



FISHERY DEVELOPMENT BLUEPRINT

Domestic Market Initiatives in the Peruvian Benthic Fishery



About Future of Fish

Future of Fish is a nonprofit that provides research, design, and business services to organizations and entrepreneurs accelerating sustainability and traceability in seafood supply chains.
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Disclaimer

The following report is an output of nearly two years of research and long-form interviews and meetings with key stakeholders involved in various aspects of the supply chain, from extractors to final consumers to regulators. These interviews were qualitative in nature, and findings were synthesized and substantiated where possible with previous work and the best available statistics preferencing official data. Fishery systems are dynamic in nature, and subject to rapid and sudden change. We present this as our best effort to capture an interdisciplinary snapshot and suggest possible steps to unlock trapped value and improve supply chain efficiencies. Together these solutions aim at reinforcing sustainable management by way of incentives and innovations that are market-driven and seek to advance the overall socioeconomic resilience of fisheries-dependent communities. We understand and take responsibility for any inaccurate data which is represented and are willing to take feedback and make alterations as necessary.

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A Blueprint for Benthic Fishery Development

As is the case with any complex system, there is no one silver bullet solution that will solve overexploitation of fishery resources. A coordinated effort is needed across multiple domains from governance to trade. We believe developing new market initiatives is a critical component of this approach, to incentivize supply chain actors to practice responsible harvesting and sourcing which would unlock trapped value.

This document outlines recommendations and strategies for unlocking new or additional value in managed access benthic fisheries connected with Peruvian domestic markets, and for setting enabling conditions for value to be created or unlocked in the future. The blueprint presented here:

- Describes the benthic fishery and some of the specific attributes that drive the need for new domestic market initiatives;
- Recognizes broad intervention areas that could be pursued to catalyze and achieve a future state vision;
- Assesses and quantifies the value and impact potential of these interventions;
- Outlines key players and potential partners, and their alignment with these intervention areas; and
- Provides a financial landscape analysis that will help us to assess where we might gain traction for future funding.

This blueprint is designed to inform multiple organizations as follows:

- For **philanthropic funders**, solution areas presented can be assessed for alignment with current funding priorities, particularly for interventions which cannot be easily funded by return-seeking investors.
- For **non-governmental organizations** (NGOs), consider the parallel efforts of other organizations and how best to synchronize and leverage each other's progress.
- For **seafood businesses**, we present strategies for generating more value without putting more pressure on stocks. This document acknowledges that business decisions need to be justified by bottom line performance, and provides practical means for meeting this goal.

Abbreviations

DICAPI

Dirección de Capitanías y Guardacostas de la Marina de Guerra del Perú (Peruvian Coast Guard)

DPA

Desembarcaderos de la Pesca Artesanal (official artisanal landing sites)

FDM

Fishery Development Model

FFI

Fisheries Finance & Innovation (Platform)

FOF

Future of Fish

IMARPE

Instituto del Mar del Perú (Government Research Institute)

IATTC

Inter-American-Tropical-Tuna-Commission

MT

Metric Tonnes

NCI

Naturaleza y Cultura Internacional

NGO

Non-governmental Organization

OSPA

Organización Social de Pesca Artesanal (Fisher Associations)

- For **fishers**, this document is built with an orientation toward preserving livelihoods, and spurring economic development to support the transition to new market roles.
- For **investors**, this document highlights where value is locked in the system, identifies the most promising areas for deal flow, and quantifies the magnitude of returns that can be targeted.
- For **government organizations**, interventions presented in this document could help better data to flow from supply chains into government databases, thereby improving management efforts.

This blueprint builds on twelve months of in-depth multidisciplinary research incorporating extensive systems analysis and iterative feedback from partners on the ground and stakeholders in the system as part of Future of Fish's Fishery Development Model (FDM). The FDM is an approach that is designed to progress a seafood system from its current state to an envisioned future state, and focuses strongly on unlocking value as a central driver of change alongside effective market initiatives. By generating and fairly distributing value in the system, fishers and supply chain businesses can be directly incentivized to conduct responsible harvesting and trade. The value-oriented interventions proposed in this blueprint align with the interests of fishers and businesses, and could, if executed successfully, ensure wins for all stakeholders that pursue responsible practices. Furthermore, by unlocking value, diverse sources of capital can be attracted to pilot and scale successful strategies. Future of Fish recommends the blueprint be implemented with an adaptive, collaborative process that refines strategies until they are scale-ready (**Figure 1**).

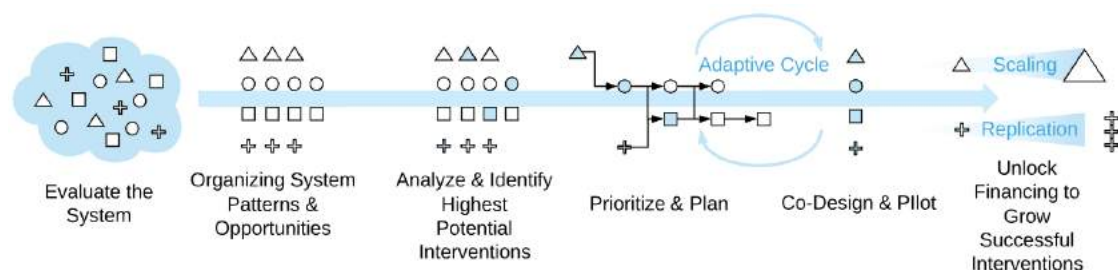


Figure 1. Fisheries Development Model process leading to scaleable models for fisheries transformation. An important aspect of the process is adaptive planning centered on deep interaction with communities and the ability to integrate changing environmental and cultural landscapes into future implementation, and thus create relevant outcomes. See **Appendix A** for more information on the Fishery Development Model.

For this blueprint, we identified the major stuck points preventing progress towards maximizing value in the Peruvian benthic fishery, and the assets (e.g. relationships, cultural norms, available funding) that can be leveraged to overcome them. Based on these stuck points and assets, we identified four solution areas. Executed successfully, each solution can drive domestic market initiatives that support responsible practices across multiple communities and/or supply chains in Peru, thereby unlocking new or additional value in the benthic fishery. These solution areas are highlighted below (**Figure 2**), and are meant to be executed in parallel and in coordination with one another.

PNACP

Programa Nacional
A Comer Pescado
(To Eat Fish)

PRODUCE

Ministerio de
la Producción
(Ministry of
Production)

SANIPES

Organismo
Nacional de
Sanidad Pesquera
(National Fisheries
Health Agency)

SPDA

Sociedad Peruana
de Derecho
Ambiental
(Peruvian Society
for Environmental
Law)

TNC

The Nature
Conservancy

USD

United States
Dollars

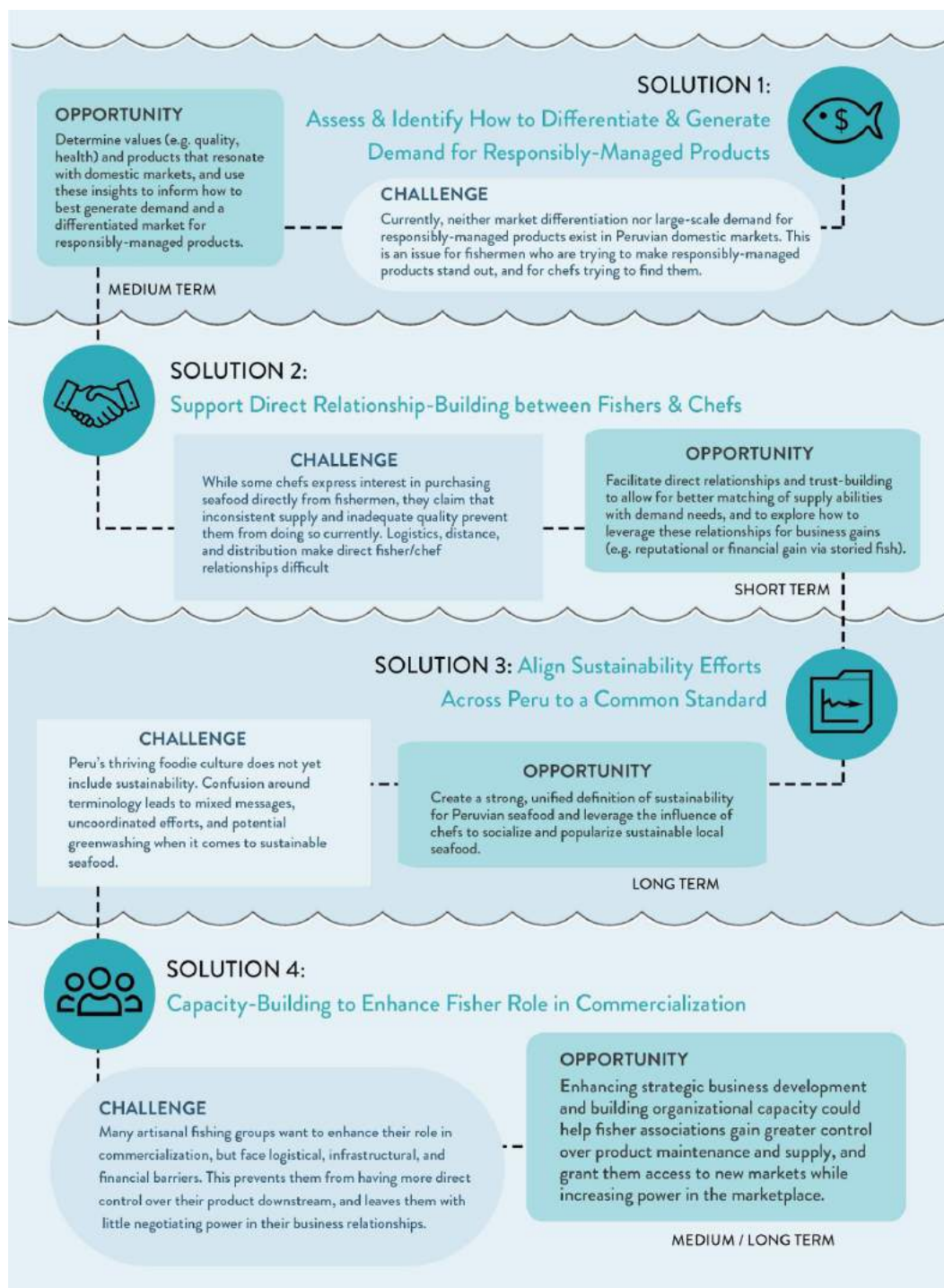


Figure 2. The four domestic market solutions we identified, including the challenges to overcome and the opportunities to capitalize on, for unlocking value in the benthic fishery. Specific focus is on connecting benthic fishers that practice responsible management with markets that value these products. Detailed descriptions of these solutions can be found in the 'Proposed Solutions' section on p. 15.

We invite you to explore this blueprint and the associated methods used to frame these opportunities. Interested collaborators can get in touch at info@futureoffish.org.

