BRIDGING THE GAP: SCALING SUSTAINABILITY IN AQUACULTURE THROUGH LANDSCAPE APPROACHES AND AQUACULTURE IMPROVEMENT PROJECTS

A Roadmap for Landscape-Level Improvements in Aquaculture

Welcome to the Roadmap

This Roadmap brings together the experience of two prominent organizations in sustainable seafood and builds upon established guidelines and the latest thinking on responsible and sustainable aquaculture, specifically landscape and jurisdictional approaches.

The Roadmap delivers a comprehensive and actionable guide to follow a landscape-level aquaculture improvement approach in any geography. Additionally, it provides real -world insights from its application in the shrimp farming sector in Andhra Pradesh - the major shrimp producing region in India.

For easy navigation, each step of the Roadmap provides a consistent suite of information, often coupled with the icons below:

The **Principle** defines the foundation of the step to be enacted.

We define our vision of **Success** to support a common understanding of how you will know each step has been achieved.

Our **Recommendations** are designed to help you steer clear of common mistakes and stay on track toward success.

Our occasional **Expert Tips** offer step-specific advice for added support.

Learnings from Andhra Pradesh share the insights and lessons from our collaborative two-year experience in the field, working with local experts in

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building the roadmap - providing you with the groundwork and essential information to move forward with improvements in this sector.

Why a landscape approach?

Aquaculture can offer a climate-friendly food source that delivers environmental and social benefits and contributes to food security. Yet, with only 58 percent of global aquaculture (excluding aquatic plants) certified or rated against recognized schemes[1], sustainability progress in aquaculture continues to be limited. And individual farms are incurring the economic burdens of interventions, such as certification, and insufficient state, regional, and national management to limit negative impact.

Sustainability certifications, such as those against the Aquaculture Stewardship Council standards, and aquaculture improvements projects (AIPs), have long been recognized as valuable tools to deliver responsible production. These mechanisms largely rely on clearly defined ownership of operations, technical (and financial) capacity to deliver improvements, spatially defined boundaries, and clear market incentives. Yet, much of global aquaculture production today relies on large quantities of seafood being delivered from numerous small-scale producers, where land ownership and regulatory requirements may be unclear or lacking, and market incentives that reward producers are missing.

Current approaches to aquaculture management are often misaligned or don't accommodate the unique challenges of a landscape of small-scale producers, nor do they embrace the opportunities delivered through local capacity and expertise to drive transformation. Transforming production for the vast majority of aquaculture producers will require different incentive structures that decrease risk, decrease input costs, or increase survival through better practices and use of technology.

A landscape approach recognizes these challenges and strives to elevate the environmental and social baseline of the entire shared area, to deliver direct and indirect benefits resulting from the improvements made by the primary sector.

A landscape approach does not omit or disincentivize certification, nor does it discourage independent projects driving best practice improvements. Instead, it builds on the strengths of various approaches to work collectively to achieve measurable change (see Figure 1).

What is a landscape approach?

Landscape and jurisdictional approaches (herein referred to under the banner of landscape approaches) are collaborative, multi-stakeholder efforts that align diverse interests, set shared sustainability goals, and drive collective action at a landscape scale (ISEAL et al., 2024).

Companies have already embraced landscape initiatives in commodities like beef, cocoa, palm oil, and soy (Tropical Forest Alliance, Proforest and CDP, 2024, 2023, 2023a; Tropical Forest Alliance and Proforest 2023). Building on this success, NGOs are increasingly exploring this approach for seafood – both fisheries and aquaculture (CI and WWF, 2023).

[1] Environmental Data Tool 2024 – Certifications and Ratings

Figure 1: Core criteria for impactful and scalable landscape initiatives

Scale: A defined ecological, socioeconomic, or administrative area, e.g. a watershed or jurisdictional boundary

Multi-stakeholder governance: Governed by a multi-stakeholder process or platform that has decision-making responsibility for the design, implementation, and monitoring of the initiative

Collective goals and action: Stakeholders agree on a set of long-term landscape-scale sustainability impact goals and a collective action plan for achieving those goals

Collective monitoring framework: A collective monitoring and reporting framework that enables assessment and communication of progress towards the initiative's collective sustainability impact goals (ISEAL et al, 2024)

Why ASC and SFP?

The Aquaculture Stewardship Council (ASC) and Sustainable Fisheries Partnership (SFP) are two science-based, nature and people-focused, data-driven NGOs that share the vision of a world where 100% of seafood is sustainably and responsibly managed.

ASC sets the standard for seafood by delivering the most robust standards and the highest assurances to ensure traceability and transparency throughout the supply chain. ASC applies expertise in aquaculture and field implementation of improvement programs, along with a deep understanding of the impacts associated with aquaculture operations, to transform seafood farming by driving and championing the making of real and meaningful change.

SFP has long advocated for improvements to aquaculture at scale, through a management approach guided heavily by the FAO's Ecosystem Approach to Aquaculture that understands that farms are interconnected, rely on shared resources, and can (and do) have a cumulative impact.

To deliver improvements at scale, landscape approaches in aquaculture provide an opportunity to capitalize upon the complementary and differing approaches of these two organizations, making ASC and SFP an important partnership in developing this model.

Shrimp farming in Andhra Pradesh

An opportunity for landscape improvement

Shrimp consumption continues to rise globally. Shrimp has become the most popular seafood in the U.S. (2.49 kg per capita in 2022) and was the third most consumed in the EU (1.68 kg per capita, 57 percent of which comes from farmed seafood) (National Fisheries Institute 2024; European Commission 2024). Current global farmed shrimp production is estimated at around 8.5 M metric tonnes and is dominated by whiteleg shrimp (*Litopenaeus vannamei; Penaeus vannamei)* production. India is the third-largest producer of whiteleg shrimp, contributing around 16 percent (one-sixth) of its global supply, worth around US$5.24 billion. Despite recent decreases in exports the US remains the largest market for Indian shrimp, followed by China and the EU (including the UK) (FAO 2025; Shrimp Insights, 2024; SFP, 2024; WORMS, 2025).

At the heart of India's shrimp industry lies the state of Andhra Pradesh, which accounts for more than 80 percent of the country's production, dominated by smallholder farmers operating on farms under 2 hectares.

As Andhra Pradesh plans to increase shrimp farming from 400,000 acres to 1 million acres by 2030,[2] the challenge of scaling sustainably becomes more urgent than ever.

This is where a landscape approach becomes essential. With rapid growth, the environmental and socio-economic pressures on Andhra Pradesh's shrimp farming sector are likely to escalate. Recognizing this, Andhra Pradesh's plans for aquaculture expansion emphasize environmental responsibility, legal compliance for farms, greater integration of technology, and a stronger focus on value-added products.

A landscape approach can address these challenges by convening diverse stakeholders, promoting sustainable practices, and balancing the industry's growth with environmental preservation and community well-being. By integrating sustainability across the entire region, this approach ensures long-term resilience for the shrimp farming sector, the ecosystem, and the communities that depend on them.

[2] As reported in multiple media outlets: e.g., Andhra to expand aquaculture to 1 million acres by 2030, says CM Naidu and A.P. govt. aims to bring 10 lakh acres under aquaculture by 2029-30; Naidu calls sector a growth engine - The Hindu

A roadmap to landscape-level aquaculture improvements

Efforts to drive improvements across the aquaculture sector are not new; there are multiple initiatives, innovations, and research initiatives dedicated to advancing the sector. In this roadmap, we apply a practical and comprehensive approach. We build from the experience and expertise of others to address challenges and identify opportunities that create connections and partnerships to deliver progress towards the shared goal of driving improvements. Rather than crowding this space with an entirely new approach, we are mapping the steps to collectively elevate the baseline (see Figure 2).

This roadmap outlines an approach for landscape-level aquaculture improvement projects (AIPs); although the implementation focus is on shrimp farming in Andhra Pradesh, the steps can be broadly applied around the globe. It is structured around two key components:

1. A step-by-step model for designing and adopting a landscape approach in aquaculture
2. Insights and findings from applying this approach within the Indian shrimp sector in Andhra Pradesh.

Figure 2: Steps in the roadmap to landscape-level aquaculture improvements

1. **Recognize the opportunity.** A clear understanding and statement of the challenge is the first step to deliver improvements in aquaculture management using a holistic approach.
2. **Scope the scale.** Identify potential management areas where key stakeholders can implement both focused and large-scale improvements across ecosystems, jurisdictions, settlements, and resource user groups.
3. **Understand the landscape and its stakeholders.** Improvement projects or scaled approaches must clearly define the improvement needs and understand the stakeholders and their roles to drive progress.
4. **Enable local expertise: Refine, Repeat, Reengage.** Continually engage with local communities and stakeholders to fully understand the challenges and opportunities. Invest time in building the skills and awareness of local experts so they can lead and strengthen collaboration across industries, communities, and the environment.
5. **Define the opportunities, barriers, and incentives.** Define meaningful incentives for actors across the supply chain that recognize the types of practices promoted in improvement projects, the sustainability goals, and associated claims that can be made.
6. **Define success and monitor progress.** A coherent, well-established and applied monitoring framework will demonstrate progress towards a landscape initiative's sustainability goals and show beneficiaries and supporters the change they are delivering.
7. **Implement solutions.** Define the landscape approach entry point. The entry point will enable the launch of a subsequent landscape initiative for responsible aquaculture at scale, while also providing tangible benefits for other resource users and the environment.

