fish (local and export markets); this subsegment will look for funding among traditional for-profit financial institutions. The other subsegment (\$1,000,000) will support the implementation of a credit line (small-loans for upgrading fish commercialization) to promote the financial inclusion of stakeholders participating in the fisheries supply/value chain, and provide incentives to current or new stakeholders for incorporating new practices in the commercialization of sustainable fish; this sub segment will be funded through a three level mechanism in order to minimize the risk of granting small loans. This involves a local savings/credit cooperative for loan allocation; national bank granting a loan (8.06% annual lending rate; 4 years) to the local saving/credit cooperative funded by the issuing of a note/deposit certificates; and a social impact investor will provide funding by buying the note/deposit certificates (5.03% annual return; renewable every year for up to 4 years).

Following we present a diagram summarizing the financial structure of the investment (Fig. 5.8). It shows the different segments of the investments (reimbursable/non-reimbursable/ for-profit investor/ impact investor) and the allocation based on the four strategies presented. The investment totals \$ 2.33 M.

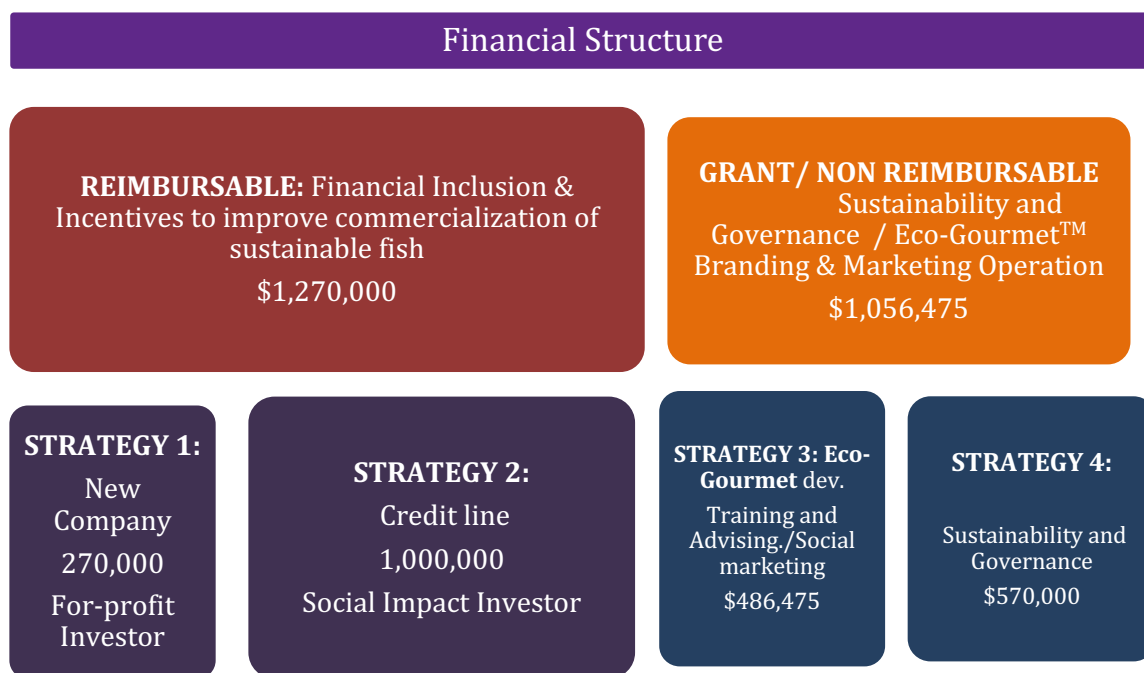


Figure 5.8. Proposed financial structure.

6. RISK ANALYSIS

6.1. PROJECT EXECUTION RISK

Value-chain middlemen, end-buyers and perhaps the fishery cooperative COPROPAG, who are either at-risk, or perceived risk, of having their market-share and profit margins reduced, may fight the proposed fishery improvement model, exerting pressure on the success of the short term goals of the project.

