



Fishery Development Model

A Systems
Development Model
for Data-Rich,
Investable Fisheries



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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Executive Summary

This document describes the Fishery Development Model (FDM) of Future of Fish, a non-profit organization progressing system-wide transformation in global fisheries, with a mission of ending overfishing. The model is the result of our extensive experience and research in both global fisheries and in systems transformation, and can be used to inform the strategy and execution of organizations pursuing positive social, environmental and economic change in fisheries.

Fisheries are complex systems that sit at the intersection of the social, environmental and economic dynamics. To focus improvements on only one of these domains in isolation limits the effectiveness of any intervention strategy that seeks long-term sustainability, whereby stocks are well-managed, fishers have a dependable livelihood, and incentives are aligned to promote transparency and collaboration.

The FDM offers a framework to evaluate fisheries systems holistically, as well as a process through which organizations can deeply understand the system, surface opportunities, create and test a strategy, then scale successful interventions. Organizations working on social, environmental or economic development with fisheries stakeholders can use the FDM to consider the broad universe of impacts on their work. This can help to uncover risks and barriers that may prevent success, or opportunities which could further bolster buy-in and long-term adoption of their work.

In addition to describing the core framework and process noted above, this document also provides a brief overview of tools that Future of Fish has developed to facilitate the FDM process.

Finally, two case studies are included, demonstrating how the FDM is currently being applied in global fisheries. While there are not yet any fully executed, referenceable FDM case studies, these case studies nonetheless serve to highlight the approach and types of context-specific interventions that result from application of the model.

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The Global Context

Fisheries around the world are under threat from overexploitation and environmental degradation due to a number of compounding factors including increased seafood demand, ineffective or lacking management, global climate change, habitat loss, and continued prevalence of Illegal, Unreported, and Unregulated (IUU) fishing. These threats operate on local and global scales, jeopardizing livelihoods, food security, and economic prosperity for hundreds of millions of people worldwide.

Stakeholders around the world, including industry, NGO, philanthropic, and government organizations have been advancing work for decades to halt and reverse this alarming decline in fishery resources. Much progress has been made within specific components of the seafood sector (e.g. fisheries management and industry sustainability commitments). However, seafood is a complex interplay of ecology, governance, and local and global trade, which means that single interventions to improve fisheries and the seafood industry are insufficient in progressing the global seafood system as a whole towards prosperity and sustainability.

To transform the deeply rooted “business as usual” practices that continue to drive fisheries towards collapse requires innovative approaches that examine and design solutions for the interlinked web of people, infrastructure, politics, culture, and biology that comprise our global seafood systems.



Woman repairs net, Vietnam. Photo by Future of Fish.

Our Approach

Future of Fish believes that attracting new financial resources to the fishery development space lies at the center of building the long-term and large-scale fundamental change that is needed to end global overfishing. To truly scale change, we must harness the power of finance to create and incentivize a new way of catching and trading seafood around the world. This requires new business models designed to reward responsible actors to progress, perpetuate, and value positive social and environmental change.

To create and fund these next generation business models, Future of Fish has developed an approach that employs two complementary, strategic lines that work in concert to: 1) identify and develop both non-profit interventions and for-profit deals needed to transform a specific seafood system; and 2) funnel financing and capital to those interventions and deals. The first component, expressed as our Fishery Development Model (FDM) is the focus of this document. A brief overview of the second component, our Fisheries Finance & Innovation (FFI) Platform, is also provided for reference in this document.

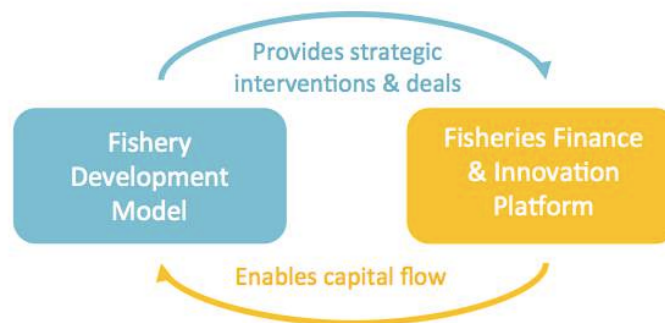


Figure 1. Future of Fish employs two complementary, strategic lines that work in concert.

The reader should note that while our approach emphasizes the role of financial resources and new business models, and the role they play in developing incentives for change. Nonetheless, it acknowledges and incorporates the critical work of governance and “not-for-profit but necessary-for-progress” interventions. These complementary interventions create enabling conditions for improving fisheries and help to effectively regulate fisheries systems. The FDM offers an expanded, augmented methodology to progress fishery transformation.¹ This approach seeks to address gaps typically encountered in science and management-based fishery transformation approaches. These gaps can include, but are not limited to black markets, a lack of incentives for data collection and sharing, and difficulties rewarding first mile actors for responsible practices.

1. Future of Fish defines Fishery Transformation as “the phased development of coordinated activities which leads to systemic change in a fishery whereby there are sustainably managed stocks, improved economic activity in fishery communities, and improved social equity for fishers and workers in the seafood sector.”

The Fishery Development Model

OVERVIEW

Future of Fish has organized its approach for understanding and engaging in complex fishery systems as its Fishery Development Model (FDM). Future of Fish uses the FDM to holistically understand fisheries systems to identify unique barriers and opportunities, and to guide the development of scalable, strategic interventions.

The FDM offers both a framework to understand the types of stakeholders and interventions required in the system (i.e. across data, value chain, governance, deal structuring, and livelihoods domains), as well as a process to guide a phased progression from research through pilot development, and ultimately the system-wide scaling of viable interventions. Both are shown below for reference and expanded upon in dedicated sections for framework “Streams” and process “Phases”.



Figure 2. Left: As a framework, the FDM assesses fisheries systems across five streams that must progress in coordination. Right: As a process, the FDM progresses interventions through five phases toward eventual scale.

The FDM uses an emergent framing of fisheries systems based on our extensive experience and research in both global fisheries development, and in systems design and transformation. This includes, but is not limited to past work producing system-level research insights (e.g. regarding barriers and opportunities for full chain traceability), on-the-ground experience building and managing fishery supply chains, substantial ethnographic research in complex fishery systems, and working as entrepreneurs and project developers building environmental investments.

INSPIRATION

“Developer” businesses are entities that are prevalent in other industries, but under-represented in the sustainable fisheries space. They have been instrumental in creating scalable models for solar energy infrastructure, and are well known for their role in bringing new real estate projects to reality.

Developers typically have to work across several disciplines to bring their vision to reality. They broker diverse relationships to fund, design, implement and manage assets over a long period of time, and enable investment through crucial prospecting, vetting, aligning and structuring activities. These developers provide an applied way to think about systems design / systems change, and serve as useful analogues for developing fisheries. Our FDM has been directly informed by the methodologies and frameworks that other development entities use in non-fisheries systems.