Fishery Context

FISHERY PROFILE

Benthic fisheries comprise harvests of marine organisms that live in and on the bottom of the ocean floor. There are at least 20 different commercial benthic species (octopus, crab, prawns, scallops, snails, sea urchins, to name a few) in Peru. Harvested by divers from small vessels and collectors from the shore, the benthic fishery employed 9,024 fishers in 2009 along the coast of Peru¹. Reported landings for benthics are relatively small compared to pelagics, demersal fish, and non-benthic mollusks, with an estimated total annual yield of 129,000 MT in 2015² (**Table 1**). This means benthic species made up approximately 3% of total landings, 5% of exports by volume, and 2% of domestic products by volume in Peru in 2015. However, reported landings are likely underestimated due to lack of monitoring at all landing sites. Instituto del Mar del Perú (IMARPE), the Peruvian government's scientific and technical research agency, conducts infrequent abundance assessments at a select few sites to estimate local stock status, then uses this information to recommend national closures. Overall, the national government prioritizes high-volume, more profitable stocks like anchoveta, mahi mahi, and jumbo squid over benthics, despite their relative value per volume and importance to the national diet³. Further, aggregated and conflicting national data sets on landing statistics, exports, and national sales lead to uncertainty as to the actual status of benthic stocks.

Despite this uncertainty, many benthic fishing communities have taken it upon themselves to manage their own local resources with the help of NGOs such as The Nature Conservancy (TNC), Naturaleza y Cultura Internacional (NCI), and Pro Delphinus. There are several examples of self-managing benthic fishing communities along the coast of Peru, with many having created their own governance models, control rules, and enforcement systems. Examples include Ancón, Marcona, Ilo, and Tumbes, to name a few⁴.

Despite these efforts, recent anecdotal evidence suggests that stocks have dwindled in some locations, and both fishers and providers are having trouble fulfilling demand to satisfy both restaurant and supermarket orders. In fact, supply appears to be decreasing for many fisheries on a country-wide scale, and benthics are no exception⁵.

1. Christensen et al. 2014. Valuing seafood: The Peruvian fisheries sector. <https://www.sciencedirect.com/science/article/pii/S0308897X13002194#t0010>

2. PRODUCE. 2015. Anuario Estadístico Pesquero y Acuicola 2015. <https://www.produce.gob.pe/documentos/estadisticas/anuarios/anuario-estadistico-pesca-2015.pdf>

3. Nakandakari et al. 2017. The importance of understanding self-governance efforts in coastal fisheries in Peru: insights from La Isilla and Ilo. https://www.researchgate.net/publication/315115732_The_importance_of_understanding_self-governance_efforts_in_coastal_fisheries_in_Peru_Insights_from_La_Isilla_and_Ilo

4. Ibid.

5. INFOPES. 2019. http://tumi.lamolina.edu.pe/infopes/?post_type=product

Table 1. Summary of key statistics of the Peruvian benthic fishery. Landings and export volumes are from PRODUCE 2015 report; domestic volumes were estimated by subtracting exports from total landings; export values are from SUNAT 2015 market information on the INFOPES website; domestic values were estimated by multiplying market price in 2015 by estimated domestic volume for each species. All currency figures are in USD. Sources:

(1) PRODUCE. Anuario Estadístico Pesquero y Acuicola 2015. <https://www.produce.gob.pe/documentos/estadisticas/anuarios/anuario-estadistico-pesca-2015.pdf>

(2) INFOPES. Accessed April 2019. <http://tumi.lamolina.edu.pe/infopes/>

(3) Christensen et al., 2014. Valuing seafood: The Peruvian fisheries sector. <https://www.sciencedirect.com/science/article/pii/S0308597X13002194#t0010>.

GEOGRAPHY		VALUE	
Small-scale coastal fisheries (which the benthic fishery is part of) land product at over 116 sites spanning the 3,000 km coastline of Peru. Product is then transported to local restaurants/markets as well as terminals in larger cities (Lima, Arequipa).		Seafood in Peru yielded a total value of ~\$3.5 billion to the economy in 2015 ² . Our analysis estimated the value of the benthic fishery in 2015 (which included 12 different species, both farmed and wild capture fisheries, and both export and domestic markets) at ~\$685 million.	
10 Administrative regions	>116 Landing sites	~\$3.5 billion Total seafood economy in Peru (2015)	~\$685 million Total benthic economy in Peru (2015)
MARKET			
In 2015, product volume was approximately evenly split between export (~46%) and domestic (~54%) markets. Chanque (abalone), algae, and sea urchin are the main exports; clams, crabs, snails, and choros (mussels) stay domestic; and octopus, scallops, and langostinos (prawns) are sent to both markets. The majority of domestic benthics are routed through two central terminals (Villa Maria and Ventanilla) in Lima.			
9,024 Artisanal benthic fishers (2009) ¹		~60,000 Tons exported (2015)	~69,000 Tons domestic (2015)

SUPPLY CHAIN & STAKEHOLDER INTERACTIONS

Benthics are essential in traditional Peruvian plates, and are found in dishes ranging from high-end restaurants to the ‘mesa popular’. They also contribute to the export market, with chanque (abalone), scallops, prawns, algae, and sea urchin fetching high prices internationally. Because this blueprint is focused on developing domestic market initiatives, only Peruvian supply chains with products remaining in-country will be discussed.

Figure 3 depicts a simplified version of a typical Peruvian domestic benthic supply chain. Most are complex, multi-nodal, and fairly opaque due to the presence of multiple aggregation points and lack of traceability. Stakeholders and their various roles and interactions are as follows:

- **Benthic** fishers harvest multiple species from small vessels or along the shore by diving, handlining, or using nets. Once landed, they sell their product to **buyers**, who then transport it on ice by truck to large central markets (**terminals**) in regional capitals, where it is either sold or repackaged for sale in the terminals of Lima—namely Villa Maria and Ventanilla—where seafood of every type is aggregated and sold.
- Retailers, including **local markets**, **supermarkets**, and **restaurants**, purchase seafood from vendors at these terminals, which are separated by product type and sold either whole, in a half shell, processed (e.g. meat extracted from the shell), or as ‘mixture’ (a mixture of multiple benthic species).
- Most **restaurants** hire a **provider*** (i.e. a person or supplying company) that goes to the terminals each morning, buys product for them, and delivers it to the restaurant. Alternatively, and less frequently, an employee of the restaurant (sometimes the chefs themselves) go to the terminals to purchase product. Other seafood sourcing pathways include buying directly from fishers, going directly to landing sites to buy fresh seafood, and buying product from supermarkets or local markets in Lima⁶.
- Finally, **end consumers** purchase benthics as restaurant customers or at supermarkets and smaller local markets for home consumption (e.g. ‘damas de la casa’ or housewives).

6. López et al. 2018. Bringing sustainability back to the table: exploring chefs’ knowledge, attitudes and practices about seafood in Peru. https://www.researchgate.net/publication/328074675_Bringing_sustainable_seafood_back_to_the_table_Exploring_chefs'_knowledge_attitudes_and_practices_in_Peru.

* To be clear, there are two types of middlemen in these supply chains: (1) buyers, who buy product from fishers at landing sites and transport it to terminals, and (2) providers, who buy product at terminals and deliver to restaurants. The term “middlemen” used in this blueprint includes both types.

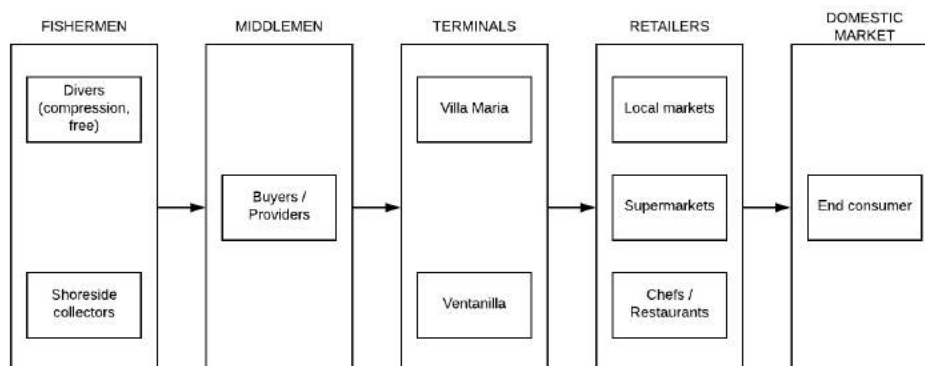






Figure 3. Simplified depiction of the typical flow of Peruvian benthic products in the domestic market. Sources: Christensen et al. 2014 report and interviews with fishers, middlemen, chefs, and NGOs.



CURRENT STATE AND DESIRED FUTURE STATE

Based on an analysis of (1) what and how progress is being made, (2) why and how initiatives and stakeholders are stuck, (3) what drives the behaviors we see in the system, and (4) where there is opportunity for improvement, we identified strategic intervention areas to progress the benthic fishery toward an improved future state. A summary of stuck points, assets, and tensions identified in the benthic fishery, specifically related to unlocking new or additional value in managed access benthic fisheries supplying domestic markets, can be found in **Appendix B**. The future state vision imagines how an improved system might function ten to fifteen years into the future, **after the blueprint has been executed**, and provides a reference point to which the solutions outlined in this document can be targeted. Our guiding question, which informs the future state, is: **How might we connect benthic fishers that practice responsible management with domestic markets that value these products?** Table 2 compares the current and future states per supply chain node.

Table 2. Contrasting current and future state visions specifically related to connecting managed access Peruvian benthic communities to domestic markets that value their responsibly-managed products.