Why now?

Despite ongoing challenges, momentum for a landscape approach to aquaculture management is clearly growing. Industry-wide consensus on the definitions and core criteria of landscape initiatives marks a major milestone for effective, scalable improvements in any commodity (ISEAL et al., 2024).

Stakeholders across the aquaculture sector increasingly recognize the urgent need for innovation and are actively refining improvement models, applying lessons learned and advancing landscape and jurisdictional approaches as drivers of meaningful, holistic, and system-wide transformation in the seafood sector. This is an approach that will not only support the FAO's Ecosystem Approach to Aquaculture, which now forms a key principle of their Guidelines for Sustainable Aquaculture, and the World Economic Forum's Global Sustainable Aquaculture Roadmap (Conservation International, 2023; WWF and Conservation International, 2023; FAO, 2025; FAO, 2010), **but can also address the ambitious sustainability and nature-related goals of major seafood retailers to protect, manage, and restore both terrestrial and aquatic environments.**

Landscape approaches also offer opportunities to test different enabling levers, whether through mechanisms that deliver insurance or financing for farms that reduce their operational risks, technology that delivers insights into operations without escalating costs and burdens, or engagement with communities to deliver shared stewardship of resources.

Beyond the farm: The case for landscape-level strategies to strengthen aquaculture sustainability

This roadmap delivers a series of activities that are carefully designed to collectively define a landscape project for implementation.

A number of impressive bodies of work point to pathways to drive more responsible aquaculture production. Some use a systems approach (e.g., The Global Sustainable Aquaculture Roadmap: Pathways for Systemic Change), while others deliver guidelines built upon years of initiatives and cross-sector learnings (e.g., the Guidelines for Seafood Jurisdictional Initiatives). This roadmap draws from the impressive steps and lessons shared through these works to help improve the shrimp aquaculture sector in Andhra Pradesh and to apply these learnings for aquaculture improvement project landscape initiatives elsewhere.

The roadmap offers a series of activities that are carefully designed to collectively define a landscape project for implementation. While a roadmap implies a one-directional approach, it isn't actually linear. Each step will inform and add to the others, and steps should be revisited along the way. This will ensure that challenges and opportunities are continually refined to further maximize benefits for participants, while minimizing financial and resource costs to those stakeholders in the position to enable change.

1. Recognize the opportunity

Principle: *A clear understanding and statement of the challenge is the first step to deliver improvements in aquaculture management using a holistic approach.*

While the aquaculture sector is experiencing global growth, with the potential to support millions of people around the world, it also faces significant socioeconomic and environmental challenges. Centuries of agriculture have transformed the ecosystem, adding to the pressure for responsible farming today. Impacts on habitats in marine and terrestrial environments can alter ecosystem services and reduce resource access for communities. Responsible practices can deliver benefits, but the potential to realize these benefits is often entangled with complicated barriers and a lack of clear incentives to deliver improvements.

Eco-certifications, such as those delivered through the Aquaculture Stewardship Council (ASC), rely on market-driven demand to drive responsible practices. But due to the technical competencies often needed to meet the requirements of certification programs, they mostly attract larger producers, leaving small-scale farmers behind. Certifications focused on improving practices at the farm level can miss addressing broader, cumulative impacts of the industry. Despite progress in the adoption of farm-level certification, the rate and scale of improvement remain insufficient to address aquaculture's rapidly growing footprint.

Improvement models, referred to collectively as aquaculture improvement projects (AIPs), are promising yet underutilized tools to address barriers to improvement. Modelled on the success of fishery improvement projects (FIPs) in transforming underperforming wild fisheries (SFP, 2025; CEA, 2016), AIPs have existed for over a decade. But they are yet to gain widespread recognition or consistency in approach for driving sector-wide change.

Frameworks with measurable steps and opportunities for group collaboration, such as those within the Improver Programme by ASC, overcome a number of barriers that have previously limited AIP successes.

Many AIPs are hindered by unclear incentives, fragmented efforts, and uncertainty over whether improvements should focus on individual farms, producer groups, or entire areas, among other challenges. In many cases, there are unclear or insufficient incentives for market demand alone to

Two routes to improvement

Rewarding and recognizing responsible operations will deliver benefits to the region and encourage uptake of responsible practices, regardless of certification status.

In a landscape AIP, there is opportunity for farms to coordinate improvement efforts with seemingly different end goals. Market demand for products that deliver high assurances and claims of responsibility can be delivered through those farms that achieve a credible certification, while other farms in the region that may need more time to achieve certification or may not have that distinct market advantage can still drive their operations towards better management practices.

Collectively, these approaches can work in tandem to address key environmental and social issues in the landscape, deliver efficiencies to farmers and elevate the performance baseline of the region. Whether the landscape AIP employs a direct route to certification, better management practices, or a combination, success relies on having clear capacity, technical knowledge, and a timebound and measurable approach to progress.

deliver social and environmental improvements, or those improvements may require significant investment or capacity, or may not be sustainable given the various regulatory or cultural aspects at play. Meeting the multifaceted needs of a production sector may start with a simple statement or challenge to traditional drivers of change.

Landscape approaches offer a compelling opportunity and path forward for AIPs. By building upon the momentum of landscape approaches in other terrestrial commodities and by embedding AIPs within broader, multi-stakeholder "seafood" landscape initiatives, the aquaculture industry can move beyond isolated farm improvements toward systemic change and the creation of responsible sourcing areas to complement farm-level certification. This approach can recognize the complexity of a problem at various scales and can define approaches by building on existing processes and projects by using local expertise to deliver change.

> **This will not be a one-size-fits-all solution. It's expected that the problem might need to be addressed by starting at a basic level and evolving later as the steps of the roadmap deliver information and learnings.**

Success: A clear understanding of the problem will identify the beneficiaries, their economic opportunities, and the environmental and social areas for improvement. It will consider the role of government, the private sector, and other stakeholders, while also considering the trade-offs and unintended consequences.

Solutions will focus on the layers of the problem, by keeping the producer at the core and defining opportunities for innovation and engagement across the supply chain.

Recommendation: Look at the scale and variables associated with the sector to understand the interconnectedness of the issues to be addressed. For landscape approaches, look to policy and conservation objectives established to progress towards nature-based goals. Define the benefits to be achieved, by whom, and outline the risks and potential unintended consequences of those affected. The government and third parties that benefit from the sector have a role to play. This will be further refined in subsequent steps.

Learnings from Andhra Pradesh: The Farmer's Dilemma

Andhra Pradesh is the largest shrimp farming state in India, with considerable sector growth over the last few decades. This growth has led to multiple social and environmental challenges, lack of land tenure, limited or unclear incentives, and farmer dependencies on third parties that limit their ability to invest in improvements.

As global demand for shrimp has increased, land conversion for shrimp farming in Andhra Pradesh has resulted in pollutants and saline water in freshwater environments. Increasing market demand has driven urgency in production without investment in improvement.

Across the region, many small-scale farmers hold short-term land leases, with limited capital or opportunity to invest in their operations or mitigate associated risks, creating a deep dependency on the outputs from individual production cycles, which further

introduces risk into their operations. Risk reduction can take place at the level of the farm (best management practices), but also at the level of the watershed, signaling that effective management of shrimp aquaculture at the landscape level can elevate the baseline of the whole region.

Where a crop may be impacted by disease, for example, the farmer may be forced to harvest early, earning a lower price for their product or losing a portion of the product. Solutions such as monitoring pond health or improving the quality of their feed are often out of reach, due to either high prices or dependency on companies that they are indebted to until their production cycle reaches harvest.

A key concern shared by Indian shrimp farmers is the lack of price premiums for certified products, largely due to their dependence on processors for certification. **This raises the question: "What's in it for me?" when they are considering transitional or improvement initiatives.**

Farmers face static farm-gate prices and rising input costs (feed, labor, power, medicines), while seeing no financial gain from certification. As a result, although they are familiar with the concept of improving product as opposed to certified product, they view improvement efforts with skepticism.

Opportunity

For improvement efforts to gain traction, solutions must address and focus their communication on cost reduction rather than price premiums, ensuring that farmers see tangible financial benefits.

