



BLUE HARVEST:

CHARTING A SUSTAINABLE COURSE FOR PEOPLE, PLANET, AND PROFITS

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Why aquatic foods?



Provide micronutrient-rich foods for **3.3 billion people**.



800 million people depend on small scale fisheries and aquaculture for their livelihoods



1 in every 2 workers in the primary and secondary sector of fisheries and aquaculture are women. They are crucial to aquatic food systems, providing labour, innovative ideas and entrepreneurship.



Aquaculture is the fastest-growing food production sector in the world. Its production is set to increase by **32% to 109 million tons**



Aquatic foods can supply essential micronutrients with **lower carbon footprint and far fewer biodiversity impacts** than many land-based crops and livestock.



Global demand for aquatic foods has doubled since 2000.



Aquatic foods are deeply interconnected with the rest of the food system – in **human and livestock diets, supply chains, and water systems**.



AqFS identifying as one of seven priority investments in agricultural research by **Experts and Scientific Group of the 2021 UN Food Systems Summit**.

Asia

- Asia accounted for around **75%** of global aquatic food production in 2018
- Asia is the largest producer of fish and seafood in the world, accounting for about **89%** of the world's total aquaculture production.
- In 2018, Asia consumed around **80%** of the global aquatic food supply,
- There is also a growing trend towards traceability and transparency in the seafood industry in Asia, with more companies adopting certification schemes and technologies like blockchain to track the origin and quality of their products.



Africa

- Africa's aquaculture **production** is relatively low, accounting for only **4.4%** of global production, compared to Asia's 89.4%.
- Fish **consumption** in Africa is low, with an average consumption of only **9.1 kg** per capita, while in Asia it is 21.6 kg per capita.
- In terms of fish **exports**, Africa only accounts for **4%** of global fish trade, while Asia's share is 72%.
- The aquaculture sector in Africa faces significant challenges such as lack of funding, poor infrastructure, and low-quality feeds, leading to low production levels and high mortality rates.



Small but Mighty

- Small-scale fisheries and aquaculture contribute to **~50%** of global fish catch & production.
- Employs over **90%** of the world's fisheries workforce.
- Over **120 million** people depend on small-scale fisheries for their livelihood.
- Generates **billions in annual income**.
- Crucial for **food security** in coastal and freshwater-dependent communities.
- Maintain **genetic diversity** by targeting a wide range of species.
- Central to the **cultural identity** of countless coastal communities.



Small-scale aquatic food producers often face institutional bias, economic exclusion, and lack of access to market and non-market services.

- Small-scale fisheries and aquaculture and fisheries are often hidden
- Not accounted for in national statistics
- Their contribution to national economies, trade, employment, food and nutrition security are often overlooked.
- How do we capture the value of small-scale aquatic food production systems?



Data Gap = Investment Gap



Data and Investment Gaps: Key Drivers of Fish Loss and Waste in the Seafood Sector



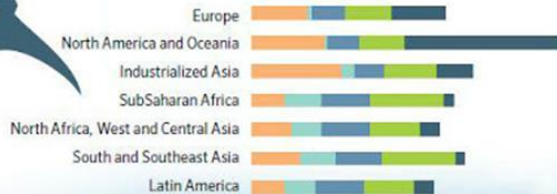
35%

FISH & SEAFOOD FOOD LOSSES

8% of fish caught globally is thrown back into the sea. In most cases they are dead, dying or badly damaged.