	Current State	Future State
Fishers 	<p>Fishers lack direct access to markets due to logistical, financial, and capacity limitations. Artisanal fishing groups want to enhance their role in commercialization, but lack marketing savvy, business knowledge, and training. Some NGOs (such as TNC in Ancón) have been filling this need with their work to improve management and increase organizational capacity, but there remains space for more targeted efforts to improve commercialization.</p> <p>Fishers also lack access to infrastructure that would allow them to properly maintain product quality, meaning they must sell product immediately to prevent spoilage.</p>	<p>Entrepreneurial training and business plan development has allowed willing and interested fishers to have a more direct role in and control of the movement of their product downstream (e.g. transporting, selling, and/or processing).</p>

	Current State	Future State
	<p>Finally, fishers lack access to capital, which hinders financial independence. They do not have sufficient funds to re-invest in inputs to support fishing activities, which limits long-term planning and forces them to rely on buyers for advances to cover input costs.</p>	<p>Infrastructure improvements now maintain product quality, giving fishers more negotiating power by eliminating the need to sell immediately to avoid spoilage.</p> <p>Benthic fisher associations have become legally registered entities with access to capital (e.g. grant funding, bank loans), facilitating financial freedom. Access to funds has allowed fishers to achieve specific goals (e.g. re-investing in inputs to support fishing activities, developing a processing facility), allowing them to use the association as a vehicle for commercialization.</p>
Middlemen 	<p>Middlemen are in a position of power on both ends of the supply chain. They play both logistical and broker roles, including orchestrating deals, negotiating price with both fishers and retailers, and coordinating logistics between landing sites, terminals, and restaurants/ supermarkets. Restaurants rely on middlemen as their primary seafood suppliers to avoid the complex logistics associated with the daily distribution of fresh seafood. Because of their intermediary position, middlemen have unequal access to information regarding seafood diversity and availability and prices at the terminals, and thus outcompete fishers trying to venture into seafood trade. Moreover, middlemen are not regulated by law and the government lacks data to properly understand and monitor their role in the supply chain.</p> <p>Each fishing community has its designated buyers, with whom they have cultivated trusted business relationships. In some cases, fishers are dependent on buyers to finance input costs to cover fishing activities. Similarly, chefs feel the need to maintain suppliers that cater to their needs (particularly their quality standards).</p>	<p>Responsibilities and expectations of intermediary roles have been clearly defined and acted upon to best ensure verified responsible products reach their destination. This means some may have opted to eliminate middlemen and restructure their supply chains, whereas others may have decided to keep their value chains intact and entrust intermediaries to deliver responsibly-managed products to domestic markets.</p> <p>The power the middlemen currently own has dissipated and is more evenly distributed throughout these supply chains. This intermediary position, whether occupied by middlemen or other actors, is more closely monitored and acts in accordance to and within a governing system, thereby diminishing markets for unsustainable seafood.</p>
Terminals 	<p>Before product even arrives at the market, it may have already exchanged hands multiple times. Once at a terminal, any data collected at landing sites (and retained) is lost as product from different locations is pooled together. Consequently, the origin of marine resources cannot be identified with precision, potentially decreasing value and increasing risk for the final consumer. In addition, once in the market, it becomes increasingly difficult to track where product ultimately ends up. There is little product differentiation other than the keen eye of the buyer for premium quality and best price.</p>	<p>Products are differentiated based on predetermined standards (whether they be based in quality, best practices, or sustainability). Differentiation is verified by some type of traceability (e.g. a physical location that receives, verifies, and sells responsibly-managed products, a QR code for product tracking).</p>
Retailers 	<p>Many chefs have expressed interest in sourcing responsible products, yet they are unclear where most purchased products originate; they buy almost exclusively through terminals, where product is aggregated and information is lost. Further, many chefs perceive the transition towards sustainable seafood to be risky because Peruvian consumers strongly prefer certain species over others, and they do not value sustainability. They also view this transition as costly in terms of time and energy required to find and build trusting commercial relationships with sustainable suppliers. Additionally, many prefer not to buy directly from fishers because they view them as not being reliable, and equate lack of organization with an inability to consistently supply high-quality fish.</p>	<p>Chefs, restaurants, supermarkets, and local markets advocate for and demand sustainably-sourced and traceable seafood, and promote the benefits and importance of sustainable seafood consumption.</p>

	Current State	Future State
	While there are some supermarkets who claim to sell sustainable products, there has been limited direct engagement with them, with some NGOs recently starting to have conversations to explore their interest in being involved in sustainability efforts. To our knowledge, local markets, who sell the majority of fresh, local seafood to Peruvian consumers, have not been yet been fully engaged.	
End consumers 	<p>Consumer preference is the main driver for seafood selection by chefs and supermarkets – specifically, they opt for species commonly demanded by Peruvians. These choices, for better or worse, then trickle down the supply chain.</p> <p>Chefs claim that Peruvian consumers do not value sustainability, and their preferences are not based on quality and taste. Rather, it seems to be about familiarity and status. This strong preference might explain why some restaurants have shied away from incorporating the ‘catch of the day’ moniker on their menus⁷. On the other hand, tourists do not have major preferences, and “eat what you give them.” This suggests that Peruvians, not tourists, are driving domestic market demand, implying more research into consumer choices is needed.</p> <p>In supermarkets, ‘white’ fish is revered due to its mild flavor (and thus popularity among children), and thus foreign species like tilapia are among the most popular products sold.</p>	<p>Peruvian consumer choices are well understood. Based on this research, sustainability has been successfully incorporated into domestic demand.</p> <p>Widespread consumer awareness on the impacts rigid consumption patterns have on the depletion of vulnerable resources leads to a movement toward a more varied palate and increased diversity in demand by restaurant, supermarket, and local market goers. Because familiarity and status seem to be key drivers of preference, consumer awareness campaigns may benefit from incorporating these elements (e.g. lead with familiar species and the importance of their sustainability, promote sustainability as a characteristic to be desired, boost “status” of less preferred species).</p>
Governance / Regulatory Framework 	<p>Regulations remain vague in theory and in practice, and key metrics (such as landing statistics), are likely incomplete and inaccurate. Additionally, open access and the sheer size of the artisanal fleet pose challenges to enforcement and monitoring. Despite decentralization in recent years, there is misalignment among national and regional governments, with each oftentimes pushing conflicting regulations. The system is thus undermined on multiple levels with respect to effective management of benthic fisheries: biology and policy do not always align, and authoritative roles and responsibilities are unclear. Further, the national government tends to largely ignore benthic fisheries in favor of high-volume, more profitable stocks like anchoveta, mahi mahi, and jumbo squid, despite their relative value per volume. These conditions threaten the health of the resources and the well-being of fishers reliant on these resources for their livelihood.</p> <p>Despite (and perhaps because of) these governance setbacks, many benthic fishing communities have, with the help of NGOs, taken it upon themselves to manage their own local resources. Several have created their own governance models, control rules, and enforcement systems. These efforts have caught the attention of the national government (they have identified these communities as initial targets of the formalization effort), and NGOs like TNC and Peruvian Society for Environmental Law (SPDA) are working with both the government and fishing communities to implement exclusive access rights for these self-managing communities.</p>	<p>National and regional governments are aligned and proactive in supporting the development of the artisanal benthic sector, bolstering fishing community efforts to manage their benthic resources (e.g. via exclusive access) by backing them with legally-recognized policies. Specifically, the Ministry of Production (PRODUCE) has passed a national policy for benthic resources using a regulatory framework for co-management schemes.</p>

The following section highlights the types of value that could be unlocked or maximized in order to overcome current state barriers and progress the Peruvian benthic fishery toward an improved future state.

7. Sueiro, J.C. and De la Puente, S. 2015. *La pesca artesanal en el Perú: Diagnóstico de la actividad pesquera artesanal peruana* (Segunda Edición)

Value & Investment Potential

Creating and sharing value in the fishery is essential to gaining buy-in from fishers and supply chain stakeholders, and for gaining access to private capital that can scale interventions beyond what grants can support. Future of Fish assesses the value potential of a fishery across four categories (**Figure 4**): (1) increased stock biomass and catch yields, (2) improved efficiency and quality, (3) optimized products and markets, and (4) externalized benefits for fishers and communities. This is a high-level, rapid assessment to determine where and how value could be created and/or unlocked, thereby defining the potential for productive engagement in a fishery and guiding opportunity discovery. The valuation method is empirical and qualitative, and improvement potential is estimated based on performance benchmarks (e.g. percent efficiency improvement that is deemed possible per node) based on our past experience in diverse supply chains. Observations were made in Ancón and Marcona, and are, for the purposes of this analysis, assumed to be representative of other benthic supply chains in Peru.

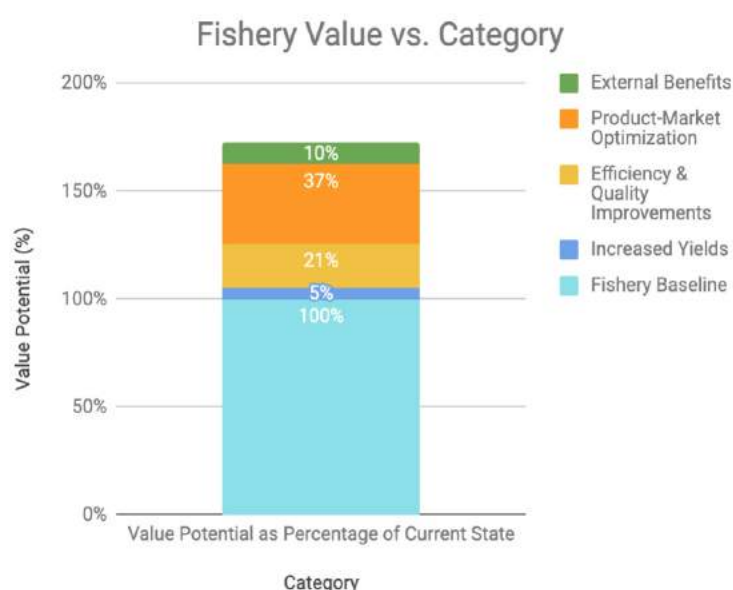


Figure 4. Value potential of the Peruvian benthic fishery as percentage of current fishery value.

Based on our analysis, from a value perspective, the Peruvian artisanal benthic fishery is best characterized by its potential to become more highly valued in the market, and for products to be optimized for market demand. High-level analysis of the product-market optimization opportunity present in this fishery suggests up to a 37% improvement could be realized over the baseline fishery value (estimated at 685 million USD in 2015 based on total landings and average benthic pricing). This could include premiums for storied and/or certified product, creation of new end markets, and/or optimization of product forms against buyer demand. The efficiency and quality opportunity demonstrates the second highest potential, and suggests up to a 21% improvement could be realized over the baseline fishery value. This could include improving efficiency and quality of operations at key nodes, waste reduction, and/or shortening supply chains. Total value-add across all categories is estimated at 73%. See **Appendix C** for a breakdown of value by category⁸.

Because the Peruvian benthic fishery demonstrate the highest value potential in product-market optimization and efficiency and quality improvements, the solutions proposed in the following section focus heavily on unlocking or adding value in these two key areas.

8. Future of Fish has developed a fishery valuation scorecard to estimate the value potential of a fishery at a high level, based on common, known sources of value. The scorecard provides a default benchmark, based on our experience in both best practice and developing fisheries. Ideally, these default benchmarks are replaced with primary fishery data collected by government non-profit agencies to derive a more accurate estimate of value, as we have tried to do in the context of Peru. However, where data is unavailable, the default benchmarks—intended to be conservative estimates—are used. These calculations represent this high level analysis for this fishery and should not be seen as an absolute certainty, but rather as a potential space within which we can work to create additional untapped value. As an example, we see value potential not only in price increases but also in quality improvements and in creating efficiency within the supply chain at various nodes. The realization and distribution of these gains depends on the interventions implemented and the dynamics of the fishery system. More detailed calculation methods are available upon request.

Proposed Solutions

THEORY OF CHANGE

Future of Fish's Theory of Change asserts that in any system, the desired future state will require multiple interventions across three levels: community, enabling, and system (**Figure 5**). Just as no single solution can act as a silver bullet to drive change within complex systems, so too do solutions need to push on different levels of the system in order to affect change. Working in concert, this approach builds the large-scale capacity needed across the system, while also targeting acute challenges within specific components of that system.



Figure 5. Future of Fish's approach in implementing its Theory of Change includes a balanced focus of interventions and solutions in all levels of the system: community, enabling and system.