- Severity of harm: Severe
- Probability of occurrence: High
- Mitigation strategy from Berman et al. 2018:
 - “To ensure that COPROPAG does not see the new entity as a threat, we will add a non-compete clause in the service contract where it will not be able to compete in the export market for the next 10 years. COPROPAG would be able to compete in the local market but it does not have the financial capacity to raise \$270,000 necessary for this structure to work nor it does have the trust of fishers, which are not willing to sell to them”.
 - “The competition will not be able to match the price and conditions offered by the new entity (...). In practice, the middlemen would need to be willing and able to take a hit of 35 cents per pound of its margin to match the new entity price to fishers. In total, the new entity will require \$270,000 in capital, with \$83,000 alone to support the price paid to fishers, before it actually increases the price to its customers. We believe that the competition will not be able to raise the capital necessary to compete with the new entity” (see customer sensitivity analysis to price increases above).

- *“The average tourist spends \$3,361 on a trip to Galapagos. Tourists that stay on cruise ship (30% of total) spend over \$5,000 per person on a trip (Stijn et al.). It seems very unlikely that restaurants and ship owners would not be able to pass through the proposed increase in fish prices to tourists”.*

Lack of buy-in from fishers to participate in the program.

- Severity of harm: Severe
- Probability of occurrence: Low
- Mitigation strategy:
 - In December 2018, fishers and the Galapagos National Park signed-up to a C-FIP action plan for improvement of the Galapagos tuna fishery, which refers to all of the fishery interventions identified in the business case.
 - From Berman et al. 2018: *“We believe that fishers will react very positively and quickly to a 26% price increase in month one with less work. Fishers do not like to have to sell the fish, because they take the risk of not being able to sell them”.*
 - *“On the operational front, the Galapagos market is very small, thus, it should not be a big challenge to reach to all of the players on the islands”.*

Galapagos tuna supply volatility and security.

- Severity of harm: Severe
- Probability of occurrence: Moderate
- Mitigation strategy:
 - Hiring of a Fishers/Client Relationship specialist in charge of buying the fish and creating the relationship with the fish shops, restaurants, hotels, and cruise boats, will help ensure that a secure supply and sale of Galapagos tuna is available (including sourcing from other islands in Galapagos if necessary).

Risk of product substitution from other seafood in Ecuador.

- Severity of harm: Severe
- Probability of occurrence: Low
- Mitigation strategy from Berman et al. 2018:
 - *“The price of competition from other types of fish in mainland Ecuador was also considered. Even with the increase in price, tuna will still be more affordable than its competitors. On the Tilapia Price table, the export price and the Galapagos import price parity of Tilapia (Banco Central del Ecuador - SINAGAP), a lower quality product, can be observed. The only product that would be close to be competitive to the new Galapagos price is the frozen whole Tilapia, but the price difference is very small, considering the quality difference and the income impact of the new suggested price”.*

Tilapia	Price	
	Export	Import Parity
fresh or chilled - whole	2.67	3.92
frozen - whole	1.15	2.40
fillet - fresh	3.62	4.87
fillet - frozen	3.92	5.17

- “For business, there would be a guarantee of volume and high-quality fish. Additionally, the new entity would offer 30-day payment terms to its customers, what is currently not offered by the current suppliers”.
- A branding effort through Eco-Gourmet will also help limit the risk of product substitution, and of the tuna commodity trap (i.e. where all sustainable tuna is the same).

Delay in the required investments. This could affect the development of the new business areas and consequently the possibilities of the business plan.

- Severity of harm: Severe
- Probability of occurrence: Moderate
- Mitigation strategy: General Manager and Conservation International will design and implement a fundraising strategy for Stages 1 and 2 of the business plan.

Potential borrowers’ unfamiliarity of credit process and paperwork could result in low placement of loans.

- Severity of harm: Moderate
- Probability of occurrence: Moderate
- Mitigation strategy: Credit advisors will promote and facilitate credit applications. The project will also hold regular information meetings where experienced borrowers (not necessarily related with the credit line for tuna commercialization upgrading) will share their experiences to potential borrowers. Besides attractive interest rates will motivate potential borrowers to engage on loan request process.

6.2 FINANCIAL RISK

Default of small loans placed to upgrade tuna commercialization. This could jeopardize the recovery of the loan funding the credit line and impact the national bank and the social impact investor.