From the FDM perspective, projects are not delineated as co-management vs. traceability vs. finance, etc. Instead, projects are viewed as holistic “fisheries development” projects with multiple, co-dependent streams that must progress in parallel. Fisheries Development Projects can be enabled with standardized processes, team, and partnership structures to provide a more replicable, scalable approach.

It is important to note that projects outside the scope of those developing a specific fishery are also of critical importance. These global systems or global innovations projects (e.g. education, awareness, development of tools and resources, standardized processes, etc.) help advance the seafood sector as a whole and can substantially bolster the success of the FDM in specific fisheries.

GOAL

The ultimate goal of the FDM is to guide the development of data-rich, investable fisheries. This goal builds on our belief that (i) there is insufficient philanthropic and government capital in the world to effectively fuel the transition to sustainable fishing practices, (ii) creating and sharing new value in fisheries is instrumental to gaining buy-in from fishers and supply chains to transform the system, and (iii) robust data ultimately de-risks a fishery by informing effective governance, providing quality baselines and forecasts, and delivering business intelligence to industry and investors alike. Interventions that are proposed and implemented through the FDM process thus should create enabling conditions to unlock value and private capital (e.g. improving the availability and robustness of fishery data), or should directly unlock or create new value that can generate a triple bottom line (social, environmental, and financial) return.

FDM STREAMS

There are five core streams of the FDM, where a stream is defined as “a progression of activities within the same domain, across multiple phases.” Each stream represents an area of intervention that plays a crucial role in developing a robust, sustainable fishery, based on our experience and the

expertise of our partners. In an ideal future state, a fishery will have evolved a high degree of maturity across each of the five streams. The reader should note that the environment is not called out as a stream in the FDM. This is because environmental concerns and outcomes are embedded within each stream. For example, Data, as a domain of activities includes stock assessment and traceability efforts, while Governance includes the implementation of policies and fisheries management activities. The FDM does not orchestrate activities that would be labelled as “environmental” in nature, but does seek environmental outcomes.



DATA

Activities that establish the infrastructure to allow data to flow to stakeholders to inform effective co-management (e.g. stock assessments, management simulations), deal structuring, and value chain activities.



VALUE CHAIN

Activities that establish a more aligned, robust, value-generating supply chain for the fishery, and incentivize participation from multiple stakeholders.



GOVERNANCE

Activities to establish a model through which government, industry, and fishing stakeholders collaborate to manage and enforce new policies, regulations, interventions, and fishing practices, etc.



DEAL STRUCTURING

Activities that lead to an investable entity, and provide contracts and terms that allow for investment capital to flow into the fishery, and to generate/disseminate returns over time. Additionally, contracts, formal or informal, that bind parties to certain standards for transacting or executing best business practices.



LIVELIHOODS

Activities that help to ensure liveable household incomes for fishers and their families, potentially including the introduction of new jobs, access to loans and insurance, and wage supplementation.

Figure 3. The five FDM Streams: Data, Value Chain, Governance, Deal Structuring, and Livelihoods

Streams are highly interdependent, and improving the maturity in one stream can directly enable progress in another. Similarly, a barrier in one stream can prevent progress in another. When creating strategy, this interdependency is kept top-of-mind, and interventions are proposed in a sequence that acknowledges this dependency and prioritizes interventions that will have the strongest system-enabling effect.

In some instances, this means that the least mature component of a system may need to evolve before further progress can be made (e.g. implementing a series of management policies before value chain improvements can occur). In other instances, a component of the system that is realizing significant traction and momentum may be further supported to inspire action in other areas (e.g. creating value chain investments where fishers are realizing greater profits from self-implementing sustainable practices in their local market). A high-level overview of stream interdependency is provided below.



For Value Chains:

Drives compliance for market access, provides business intelligence.



For Governance:

Informs governance policies, regulation, enforcement, and monitoring (e.g. assurance of stock stability).



For Deal Structuring:

Informs investor due diligence, while adequate data de-risks the fishery as a whole.



For Livelihoods:

Reveals the extent to which alternative/complementary livelihoods are/will be needed (baselining and monitoring).



For Data:

Provides incentives for data collection.



For Value Chains:

Provides incentives, and can provide enforcement resources (e.g. supply chain rejections), for changing fishing behavior



For Deal Structuring:

Can be a source of capital (i.e. trade financing).



For Livelihoods:

Fishers may become more loyal to supply chain when livelihoods are well supported.





For Data:

Creates mandate for collecting data, provides standards to guide data and traceability efforts.



For Value Chains:

Ensures long-term supply of products.



For Deal Structuring:

Provides confidence and certainty to potential funders and investors.



For Livelihoods:

Drives extent and time horizon over which fishers need to pursue alternative income / livelihoods to maintain standard of living.



For Data:

Pays for data collection and processing.



For Value Chains:

Helps establish new value chains, pays for improvements.



For Governance:

Helps grant / government capital go further – provides greater leverage.



For Livelihoods:

Strengthens incentive to improve socioeconomic well-being of fishing communities (i.e. as requirement to receive funding).



For Data:

Can create resources to collect data (e.g. data collection jobs).



For Value Chains:

Reduces effort on stocks to keep supply stable.



For Governance:

Easier grounds for enforcement when livelihoods are provided for.



For Deal Structuring:

Provides access to larger pool of supporters and funders outside of conventional fish / environmental conservation group

Figure 4. Cross-stream impact of the five FDM Streams

FDM PHASES

The FDM is organized by five phases of development, where a phase is defined as “a period of time during which fishery transformation activities take place.” Each phase becomes increasingly tactical as efforts move from system profiling to pilot implementation, to scale up.

The five phases are Scoping, Research, Design & Demonstration, Implementation and Scale-up, as shown below.

Scoping Phase

High level information is gathered on the fishery to determine the potential for generating triple bottom line (environmental, social, economic) impact, and for assessing the fit of the FDM to the fishery. Scoping results in a “Go / No-Go” decision to proceed to Research.

Activities:

- Gather known data about the fishery
- Estimate value potential and impact potential
- Ensure no “red flag” issues, and make “Go / No-Go” decision
- Flag areas where more research is needed
- Identify suspected opportunities and stuck points to validate
- Develop research plan



Research Phase

The fishery system is studied in depth to gain a comprehensive understanding of dynamics across the five streams, and establish an initial Theory of Change to transform the fishery.

Activities:

- Field visits / ethnographic research in fishing communities
- System profiling (supply/value chain, markets, biology, stakeholder mapping, etc.)
- Synthesize opportunities and stuck points
- Identify active and necessary interventions
- Articulate initial Theory of Change for the fishery



Design & Demonstration Phase

Initial interventions identified in the Theory of Change are designed together (“co-designed”) with fishery system stakeholders, and localized pilots are implemented to test viability. The Theory of Change is updated and a growth strategy is defined for successful concepts.