Community solutions are oriented towards directly meeting the needs *within fishing communities*, to reward responsible fishing practices. Solutions are centered around pilot projects created through co-design to improve and maintain livelihoods, and which are grounded in each community's unique strengths and interests. **Enabling solutions** are designed to address gaps consistently seen *across fishing communities*, and include tactical initiatives that work within the existing system to catalyze progress. Enabling solutions build capacity and collaboration across supply chain actors while finding ways to make resources accessible to replicate successful models. **System solutions** focus on creating big-picture solutions that *cross communities and geographies*, and may include innovative business and operating models, unlikely alliances across industries and organizations, efforts to attract new resources to fisheries transformation, and applying disruptive technologies that allow effective innovations to scale.

PERUVIAN BENTHIC FISHERY DOMESTIC MARKET SOLUTIONS

Future of Fish has developed a set of domestic market solutions that are intended as a guide for how to effectively unlock new or additional value in the managed access benthic fishery. We intentionally aimed to identify **system** or **enabling** level solutions—by definition these are not specific to a particular community or supply chain, but are opportunities that could directly drive domestic market initiatives that boost the prevalence and verification of responsibly-managed seafood products in the Peruvian marketplace, support sustainability across multiple benthic communities and/or supply chains in Peru, and reward sustainable practices and the actors upholding them. We would then explore how to best develop community-specific interventions that stem from these higher-level system and enabling solutions by collaborating closely with local partners already working in these communities as well as stakeholder groups, whether it be creating new or building on existing community level interventions (more information on these partnerships and how they apply to these solution areas can be found in the ‘Partnership and Stakeholder Mapping’ section beginning on p. 26).

An overarching theme we identified in the Peru benthic fishery is a lack of market differentiation for responsibly-managed products, and an absence of awareness about what the term “responsibly-managed” actually means. Quality, however, is a familiar term and is of utmost importance to chefs, meaning quality could be a strong driver for the implementation of responsible practices and sourcing, and could serve as the basis for differentiating the sustainable from the unsustainable.

We identified four overarching solution areas, within which interventions can be designed to help unlock value in benthic fisheries and supply chains, and promote improved value of responsibly-managed products in the domestic market. For each solution, we note the underlying problem and rationale (“The Challenge”), supporting forces and potential impact (“The Opportunity”), and opposing forces or risks (“Potential Risks”). Additionally, each recommendation includes a set of suggested interventions that range from system-wide initiatives to specific pilots. According to our Theory of Change, overall success will be most likely when several (if not all) of these interventions are implemented in coordination with others across each of the four solution areas.



SOLUTION 1: Assess and Identify How to Differentiate and Generate Demand for Responsibly-Managed Products

The Challenge: Currently, neither market differentiation nor large-scale demand for responsibly-managed products exist in Peruvian domestic markets. Additionally, a

lack of market research on seafood trends in Peru makes it difficult to determine the best way to create more demand for these products. This is an issue for fishers who are trying to make their responsibly-harvested products stand out, and for chefs who may be trying to find them.

The Opportunity: Chefs are looking for quality products and showing interest in supporting sustainability, with many stating the need for a mechanism to differentiate the sustainable from the unsustainable. Determining values and products/product forms that resonate with domestic markets will inform how to best generate demand for responsibly-managed products. Better information on what consumers care about and what chefs need will help identify: (1) better markets for responsible benthic fishers, (2), attributes to highlight in targeted branding for Peru clientele, and (3) product forms to push into pilots. This is key in ensuring better match in supply and demand as opposed to making assumptions or guesses about what may or may not resonate in the end market. For example, because chefs emphasize the importance of quality and health over sustainability, perhaps differentiating products based on the former while embedding the latter would be more palatable.

Potential Risks: High-level market research (particularly that focused on consumer behavior) can often be expensive and time-consuming, but not always that insightful. Current seafood market analyses are often done at both global and regional levels, meaning the results are not granular. The best consumer behavior research is based on real consumer analytics tracked over time, which can be costly and time-consuming. Firms in the U.S., especially in emerging seafood markets, have dedicated consumer analytics teams that spend hundreds of thousands of dollars annually trying to understand consumer buying preferences.

Intervention Ideas: Apart from a subset of chefs who have shown interest in sourcing sustainably, generating large-scale demand for these products requires assessing whether or not responsibly-managed products would resonate with these markets, then creating a differentiated market for fishers who possess them and a mechanism for the end market to locate them. This could include:

- Market research to identify what it would take to build a market for responsibly- managed products. This includes determining the approaches and values that are most likely to resonate with chefs, supermarkets, and consumers based on current trends and cultural preferences to inform branding and product development.
- Product transformation pilots to test and identify new products or product forms that are likely to resonate with chefs, supermarkets, and consumers.
- Establishing a physically separate distribution center (whether a section of an existing terminal or a completely new terminal) that receives, verifies, and sells sustainable seafood only. Some chefs stated the need for a physical location where they can find sustainable product with ease and efficiency. Traceability would need to be a core component to verify products entering the center as responsibly-managed, meaning it could also serve as a data collection point. This center could be run by an OSPA, an independent company, the government, or some other entity.



SOLUTION 2: Support Direct Relationship-Building Between Fishers and Chefs

The Challenge: Several chefs have expressed interest in purchasing seafood directly from fishers. At the same time, most do not currently buy from them directly,

claiming that fishers do not supply desired fish consistently, fail to meet their product quality and/or handling standards, and do not provide proof of transaction. There is also the issue of arranging and coordinating logistics between landing sites, terminals, and restaurants; a service currently provided by middlemen, who release both fishers and chefs from the complex logistics and paperwork associated with the daily distribution of fresh seafood. Most fishing communities are separated by large physical distances from their target markets, making direct relationships (e.g. selling or transporting directly) difficult.

The Opportunity: Both fishers and chefs have clear ideas about what they want: fishers desire logistical support, chefs want quality maintenance and consistent supply. Bringing these stakeholders together would allow them to discuss their individual needs and explore potential overlaps that could benefit both parties. Specifically, direct relationships allow for better matching of supply abilities with demand needs, meaning fishers receive valuable information regarding what chefs need and/or look for so they can better meet demand. It also allows for exploring how each could leverage these relationships for business gains. For example, direct relationships give chefs insight into fisher practices and lifestyle—details that chefs can use to enhance their clients dining experiences by providing story with their seafood, potentially driving more sales and higher pricing while also helping to amplify fisher voices. Finally, face-to-face meetings build trust, which helps to secure loyalty and long-term success.

Potential Risks: Currently, most fishers and chefs do not know one another because middlemen are prevalent, and function as the link between them. Middlemen may feel threatened by direct relationship-building—even if it is not about shortening supply chains—and fear of jeopardizing these relationships may cause both fishers and chefs to hesitate when exploring more direct avenues. Overcoming this fear and helping fishers and chefs to see the potential value in more direct relationships (and perhaps exploring ways for middlemen to benefit as well) is key. There is also a tendency to be risk averse and return to what is familiar. This solution area is not necessarily about restructuring supply chains and eliminating middlemen, but instead is about both chefs and fishers being open to exploring a closer connection with one another to develop understanding, trust, and perhaps joint initiatives and/or more direct business relationships.

Intervention Ideas: Initiatives that bring fishers and chefs together might include:

- Fisher and chef co-authored cookbooks or YouTube channels featuring traditional recipes.

- Fisher-chef “speed-dating” workshops.
- Chef-driven initiatives rooted in fishing communities.
- Chef and fisher in-person exchanges, “a day in the life” experiences (e.g. fishers take chefs out on their boats, chefs invite fishers into their kitchens), storied fish dinners featuring products from local fishing communities and storytelling attached on the culture and history of the region and/or fishing method.



SOLUTION 3: Align Sustainability Efforts Across Peru to a Common Standard

The Challenge: Peru’s thriving foodie culture does not yet include sustainability. There is a lack of awareness of what the terms “responsibly-managed,” “sustainable,” and “traceable” actually mean, resulting in varying definitions. For example, some people view respecting size limits or closures, shortening of supply chains, or buying “healthy” or “fresh” product as equal to sustainable. Confusion around terminology leads to mixed messages, uncoordinated efforts, and potential greenwashing when it comes to sustainable seafood.

The Opportunity: Many chefs are aware of the negative consequences that human activities have on the ocean, and believe that restaurants have the obligation to become part of the solution. Leaders are emerging who want take a stance and promote responsibly-managed fisheries, especially in the culinary space, but they are currently ill-equipped to do so. The gastronomic movement can be leveraged to promote generation of a standard based in sustainability, with chefs using their influence to socialize and popularize sustainable local seafood. Creating a strong, unified definition of sustainability for Peruvian seafood will enable market interventions such as branding and storytelling to have greater impact in the end market. It also roots the system in sustainability long-term, promoting responsibility among supply chain actors and thereby ensuring resource preservation into the future.

Potential Risks: Many chefs claim sustainability is important to them, yet product knowledge (e.g. origin, date harvested) is limited. The newness of the sustainability movement leaves opportunity for exploitation and greenwashing, where actors may willingly take advantage of a trend without demonstrating any real progress. In addition, building such a standard requires significant effort and time, and chefs’ busy schedules mean long-term engagement to move this forward could be a challenge. Finally, many chefs perceive the transition towards sustainable seafood to be risky because Peruvian consumers strongly prefer certain species over others and they do not value sustainability, so changing demand to more sustainable products could be a heavy burden.

Intervention Ideas: Creating a Peruvian seafood standard might include:

- Forming a group of leaders composed of members of the Peruvian gastronomic community by creating a dialogue on various topics related

to sustainability based on the needs of members of this community, then proposing potential solutions that must be developed to promote innovation and change in this sector.

- Developing and strengthening top chefs' capacities to advocate for and demand sustainably-sourced seafood, for example by facilitating learning exchanges between Peruvian chefs and other leading chefs around the world who participate in chef-led seafood sustainability programs (e.g. James Beard Foundation SmartCatch Program, Monterey Bay Aquarium Seafood Watch Restaurant Program, Asian Seafood Improvement Collaborative).
- Promoting certification of origin and best practices by defining agreed upon best practices (e.g. quality maintenance, product handling) to streamline uniformity in product standards, then determining metrics for defining product quality based on species and product type and implementing an industry-wide regulation based on this standard.
- Promoting flexibility in demand to match variability in supply as opposed to consistently demanding the same species (e.g. widespread use of 'catch of the day' moniker) by educating chefs and consumers about species other than those most commonly preferred.
- Developing seafood sustainability campaigns by building on and expanding existing initiatives to raise awareness and spread knowledge through restaurants, schools and public campaigns.
- Using traceability technology and labelling mechanisms, for example QR codes, to ensure legality and provenance.
- Leveraging existing effort to classify ceviche as a UNESCO world heritage product. Peru is aiming to label ceviche as an immaterial UNESCO world heritage with the goal of not only differentiating Peruvian ceviche.
- Training sustainability ambassadors in culinary school programs.