2. Scope the scale

Principle: *Identify potential management areas where key stakeholders can implement both focused and large-scale improvements across ecosystems, jurisdictions, settlements, and resource user groups.*

Defining the landscape is critical to implementing a well-designed approach. Yet while that seems an obvious statement, it is not nearly as straightforward as delineating a geographic boundary. To drive incentives, deliver improvements for producers, and elevate the social and environmental baseline of the landscape, we need to understand the various layers and ecological, administrative, jurisdictional, cultural, or other boundaries at play.

Any landscape will include the following essential components:

- Ecological connectivity and a statement on how the land is being used, including important ecological features, access to shared natural resources, and their use and status
- Shared regulatory authority among sectors, with common goals and objectives for resource use and conservation
- Connectivity across the supply chain
- Various stakeholders with varying levels of influence
- An understanding of, respect for, and alignment with cultural norms.

These various boundaries will intersect and will also likely have some independence from each other. A visual representation of these boundaries is an important step in defining the scale of the landscape work. This should be created using available data layers and reviewed with stakeholders to further improve the outputs to guide project definition and decision making.

Developing this map will require review of publicly available GIS data and relevant spatial information sources, including those identified through desk-based research and institutional resources. Landscape implementers should then organize and visualize this data.

The availability and detail of data will vary based on geography, administrative transparency, target species, data quality, and the resources accessible to project partners. Some datasets may include specific reference points for mapping, while others may require aggregation at the most appropriate geographic levels.

Bringing the landscape into focus

There will be many potential data layers that would bring the landscape into focus, including:

- Administrative boundaries defining local divisions
- Natural and manmade hydrological resources
- Previous and current ecological areas of importance (e.g., wetlands, mangroves)
- Cultural areas of importance
- Types and status of farming activity
- Locations of certified and improving farms, processing facilities, and feed mills
- Areas of existing and planned aquaculture development
- Previous and current non-aquaculture land and water resource use
- Communities, villages, and urban areas.

This activity may begin with layering data on a map, but the application of that data to further refine the opportunity and inform a landscape analysis, social impact assessment, and stakeholder mapping is paramount to implementing an effective approach. If the scale is too narrow, it could miss important ecological connectivity or supply chain opportunities that should be targeted under the landscape improvement approach.

Success: The creation of a responsible sourcing area in which diverse stakeholders within a defined geographic region work collaboratively to address critical sustainability priorities – such as deforestation, biodiversity conservation, and rural livelihoods – through integrated actions at the farm, watershed, and broader landscape levels.

Recommendation: Start with your broad farmed seafood production geography, such as a state or province, to explore potential locations within. Review publicly available and relevant geospatial data sources that cover this area, including those identified through desk-based research and your own institutional resources. Organize and visualize the data using GIS expertise. Build every available data layer into this map and hold sessions with project participants to interrogate and ask questions of the map as they relate to the opportunity for landscape improvement.

Expert Tip: Remember that each step will inform and add to the others – this is a living map! It should be continually refined as the project progresses.

Ultimately, maps should be put in the hands of stakeholders. Let them define the areas for improvements and provide additional questions and issues that can be visualized by mapping

Learnings from Andhra Pradesh: Expanding on what we know

Using data from ASC, SFP, and publicly available sources, we worked with a GIS expert to develop a map highlighting shrimp production hotspots in Andhra Pradesh and their distribution across ecological and social features of the region.

By combining usable data layers, we pinpointed areas of concentrated shrimp farming activity, including ASC-certified farms and predominantly small-scale farms registered with the Coastal Aquaculture Authority (CAA). We reviewed how these areas intersect

with water bodies, protected areas, and sensitive habitats such as mangroves. Building in these various layers illuminated the scale of the opportunity and where there were potential immediate gains for directed improvement actions (see Figure 3).

The analysis highlighted the East and West Godavari and Krishna districts as priority areas (and also as areas located close to the protected habitats of Kolleru Lake and associated mangroves) for further landscape assessment and stakeholder engagement. These areas rest between two significant waterbodies, the Krishna and Godavari rivers, pointing to both the importance of the area and the sensitivity to climate change.

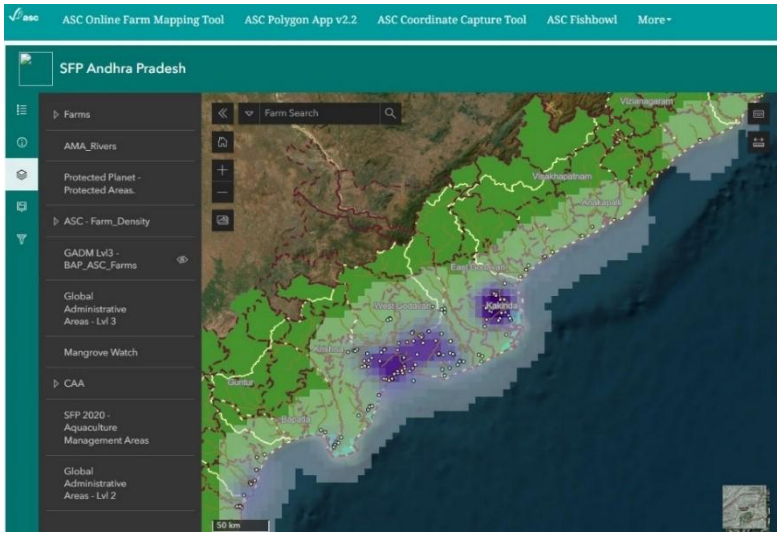


Figure 3: GIS mapping of ASC-certified farm clusters, district boundaries and other ecological features.

Connectivity assessment: Is identifying farming activity enough?

Initial mapping activities revealed general farm densities across main production areas, but this does not communicate farm activity and readiness for improvement or certification.

These details are important components in parsing out mechanisms to drive improvement across a landscape. A connectivity assessment will work from farm maps to scale this exercise through a combination of several spectral indexes, such moisture and vegetation. This delivers a deeper understanding of pond activity, as inactive ponds can be covered with vegetation, completely dry land, or filled with some water but have structural damages. A connectivity assessment also includes distances to ecological features that may limit growth and improvement opportunities and be in conflict with requirements against sustainability standards, such as the ASC.

ASC and SFP worked with Longline UK to develop a connectivity assessment of farming in Andhra Pradesh.

3. Understand the landscape and its stakeholders

Principle: *Improvement projects or scaled approaches must clearly define the improvement needs and understand the stakeholders and their roles to drive progress.*

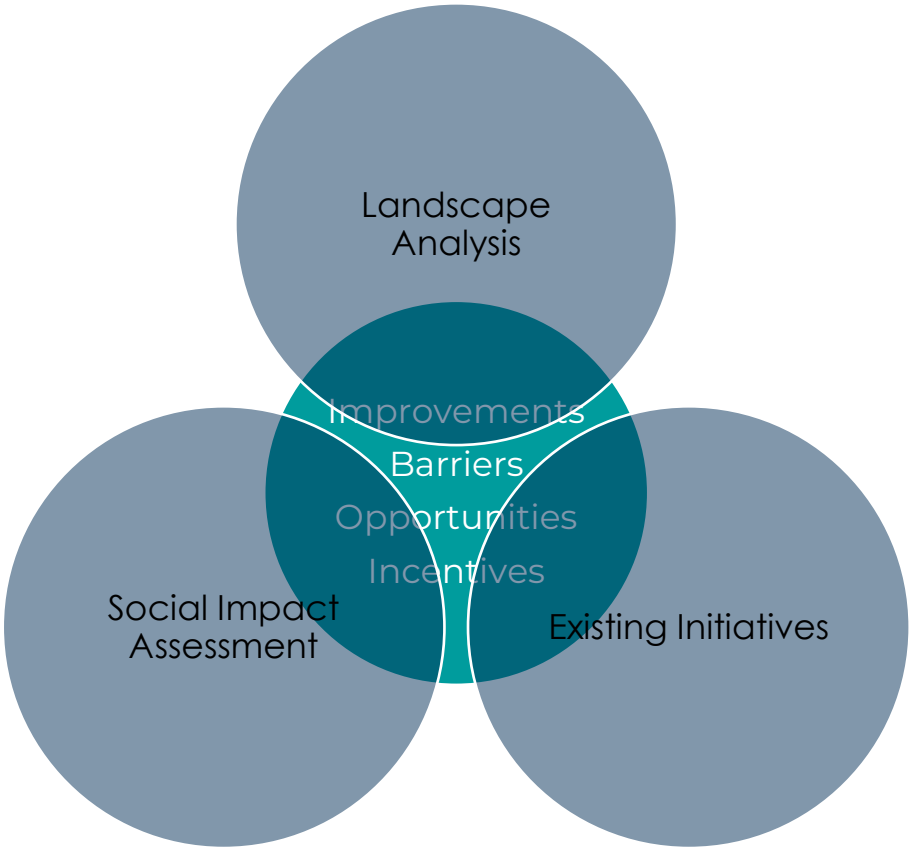
Identifying key aquaculture improvement needs and stakeholders helps determine collective goals and coordinated actions. Expanding improvements beyond the farm to the wider landscape creates opportunities to engage with a broader range of stakeholders in the aquaculture supply chain, including those who govern and provide services to the supply chain and those who are impacted by it. All of these stakeholders have a vested interest in a landscape initiative and decision making.