Activities:

- Co-design pilots with stakeholders
- Refine both nonprofit and business intervention concepts
- Implement, iterate and validate concepts
- Refine Theory of Change
- Develop growth strategy and plan (replication and/or scale of concepts)



Implementation Phase

Concepts from Design & Demonstration that have demonstrated sufficient impact are implemented in full. Additional resources are secured for implementation.

Activities:

- Assess triple bottom line impact of interventions
- Compare progress with baselines (e.g. maturity assessment, MSC, etc.)
- Implement concepts across the pilot region
- Improve investment readiness of businesses
- Negotiate terms for supply chain and finance deals



Scale Phase

Growth-stage resources are secured to extend the scope and influence of now proven programs and business entities. Large geographic regions are addressed through replication of ideas and scaling of entities that are global / national in scope. Product flow aggregates into responsible, optimized channels.

Activities:

- Identify best-fit locations for replication across multiple regions
- Define scaling strategy for scale-up entities
- Secure growth capital
- Aggregate supply into optimized supply chains and markets
- Incentivize fishers toward more profitable, sustainable models



ADAPTIVE PROCESS

While phases are shown in a linear fashion, it is important to note that the FDM is an adaptive process. Strategy is continually evaluated and refined as new information is discovered. Ineffective ideas do not progress through the full continuum, and new interventions will enter the adaptive cycle of development. Effective ideas will proceed to grow through either replication (being copied by new organizations and managers), or scaling (increasing the resources and mandate of the originating organizations).

An alternative representation of the FDM process is shown below, demonstrating the adaptive cycle:

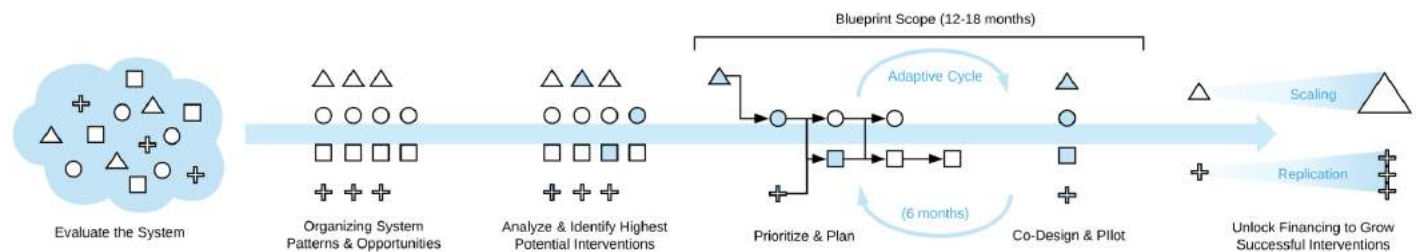


Figure 5. An important aspect of the FDM process is adaptive planning centered on deep interaction with communities and the ability to integrate changing environmental and cultural landscapes into future implementation and thus, create relevant outcomes.

Tools

Future of Fish has developed a suite of tools to support the application of the FDM in a standardized, repeatable way. A brief overview of key tools is provided below, and expanded in greater detail in subsequent sections.

Table 1. Tools to support the FDM application.

TOOL	PHASE	PURPOSE
Scoping Assessment	Scoping	Quickly profiles a fishery, informs decision as to whether to implement FDM, and scopes the Research phase if so.
Valuation Scorecard	Scoping, Research	Evaluates where value can be unlocked or newly created across the fishery system, to inform where to direct business and investment efforts.
System Profile	Research	Captures the holistic understanding of a fishery system, and identifies opportunity areas where high-impact change can be created.
Maturity Assessment	Research	Baselines the maturity of a fishery to communicate the current state and monitor progress over time.
Archetype Profile	Research	Communicates the defining characteristics of a fishery, allowing it to be compared to and informed by fisheries with similar characteristics.
Blueprint	Research, Design & Demonstration, Implementation, Scale	Captures the Theory of Change for transforming a fishery at a point in time, initially during Research, then refined through subsequent phases.
Finance & Innovation Platform	Design & Demonstration, Implementation, Scale	Directs interventions to the most aligned sources of funding, and creatively structures deals to allow for capital flow from multiple funders to multiple projects.
Diligence Package	Implementation, Scale	Fulfills investors requirements for understanding a prospective investment, its return and impact potential, and the context within which it operates.

SCOPING ASSESSMENT

The Scoping Assessment is a lightweight analysis based on existing data (e.g. secondary research and any prior primary research) that is used to gain rapid context into a fishery (e.g. catch volumes, number of fishers, prior sustainability initiatives), drivers of value, and risks to be addressed. The assessment identifies “red flags” that must be de-risked before a fishery can be addressed with the FDM process (e.g. country must be sufficiently safe), and provides a high-level assessment of the value potential of the fishery.

The scoping analysis evaluates the fishery across three categories: Investment, Markets, and Fishery. The sub-categories and criteria explored

during the scoping assessment are shown below. Where possible, these criteria are informed by existing third-party data, such as published indexes and research and professional analysis reports. The scoping is further augmented by interviews with key stakeholders and informants in the fishery and its supply chain.

Table 2. Scoping Assessment criteria

STREAM	CATEGORY	CRITERIA
Investment	Fund alignment	Fund alignment
	Accessibility	Political stability
		Ease of doing business, incl. openness to FDI
		Familiarity with archetype, context, laws and norms
	Stakeholders	Additivity / competition
Performance	Economic risks, including volatility, market liquidity / functionality	
Markets	Market size	Global demand
		Regional demand
		Global production
		Regional production
	Market trends	Global trends
		Regional trends
	Accessibility	Export Markets
	Market value	Product Value
		Under valued product
		Value type
Fishery	Target species	Stock health
		Vulnerability/Susceptibility
		Fishing pressure
	Management	Management regime in place
		Data availability
		Resource Tenure
		Co-management
		IUU
	Ecosystem	Gear
		Other associated fisheries
	Social	Income levels (vs living wage)
		Human rights challenges

Where criteria are not quantitative, a relative scale (e.g. 1-5) or a list of standard, pre-set options are used for the purpose of comparative analysis between fisheries. Upon completion of the analysis each fishery is given an overall score and a qualitative profile is created, indicating the strengths, weaknesses, opportunities, and threats that are prevalent.

VALUATION SCORECARD

During the scoping phase, the value potential of the fishery is also assessed at a high level. It is widely acknowledged in the fishery development space that substantial value is lost in fisheries.² While many conservation organizations have focused on the potential to recover value through improvement of stock biomass and catch yields, there is a broader universe of value that, in some cases, can be more readily unlocked. Future of Fish categorizes this universe of value under four categories, with a fifth “catalyst” category.