SOLUTION 4: Capacity-Building to Enhance Fisher Role in Commercialization

The Challenge: Many artisanal fishing groups want to enhance their role in commercialization, but lack the capacity to execute. Additionally, fishers face logistical

barriers—most fishing communities are separated by large physical distances from their target markets and also lack access to infrastructure to maintain quality properly (only a few landing sites, such as Pisco, have cold storage facilities). This means they must sell their product quickly to prevent spoilage, giving them very little negotiating power in their relationship with buyers. Finally, fisher associations do not have sufficient funds to re-invest in inputs to support fishing activities, and they are unable to access capital (e.g. grant funding, bank loans) because most are not legally registered entities.

The Opportunity: Many fishers want and are asking for ways to enhance their

role in commercialization. Targeted efforts to support fishers in strategic business development, entrepreneurial training, and building organizational capacity could grant fishers market access via differentiated product based on quality improvements made through small investments. This, in turn, could result in business benefits such as having greater control over product maintenance, being able to market high-quality products, having more control over supply based on storage capacity, and increased power in the marketplace. Such initiatives would build upon existing efforts (such as that of TNC in Ancón and the government program Programa Nacional A Comer Pescado (PNACP) in other fishing communities) to increase fishers' direct involvement in transporting and selling their products.

Potential Risks: Old habits die hard, and helping fishers transition to new commercialization approaches will require education, training, and a secure market (note dependency on Solution Area 1) to realize change. Additionally, in some cases fishers are most suited to fishing and not to commercialization. Also, middlemen often outcompete fishers trying to venture into seafood trade because they have occupied this intermediary space for a long time, and thus have unequal access to market information and long-term relationships with both restaurants and supermarkets. Finally, many fishers are reluctant to obtain a tax code (RUC) because they fear incurring taxes or fees. However, obtaining a RUC would allow them to use the association as a vehicle for commercialization via access to capital.

Intervention Ideas: Building fisher capacity to support their role in commercialization might include:

- Providing training and resources to support fishers as competitive supply chain actors who are able to expand their businesses further downstream.
- Collaboratively conducting business analyses to determine return on investment (ROI) of taking on greater responsibility and roles in the supply chain. This includes cost benefit analyses to determine which additional components produce more value for fishers and do not result in increases in operational costs that cannot be recouped.
- Redesigning current practices to reduce waste and drive improvements in product freshness, quality, and value in the marketplace. For instance, redesigning basic handling and processing techniques (e.g. better cold chain storage such as trucks with ice/refrigeration, landing site storage) could lead to significant value recapture for multiple species—practices that could spread to fishing communities along the coast.
- Demonstrable market differentiation based on new product development through low capital value add (e.g. non-soaked octopus, hygienic snail processing).
- Building community-based brands, improved storytelling, and marketing based on storied fish and communities.

DESIGN PARAMETERS

Design parameters serve as guides for how to best design a solution so as to maximize the likelihood of success and effectiveness. Design parameters can be thought of as the non-constrictive walls of a container within which interventions can be constructed, or an overarching checklist: the more parameters included, the greater the chances are the design will work well in the system.

Design Parameter 1: Support Fishers in Formalization

Because formalization is expensive and difficult to navigate, many benthic fishers are still not formalized. Linking formalization to some type of benefit (e.g. access to grants, bank loans) will help fishers to not only receive a benefit they desire, but to actively engage in the formalization process by perceiving it as valuable to them rather than obligatory. We see formalization as a required condition to participate in a given initiative, or as a “stick” to get to a “carrot” (e.g. requiring a fisher association to formalize in order to access capital or participate in product differentiation initiatives). The Regional Fisheries Livelihoods Programme for South and Southeast Asia (RFLP) did something similar when implementing livelihood initiatives; locals had to join a fisher association in order to participate in livelihood programs. They found that this approach incentivized engagement while promoting local buy-in and longevity⁹.

Design Parameter 2: Incorporate Short-Term Gains into Initiatives to Attract & Retain Buy-In

Because long term benefits are often not a strong incentive to gain fisher buy-in, incorporating short-term gains that demonstrate quick returns is key. This approach can capture fisher interest and incentivize participation in initiatives. An important first step is to identify community incentives of value (e.g. access to working capital, healthcare, education, fishing equipment), followed by finding ways to turn these values into short-term gains. Finally, access to those benefits must be linked to project involvement, and interventions that can offer quick returns on these benefits should be prioritized as a way to build engagement and commitment to projects. Initiatives that demonstrate immediate returns may also influence collective action, meaning fishers in neighboring communities may be motivated to follow suite.

Design Parameter 3: Incentivize Better Data for Marketing

Current efforts push the argument that better data collection is needed for management. While true, this frames data collection as a burden to fishers who are not rewarded by the market for more information. Demand for data in Peruvian markets does not exist (other than basic information such as species, volume, and price), meaning there is no reward and thus data collection does not directly benefit fishers. But there are business benefits to better

9. FAO. 2012. *Regional Workshop on Lessons Learned and Best Practices: Post-harvest; Livelihoods Enhancement and Diversification; and Gender Mainstreaming. Regional Fisheries Livelihoods Programme for South and Southeast Asia (RFLP) Field Project Document*. <http://www.fao.org/3/a-ar471e.pdf>

data that markets can support. Framing data collection as a way to achieve and verify other characteristics the market is demanding (e.g. ensuring products are legal, high-quality, and sanitary/from a contamination-free site) can incentivize supply chain actors to require, reward, and benefit from data. An important first step would be determining the types of data the market is likely to reward, which could be assessed and tested during market research to identify approaches, values, and product forms that are most likely to resonate with the end market in Solution 1. Access to these traceable products could then be restricted to those abiding by responsible management and data reporting rules. This could provide an incentive for fishers to collect data, and for supply chain actors to request this data as it could allow them to enjoy business wins by ensuring their standards are met consistently.

ROADMAP

Taken together, the solution areas proposed set a vision for fishery transformation towards sustainable Peruvian benthic fisheries that span a 5-10 year timeframe (short-term = 0-2 years, medium-term = 2-5 years, long-term = >5 years). Successful execution requires close partnerships, extensive collaboration, innovative approaches, and potential policy changes over time. A roadmap highlighting how these interdependent strategies can support and build on one another is shown in **Figure 6** below.

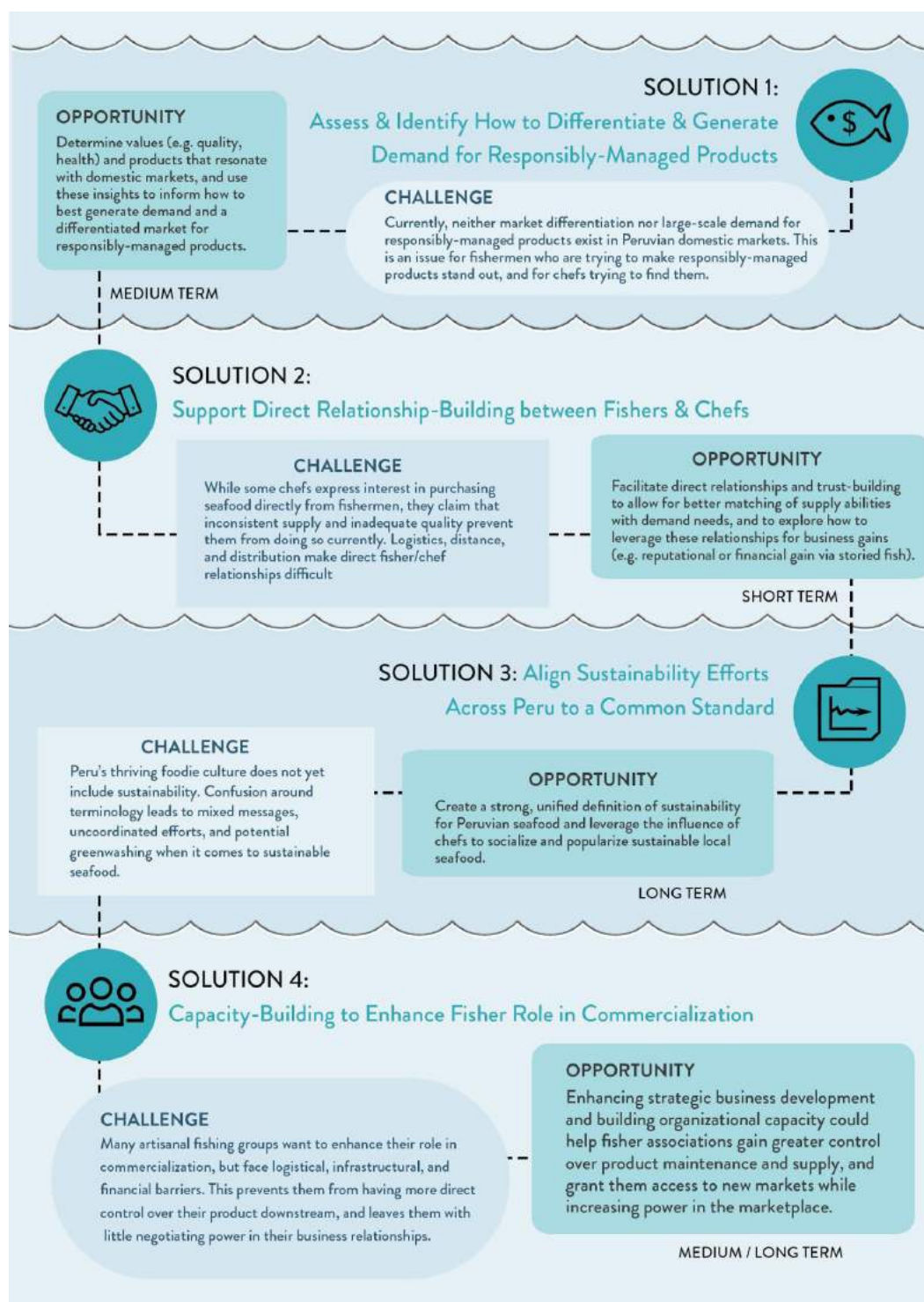


Figure 6. The four domestic market solutions we identified, including the challenges to overcome and the opportunities to capitalize on, for unlocking value in the benthic fishery. Specific focus is on connecting benthic fishers that practice responsible management with markets that value these products.

These solution areas are pushing on different parts of the system, yet all relate to and build on one another. **Solution 1** is critical from a knowledge standpoint, as market research outcomes will both affect and inform the approaches required in all other solution areas. A better understanding of values and products most likely to resonate with the end market (e.g. consumers, chefs, supermarkets) will allow fishers and chefs to develop concrete ideas, based on the realities of market trends, when exploring how each could leverage direct relationships for business gains (**Solution 2**). For example, Solution 1 would shed light on whether storied fish (e.g. providing story about the product, including fisher practices and lifestyle) is something consumers care about, which would inform if this is a viable approach worth pursuing. In addition, better information on what consumers, chefs, and other retailers care about will help identify attributes to highlight in creating a strong, unified definition of sustainability for Peruvian seafood (**Solution 3**). For example, market research conducted as part of Solution 1 may further highlight the importance of quality and health, implying that leading with these characteristics when setting a sustainability standard would be more palatable. Finally, better information on what consumers care about and what chefs need will help identify ways in which responsible benthic fishers looking to enhance their role in commercialization can differentiate their products and/or gain access to better markets by determining values to highlight and product forms to push into pilots (**Solution 4**).