- Severity of harm: Severe
- Probability of occurrence: Moderate
- Mitigation strategy: The national bank and the local savings/credit cooperative has its own credit granting policies and risk provisions. In the case of the national bank, the project will choose at least an AA-rated institution, it will guarantee a rigorous process to choose the loan beneficiary/credit line implementer. This also guarantees the local savings/credit cooperative will apply a rigorous process for allocating, following-up and recovering the small loans.

6.3 ENVIRONMENTAL RISK

Fishers may increase Galapagos tuna fishing effort in response to improved Yellowfin tuna prices.

- Severity of harm: Low
- Probability of occurrence: High

- Mitigation strategy: The establishment of fishery-specific fishing licenses, as called for in the business case, is an initial step in regulating fishing capacity in the Galapagos Pelagic Fishery. Note however that the current 118 tonnes of Galapagos tuna exports represent a very small fraction of the Maximum Sustainable Yield (MSY) 275,300 tonnes for the regional yellowfin tuna stock in the Eastern Pacific Ocean (EPO) according to IATTC (=0.04% of YFT MSY in EPO). Any increases in Galapagos YFT tuna mortality would therefore have an insignificant impact on the regional stock, particularly given the fact that more intensive fishing practices such as longlining or purse-seining are prohibited within the Galapagos Marine Reserve.

Potential negative effects of El Niño. During the time ocean water increase its temperature tuna/fish stocks change their distribution probably they will shift to deeper waters.

- Severity of harm: Low
- Probability of occurrence: High
- Mitigation strategy: The negative effects of El Niño are temporary (one year); they could shift stocks to deeper waters. Two years after the event, tuna stocks experience a population peak.

6.4 SOCIAL RISK

The role among government agencies are unclear due to changes in legal framework produced by the new Galapagos Special Law. The uncertainty created could increase transaction costs for implementing commercial strategies.

- Severity of harm: Moderate
- Probability of occurrence: Moderate to Low
- Mitigation strategy: Partner organizations will implement actions in the framework of a FIP project to facilitate the clear definition among government agencies through setting up inter-institutional agreements on overlapping issues and defining planning instruments (for example: “Capitulo de Pesca”) with clear activities and responsible.

The participation process of local stakeholders is unclear due to change in legal framework produced by the new Galapagos Special Law. Local stakeholders, including fishers, are afraid to be marginalized from decision making of policies affecting the fishing activities.

- Severity of the harm: Moderate
- Probability of occurrence: Moderate to Low
- Mitigation strategy: Partner organizations will implement activities in the framework of a FIP project to facilitate a process to define stakeholders participation procedures aiming to keep the collaborative management achievements.

Destructive competition among new fish commercialization companies, existing small companies and COPROPAG. The arrival of a new fish commercialization company could generate anxiety in the supply side of the fish market motivating price wars or other aggressive strategies that could lead to the destruction of competitors.

- Severity of harm: Moderate
- Probability of occurrence: Moderate
- Mitigation strategy: Eco-Gourmet will promote collaboration among fish suppliers that stick to its guidelines. It will help to guarantee quality of the product, fair prices and consistency on supplying the product. Eco-Gourmet will also generate opportunities outside Galapagos market to expand the

demand of tuna/fish mostly in the mainland, which will benefit COPROPAG as logistical services provider.

Gender fishery participation imbalance, exclusion and/or disenfranchisement

- Severity of harm: Moderate
- Probability of occurrence: High
- Mitigation strategy: Currently fishers sector is dominated by men, there are no records of women working as fishers, although there are some women owning boats. Also, women regularly play an important role on the commercialization of fish among those fishers that are integrated vertically. The project will take in advantage this fact and will look to give preference in the allocation of small loans to women who are currently participating in the supply chain. That way it will be possible to highlight the role of women as important player on the supply/value chain.

6.5 ECONOMIC RISK

Deterioration of country's macroeconomic variables such as fiscal deficit, economic growth, and unemployment could lead to an increase of the country risk premium. This will make less attractive/increase the price of a financial operation such as buying a deposit certificate from a national bank by a private investor.

- Severity of harm: Severe
- Probability of occurrence: Moderate
- Mitigation strategy: The segment of investors in which the project will focus on is the social impact investing. This type of investors focuses on the environmental and social impact of their investments besides a normal market return, as a such they are less sensitive to speculative movements of the markets.