Table 3. Valuation scorecard framework

CATEGORY	TYPE	MECHANISM
Stock Biomass & Catch Yield Increases	Value Driver	Fisheries management and other governance efforts restrict fishing effort or gear, taking pressure off of stocks so they can rebound to maximum sustainable yield, in best case scenario to maximum economic yield.
Efficiency & Quality Improvements	Value Driver	Reduce waste, such as spoilage, discards, or quality degradation that occurs through uncoordinated, uneducated and under-resourced supply chains, and optimize the supply chain to avoid unnecessary price markups that reduce profits for value-adding organizations.
Product & Market Optimization	Value Driver	Efforts that seek to increase price paid for seafood, for example through certification, to gain access to more lucrative markets, and to ensure the optimal mix of seafood products is produced and sold to aligned and ideally varied customers.
Maturity Assessment	Research	Baselines the maturity of a fishery to communicate the current state and monitor progress over time.
External Benefit Generation	Value Driver	Increase wealth in circulation in fishing communities, for example through local spending and multiplier effects, increased tax compliance and diversification into new industries such as tourism and aquaculture that fit the context of the community.
Finance & Trade Innovation	Value Catalyst	Fishery improvements are often limited by access to working capital, or risk mitigating products such as insurance. While these products do not increase value of the fishery, they can greatly improve the time and effort it takes to unlock value in the four categories above.

The valuation scorecard assesses the current and potential value of a fishery across these categories. It is a living assessment that is refined over time as

more data is gathered, and greater context is acquired through more robust research efforts.

Where possible, value is benchmarked with secondary research. Where data is unavailable, standard percent-based benchmarks (e.g. based on percent of total output of the fishery) are used. These benchmarks are based on Future of Fish experience, and third party reference statistics where available.

Table 4. Valuation Scorecard calculations

CATEGORY	OPPORTUNITY	CALCULATION	COMMENTS
Stock Biomass & Catch Yields	Management - General	% Additional Yield * Market Price	Current yields relative to MSY if known
Stock Biomass & Catch Yields	TURF (attributable to TURF if modeled)	% Additional Yield * Market Price	Current yields relative to MSY if known
Stock Biomass & Catch Yields	TAC (attributable to TAC if modeled)	% Additional Yield * Market Price	Current yields relative to MSY if known
Stock Biomass & Catch Yields	MPA (attributable to MPA if modeled)	% Additional Yield * Market Price	Current yields relative to MSY if known
Stock Biomass & Catch Yields	Closure (attributable to Closure if modeled)	% Additional Yield * Market Price	Current yields relative to MSY if known
Efficiency & Quality	Cut out no/low value-add intermediaries	# nodes * Margin per node * Yield	
Efficiency & Quality	Reduce spoilage/loss during distribution	[Current - Future Spoilage] * Market price	
Efficiency & Quality	Reduce labour inefficiency	[Best Practice Efficiency - Benchmark Labour Efficiency] * Cost per lb * Yield	
Efficiency & Quality	Reduce processing waste	[Benchmark Waste - Best Practice Waste] * Cost per lb * Yield	
Efficiency & Quality	Reduce spoilage on-site	[Benchmark Spoilage - Best Practice Spoilage] * Cost per lb * Yield	
Product & Market Optimization	New destination market	[Market X - Market Y price] * Percent redirected yield	
Product & Market Optimization	Product mix optimization (same species)	[Weighted average value X - Weighted average value Y]	
Product & Market Optimization	Cooperative	Dock price increase * Yield	Attributed to increased supply power
Product & Market Optimization	Certification	Price premium * Applicable yield	
Product & Market Optimization	Storied fish	Price premium * Applicable yield	
Product & Market Optimization	Value-added processing	Percent product newly processed * [New price - Current price]	

CATEGORY	OPPORTUNITY	CALCULATION	COMMENTS
External Benefits	Local seafood markets	Percent local product * Market price	
External Benefits	Local tourism	Anticipated annual tourist visitors * Spend per tourist	
External Benefits	Local multiplier effect	Net new local spend * [Local multiplier (~1.45) - National multiplier (~1.15)]	
External Benefits	Tax recuperation	(Income + Sales tax rates) * (Yield Value Add + Price Premium Value Add)	
External Benefits	Ecosystem services	As analyzed by third party if applicable	

SYSTEM PROFILE

The results of the Research Phase are expressed as a System Profile. This is an extensive document that is informed by multiple types of research including:

- **Ethnographic analysis:** Application of anthropological and ethnographic research methods to deeply understand the social dynamics of a fishery system, including motivations and incentives, and cultural strengths and barriers.
- **Business analysis:** Use of market analysis, supply chain mapping, value chain mapping, and quantitative analysis of fishery economy to identify areas of lost or potential new value.
- **Social network analysis:** Mapping of stakeholders and types of relationships and flows in the system, including product flow, data flow, and capital flow to understand influential actors in the system.
- **Systems design analysis:** Clustering of concepts around emergent themes in the system, including assets, barriers, tensions (simultaneous opposing forces in the system that can create opportunity if resolved), insights, and opportunities.

The System Profile provides deep context to new partners, investors, or other stakeholders interested in intervening in the system, providing a crucial diligence function for project development and investment.

The System Profile concludes with the articulation of design principles that should be incorporated into any intervention design to improve the chances of success and potential for impact, and the identification of high-impact “Opportunity Areas” that provide the framework for the initial Theory of Change.

MATURITY ASSESSMENT

The Maturity Assessment is completed at the end of the research process, and describes the current state maturity of the fishery across the FDM streams. The assessment evaluates 5-10 attributes within each stream that

are ranked from 1-5 against standard definitions that allow the relative comparison of different fisheries, helping to quantify the gap between the current and desired future state.