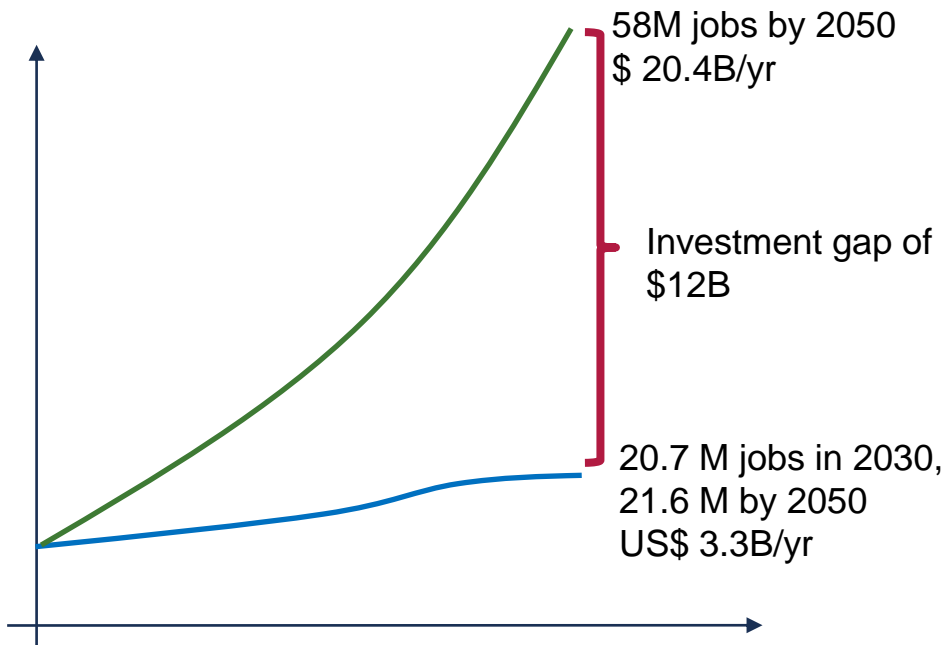


This is equal to almost
3 billion Atlantic salmon.



- **Data Gap:**
 - **Catch Reporting:** Inaccurate catch reporting can lead to overfishing or underfishing, thereby affecting sustainability and potential waste.
 - **Supply Chain Traceability:** Lack of detailed data on the journey of seafood from source to market can result in inefficiencies and waste, especially in longer supply chains.
 - **Post-Harvest Losses:** Without accurate data on post-harvest losses, it's challenging to develop strategies to minimize them.
- **Investment Gap:**
 - **Infrastructure:** A lack of investment in storage, transportation, and processing infrastructure can lead to significant post-harvest losses.
 - **Technology:** Investment gaps in technologies like cold storage, preservation methods, or efficient fishing gear can result in more significant losses and waste.
 - **Training and Capacity Building:** Insufficient investment in training fishers and fish farmers in best practices can lead to inefficiencies and losses.

Chronic investment gap in Africa





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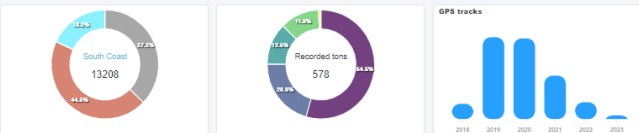
PELAGIC



Automated analytics system for small scale fisheries in Timor-Leste

Peskas is an open-source web portal that provides data and insights on fisheries in Timor-Leste. The platform uses catch data collected by local enumerators and vessel tracking data to show fishing trends over time and space. The project was initiated in 2018 in partnership with the Timor-Leste Ministry of Agriculture and Fisheries and has been funded by various organizations. Peskas is a near-real-time monitoring system that is low-cost and open-access, with a focus on small-scale fisheries. Its application in fisheries research and management has been documented in several publications.

Download full report



Fishery General Statistics

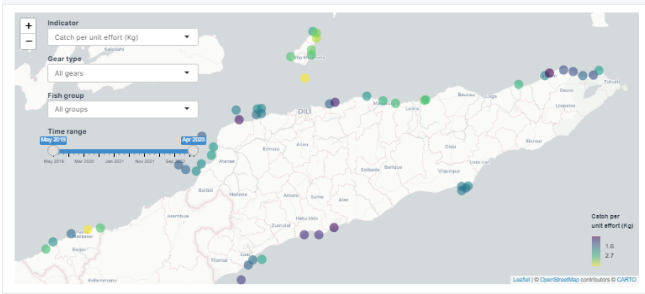
Explore the main fishery indicators in Timor-Leste. The table shows the aggregated values of the estimated revenue and catch, along with the median values of landings per boat, revenue per trip, catch per trip and price per kg.

Municipality +	Revenue per trip	Catch per trip	N. landings per boat	Total revenue	Total catch	Price per kg
Ainaro	\$15.79	4.54 kg	3.57	\$0.35 M	77.73 t	\$3.73
Atauru	\$39.18	12.89 kg	10.89	\$10.08 M	3,354.96 t	\$3.13
Bacucu	\$17.49	7.11 kg	5.73	\$3.52 M	1,834.03 t	\$3.81
Bobonaro	\$32.82	1754 kg	11.85	\$20.56 M	8,279.77 t	\$2.88
Covallima	\$19	3.33 kg	12.91	\$4.24 M	724.07 t	\$5.79
Dili	\$19.93	2.25 kg	18.98	\$8.43 M	1,135.68 t	\$8.9
Lautem	\$61.02	10.1 kg	11.3	\$14.68 M	2,919.38 t	\$4.66
Likiep	\$22.52	4.48 kg	12.81	\$13.91 M	2,840.69 t	\$5.22
Manufahi	\$38.61	15.57 kg	18.63	\$13.91 M	5,995.25 t	\$2.83
Manufahi	\$10.6	1.59 kg	9.15	\$1.48 M	236.67 t	\$7.48
Oecusse	\$25.58	13.13 kg	9.42	\$4.71 M	2,903.36 t	\$2.38
Viqueque	\$32.2	9.16 kg	14.2	\$6.51 M	1,607.54 t	\$3.72

Fishing Trips Around Timor-Leste Island

Explore fishing trips and associated statistics around the Timor Island coast with our interactive map. Select fishery indicators, fishing gear type, and fish group to filter the results. Click on a trip point to see detailed fishery statistics for that point and the associated municipality.