Deterioration of country's macroeconomic variables such as fiscal deficit, economic growth, and unemployment could lead to a decrease of the aggregated demand in the country, which could limit the ability of the new commercialization company and small companies' beneficiaries of the loans to gain the required market share to meet the revenue goals. For instance, new commercialization company expects to start with a 4% market share and grow to 18% in the 5th year; small companies will start each with 2.5% of market and grow to 2.6% (5th year).

- Severity of harm: Severe
- Probability of occurrence: Moderate
- Mitigation strategy: The target for the new commercialization company and the existing small companies' beneficiaries of small loans is mostly the tourist market. Demand of Galapagos tourists is strong and do not follow national economic cycles. New commercialization company has as partial target upscale restaurants in Quito and Guayaquil, in this case the negative impact of economic cycle will be mitigated by establishing strong partnership with local restaurants through the Eco-Gourmet program to guarantee the demand along the project lifetime.

6.6 REPUTATIONAL RISK

Galapagos seal holders and Eco-Gourmet supplier lack of compliance with sustainability guidelines could compromise the credibility of the product as sustainable and erode consumer trust on both the seal and the program; for instance, the risk that fishers participating in the program use illegal longline gears.

- Severity of harm: Severe
- Probability of occurrence: Moderate

- Mitigation strategy: Eco-Gourmet program will have field advisors who will be training small companies' beneficiaries of the loans on how to verify their purchases comply with the Eco-Gourmet and Galapagos Seal guidelines. The program will support also the strengthening of the traceability program of the Galapagos National Park in collaboration with partner organizations. And, Eco-Gourmet program will perform random audit among its members to assure compliance with the program guidelines

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**ANNEX 1. MEMORANDUM OF UNDERSTANDING (MOU) TO IMPLEMENT
THE C-FIP ACTION PLAN FOR THE GALAPAGOS TUNA FISHERY FROM THE
GALAPAGOS MARINE RESERVE**

**Acuerdo marco de colaboración para el
"Mejoramiento de la pesquería de atún de la Reserva Marina de
Galápagos con un enfoque comunitario"**

MINISTERIO DEL AMBIENTE



Parque Nacional
GALÁPAGOS
Ecuador



Consejo de Gobierno del
Régimen Especial
de Galápagos

CONSERVACIÓN
INTERNACIONAL

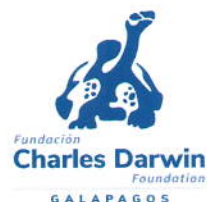
Ecuador



MINISTERIO
DE ACUACULTURA
Y PESCA



WILDAID



Antecedentes

El 3 y 4 de mayo de 2018 se realizó el taller multisectorial "*Definición de un Plan de Acción para el mejoramiento integral de la pesquería de atún de la Reserva Marina de Galápagos con un enfoque comunitario*", cuyo objetivo fue acordar el Plan de Acción de un Proyecto de Mejoramiento Pesquero Comunitario para la pesquería de atún de la Reserva Marina de Galápagos (RMG). El taller fue coordinado conjuntamente entre Conservación Internacional Ecuador (CI) y la Dirección del Parque Nacional Galápagos (DPNG), y contó con un total de 38 participantes, incluyendo representantes de la Cooperativa de Producción Pesquera Artesanal de Galápagos (COPROPAG), Federación Nacional de Cooperativas Pesqueras del Ecuador (FENACOPEC), Consejo de Gobierno de Régimen Especial de Galápagos (CGREG), Ministerio de Acuacultura y Pesca (MAP), Instituto Nacional de Pesca (INP), Gobierno Autónomo Descentralizado de Santa Cruz (GAD-Santa Cruz), Fundación Charles Darwin, y WildAid.

El presente acuerdo marco de colaboración tiene como objetivo facilitar la implementación del Plan de Acción acordado para el mejoramiento de la pesquería de atún de la RMG, bajo los términos descritos a continuación.

Acuerdo Marco

Este Acuerdo Marco de Cooperación (a partir de aquí referido como "Acuerdo") es suscrito por y entre las siguientes partes.