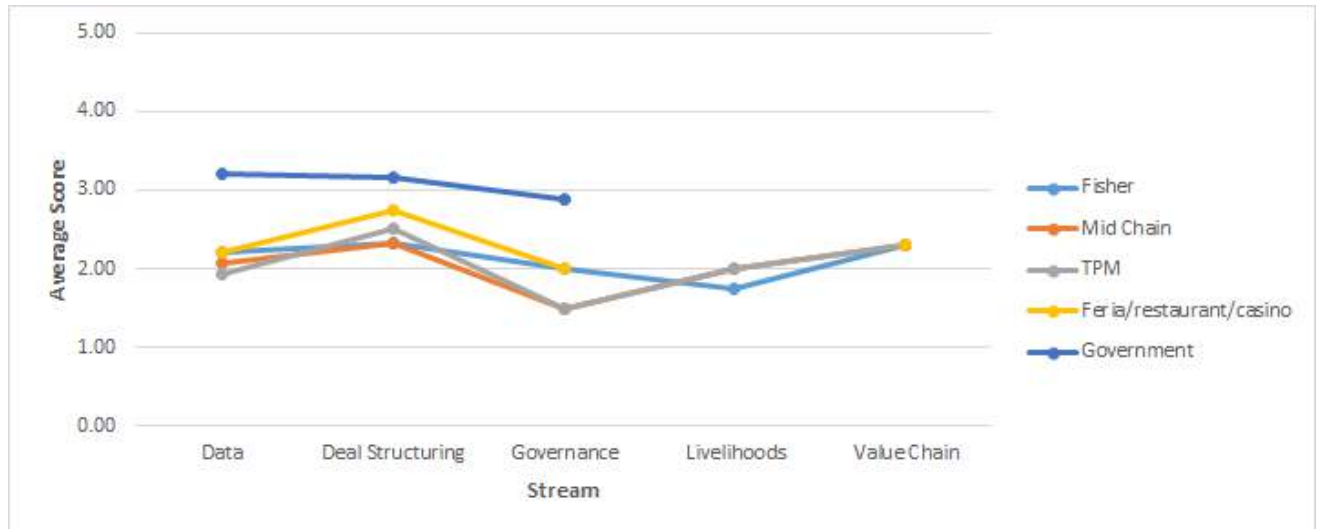


Figure 6. Composite system maturity showing stream averages for each stakeholder group.

The Maturity Assessment is a useful strategic reference. It helps to show which components of the system are in most need of improvement, and those that are experiencing positive progress and momentum. An ideal fishery would demonstrate a high-level of maturity in each stream. The Maturity Assessment is revisited over time, and can also be used as the basis for impact measurement and monitoring, to demonstrate progress that has been achieved over time. Other accepted baselines, such as those for Fishery Improvement Projects (MSC pre-assessment) can be folded into the Maturity assessment by adding specific attributes where needed/desired.

ARCHETYPE PROFILE

Based on the Scoping Assessment and Maturity Assessments, we assign an archetype as a shorthand for the defining characteristics of the fishery. The archetype includes parameters that guide identification / prospecting for fisheries where similar intervention and models can be sourced or applied on the premise that interventions that were successful in a similar fishery could yield successful results or offer useful learning. An example archetype profile that was developed for the Artisanal Chilean hake fishery is shown below. Defining characteristics were noted for the species, resource, culture, funding, and market of Chilean hake.

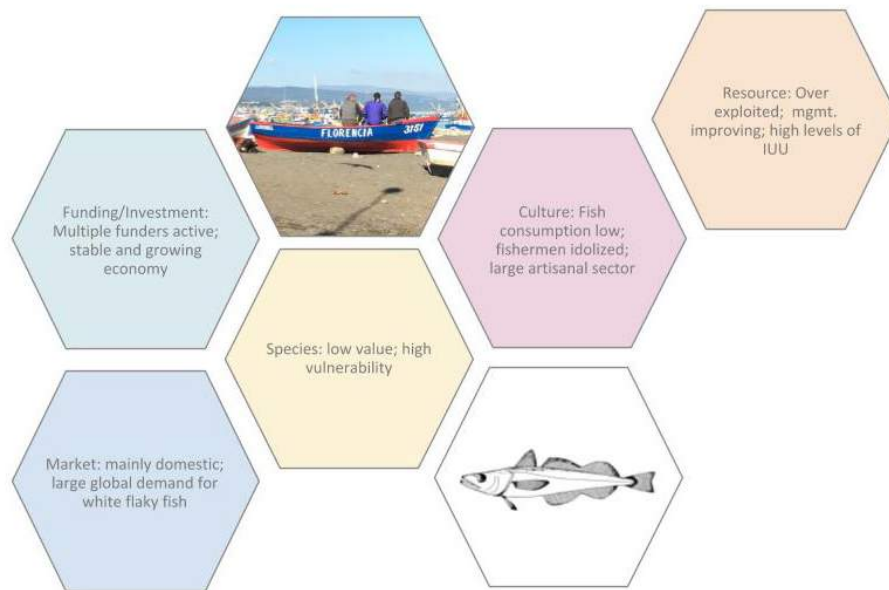


Figure 7. Example archetype representation, showing the defining characteristics of a fishery to inform intervention strategy, and replication of models from similar fisheries.

BLUEPRINT

The blueprint is a strategic document that describes the intended progression of a fishery system as a whole, across multiple stakeholders and types of interventions. It is a “shot in time” of the Theory of Change for the fishery that is first defined through the Research Phase of the FDM, and refined through subsequent FDM Phases to guide and coordinate efforts. It includes opportunity areas with proposed strategies for each, as well as a funding landscape linked to these strategies.

To assist new audiences (e.g. new funders that may be interested to invest in the fishery system) with the context of / opportunity within the fishery, the blueprint also provides a synopsis of fishery dynamics and value potential. The blueprint underpins the business case of investing in the fishery system as a whole, demonstrating how value can be unlocked through strategic intervention.

FINANCE & INNOVATION PLATFORM

Future of Fish has developed a conceptual architecture for a finance platform, which would serve to catalyze cluster development. It consists of a development function, responsible for bringing nascent fisheries-focused opportunities to investment readiness, and a structuring function, aimed at packaging potential investments in a way that meets funder requirements. This platform could include multiple agents that are prospecting for opportunities, and coordinating funding to ensure timely progress. In alignment with the cluster theme, the platform could also include one or more challenge funds as a third component.

The finance platform takes a blended finance approach, which is an emerging 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. This can include establishing capacity and key pieces of infrastructure in social, financial, and ecological systems, providing financial incentives for business solutions via price or volume guarantees, or creating a more attractive risk-return profile of an investment by taking a first-loss and subordinated debt position.

The conceptual architecture is shown below, including three important roles:

1. Blended Finance Agent:

One or more organizations that identify and direct projects and organizations to their most aligned source of funding. For not-for-profit but necessary-for-progress efforts, this can include government and philanthropic funders, and development funders. Business initiatives are referred to the development company (“DevCo”) entity.

2. DevCo

A DevCo entity is established to provide investment readiness and structuring services to business initiatives. DevCo takes a high-risk position with business concepts, and helps to overcome major investment barriers such as management and marketing capacity, aggregation into larger transactions, and diversification of opportunities. DevCo also applies blended finance strategies, incorporating philanthropic and development capital to reduce the risk profile for private investors. Over time, DevCo also provides an important scaling function, helping to replicate concepts to new regions, or helping business to access growth capital.

3. Fund

As the portfolio of supported concepts matures, a fund can be incorporated to the platform. This would make capital more readily available to proven concepts, and provide a channel for investors to make larger transactions, knowing that the fund can disseminate funds to smaller projects. Challenge funds may be considered as a sub-component of this Innovation Fund, to spur the development of solutions where there are still unaddressed components of the cluster mandate.