Fostering direct relationships between fishers and chefs (**Solution 2**) would allow for both parties to share their respective knowledge about opposing ends of the supply chain, thereby providing a powerful mechanism for determining how to best match supply with demand as opposed to making assumptions or guesses about what may or may not resonate in the end market (**Solution 1**). This, in turn, would allow fishers to better understand commercialization efforts worth pursuing based on the needs of their target market (**Solution 4**) while also bringing together key actors in creating a sustainability for Peruvian seafood (**Solution 3**).

Uniting members of the Peruvian gastronomic community around generating a sustainable seafood definition (**Solution 3**) would allow for targeted learning exchanges around generating demand for responsibly-managed products (**Solution 1**) by bringing key supply chain actors together to share their unique expertise on domestic market dynamics. Working on setting this standard together could support direct relationship-building between fishers and chefs (**Solution 2**) by helping them to identify common ground and define a shared goal that drives both their individual and joint efforts. It could also provide guidelines around best practices that benthic fishermen must include in order to satisfy a sustainable product standard, thereby providing direction when exploring potential pilots to enhance their role in commercialization (**Solution 4**).

Lastly, building capacity in fishing communities (**Solution 4**) would help fishers to be better equipped to enhance their role in commercialization once the most promising ways for generating demand for responsibly-managed products have been identified (**Solution 1**) and a sustainability standard has been defined (**Solution 3**). It would also allow fishers to better uphold

practices set by this standard. Finally, fishers would be able to better meet chef needs by having the ability to consistently meet their product quality standards and be more transparent about availability in supply, helping to build trust and promote direct relationship-building (**Solution 2**).








We believe the four solution areas proposed above are ripe for development. In the following section, we discuss key stakeholders and partners that we perceive to be important in moving these initiatives forward in the Peruvian benthic fishery.









































Partnership and Stakeholder Mapping







We have identified a broad universe of stakeholders that influence and engage in the benthic fishery and associated value chains. Table 3 below outlines key stakeholders and potential partners relevant to implementing domestic market initiatives in benthic supply chains, specifically related to the four solution areas we have proposed. Each stakeholder is described as follows:

1. Key grouping into which the organization falls;
2. Where they fall in the community, enabling, and system level categorization; and
3. How each organization fits into our four solution areas, either directly or indirectly.

Table 3. Key stakeholders and potential partners relevant to implementing domestic market initiatives in benthic supply chains, and their perceived alignment with our four proposed solution areas.

Category	Organization	Level of Engagement	Solution Areas
Local supply chain actors	OSPAs (Organizaciones Sociales de Pesca Artesanal): There are over 1,000 OSPAs, or fisher associations, along the entire coast of Peru. They typically are composed of members of a single fishing community.	Community	   
	FIUPAP (Federación de Integración y Unificación de los Pescadores Artesanales del Perú): The largest and most politically active artisanal fishing organization in Peru, FIUPAP is made up of over 200 OSPAs and represents approximately 45,000-60,000 artisanal fishers.	Enabling/System	  

Category	Organization	Level of Engagement	Solution Areas
Local supply chain actors	ANEPAP (Asociación Nacional de Empresas Pesqueras Artesanales de Perú): The second largest artisanal organization, ANEPAP is an association of boat owners that works with private and public sectors to leverage investments for the artisanal fishing sector.	Enabling/System	   
	APEGA (Sociedad Peruana de Gastronomía, Peruvian Society of Gastronomy): Founded in 2007, APEGA is a nonprofit institution whose goal is to “bring chefs, gastronomes, nutritionists, restaurants, researchers, food writers, cooking training centers, and universities together” in an effort to elevate Peruvian cuisine.	Community/Enabling	   
	ARMAP (Asociación de Restaurantes Marinos y Afines del Perú, Association of Marine and Allied Restaurants of Peru): ARMAP is an association of ceviche restaurants whose objective is to promote ceviche as the representative dish of Peru at both national and international levels.	Community/Enabling	   
	Chefs and Restaurants: Buy and sell seafood products to local and foreign consumers.	Enabling	   
	Supermarkets and Local Markets: Buy and sell seafood products to local consumers.	Enabling	   
	Restaurant Providers: Buy seafood products from fishers and sell to restaurants; could play a supportive role in upholding branding, optimized value, and sustainability standard as a middleman between fishers and chefs.	Community/Enabling	   
Government programs	PNACP (Programa Nacional A Comer Pescado, To Eat Fish): A program of the Ministry of Production, PNACP works to encourage, consolidate, and expand domestic seafood markets intended for direct human consumption. PNACP's 'De La Red a La Mesa' project aims to expand the role of artisanal fishers in commercialization by connecting them directly with better-paying markets.	Enabling/System	   
Peruvian NGOs	REDES: Building on past work mapping Peruvian seafood preferences with Oceana and Villy Christensen of UBC, REDES is interested in exploring factors that affect consumer behavior towards sustainable fish on the 'mesa popular'. Their goal is to address protein and nutrition consumption in Peru, and to promote greater domestic consumption of seafood.	Community/Enabling	   
	SPDA (Sociedad Peruana de Derecho Ambiental, Peruvian Society for Environmental Law): SPDA is providing guidance to PRODUCE in reforming Peru's fisheries legal framework to support formalization of and establish rights-based management (RBM) for the artisanal fleet.	System	   
	NCI (Naturaleza y Cultura Internacional, Nature and Culture International): NCI's goal is to protect Peru's biologically diverse ecosystems while supporting local efforts. They strive to help local communities find and sustain livelihoods based on thriving ecosystems, and recently partnered with DIREPRO in a pilot to assist in registering vessels.	Community	   

Category	Organization	Level of Engagement	Solution Areas
	Pro Delphinus: Pro Delphinus works in fishing communities to spread knowledge about environmental issues, to promote conservation of macrofauna, and to help fishers accomplish community-specific goals.	Community	 
International NGOs	TNC (The Nature Conservancy): In previous years, TNC visited 20 coastal sites in which several fisher associations had self-imposed management measures, and is now supporting PRODUCE in the development of a regulatory framework for benthic resources based in co-management, collaborating with SPDA on the legal aspects. TNC has a strong presence in Ancón, and has spent the last several years focusing on capacity-building.	Community/Enabling	 
	Oceana: Oceana focuses its efforts on directed campaigns that advocate for science-based fishery management. Building on past work with REDES and Villy Christensen of UBC, Oceana continues to map and analyze Peruvian seafood value chains, has collected information on site-based seafood preferences, and is leading a campaign on combating fraud in supply chains.	Enabling/System	 

The section that follows highlights where financial resources in Peru fisheries transformation work are currently focused, and will help us to assess where we might gain traction for future funding and determine where and how funds need to be focused in order to move these solution areas forward.

Financial Landscape Analysis

A blended finance approach is recommended to fund interventions in complex fisheries systems, in alignment with the *Principles for Investment in Sustainable Wild-Caught Fisheries*. Blended finance is defined as “a strategy to leverage philanthropic and development capital to crowd-in private investment in the pursuit of sustainable development goals.” Where typical grant funding supports efforts that lack a strong financial return but are necessary for progress, blended finance seeks to remove systemic barriers that prevent the flow of private capital. To apply this approach, we engage diverse funders, including national, regional, and municipal grantors, in the co-design of interventions and in business planning with stakeholders.

We conducted an initial funding landscape to map funders that are active or interested in Peru against the economic, social, and environmental impacts that proposed interventions seek to create (see **Table 4** and **Figure 7**). This landscape can be referenced for the creation of tailored funding strategies to fuel commercialization efforts in the benthic fishery. Generally, grants should be strategically targeted to remove risk that allow development capital and subsequently private investment to be unlocked, given the substantially larger availability of development and private capital potentially needed for large scale roll-out of domestic market initiatives across an entire fishery and beyond.

THEMES

Innovation: Several Peruvian grant programs target scientific, technological, and business model innovation. These range from grants to develop new business models, to supporting entrepreneurs in launching new enterprises, to adopting or developing technologies that provide new capabilities or efficiencies. Interventions should consider and explicitly communicate their use of innovation and technology.

Economic Development & Livelihoods: Peru is currently classified as a low-income country. As such, development capital is being actively deployed to drive economic growth. This includes development of new infrastructure (physical or institutional), creation of new markets and linkage to existing markets, and initiatives that bolster private sector engagement. Interventions should consider the extent to which they are helping to generate private sector revenues, and improving the livelihoods of communities

that live below the poverty line or struggle with financial instability.

Environmental Stewardship: Peru is rich in biodiversity and critical habitats for marine life. As such, Peru is a focus country for many environmental funders seeking to preserve life underwater. Interventions should consider the extent to which they are protecting habitats, and helping to preserve or rebound stocks (e.g. management).

Table 4. Preliminary selection of potential funders that are active or have prospective alignment to Peruvian fisheries transformation work.

Category	Type	Funder Name	Mechanism	Mandate
Active	Philanthropic	Walton Family Foundation	Grants	Environment
Active	Government	Programa Nacional de Innovación en Pesca y Acuicultura (PNIPA)	Grants	Technology Development Training & Capacity Building Technology Adaptation Pilots
Active	Government	Fondo Nacional de Desarrollo Pesquero (FONDEPES)	Grants & Loans	Tools & Materials Construction
Active	Government	Programa Nacional de Innovación para la Competitividad y Productividad (INNOVATE)	Grants	Business Development
Prospective	Philanthropic	Inter-American Foundation	Grants	Livelihoods, Economic Development
Prospective	Philanthropic	Livelihoods Funds	Grants & Loans	Livelihoods, Economic Development
Prospective	Government	PROCOMPITE	Grants	Economic development
Prospective	Government	Cosejo Nacional de Ciencia, Tecnología, e Innovación Tecnología (CONCYTEC)	Grants	Innovation
Prospective	Development	International Development Bank (IDB) Lab	Loans	Economic development / Social Impact
Prospective	Development	United States Agency for International Development (USAID)	Grants	Economic development
Prospective	Development	Spanish Agency for International Development Cooperation (AECID)	Grants	Economic development
Prospective	Development	Global Affairs Canada (Canada)	Grants	Economic development
Prospective	Development	Food and Agricultural Organisation (FAO)	Grants	Science
Prospective	Private Investment	Conservation International (CI) Ventures	Loans, Equity, Convertible	Social/Environmental Impact

STRATEGY

Building on the three themes above, interventions in the benthic fishery should orient around the use of technology and business model innovation, economic development, and environmental stewardship. Given that value predominantly lies in the development of new markets, there should be clear alignment to economic development funders. Meanwhile, technology innovation that will be needed to achieve necessary quality improvements and traceability demanded by these new markets can be funded through innovation funders while efforts to create management incentives and management data can target environmental funders.