Cooperativa de Producción Pesquera Artesanal de Galápagos (COPROPAG), con domicilio en Puerto Ayora, Santa Cruz, Galápagos; representado por el Sr. **Dionisio Zapata**,

Federación Nacional de Cooperativas de Pesca (FENACOPEC), con domicilio en Puerto Ayora, Santa Cruz, Galápagos; representante Nacional por el Sr. **Pedro Ascencio**,

Consejo de Gobierno del Régimen Especial de Galápagos (CGREG), con domicilio en Puerto Ayora, Santa Cruz, Galápagos; representado por el Sr. **Daniel Proaño**

Dirección del Parque Nacional Galápagos, con domicilio en Puerto Ayora, Santa Cruz, Galápagos; representado por el Dr. **Jorge Carrión**,



Gobierno Autónomo Descentralizado de Santa Cruz (GADS), con domicilio en Puerto Ayora, Santa Cruz, Galápagos; delegada la Lcda. **Lorena Guerra**

Ministerio de Acuicultura y Pesca (MAP), con domicilio en Puerto Ayora, Santa Cruz, Galápagos; representado por el Ing. **Gabriel Bohórquez**,

Instituto Nacional de Pesca (INP), con domicilio en la ciudad de Guayaquil, Ecuador; representado por Dr. William Revelo.

Fundación Charles Darwin (FCD), con domicilio en Puerto Ayora, Santa Cruz, Galápagos; representado por Dr. **Arturo Izurieta**,

WILDAID INC, con domicilio en Puerto Ayora, Santa Cruz, Galápagos; delegada por la Bióloga **Diana Vinuesa**,

Conservación Internacional (CI), con domicilio en Quito, Ecuador, representado por **MSc. Luis Suarez**, cada uno de los cuales son las "Entidades Participantes"

Este Acuerdo será normado por los siguientes principios:

Primero: Es mutuamente acordado que las Entidades Participantes promoverán el desarrollo de un Proyecto de Mejoramiento Pesquero Comunitario (C-FIP, por sus siglas en inglés) para la pesquería de atún de la Reserva Marina de Galápagos, incluyendo trabajo técnico-científico, intercambio de datos e información, entrenamiento y/o financiamiento, así como cualquier otro tipo de cooperación que tenga como objetivo alcanzar y mantener la sostenibilidad de esta pesquería.

Segundo: Cada Entidad Participante nombrará un representante, quien formará parte de un Comité Técnico Interinstitucional. Cada representante participará en las actividades de coordinación y planificación de las actividades que se originen a partir de este Acuerdo. A través del Comité Técnico, cada Entidad Participante podrá sugerir propuestas de actividades dentro del alcance de este Acuerdo.

Tercero: Las actividades que resulten de este Acuerdo serán implementadas de conformidad al Plan de Acción acordado al término del taller multisectorial denominado "*Definición de un Plan de Acción para el mejoramiento integral de la pesquería de atún de la Reserva Marina de Galápagos con un enfoque comunitario*", realizado el 29 de noviembre de 2018 en la Sala de reuniones Miguel Cifuentes en Puerto Ayora, Galápagos, Ecuador (ver Anexo 1).



Cuarto: La firma de este Acuerdo no deberá ser interpretado como un obstáculo para ninguna de las partes firmantes para firmar acuerdos similares con otras instituciones o entidades interesadas en compartir metas comunes.

Quinto: Las Entidades Participantes determinarán por unanimidad la admisión de nuevos participantes. Por virtud de su unión a la implementación del C-FIP, los nuevos participantes reconocerán los términos de este Acuerdo.

Sexto: Las Entidades Participantes mantendrán en sus relaciones el más alto espíritu de cooperación, manteniendo en mente que el propósito de este Acuerdo es beneficiar las actividades de cada una de las partes. Por lo tanto, las actividades a desarrollar deberán ser un ejemplo de esfuerzo cooperativo.



Séptimo: Este acuerdo tendrá una validez de un año contado a partir de la fecha en que cada Entidad Participante firmó el Acuerdo, y será renovado automáticamente por un año adicional si ninguna de las partes ha entregado a las partes restantes una notificación escrita que especifique el deseo de no renovar este Acuerdo, al menos con tres meses de anticipación a la fecha de expiración del primer año de implementación. Sin embargo, cualquiera de las partes puede terminar este Acuerdo brindando una notificación escrita a las partes restantes, al menos con tres meses de anticipación.