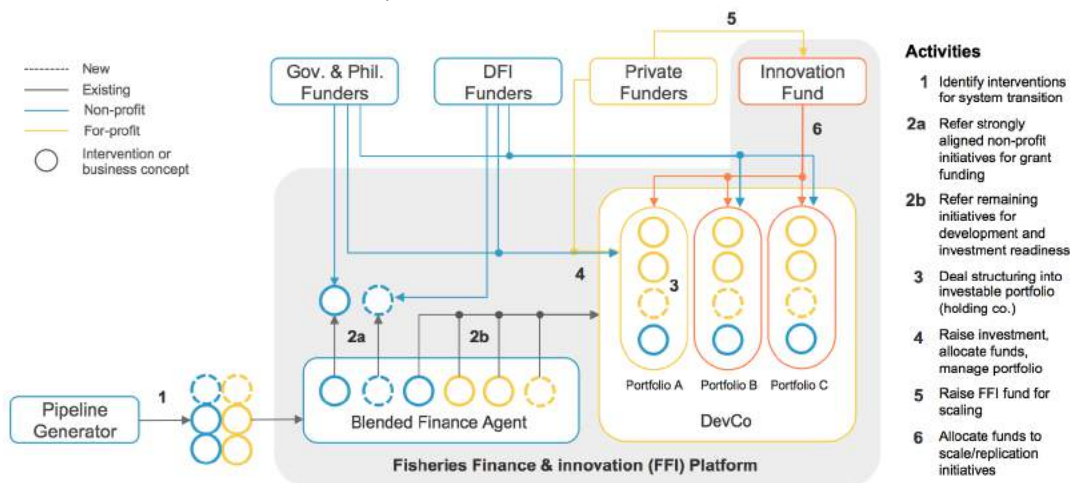


Figure 8. Schematic showing evolution of FFI Platform over time.

DILIGENCE PACKAGE

Future of Fish worked with multiple impact investment firms to understand their due diligence needs during the development of the FDM. The FDM supports the diligence process both by providing a comprehensive understanding of the fishery, its dynamics and risks via the FDM outputs described above, and by mitigating these risks through strategic interventions (e.g. adding management capacity to investable entities) and deal structuring work. We identified three important investor-facing deliverables that inform the diligence process: a context report, a business plan (for the identified investable entity), and a diligence package.

Table 5. Diligence package components

CONTEXT REPORT	BUSINESS PLAN	DILIGENCE PACKAGE
<p>An amalgamation of FDM analyses, including:</p> <ul style="list-style-type: none"> • System Profile • Maturity Assessment • Valuation Scorecard • Blueprint 	<p>Describes strategy of the entity that is seeking investment:</p> <ul style="list-style-type: none"> • Executive summary of proposed deal • Overview of problem the business addresses • Proposed solution to the problem • Value proposition and impact analysis • Market and competition • Team profile • Financial projection • Investment risk and proposed deal terms 	<p>Detailed snapshot of the entity's operations and finances:</p> <ul style="list-style-type: none"> • Financial overview (historical accounts, projections, capital structure, etc.) • Description of products and services • Inventory of customers and suppliers • Competitive analysis • Marketing, sales and distribution overview • R&D overview • Management and personnel overview • Legal and related matters

Case Study #1

CHILEAN HAKE

Context

With its long coastline, fishing is naturally a deeply-rooted occupation in Chile. Common hake is one of the main wild catch fishery products from Chile that is consumed predominantly in domestic markets. It is so pervasive in the diet and culture that most refer to it simply as "La pescada" at local open air markets (caletas). Per capita fish consumption in Chile is expected to increase from 9kg to 15 kg by 2020, yet there have been substantial biomass decreases over the past 15 years which have triggered TAC (total allowable catch) reductions. Hake has now become expensive in both domestic and international markets, making it more inaccessible to average domestic consumers.

As a result, driven both by fishers' need for subsistence and insatiable market demand, IUU fishing has become a major problem in fisheries across Chile. Powerful players within the system currently incentivize businesses and fishers not to report, and force product through complex, opaque, inefficient supply chains that drive value for mid-chain players. Notably, the vast majority of product flows through a central terminal in Santiago before being redistributed to caletas across the country.

Maturity Assessment

Future of Fish conducts a maturity assessment as part of its baselining process in fisheries where it is active. The maturity assessment provides a basis for understanding where there is opportunity to improve the system, and where barriers have been preventing progress. Stream scores are a composite metric averaging more detailed criteria in each area.

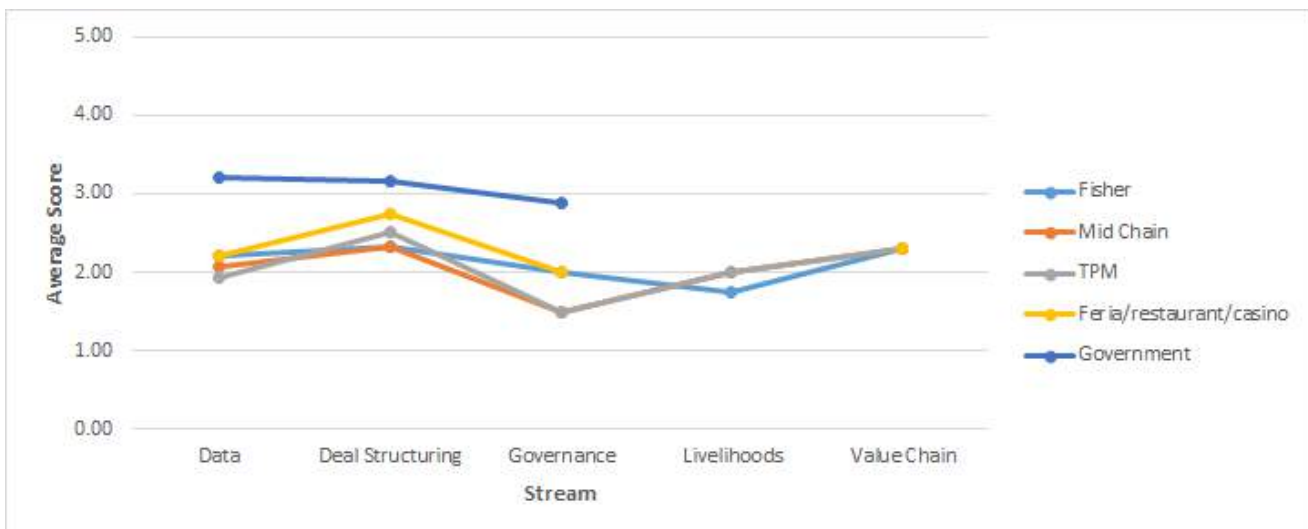


Figure 9. Chilean hake maturity assessment: The fishery shows strong government commitment that has requires greater uptake on the ground. Corruption and IUU remain a major barrier driving the need for traceability. Value is present but not evenly distributed, and fisher livelihoods are insecure.