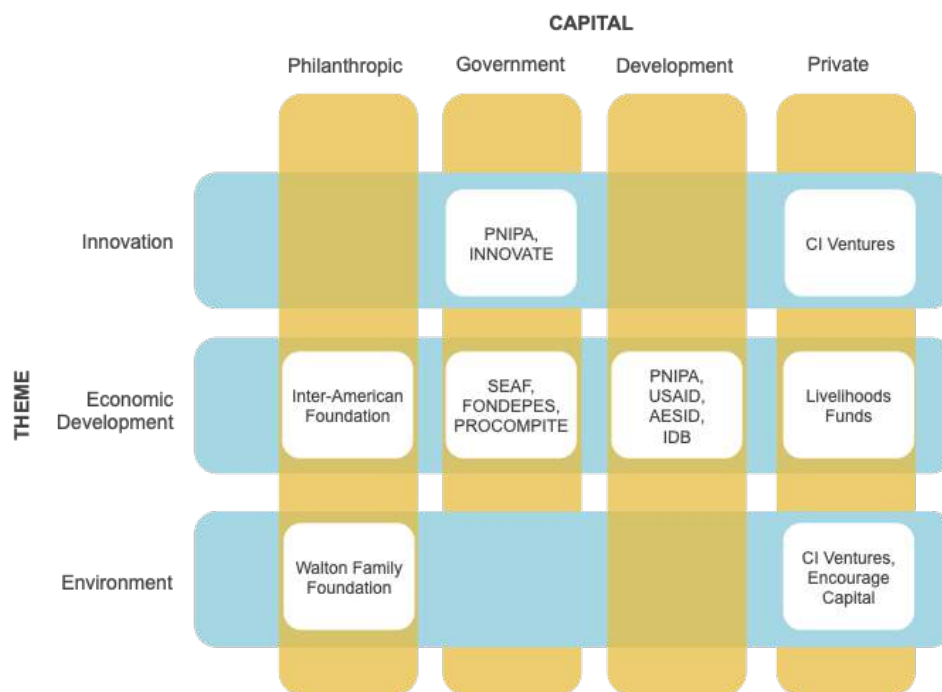


Figure 7. Landscape of potential Peruvian investors according to the predominant themes identified in the funder mandates.

This strategy will be referenced in the development and launch of new fishery transformation programs and ventures, to match them with the best fit portfolio of funders. Crucially, a deal structuring and development service will be required to adequately package initiatives together to meet the requirements of such a diverse funder base. Future of Fish advocates developing a finance platform with three core functions:

1. Connect funders to interventions aligned with fund size, mandate and risk profiles;
2. Add development capacity (e.g. professional services, management coaching, impact measurement) to get projects and organizations investment-ready; and
3. Structure deals to mobilize capital (e.g. aggregation of projects and/or funders, de-risking partnerships such as insurers and guarantors, etc.).

Such a platform would act as the go-to entity to fund interventions, regardless of their profit orientation and impact targets, thus simplifying the process of resourcing and scaling effective strategies. By holding relationships with diverse funders, and being able to map projects to the mandates and investment requirements of these funders, time to funding can be greatly reduced and structural barriers to the flow of capital can be minimized.

While the platform is initially envisioned as a holding company making one-off investments into deals that align to this blueprint and strategic themes outlined in this document, the proposed platform could eventually include its own fund (with participation from other aligned funders in the region), as a pipeline of investable deals is built up and consistent, scalable investment strategies are demonstrated. The phased progression of this strategy is shown in **Figure 8** below.

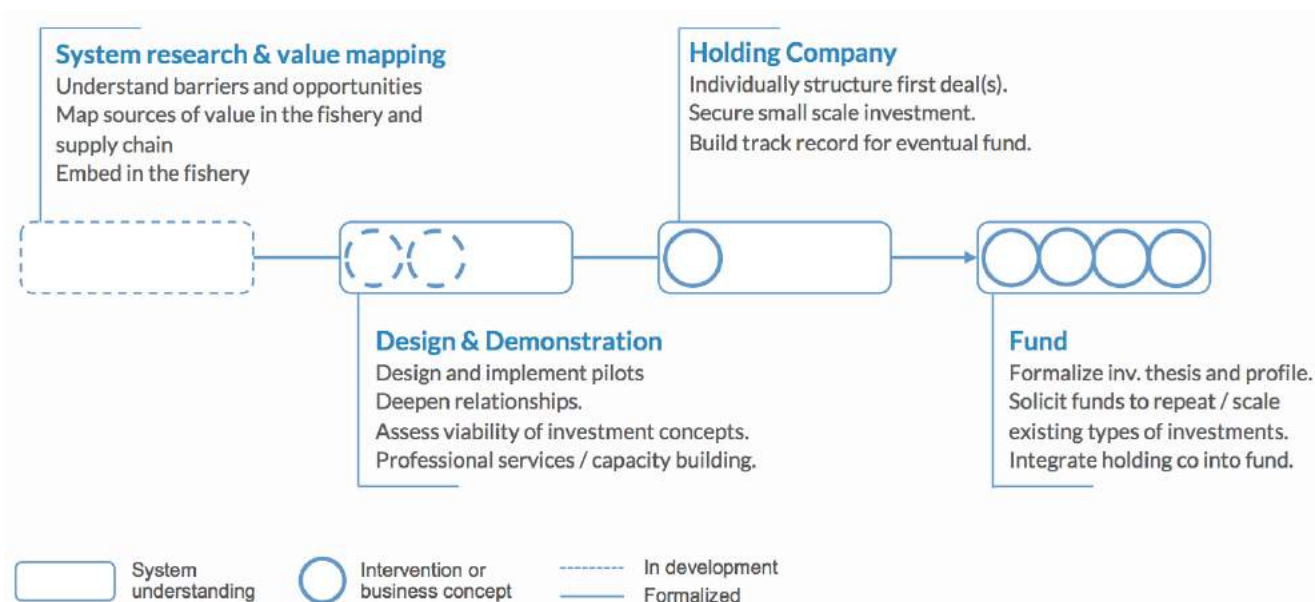


Figure 8. Evolution of a finance platform over time.

Once interventions that stem from the solution areas above have been developing into concrete projects with stakeholders, an important next step will be to determine barriers to funding from each of the listed funding organizations. This will inform how we might de-risk concrete initiatives. From there, we will map these initiatives to funding themes, and perform the structuring needed to unlock funding sources.

Next Steps

Given anecdotal evidence that benthic resources are in decline and a track record of low prioritization by the government, now is the time to find fisher- and supply chain-driven solutions to responsible management and sourcing in Peru's benthic fisheries, including ways to reward more responsible practices. The blueprint presented here offers interventions that can prime the system and forge pathways that connect responsible fishers to markets that value their products, in order to promote long-term health and sustainability of these vulnerable and potentially threatened stocks while improving livelihoods for artisanal fishing communities.

Proposed solutions and associated intervention ideas identified in this document will continue to be refined through an adaptive cycle that responds to stakeholder input, system response to these interventions, and changing conditions in the fishery. In this way, we aspire to catalyze progress of the Peru benthic fishery toward a data-rich, value-generating future that rewards responsible fishing and sourcing practices. Fishery development is a multi-stakeholder process that will require collaboration across multiple actors, and we by no means intend to implement these solutions alone. Future of Fish is actively seeking partnerships to support the implementation of this blueprint. Interested organizations can contact us at info@futureoffish.org.

Appendix

APPENDIX A: FISHERY DEVELOPMENT MODEL

The Fishery Development Model (FDM) is a development approach that is designed to progress a seafood system from its current state to an envisioned future state. A short description of the FDM can be found [here](#).

APPENDIX B: SYSTEM ASSETS, STUCK POINTS, & TENSIONS

Future of Fish develops an emerging framing of systems based on the patterns we observe throughout the research process. Analyzing assets, stuck points, and tensions within the system help to reveal insights about the system, which in turn inform the opportunities for system transformation.

Stuck points are defined as obstacles hindering progress toward connecting benthic fishers that practice responsible management with domestic markets that value these products. Stuck points include major challenges that are symptoms of larger failings or inefficiencies in the way a process or system works, so as to prevent optimal functioning. Understanding stuck points allows us to gain insight into how we might design solutions that can overcome deeper, underlying system-wide barriers. Stuck points are often challenges one or more individual actors in the system are trying to resolve, but the integrated solution required is beyond the capacity of any single actor to implement. By definition, stuck points are moveable—and thus changeable—elements of the system.

Just as there are stuck points that impede adoption of integrated solutions, so too are there **assets** – elements within a system that can be leveraged to address stuck points, and that can be used to unlock challenges. Assets include factors such as relationships, ongoing initiatives, and tools that currently exist within the system.

Another critical component of the fishery analyses is the identification of **tensions**, defined as social, political, economic, and behavioral trends and biases that perpetuate a problem. These are the conflicting realities of the system that tend to lock in the status quo. Finding tensions is often the first step towards generating insights and opportunities in a space, and tend to show where big change is needed.

Stuck Points

Current challenges that hinder connecting benthic fishers that practice responsible management with domestic markets that value these products can be found in **Table 5** below.

Table 5. *Stuck points in the Peruvian benthic fishery that prevent or impede connecting managed access fisheries with domestic markets that value responsible products.*

Stuck Point	Description and Examples
Misconceptions around what responsibly-managed products are generate confusion and increase risk of exploitation and greenwashing	<ul style="list-style-type: none"> Seafood sustainability is still a nascent concept in Peru. Confusion around what “sustainable”, “responsibly-managed”, and “traceable” actually mean results in varying definitions. Misconception that shortening supply chains and bypassing terminals is equivalent to sustainability. Product sourcing knowledge is limited to general region of harvest and lacks any robust traceability. Restaurants want to promote sustainability, but lack the proper tools to do so.
Sustainability efforts limited by price sensitivities	<ul style="list-style-type: none"> Surveys and conversations with chefs revealed price to be most important (as long as quality is of certain caliber). Many claim sustainability is important to them, yet they are unclear where most purchased products originate; they buy almost exclusively through terminals, where product is aggregated and information is lost. Chefs are risk averse to actions that might result in profit loss.
Currently, there is no market differentiation for responsibly-managed products	<ul style="list-style-type: none"> While there are some chefs attempting to source responsibly, large-scale demand for responsibly-managed products does not exist in Peruvian domestic markets. Further, the products these chefs are purchasing may not actually be responsibly-managed products (e.g. they may be “fresh”, but not sustainable). There seems to be an interest in sourcing responsible products, but unclear if there is a willingness to pay higher prices (e.g. a premium) for those products. Aggregation and poor record-keeping hinders product differentiation.
Fishers lack direct access to markets due to logistical, financial, and capacity limitations	<ul style="list-style-type: none"> Many artisanal fishing groups lack direct relationships with restaurants and other commercial players. Artisanal fishers lack the capacity to enhance their role in commercialization—they have little marketing savvy and lack business knowledge and training. Fishers face logistical and financial barriers to having more direct control over transporting, selling, and processing their own product. Most fishing communities are separated by large physical distances from their target markets, making direct relationships (e.g. selling or transporting directly) difficult. Fishers lack access to infrastructure that allows them to maintain quality properly, meaning they must sell product immediately to prevent spoilage. Financial barriers extend beyond market access, and are thus discussed in more detail in the stuck point below.
Fishers lack access to capital, which hinders financial independence and long-term planning	<ul style="list-style-type: none"> Fisher associations do not have sufficient funds to re-invest in inputs to support fishing activities; this limits planning to day-to-day rather than long-term. Many fisher associations are unable to access capital (e.g. grant funding, bank loans) because they are not legally registered entities. Many are reluctant to obtain a tax code (RUC) because they want to avoid incurring taxes or fees. The constant struggle to make ends meet leads to dependency on buyers, which inhibits financial freedom. Social organizations do not represent economic interests of fishers to increase value and benefits to fishers - only political.