The previous sections provided the information base for informed decision making. Once you have gained a broad understanding of the potential project locations, issues, and stakeholders through remote mapping, you are ready to dig deeper into the landscape through on-the-ground engagement.

Landscape approaches are complex. At the most basic level, you need to identify what key improvements you are trying to address, who the beneficiaries are, and where to work. However, this gets much more complicated as the layers are revealed. Stakeholders have different perspectives and needs, and a holistic collection of approaches is needed to address the issues (see Figure 4).

This step combines desktop research with producer, supply chain, and stakeholder engagement to identify key sustainability issues and stakeholders in target regions.

Figure 4: ***Three key components for understanding the landscape and stakeholders:***



1. ***Landscape analysis*** *involves studying geographical features, ecosystems, and human impacts in a specific area to understand its structure and function and stakeholders. Landscape analysis helps evaluate industry dynamics, emerging trends, opportunities, and threats.*

2. ***Social impact assessment*** *evaluates the potential social impacts of a proposed project or program and the relevant stakeholders. It reviews the social dynamics and key players associated with a sector or project to predict and mitigate negative impacts and identify opportunities to enhance benefits for local communities and the broader society.*

3. ***Existing initiatives review*** *creates awareness of all the good work being done in a region and presents opportunities to leverage expertise, support work towards common goals, avoid duplication of effort, and mitigate confusion among stakeholders.*

These processes will further identify and refine priority issues, stakeholders, and project locations. Depending on context, they can be conducted individually or combined.

Landscape analysis

Goal: To increase your understanding of the main production, environmental, and social improvement needs, and barriers to improvements and opportunities as they affect primary sector participants.

Equally important is identifying who the beneficiaries of these improvements are, along with the influential stakeholders and actors who could carry them forward.

Principle: Identifying key sustainability challenges and opportunities for landscape-level improvements begins with understanding the main production and environmental concerns of the aquaculture sector, supply chain, and supporting industries in the designated region. A landscape analysis evaluates both the strengths and improvement needs via engagement with local stakeholders, to ensure a well-informed process and the basis of a collaborative approach.

Process: The landscape analysis should offer a clear overview of regional aquaculture, covering farm density, operational status, regulatory bodies, and key stakeholders. The analysis should deliver insights on the role of government, supply chain, and other convening organizations, as well as their goals and barriers, to identify opportunities for collaborative approaches. It should highlight production and environmental challenges, capacity gaps, and opportunities for improvement, especially in training and support. Priority issues should be identified at multiple geographic levels – from individual farms to farm groups or shared water bodies, and up to the broader landscape.

The analysis should also include a market assessment to identify influential supply chain companies that can drive change. This will draw on desktop research, industry news, trade groups, interviews, surveys, and workshops. Access to supply chain databases may be possible with strict data security measures.

A landscape analysis can be achieved through various approaches but should always use local expertise and include stakeholder mapping and market analysis.

Social Impact Assessment

Goal: To increase your understanding of the main social improvement needs, via identification of the issues impacting local communities, stakeholders, and other resource users.

Equally important is identifying who the beneficiaries of these improvements are, along with the influential stakeholders and actors who could carry them forwards.

Principle: Expanding improvements beyond the farm to the wider landscape creates opportunities to engage with a broader range of stakeholders, such as other resource users and local communities. This approach helps identify the potential benefits and conflicts related to aquaculture and drive change towards common goals, while ensuring that the priorities, concerns, and voices of these groups are included.

Process: The social impact assessment evaluates the potential social impacts of aquaculture, the proposed project or program, and the associated stakeholders. It reviews the social dynamics and key players associated with a sector or project to predict and mitigate negative impacts and identify opportunities to enhance benefits for local communities and the broader society. The analysis should cover local communities and resource users, both within and beyond aquaculture.

Social impact assessment can be achieved through various approaches but should always use local expertise and include stakeholder mapping.

Existing Initiatives Review

Goal: To increase your understanding of other existing and planned aquaculture projects and improvement initiatives (at any scale) that overlap geographically with the target area and potentially align with your identified improvement needs and stakeholders.

Equally important is to identify the local experts, technology providers, and conservation projects in the region that could be valuable partners in your own project.

Principle: Working together can amplify impact, increase efficiency, and strengthen outcomes. Coordinating efforts where appropriate will support stakeholder engagement by limiting duplication of efforts and avoiding confusion among stakeholders, the supply chain, and local and international audiences.

Process: Reviewing active, planned, or completed initiatives and projects operating in the same geography and commodity – by both local players and national or international organizations – presents opportunities to leverage expertise, support work towards common goals, avoid duplication of effort, and mitigate confusion among stakeholders. Steps include:

- **Review other projects:** Research recent and upcoming aquaculture improvement projects, especially in your target commodity and other related landscape approaches.
- **Compare projects:** Use a matrix to assess each project based on ISEAL's (2024) landscape initiative criteria. Take note of project focus areas and how those may align with your work or where there may be gaps or potential duplication, such as on environmental protection, community involvement, sustainable production, technology use, and certification programs. Identify local partners involved.
- **Connect:** Reach out to project leaders to share insights, learn about their goals, and explore collaboration opportunities, such as data sharing or joint reporting under a shared platform.

Improvements Barriers, Opportunities, and Incentives

The outcomes of these three components will allow you to better understand the improvements needed, the barriers to overcome, and the opportunities to build upon under a landscape initiative as well as the required incentives in Step 5 of the roadmap.

From the field

Feedback from stakeholders emphasizes the importance of understanding and building on the resilience of impacted communities, making improvements where needed and avoiding imposing new models. Therefore, there is a need to identify **local** land/agricultural and social issues and **local** supply chain actors and NGOs and expertise that are already tackling these issues and build on this capacity.

"The answers to climate change adaptation and improvements in general lie within the people impacted. It is our role to understand and build upon it. In some cases, this will mean no changes are needed. In some cases, major changes will be needed. In most cases, adaptations and improvements lie somewhere between the two, with people needing support to make them as effective as possible. We need to understand the resilience of people in the system and build upon what already exists, not come with new models."

- Small-scale fisheries consultant

Success: The landscape initiative is informed by a deeper understanding of:

- The key production, environmental, and social aquaculture improvement needs and locations from those involved (at local, national, and international levels) and affected, to lay the foundation for shared goals
- The key stakeholders/players in the region, including which groups are engaged, capable, and willing to drive collective action on these shared goals and which supply chain companies share a desire to improve production that aligns with sustainability goals and willingness to leverage their market influence to encourage participation
- Other initiatives and conservation projects included in the target geography that may align with these shared goals and stakeholders and may provide opportunities for inter-project collaboration, including with their network of local experts and technology providers.

Recommendation: Unlock local expertise for all engagements, especially in conducting landscape analysis and social impact assessment. Start by looking at other projects already working in the same area to explore possible collaborations.

Empower your own networks and ask for recommendations to find the best partners who have the right industry, social, and environmental knowledge, but also know your goals and can demonstrate to stakeholders the value for their time.

Expert tip: This is one of the most significant and foundational steps in the roadmap, as it brings local experts into the fold – and with this the priorities of the local aquaculture industry and community stakeholders. As a result, it helps to pinpoint the project location and focus on the priority sustainability challenges and key stakeholders involved and affected.

Learnings from Andhra Pradesh

The Andhra Pradesh shrimp farming sector is both important and complex. Conducting these three components helped the team understand the landscape of Andhra Pradesh and delivered meaningful insights into improvement needs, stakeholders, and recommendations. Below is a summary of these insights and recommendations – for more details, see the Landscape Analysis and Social Impact Assessment reports.

Improvement Needs

The analyses revealed pressing ecological and socio-economic challenges at multiple geographic levels across the landscape:

- Farm-level operational challenges included poor seed quality, inefficient feed use, high input costs, antibiotic use in polyculture systems, limited knowledge of the benefits of certification, limited technical capacities to improve, and limited access to credit and insurance.
- Social challenges in the sector included poor working conditions, particularly for women in processing facilities; lack of formal labor contracts; limited rights for workers; and critical gender disparities.
- Limitations on land tenure represent a particular challenge, hindering investment into improvements and prioritizing short-term over long-term gains.
- Multi-site and waterbody-level environmental issues included polluted and salinized water sources, habitat degradation, and weak management of disease and water quality.
- Regional level challenges highlighted inadequacies that prevent broader uptake of improvement. These included a fragmented registration process, lack of economic incentives, and inadequate diagnostic and extension services, to name a few. Limits on information sharing around research, market demands, and traceability further perpetuate poor performance. Farmers generally lack coordination and there are labor shortages. Environmentally, the region has obstacles to address around unsustainable feed sourcing and increasing climate vulnerability (e.g., coastal erosion, disease outbreaks).