Follow-on Research

Our field research indicated the need to better map the intricate, complicated network of active efforts in the Chilean fishery, including supply chain players, NGOs, local/regional development agencies, private funders and others.

The network map helps to guide where collaborations can be built to progress regional interventions to transition the fishery and supply chain, and which relationships can be used to engage actors that hold power and leverage in the system. It also highlights where energy is focused across FDM streams, to be leveraged or built-out.

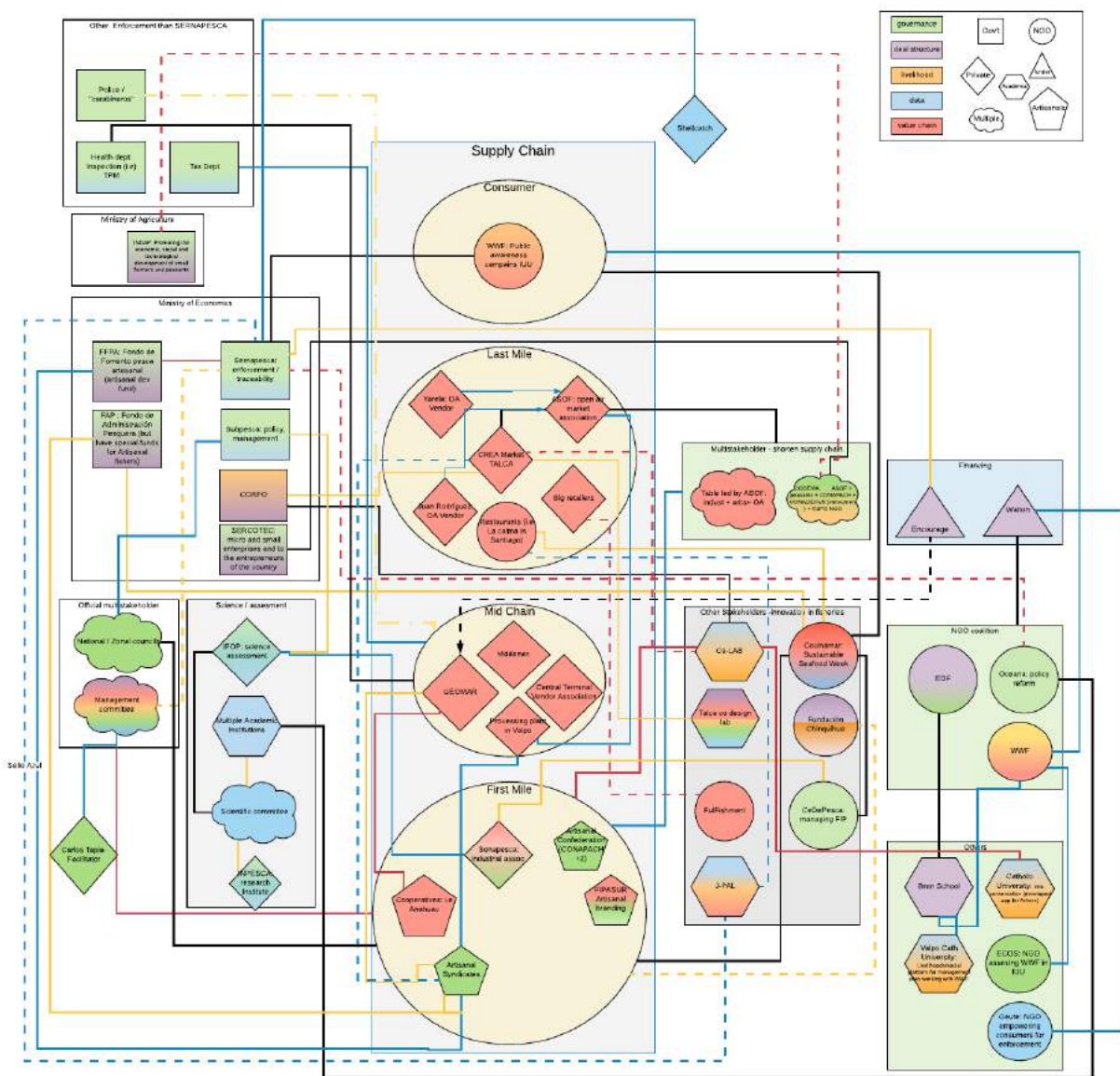


Figure 10. Stakeholder map

FDM Approach

A decentralized, regional approach is needed in Chile, working with stakeholders that hold influence in specific communities that show strong commitment to sustainability and are in pursuit of better value and new supply chain models. Power is concentrated in the current top-down central terminal model, and historical precedence indicates this is not a good channel to gain traction.

From our research and field engagement, we prioritized the potential sources of value in the fishery:

- **Supply chain efficiency and coordination:** Substantial value is lost across numerous hand-offs in the supply chain, leaving minimal value for fishers, and decreasing quality of the end product.
- **Regional models that are not dependent on the central terminal could drive far better margins for all parties involved.**
- **Stock recovery:** TACs are driven by inconsistent data and methodologies that do not align with real hake stocks. A more robust, dynamic system of data and traceability could relieve pressure on the stock through appropriate allocation of TAC and regulation of fishing effort, together with stronger enforcement.
- **Improving product value:** Hake is sold as a commodity product, yet has strong cultural roots, and a consumer base that is increasingly demanding safe, trustworthy food. There is an opportunity to generate value by selling the story and verified origin of hake, ideally in coordination with a more diverse seafood diet that introduces other affordable products.

The FFI platform in Chile leads with supply chain efficiency and coordination. In contrast, fisheries with less complex supply chain structures may emphasize finding new markets or bolstering value of products through certification and story/branding efforts.

Future Developments

Per the FFI Platform model and the strategy described above, Future of Fish is now engaging with select communities and caletas in Chile to co-design pilots that test the efficacy of interventions in the opportunity areas identified. These efforts focus on the northern hake fisheries to start, and intend to scale to additional fisheries across the country (other hake fisheries as well as complementary species such as squid, scallops and other finfish).

Pilots will emphasize the following themes:

- **Shorten and Align the Supply Chain:** Build upon nascent initiatives that remove middleman and establish effective deal structures to redistribute trapped value back to fishers and to OA vendors.
- **Diversify Fishery, Caleta, and Syndicate:** Expand business opportunities of caletas and fishers beyond hake to leverage other commercially viable species, eco-tourism trends, and the benefits of smarter, more sophisticated organizational management.
- **Drive New Branding and Story:** Leverage cultural affinity, history, diverse identities, and quality of select syndicates and caletas to increase value (and recognition) of responsible, legal hake.