Stuck Point	Description and Examples
Most chefs currently prefer NOT to buy directly from fishers because they perceive them to be unreliable suppliers	<ul style="list-style-type: none"> Many chefs view fishers as not being properly organized, and equate this lack of organization with being unable to consistently supply high-quality fish. Many chefs claim that fishers: <ol style="list-style-type: none"> (1) do not properly fill requested orders nor supply desired fish consistently, (2) do not meet their product quality and/or handling standards, (3) do not provide proof of transaction (e.g. receipts) and often request down payments, and (4) fail to maintain regular contact with them. Because of the above claims, chefs feel the need to maintain their suppliers that cater to their needs (particularly their quality standards).
Stock status of individual benthic species is unclear, generating confusion about resource health and abundance	<ul style="list-style-type: none"> Actual status of benthic stocks is unclear due to lack of formal assessments: IMARPE conducts infrequent and inconsistent abundance assessments at a select few sites. PRODUCE tends to release reports containing data aggregated by site and species. Conflicting national data sets (PRODUCE, IMARPE, PROMPERU) on landing statistics, exports, & national sales add to the confusion.
Lack of access to reliable fisheries data and associated protocols breeds uncertainty, confusion, and mistrust	<ul style="list-style-type: none"> Transparency and sharing of data collection and analysis methodologies and results from IMARPE and similar institutes would be beneficial to various stakeholders. There are unverified claims that government institutes have, in the past, produced unreliable data, and may have even altered reports in order to portray best case scenarios or favorable outcomes for industry. It should be noted that whether or not these claims are unfounded, rumors related to this are already enough to create mistrust and conflict amongst stakeholders. Obtaining information from government institutes requires a formal written request that may or may not be granted.
Little to no data is captured along domestic supply chains	<ul style="list-style-type: none"> Data collection for domestic benthic products does not happen beyond the landing site (this does not include export products because data is collected as they pass through processing plants). Apparent lack of environmental concern in the mid-chain. Little evidence of supply chain actors other than fishers being involved in data collection efforts.
Poorly created and executed formalization process provides barrier to data collection and management	<ul style="list-style-type: none"> SIFORPA program has yet to aid in streamlining formalization process. Because formalization is expensive and difficult to navigate, many benthic fishers are still not formalized. Currently, formalization offers no incentives for nor benefits to fishers.

Assets

Existing elements that can be leveraged to address stuck points or risks can be found in **Table 6** below.

Table 6. Assets in the Peruvian benthic fishery that can be leveraged to connect managed access fisheries with domestic markets that value responsible products.

Asset	Description and Examples
Stakeholders know what they want and have ideas about how to achieve that	<ul style="list-style-type: none"> Fishers want logistical support and cold storage improvements (but do not have finances to pay for infrastructure needed). Chefs want quality maintenance, consistent and reliable supply, and formal record of the transaction. Chefs want someone to do the heavy lifting (whether it be fishers or middlemen) so they can simply buy fish and not think about the rest. Many chefs have identified a need for a separate distribution center or section within a current terminal that caters to sustainable product only. Many fishers and chefs see shortening the supply chain as a mechanism for achieving sustainable, healthy product, but perhaps there are other avenues to explore.
Awareness campaigns about control measures exist	<ul style="list-style-type: none"> Focus is on closures and minimum size limits. Effort El Tamano Si Importa is doing is more education and awareness - not a law. Oceana: one fish, one name, seafood mislabeling. SPDA: sustainability labeling. PNACP: internal label of quality. H2Oceanos/ProDelphinus: Artisanal fishers cultural recognition.
Nascent efforts to grant fishers more direct market access exist	<ul style="list-style-type: none"> Restructuring domestic supply chains is familiar; most efforts shorten supply chains that circumvent Lima fishing terminals and instead connect fishers directly with restaurants in an effort to help fishers attain better prices for their products. PNACP has connected some fishing communities directly with end markets, and provides some business training to fishers about requirements and costs of transporting product directly to market. This implies that supply chains are open to disruption and change.
Signs of interest in improving knowledge of product sourcing	<ul style="list-style-type: none"> Some interest among chefs to know specifically where their products come from. One chef believes it is "better to know than pretend ignorance." Implies improving communication and coordination between fisherman and chefs is needed and desired.
Empowerment from tangible learnings implies openness to try new approaches	<ul style="list-style-type: none"> Having real-world, tangible examples upon which to build knowledge appears to resonate with Peruvian artisanal fishing communities, as it grounds experiments and incidents in their own past from which they can learn and adapt. Peruvian fishers have an eagerness to learn from both successes and failures of the past. This implies openness and willingness to try new approaches.
Efforts are underway to create legal structures to support rights-based access for self-managing benthic fishers	<ul style="list-style-type: none"> Several examples of self-management of benthic fisheries exist along the coast of Peru, with many having created their own governance models, control rules, and enforcement systems. TNC and SPDA are working with government officials and are leading efforts to create these legal structures (TURFs, specifically). As such, there is work to legitimize the actions done by artisanal fishers.

Tensions

Conflicting realities of the system that tend to lock in the status quo, and that need reframing in order to connect benthic fishers that practice responsible management with domestic markets that value these products can be found in **Table 7** below.

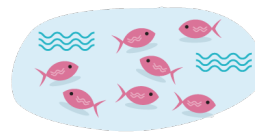
Table 7. Tensions in the Peruvian benthic fishery that need reframing to facilitate connecting managed access fisheries with domestic markets that value responsible products.

Tension	Description and Examples
Chefs believe they could increase profit margins by cutting out middlemen <—> Chefs perceive direct buying relationships with fishers to be inconsistent & unreliable	Many chefs believe removing 1-2 nodes between themselves and fishers will reduce markups in price and thus the costs they incur. At the same time, they view fishers as being unable to consistently supply high-quality fish. Many claim that this inconsistency and unreliability has strengthened the role that middlemen play in the seafood value chain, and have led chefs to feel the need to maintain suppliers that cater to their standards. Several chefs want to buy directly from fishers, but many feel it might be best to keep one entity in between to avoid the stress of these inconsistencies. This suggests that having some type of middleman between fishers and restaurants might be necessary.
Fishers believe they could increase their profit margins by cutting out middlemen <—> Ending relationships with middlemen is risky	There is a shared sentiment among most Peruvian artisanal fishers that middlemen pay them unfairly. Many fishers believe they could earn more if they take on the transportation and selling of their products themselves rather than relying on middlemen to do so. At the same time, fishers recognize that breaking these long-standing relationships is risky. For instance, if a fisherman takes a risk and opts for a direct relationship with a restaurant only to find that this new arrangement is not working, he must return to the middleman and ask to restore the relationship, which could put the fisher in a compromising position (e.g. he must agree to alter previous agreements, such as selling price). Additionally, fishers tend to be risk averse and return to what is familiar.
Fishers and chefs express desire to cut middlemen <—> Fishers and chefs have long-standing relationships with middlemen	Both fishers and chefs believe they will enjoy financial gain by removing middlemen from their supply chains. At the same time, both are currently dependent on entrenched, long-term relationships with those middlemen for different reasons; fishers are often dependent on buyers for assistance in financing fishing activities upfront because they do not have sufficient income to re-invest in these inputs, chefs feel the need to maintain suppliers that cater to their standards and are wary of direct relationships with fishers who they perceive to be inconsistent and unreliable in supplying high-quality fish. In short, both see potential value in shortening their supply chains, yet are hesitant to end their long-standing relationships with middlemen.
Restaurants pay once every 1-2 months <—> Fishers want to be paid often and frequently	There is a mismatch in payment timelines among fishers and chefs; fishers want to be paid daily, whereas restaurants typically pay monthly. Currently, this is a tension that middlemen deal with on a regular basis. This is related to the 'Fishers lack access to capital, which hinders financial independence and long-term planning' stuck point in Table 5 above. Fishers currently rely on others (buyers) to help finance fishing activities upfront because they do not have sufficient income to re-invest in these inputs. As a result, they rely heavily on both daily pay and down payments to ensure they can cover input costs on a regular basis.

APPENDIX C: VALUE POTENTIAL BY CATEGORY

Stock biomass & catch yields

Where value is lost or unrealized: Increased demand for benthics has grown at an unexpected rate, and management is lagging. Lacking strong records and government involvement, this increased effort is putting pressure on stocks, which have been declining.

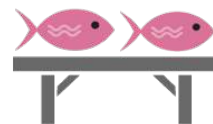


How value can be reclaimed or generated: Self-management efforts are underway in some benthic fishing communities, aimed at controlling yields and stabilizing the stock.

Economic benefit: A conservative estimate of 5% improvement has been applied (based on Future of Fish benchmark). More comprehensive analysis is required to more accurately assess the stock rebound potential.

Efficiency & quality

Where value is lost or unrealized: Processing techniques are rudimentary, producing excess waste and reducing quality. Intermediaries are embedded, yielding indirect supply chains.



How value can be reclaimed or generated: Supply chains can be streamlined to more directly deliver product to end markets and maintain better product integrity in transit. Formal processing facilities could be established for quality control and waste reduction.

Economic benefit: Shortening the supply chain could result in a modest benefit of approximately 0.75%, thus may not be worth the risks of disruption. Improving efficiency and quality of operations at key nodes (e.g. at landing) could yield greater benefits totalling approximately 20%.

Product & market optimization

Where value is lost or unrealized: There is a powerful gastronomic movement in Peru, where unique and high-quality products are highly valued - benthics are not robustly tied into this movement.



How value can be reclaimed or generated: Status of local, sustainably managed benthics can be elevated through branding and storytelling collaboration with chefs. New markets can be established and supplied, for example where affluent consumers purchase seafood and value sustainability.

Economic benefit: A breadth of benefits could be delivered including premiums for storied and/or certified product (2-10% on 5-10% of product),

creation of new end markets (1% premium on 10% new market access), and optimization of product forms against buyer demand (10% value on 10% of product).

Externalized benefits

Where value is lost or unrealized: Many fishers and community members are not formalized, so tax income is not generated to fund services. Tourist and other local markets are under-engaged in many fishing communities.



How value can be reclaimed or generated: Localization is the preferred strategy that has been assessed, though formalized promises greater long-term potential.

Economic benefit: Bolstering local consumption would recirculate wealth in the local economy - assuming 5% of products could be consumed locally, and that local consumption has a standard local economic multiplier of 1.45, an additional 10% in value could be created.



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