These findings mirror systemic challenges faced across the Global South, underscoring the need for policy responses that integrate farmer well-being with environmental stewardship. Additionally, the findings highlight the need to strengthen grassroots governance, support inclusive, multi-stakeholder platforms, encourage polyculture farming systems, support farmer cooperatives, and improve traceability and transparency across the shrimp value chain to meet sustainability standards that enhance global market access.

Stakeholders

Stakeholder engagement revealed an intricate map of engaged actors and their interest in and influence on the sector (see Figure 6). Classifying supply chain actors (feed mills, input manufacturers, traders, hatcheries, farmers, processors and exporters, and professional experts/advisors) against the organizations they interact with (regulatory bodies, promotion and extension, associations, research providers, and non-

profit organizations) offered an understanding of relationships within the shrimp farming sector.

Middlemen play a key role as trusted go-betweens, helping farmers, suppliers, and processors stay connected. They build and manage relationships, take on financial risks, and help navigate the ups and downs of the market – making them vital to both trade and the flow of information. Middlemen also offer advice on farming supplies and organize shrimp sales to ensure buyer demand is met by farmer supply and farmers receive secure payments from processors. While valuable actors in supporting farmers, it remains unknown at what cost are these services delivered and with what level of inefficiency.

Once identified, stakeholders should be engaged throughout the design and deployment of an initiative:

- **Adopt a systemic approach:** Improve the entire supply chain through a phased, ecosystem-based strategy, beginning with core issues like data transparency and then progressing to key sustainability challenges.
- **Engage all supply chain actors**: Involve retailers, intermediaries, feed and other input dealers, and post larvae (PL) suppliers, recognizing their local knowledge, expertise, relationships, and financial roles. These groups also provide financial support and should not be excluded by projects.
- **Streamline data collection:** Integrate information gathering into routine farm activities to avoid overburdening farmers.
- **Offer long-term incentives:** Provide sustained financial support, such as subsidies, to encourage adoption of sustainable practices.

Mapping stakeholders puts more focus on driving change

In the process of identifying stakeholders across various roles and levels of engagement, it is useful to categorize by their influence and level of interest in the project. A **Mendelow's Matrix** (see Figure 5)

is a valuable tool to organize stakeholders, from those that are crucial to decision making to those that should be observed and informed.

The matrix is divided into four main categories, based on levels of interest and influence: Key Players (high influence, high interest), Keep Satisfied (high influence, low interest), Keep Informed (low influence, high interest), and Monitor (low influence and low interest).

The Key Player category can also be further disaggregated to include Key Influencers (moderate influence, moderate interest) and Key Supporters (moderate influence, high interest) to further reflect real-world complexity.

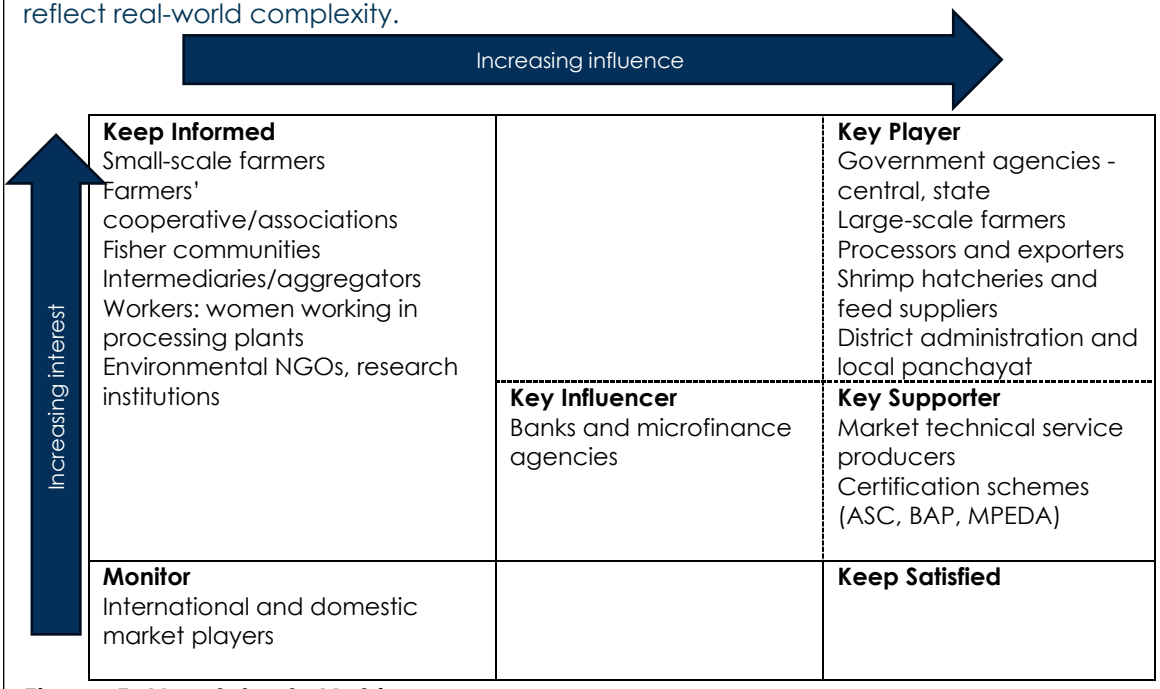


Figure 5: Mendelow's Matrix

Recommendations

Information sharing between entities and farmers is a critical barrier to improvement, along with the dependencies of farmers on other parties. However, there are clear actions that can mitigate these obstacles, such as improving farmer registration to permit the delivery of regulatory support and access to technology and finance services in support of better management practices.

The majority of shrimp farms in Andhra Pradesh (80 percent) are classified as non-renewed – the reasons are unclear and suggest that farms are either not in operation or are unregistered, in violation of Coastal Aquaculture Authority regulations (SFP, 2024a). An estimated 20-30 percent of shrimp farmers participate in aquaculture welfare

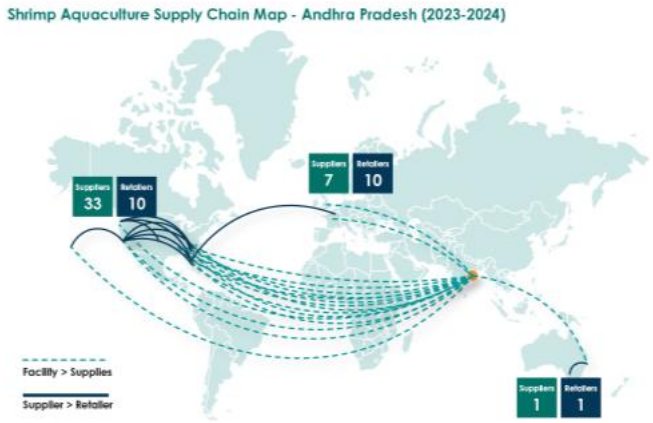
societies, collectives registered with the National Centre for Sustainable Aquaculture (NaCSA), representing thousands of farms in Andhra Pradesh (Landscape analysis, 2025).

With disease recognized as a priority issue for farmers, these collectives offer an opportunity for sharing knowledge and coordinating management. There is no database on disease outbreaks or management, but the National Bureau of Fish Genetic Resources (NBFGR) is the key organization reporting on quarterly aquatic animal disease information to the World Organization for Animal Health, formerly the Office International des Epizooties (OIE) (Landscape analysis, 2025).

While the improvement needs are numerous and complex across geographical scales, certain recommendations can reduce barriers and enable progress.

- **Establish multi-stakeholder platforms:** Create a multi-actor platform involving the shrimp value chain, other projects, civil society, and government to pursue shared sustainability goals led by a neutral party.
    - As will be seen in step 6, evaluate and approach landscape-level platforms in support of this goal, including the opportunity for collective monitoring of multiple but complementary projects operating in a shared landscape.
- **Integrate local governance:** Recognize and involve both formal and informal local governance systems in planning and decision making, especially around resource management. Support shaping policy development with real-world experiences and local innovations.
- **Promote producer organizations and cooperatives:** Opportunities for producers to organize can deliver strength in voice and bargaining power, positioning them as key players in the supply chain.
- **Empower grassroots institutions:** Strengthen village-level governance institutions and link them with aquaculture clusters to support implementation, monitoring, reporting, and farmer representation. These bodies can also address illegal operations through legal channels.
- **Support biodiversity conservation:** Partner with agencies already active in coastal habitat restoration to protect and rehabilitate areas affected by aquaculture. Reduce reliance on wild fish by promoting responsible marine ingredient sourcing and forming coalitions with fishmeal and fish oil (FMFO) producers and industry leaders.
- **Promote polyculture:** Encourage and incentivize low-risk shrimp production through polyculture practices.
- **Advance labor rights and gender equity:** Improve working conditions and pay by adopting gender-inclusive policies, especially for women in shrimp processing.
- **Tackle water pollution:** Collaborate with the Department of Drinking Water and Sanitation to address water contamination and deliver village-level training.
- **Leverage mobile technology:** Work with technology providers to enhance production monitoring, product tracking, and sustainability assurance.
- **Enable trainers:** Build a network of competent and qualified trainers and equip them with the knowledge and tools to share learnings to deliver environmental, social, and operational improvements.