Octavo: Las partes acuerdan y aceptan la siguiente distribución de deberes:

- a) Conformar una comisión técnica interinstitucional conformada por representantes de COPROPAG, DPNG, INP, MAP, CGREG, GADS y CI, FCD, FENACOPEC, WildAid cuya responsabilidad será llevar un seguimiento de los avances en la implementación del C-FIP, brindando una comunicación periódica sobre los avances y obstáculos asociados a su implementación a sus respectivas instituciones.
- b) Conservación Internacional coordinará el proceso de implementación del Plan de Acción del C-FIP acordado para la pesquería de atún de la Reserva Marina de Galápagos, contribuyendo además al desarrollo de un plan de inversión para la pesquería y a la búsqueda de financiamiento para su implementación.
- c) Las Entidades Participantes, y cualquier otra entidad que decida subsecuentemente ser parte de este Acuerdo, contribuirán a la ejecución de las acciones acordadas en el "Plan de Acción" descrito en el Anexo 1. Esto se realizará mediante trabajo técnico-científico, intercambio de información,



entrenamiento y/o financiamiento, así como cualquier otro tipo de cooperación que tenga como objetivo asegurar la implementación del C-FIP.

Noveno: Las actividades del C-FIP, que hayan sido aprobadas por las Entidades Participantes, serán resumidas en un plan de trabajo anual y actualizaciones semestrales serán hechas públicas mediante la estrategia de comunicación que, mediante común acuerdo, decidan las partes.

Décimo: Ninguna compañía u organización puede usar el logo o nombre de las partes sin el consentimiento previo de las otras partes en forma escrita.

Para llegar a la firma de este Acuerdo Marco, se han considerado los aportes de todos los sectores invitados, lo que nos permite declarar de importancia regional el considerar estos aportes como aspectos esenciales para alcanzar el desarrollo sostenible de la pesca de atún en la Reserva Marina Galápagos.

Acordado y firmado el día 29 de noviembre de 2018, en la sala Miguel Cifuentes del Parque Nacional Galápagos, por los abajo firmantes:

Por (nombre y firma):


Director de PNG

Por (nombre y firma):


Representante CGREG

Por (nombre y firma):


Director de CI-Ecuador

Por (nombre y firma):


Presidente Copropag

Por (nombre y firma):

Representante del MAP

Por (nombre y firma):

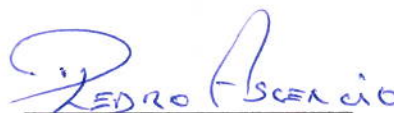


Representante de GADMSC

Por (nombre y firma):

Representante del INP

Por (nombre y firma):



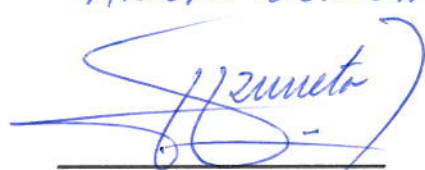
Representante del FENACOPEC

Por (nombre y firma):



Representante del WildAid

Por (nombre y firma):

ARTURO IZURLETA VALERY


Representante del FCD

ANNEX 2. Eco-GOURMET SUPPLEMENTARY MATERIALS

LOS PESCADORES Y ASOCIACIONES SE COMPROMETEN A:

1. CAPTURAR Y COMERCIALIZAR SOLO ESPECIES
Con tallas adecuadas
Que no estén amenazadas, en veda ni áreas con restricción

2. PROPENDER CAPTURAR CON ARTES DE ANZUELO
Espinel
Línea de mano

3. PESCAR CON REDES REGLAMENTARIAS
Corazón mayor a 2.5 pulgadas
Peces mayores a 3.5 pulgadas

4. MEJORAR PRÁCTICAS DE MANUFACTURA
manipulación, empaque, transporte, acopio y cadena frío

5. ENTREGAR INFORMACIÓN
comercial y pesquera del proceso

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See draft Commercial Agreements from CI-Colombia Eco-Gourmet:

<https://drive.google.com/open?id=1mwcfR1clkwPwKS1LYbr9EpdGlj93lpd>