- **Create Safety Nets to Reduce Effort:** Develop a combination of support services and incentive programs—from gear swaps to a spawning closure fund to cold chain access— that effectively motivate fishers to reduce effort and illegal catch without leaving them bankrupt.
- **Amplify and Coordinate Innovation Across the System:** Generate greater collective impact through modernized data collection and analyses, increased opportunity for shared learnings, and stronger collaboration across stakeholder groups.

This emerging model may serve as a blueprint for transition of fisheries with complex supply chains and governance issues, toward models that reward traceability and create new structures that improve value for fishers.

Case Study #2

BLUE SWIMMING CRAB IN VIETNAM

Context

Coastal fishing communities that target blue swimming crab (BSC) in the Kien Giang province of Vietnam are under pressure from declining, over-fished stocks, putting the livelihoods and socio-economic wellbeing of fishers, their families and community members at risk.

In particular, the fishery struggles to prevent the harvesting of juvenile crabs, and of female crabs that have a disproportionate impact on reproduction volumes. Interventions are required that can improve the management of the resource, establish strong enforcement, and develop alternative livelihoods.

Target communities currently lack resources and scalable models to improve. To date, the fishery has not received substantial philanthropic funding for improvement efforts, and government departments remain under-resourced for implementing stronger management and enforcement practices that could improve the resilience and dependability of the resource.

Maturity Assessment

Future of Fish conducts a maturity assessment as part of its baselining process in fisheries where it is active. The maturity assessment provides a basis for understanding where there is opportunity to improve the system, and where barriers have been preventing progress. Stream scores are a composite metric averaging more detailed criteria in each area.

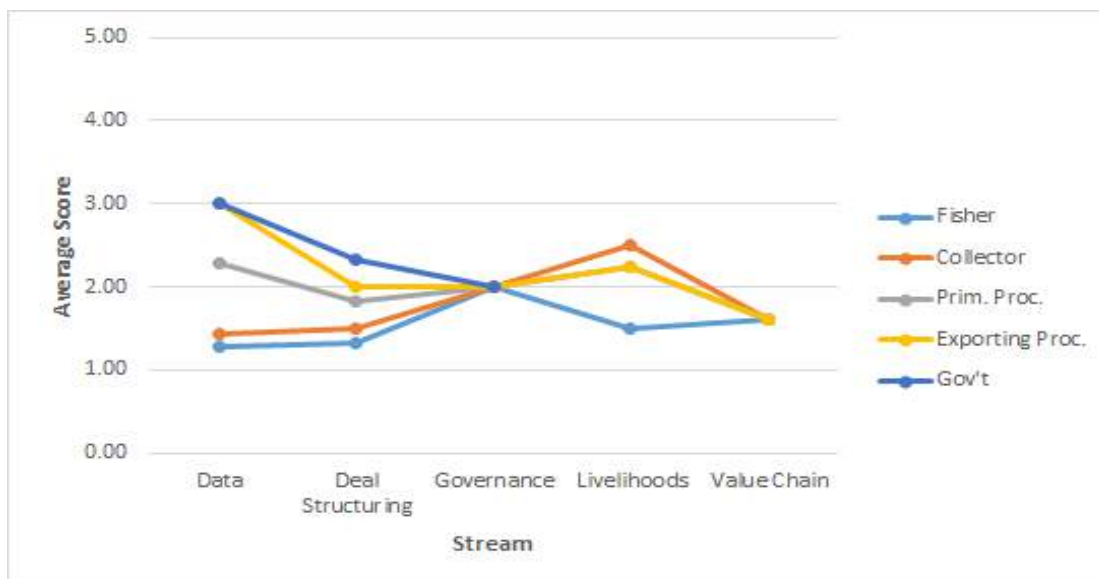


Figure 11. Vietnamese BSC maturity assessment: The fishery is early in its maturity as a sustainable fishery. It faces significant livelihoods challenges for fishers, lacks robust data and investable entities in the first mile, has an unoptimized value chain, and lacks strong enforcement of management policies.

Follow-on Research

Our field research indicated the need for better bio-economic data to validate the recovery potential of stocks, understand which management interventions would best support recovery, and ultimately determine whether recovery could be a substantial driver of value for the fishery.

The model establishes clear need for a Minimum Legal Length (MLL) of 10cm (current policy), as well as restrictions on harvesting females and a ban of “Chinese trap” gear (proposed policies).



Figure 12. Stock response to management interventions.

FDM Approach

A cross-sector approach is needed that leverages alternative sources of capital and support (e.g. private investors, supply chain partnerships, and partnerships with other economic sectors) to build a stronger, more resilient and inclusive economy that is less dependent on BSC, while supporting the adoption of new management practices.

From our research and field engagement, we prioritized the potential sources of value in the fishery:

- Access to capital: Lacking access to major grants, the fishery needs to be primed with capital to make improvements. Opportunity exists where the needs of the fishery intersect with the mandates of other funders such as development agencies (e.g. livelihoods for fishers)
- System coordination: Incentives for sustainable fishing need to be created and maintained by multiple actors in the fishery. This includes the role

The FFI platform in Vietnam leads with systemic coordination and access to capital. In contrast, higher maturity fisheries may emphasize market optimization before seeking multi-stakeholder solutions and access to new sources of capital.

of buyers and communities to create “soft” or social enforcement of management objectives, and the role of government in introducing new types of policies (e.g. harvesting only male crabs)

- Stock recovery: By leading with capital infusion and system coordination, new means of accomplishing management objectives should be introduced, which allow a sustained volume of crab to be harvested each year. in coordination with a more diverse seafood diet that introduces other affordable products.

Future Developments

The FFI strategy in Vietnam can best be supported in the short term through a development program that aligns with complementary objectives in Kien Giang and the Mekong Delta. This includes improving household wages, creating opportunity for women, and fostering innovation of small and medium enterprises.

Example types of business concepts that could be supported include:

- Compliant gear manufacturer: Work with communities to manufacture compliant gear, and facilitate a grant-funded gear swap or buy-back program that equips fishers with gear that does not capture juvenile crab.
- Cooperative formation: Fishers may be able to capture a better price and exert supply power in the market by formally organizing, and can create subsequent opportunities for value-added products.
- Supply chain upgrades: Investments into processing facilities, cold storage, and other transportation and infrastructure businesses that can facilitate better quality and access to new, higher-paying market
- Aquaculture: Development of facilities that diversify the prospective investment portfolio, while providing alternative forms of livelihoods that are connected to the fishing profession.

The proposed development program would fund the design, implementation and validation of viable business concepts, helping viable concepts to become investment ready, and identifying opportunities to scale them both domestically and globally (e.g. to other BSC fisheries, or fisheries with similar structural challenges).

This emerging model may serve as a blueprint for recovery in heavily-depleted fisheries with high value products, lacking access to conventional funds.



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