Figure 6: Market analysis identifies complex chain of suppliers and retailers of shrimp farmed in Andhra Pradesh



The independent market analysis drew on data from certified farms (ASC and BAP) and from SFP's Seafood Metrics to explore supply chain relationships. The study identified major buyers, leading processors, and key suppliers involved in the export and sale of shrimp from the region. These insights revealed a network of influential supply chain actors with a strategic interest in improving the sustainability and resilience of shrimp production – offering a valuable foundation for targeted policy engagement and regional development initiatives. Due to the sensitive nature of data applied from the Seafood Metrics dataset, detailed results cannot be shared publicly, but the general results offer a window to the global activity of the sector.

4. Enable local expertise: Refine, repeat, reengage

Principle: *Continually engage with local communities and stakeholders to fully understand the challenges and opportunities. Invest time in building the skills and awareness of local experts so they can lead and strengthen collaboration across industries, communities, and the environment.*

Landscape approach projects can connect the dots and facilitate relationships that may otherwise not be built. This step builds from the previous ones by unlocking local expertise to revisit early learnings, add focus to priority issues, and begin identifying shared goals and actions. Continuous engagement with both project partners and stakeholders is essential.

The designers of a landscape initiative are in a unique position – to look across the challenges and opportunities in a sector and identify those groups that are best positioned to address them. They can lend support toward existing efforts to help strengthen the system rather than impose new models. In short: listen, learn, and move forward through ongoing engagement and adaptation. This can be termed "ground truthing."

This isn't a desk exercise – it requires on-the-ground, direct interaction. It's about uncovering the lived experiences of people involved in the aquaculture supply chain and the communities that depend on its resources.

Active collaboration with local social and aquaculture experts, who oversee landscape and social analyses, helps foster connections between aquaculture producers and social experts. This builds trust and awareness of the project's goals among stakeholders and deepens understanding of holistic landscape approaches.

> *"The key to improvement lies with those who are directly affected. Our role is to listen, understand, and enhance existing efforts. Sometimes, no changes will be necessary, while other times, significant transformations may be required. More often than not, adjustments will fall somewhere in between, with individuals needing support to implement them effectively."* Small-scale fisheries expert, Andhra Pradesh
>
> *"However you define it, change at the landscape-level needs to be driven locally, through local governance arrangements, policy frameworks, and organizations."* Chris Ninnes, CEO ASC

In the previous step, stakeholder feedback helped with understanding and building on the resilience of impacted communities, making improvements where needed, and avoiding imposing new models. This step reinforces the need to look locally to identify those issues that are relevant to the local context and explore the government agencies, supply chain actors, NGOs, and others with the knowledge and expertise to tackle these issues and build on capacity needs. Mechanisms exist and can be expanded on, such as those existing models to engage stakeholder and delivering hubs

of information has successfully shared knowledge across rural environments and expanding existing technical expertise and delivering trainer to trainer models.

Support and work with local organizations that are already doing good work.

Ultimately, multi-disciplinary, hands-on field visits are vital, not only to identify key challenges but also to strengthen local capacity for implementing integrated solutions and to build stakeholder trust in the project.

Success: Stakeholders are consulted regularly throughout the project, understand the goals, and feel empowered to participate in and support the work. These consultations deliver a deeper understanding of the landscape, the key issues, and the complexities around delivering improvements.

A landscape approach should identify those groups and individuals with the knowledge and ability to expand their work to contribute to the project's goals and increase awareness among them about their roles and opportunities to build long-term, locally driven solutions.

Recommendation: Form a coalition of local experts to strengthen collaboration. Share information and resources with them to drive improvements across the sector and beyond the landscape. Bring early learnings to them, hear their stories, and refine project activities. Recognize the tremendous expertise and capacity at the local level – let these local institutions lead the way!

Expert tip: Don't rush into the field. Before you go, establish a baseline of knowledge, understand some of the key challenges in the region, and clearly articulate what you will be asking of stakeholders. Value their time and ensure there is follow-up to demonstrate how their input will be applied.

Learnings from Andhra Pradesh: Know the experts

When scoping a landscape approach, effective collaboration is key. This depends on identifying the right local project partners with expertise in industry, social, and environmental spheres. We worked closely with two local teams to deliver the studies described in Step 3 – Seafood Solutions and the Dakshin Foundation in association with Living Landscapes. Their wealth of knowledge and contacts opened doors for further engagement and consultation.

Through these engagements, we very quickly learned how little we knew. Each stakeholder we met – from government, research and academia, communities, farmers, technology, and the supply chain – offered insights that drive action-based recommendations and mechanisms to clearly communicate the goals of landscape initiatives and address cultural needs.

The impressive volume of action already taking place on the ground further confirmed that effective change builds on what already works. Our role is to listen, support existing efforts, and enhance system resilience, rather than impose new models.

A web of great work

Reviewed against the ISEAL landscape initiative criteria (2024), all projects focus on small-scale producers, with the aim of generating broader impact by engaging government stakeholders and improving farm performance. Each aligned with core ISEAL landscape criteria, though they didn't identify as landscape initiatives, and together covered environmental, social, and production-related issues. These alignments suggest an opportunity to report collectively through landscape-level platforms (i.e. SourceUp, LandScale) to improve transparency and unify components in a shared landscape initiative.

Two of the four projects were linked to third-party certification schemes and seafood rating programs, offering an opportunity to reduce barriers and expedite improvements through public disclosure of relevant performance data that could positively influence seafood assessments – particularly SFP's FishSource profiles and the Monterey Bay Aquarium's Seafood Watch.

Lack of coordination and openness in project activities and learnings lead to stakeholder confusion and inefficient use of resources. Projects have a responsibility to engage and collectively build their capacity and expertise where there are shared goals.

The importance of on-the-ground field visits

Ground truthing is not a desktop exercise. It requires real-world action and direct engagement to uncover the lived experiences of those within the shrimp supply chain and the communities that share its resources. This process involves actively engaging and re-engaging with stakeholders and collaborating with local social and aquaculture experts who oversee landscape and social analyses.

By fostering connections between local aquaculture producers and social experts, we enhance their understanding of holistic landscape approaches while building trust and awareness of the project's objectives among stakeholders.

Ultimately, **multi-disciplinary, in-depth, and on-the-ground field visits are essential**, not only to identify key challenges but also to strengthen local capacity for implementing holistic solutions and to establish stakeholder trust in the project.

5. Define the opportunities, barriers, and incentives

Principle: *Define meaningful incentives for actors across the supply chain that recognize the types of practices promoted in improvement projects, the sustainability goals, and associated claims that can be made.*

Defining incentives across user groups builds from mapping the influence and interest of stakeholders and understanding their ambitions, along with barriers and risks to deliver desired behaviors. Incentives may seem straightforward enough but are often complicated and difficult to untangle. Further, caution must be taken to avoid disincentivizing actions that may result in unintended behaviors.

An economic incentive that could deliver a price premium is the most well-defined. But the global seafood market is a complex network, and the competitive advantages delivered through certification and improvement models are closely tied to market demand.

While products bearing a label may command higher prices, whether the benefits of these higher prices reach the producer will depend on several dynamics, including type of seafood, retail context, and consumer awareness. Certification opens market opportunities that can stabilize prices in otherwise volatile global markets, particularly when farmers are receiving the direct benefits of the certification. This is certainly the case with shrimp farming. There are additional factors associated with certified seafood, such as certification costs, supply, and demand, but in consideration of driving scaled improvements, these can be set aside.

In the absence of price premiums (direct economic benefits), there are clear opportunities to deliver on-farm improvements that drive change, award producers with reduced risk in their operations, and deliver consistent (and improved) product quality. Improvements can be made in terms of resource use efficiency, for example by reducing the feed input per unit of production and driving improved survival rates, which deliver direct benefits of cost reduction. These may include supporting farmers by offering a pre-harvest price as opposed to one more driven by price at the time of harvest, thereby giving more certainty for the entire supply chain. While pre-harvest price may be higher or lower than at harvest, the choice allows farmers to discount more accurately possible future higher prices and to align production costs during the cycle, also reducing some of the reliance of the farmer to the end buyer.

While there are clear gains to be seen at the farm level, identifying incentives for farmers to operate in the interest of the wider landscape remains a challenge. Benefits of collaboration, such as through information sharing on topics like disease management and water quality will need to be realized and communicated. Sharing information needs to be normalized and approached through trusted actors. Bringing scale to these solutions for small-scale producers will be essential, and there is a role for technology-led improvement efforts that build from certification frameworks.

Success: Stakeholders with influence and interest share a common ambition and are empowered to deliver change towards shared goals. Each stakeholder recognizes the opportunity and how it will benefit them and understands the risks and barriers and how to mitigate them.

Recommendation: Build from understanding the landscape so that the key challenges across each user group are defined and their various levels of influence and interest are known. Identify the key drivers that will enable and incentivize the desired change. Deliver clear and sustained value to each participant and establish a shared responsibility among them.

Learnings from Andhra Pradesh: "What's in it for me?"

Small-scale farmers in Andhra Pradesh are highly reliant on feed companies and processors for their operations. There are limitations in available financial and technical capacity, clear challenges with on-farm operations, and limited knowledge of certification and aquaculture improvement project (AIP) pathways. Consultations with stakeholders revealed the main on-farm improvement areas were related to disease management, water quality and effluents, and post larvae sources. Larger-scale farms do not struggle with these issues as much, given the higher volumes and profits, and ability to employ technologies and negotiate prices.

Related to this is the need for consistent supply at consistent quality by processors and end buyers. Improving product quality is not only the responsibility of the farmer; the technical and financial capacity needed typically exists among other actors. Processors and end buyers can sponsor farms to raise awareness of improvement programs and certification, as well as deliver technical and financial support to drive change.

Assurances delivered through the supply chain provide guarantees that farms are committed to and making improvements. This awareness rewards the farms by increasing demand for responsible products and delivers recognition to the supply chain that those operations are trustworthy.

Regional agencies lack full transparency about the number and types of farming operations but also possess information important to educate producers on improving operations. The government can play a key role in distributing knowledge and support to farmers in exchange for farm registrations.

Transforming production for the vast majority of farmers will require different incentive structures, mainly through decreasing risk (including the provision of insurance), decreasing input costs (e.g., capital, feed, electricity), or increasing shrimp survival with better practices and use of technology. Collectively, all actors can play a role in normalizing information-sharing mechanisms that drive new incentives to deliver benefits at scale.

The needs of various actors in the shrimp farming industry in Andhra Pradesh can in part be addressed through collaborative awareness of the ambitions and desired behaviors to be achieved.

Economic incentives remain on top

Economic analysis should be a key component of a landscape analysis. During field visits to Andhra Pradesh, interviewed stakeholders emphasized that farmers prioritize understanding the financial incentives available to them. Currently, farmers do not receive a financial premium for producing certified products. While quality improvements are encouraged, premiums are typically only realized by processors. High costs for feed are a constant barrier for farmers; a consistent suggestion was raised for forming groups to reduce these costs effectively.

But there are options to explore branding opportunities and framing benefits such as reduced input costs through collective bargaining and coordinated management that mitigates risks. Branding efforts should emulate successful examples in agricultural products, focusing on clear and compelling marketing strategies. A structured approach to harvesting is necessary to counter production gluts, which often depress market prices during peak periods.

There is often distrust when improvement projects overpromise and under-deliver. **Improvement projects should avoid promising price premiums, as these rarely materialize for farmers. Instead, focus on delivering support as a means to enhance farm management, reduce risks, and minimize crop losses.** This can be further supported through integrated management; a comprehensive platform to reduce costs and risks while supporting animal welfare and improved farm management can provide significant economic and operational benefits.

Identifying financial incentives or effectively framing sustainability benefits in financial terms is crucial for engaging producers and ensuring their participation in improvement initiatives.

6. Define success and monitor progress

Principle: *A coherent, well-established and applied monitoring framework will demonstrate progress towards a landscape initiative's sustainability goals and show beneficiaries and supporters the change they are delivering.*

There is a wealth of indicators of progress to draw from at the farm, landscape, and sector levels. The monitoring framework applied to any landscape initiative should be built from those that have already been developed, tested, and applied, with thoughtful alignment to the project sustainability goals, target areas for improvement, and the various scales at which change is expected.

Review the data provided by existing tools, assessments, and standards available for aquaculture in your selected geography. Data applications should consider the temporal and spatial scale of the project, data access, quality, and means of verification. The use of available data may be a challenge but should not limit the selection of indicators, as this provides an opportunity to review or implement data collections where appropriate and without adding unnecessary cost and burden.

Indicators should measure the intent of the project, including the specific targeted environmental and social improvements and the implemented enabling conditions, looking across the various players and the outcomes and impacts anticipated in the short and long terms. A thorough framework will take into account the risks and unintended consequences of implementing improvements at scale and include measures to track those (see Figure 7).

Landscape initiatives, and steps embedded within them such as community engagement, are long-term processes. Positive outcomes often take years to materialize. This underscores the need for thoughtful messaging and sustained monitoring to track landscape-level improvements effectively.

With this in mind, an initiative's vision of success should be refined with new learnings. Any framework should consider the ability of the project to deliver as expected along with progress against goals, to ensure the selected measures of success resonate with the actors that support the initiative.

Success: Monitoring short-term and long-term change against key performance indicators and contribution to sustainability goals demonstrates progress and provides assurances to the supply chain that the landscape initiative is delivering meaningful and actionable impact.

Demonstrate ecosystem responsibility to retailers and then reward responsible actions by measuring and communicating success and applying this approach to acquire financial benefits.

Recommendation: Continue to build on existing initiatives and look beyond the target sector. Conduct a gap analysis of tools and indicators available to begin this process. Measures of landscape improvement and assurances on improvements are important concepts across commodities, and there is opportunity to expand upon existing work.

Expert tip: Monitoring and evaluation, i.e., reporting on progress and results and providing verification and assurances on these should be a requirement for every landscape initiative. Look at existing platforms to track, monitor, and showcase your work and incorporate geographically specific measures appropriate to the AIP, depending on the landscape in which it operates.

Learnings from Andhra Pradesh: From farm to landscape and beyond: Measuring AIP impact at every scale

The proposed M&E framework is built upon the earlier gap analysis. It brings together publicly available aquaculture and other relevant sustainability indicators at various scales but also identifies important sustainability indicators that may require more dedicated data collection. All of these indicators have the potential to demonstrate the impact and progress of landscape-level improvements in aquaculture. Indicators selected should provide a way to capture outcomes and information, as well as legal or policy frameworks to demonstrate the critical role that governments and NGOs play in providing this information and enabling demonstrable change.

The landscape-level reporting platforms identified also offer the potential for multiple projects operating within the same geographic area and aquaculture commodity to collaboratively report on their activities and impacts. This approach can enhance coordination among projects—including liaising with stakeholders—and reduce duplication of effort and confusion among intended audiences and beneficiaries.

Throughout the steps of the roadmap, the issue of scale will be a recurring theme. Data and tools will be available at various geographic levels within a landscape. These can be aggregated to build a ladder toward landscape-level reporting, but exercise caution to avoid masking meaningful results with consolidation.

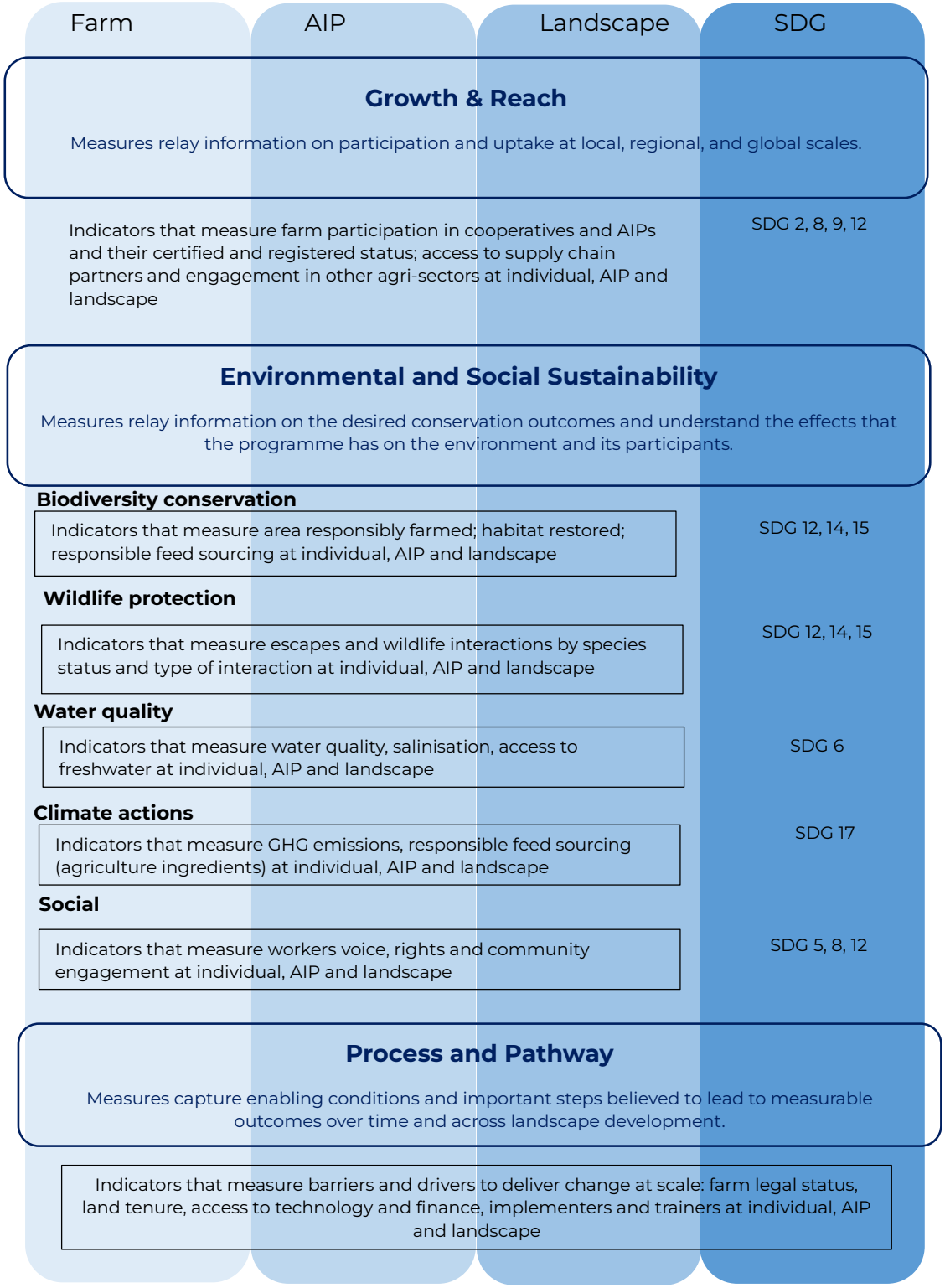


Figure 7: Indicators across growth and reach, sustainability and process and pathway should be monitored across scales.

7. Implement Solutions

Principle: *Define the landscape approach entry point. The entry point will enable the launch of a subsequent landscape initiative for responsible aquaculture at scale while also providing tangible benefits for other resource users and the environment.*

Managing aquaculture on a larger scale is a pressing challenge, and it can be overwhelming to identify a clear starting point. For producers, there will be small, tangible steps they can take toward improvements in key impact areas critical to deliver landscape-level improvement in an ecosystem approach, including sensitive and critical habitats, water quality, disease management and feed use. The supply chain can make larger commitments and investments to address these challenges from the top down – scaling farm-level steps and delivering assurances that social and environmental risks are being addressed. For government, policy development and the enforcement of existing aquaculture regulations (or lack thereof) is an issue common to many geographies. Consistent and enforceable governance can provide opportunity and define common sustainability goals that should be a key component of landscape approaches.

Another promising entry point for a broader, landscape-level approach is managing the impact of shrimp farming on critical habitats like wetlands and mangroves. This not only ties into larger challenges, such as land access for marginalized fishing communities, but it also connects improvements to aquaculture at scale with people and nature. This is reinforced by the recent World Economic Forum report on investing in mangroves, which states that jurisdictional and landscape approaches maximize the value of mangrove interventions (WEF, 2025).

Priority issues in Andhra Pradesh

Our engagement and re-engagement in Andhra Pradesh has focused in on priority issues for a landscape approach in the region. These include:

- Habitat loss to aquaculture continues and impacts marginalized groups, such as fishing communities, but there are projects and opportunities for protection and restoration.
- Diseases such as EHP and white spot disease remain a concern, as does the detection of antibiotics in shrimp products.
- Farmers do not receive price premiums for certified and improving products, but there are opportunities to reduce input costs through collective action.
- Labor issues are extensively reported with concerns within the supply chain, highlighting the need to ensure the protection of human rights.
- There are complex challenges related to access and use of shared resources, especially in the allocation of government land that often does not assist the intended beneficiaries.
- Marginalized groups, such as local fishing communities, must be included in the landscape, particularly those that supply to aquaculture feed suppliers. Lessons from successful initiatives in other sectors within the region could enhance sustainability and support these communities.

"Our role is just to connect the dots and work through established local players – they will be there long after you're gone." – Jim Cannon, SFP Chief Executive Officer

However clear the actions may be, the enabling conditions to implement these actions must be established. This creates an opportunity to define a service-delivery model with access to finance and insurance. Improving the technological advantage of farms and the provision of related services can disrupt traditional supply chain arrangements and administrative barriers that have hindered responsible development of the sector. For example, the Indian farmed shrimp sector is significantly focused on export markets, despite local initiatives to create a stronger domestic market. Thus, the export market will continue to define the product need, with the domestic market absorbing those products not fit for export. Traditional market-based incentives, such as those delivered through certification, do not remove the institutional blockers that hold the sector back. This has created a valuable opportunity for technology providers to offer the promise of change, fueled by the growth and uptake of tech solutions.

Success: Established agencies deliver support for farm clusters through implementation of a service-delivery model to break the reliance of producers on third parties, processors, and input suppliers. Government enables improvement at scale through the provision of information and clear conservation goals that support the social and environmental needs of the regions. The supply chain commits to landscape approaches, supports implementation, and recognizes and rewards the measured progress across scales.

Recommendation: Build on what is working well – don't reinvent the wheel but rather drive for strengthened connections. Identify where supply chains, NGOs, and others can take action. Use the knowledge gained from local experts to implement practical solutions.

Follow the roadmap and define the key components prior to implementing an approach. Support AIP models, adopt sustainability commitments in supply chains, and take measurable action.

Expert Tip: Be patient. Landscape initiatives, and steps embedded within them such as community engagement, are long-term processes. Positive outcomes often take years to materialize. This underscores the need for clear collaboration, defined incentives, thoughtful messaging, and sustained monitoring to track landscape-level improvements effectively.

Learnings from Andhra Pradesh: Enabling tech to insure farmer risk

Technology providers, such as Aqua Exchange in India, offer the promise of change. This is fueled by the rapid growth and uptake of their tech solutions and is coupled with the introduction of crop insurance linked to farmers that can demonstrate strong and low risk performance in those key environmental impact areas identified.

These types of interventions could be game-changing. For example, if disease is a major concern, the spread of disease could be further exacerbated by the lack of incentives to report diseases to relevant authorities. The introduction and application of crop insurance for smallholder farmers could deliver those incentives, particularly when

coupled with preferential financing to farmers that perform well, to mitigate risk and help farmers act as environmental stewards.

This link between improved bottom-line production and access to finance – whether through technology-enabled support or government support systems – will create an incentive for change that can operate outside of direct market incentives.

Offering financial mechanisms reliant on the use of technology and information sharing to mitigate risks and achieve landscape-level performance – as measured through clearly defined indicators and established programs (such as the Improver Program by ASC) – could accelerate uptake of critical sustainability elements delivering broader ecosystem and community improvements.

The Road Ahead: Planning your next steps and actions

This Roadmap is an invitation to collaborate, innovate, and drive meaningful, verifiable change in aquaculture. The steps outline a landscape-level Aquaculture Improvement Project (AIP) to empower you to adopt a coordinated, inclusive, and holistic approach—one that reflects both local needs and the latest global best practices and thinking on this emerging model.

The path forward is clear: commit, engage, and launch.

In the interest of improving shrimp farming in Andhra Pradesh, we invite you to explore the key findings in this Roadmap related to improvement needs, stakeholders, existing initiatives, barriers, opportunities, and incentives, within the Andhra Pradesh shrimp farming sector, and apply these learnings.

In the interest of improving shrimp farming in other regions or other aquaculture commodities, we invite you to apply the Roadmap to understand the opportunities and challenges, identify shared goals and relevant stakeholders, and collaborate with the experts in your specific geography and farmed product of interest.

Regardless of your focus area, recognize the opportunity that landscape improvement can deliver. However, plan appropriately and be patient, as this scale of change takes time.

- Engage with the identified local experts, other projects, as well as AIP implementers such as the Improver Programme by ASC, ThinkAqua etc., to review and discuss relevant findings—whether from shrimp farming in Andhra Pradesh or insights developed by applying the Roadmap in your own context.
- Co-develop an initial workplan that outlines the identified priority location, landscape-level issue(s), the improvements required, and the stakeholders (including supply chain actors) who should be involved and consulted.
- Implement the monitoring and evaluation framework provided in this Roadmap to plan how progress and success will be measured and demonstrated.

Contact ASC and SFP to find out more

ASC: Jill Swasey, Director, Impacts, Monitoring & Evaluation and Roy van Daatselaar, Head of Improver Programme

SFP: Paul Bulcock, Aquaculture Information Manager and Kathryn Novak, Biodiversity and Nature Director

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