The map displays only the fishing trips for which we have geolocation data, these represent about 5% of the total fishing trips recorded.

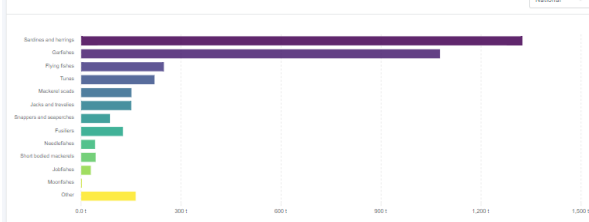


Catch composition

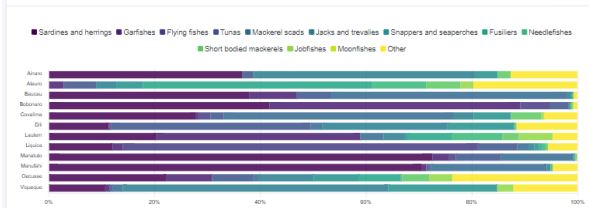
Estimates are provisional
These estimates have not been validated and might be inaccurate. Use with caution.

Learn more

Total catch



Relative composition



Total catch

Name	code	2018	2019	2020	2021	2022	2023
Sardines and herrings	CLP	1400	1800	1300	1500	1800	1300
Flying fishes	FLV	660	630	400	750	730	250
Tunas	TUN	410	510	1200	300	310	220
Mackerel scads	SDX	370	610	430	630	440	150
Garfishes	GZF	220	320	290	360	390	1000
Snappers and seaperches	SNA	220	400	380	370	270	87
Jacks and trevales	CGX	280	370	250	400	360	150
Fusiliers	CJK	190	190	180	280	280	130
Needlefishes	BEN	110	76	300	210	300	62
Moonfishes	MDD	160	180	43	330	560	2.6
Short bodied mackerels	RAX	320	140	98	140	140	44
Jodfishes	LWX	100	150	72	69	74	29
Other	MZZ	520	460	460	540	760	160

* All values in metric tons. Totals include data after April 2018.

About the data

These estimates have not been thoroughly validated and might be inaccurate. There is some uncertainty on all data used in the calculations. Estimates, even from previous years, may be updated whenever new data is available. Indicators only include data from artisanal and subsistence fisheries.

INDICATOR INFORMATION

- Estimated catch
- Taxa (species)

The taxa (species or groups of species) are recorded by enumerators at the landing site.

Data processing and validation:
We calculate national catch for the eleven most common taxa by weight.

Known problems and limitations:
The composition of taxa has changed over time. Prior to April 2018, taxa were recorded at the species level. Later, taxa were grouped into about 60 categories that loosely correspond to the species family or genus. It is not known how this change might affect the estimates.

DATA QUALITY METRIC

Estimated revenue

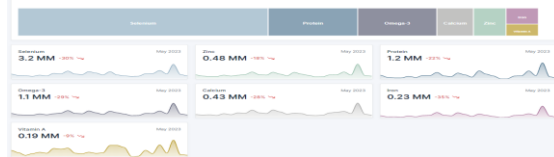
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Learn more

People fleet



People fleet by average catch



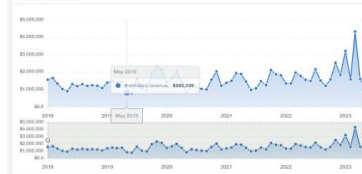
Revenue

Select area

National

Estimates are provisional
These estimates have not been validated and might be inaccurate. Use with caution.

Estimated revenue



About the data

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INDICATOR INFORMATION

- Estimated revenue
- Recorded revenue
- Average trip value
- Trips per boat
- Number of boats

The number of boats is derived from the 2023 East-Timor census. The number of boats in each municipality level is added together to form the national total.

Data processing and validation:
None

Known problems and limitations:
None

DATA QUALITY METRIC

Annual summary

Month	ESTIMATED REVENUE	RECORDED REVENUE	AVERAGE TRIP VALUE	TRIPS PER BOAT
January	\$3,200,000	\$24,000	\$58	12.0
February	\$1,800,000	\$18,000	\$32	12.3
March	\$4,400,000	\$17,000	\$66	12.3
April	\$1,800,000	\$20,000	\$30	15.4
May	\$1,200,000	\$7,600	\$37	6.92

Estimated revenue - \$12,000,000 | Recorded revenue - \$17,000

Faizal Zabri Nelayan Penang Jaring...

Photo



Salam hafiz
Boleh semak tak kedudukan transponder
sampan pps4414
sampan org tua sy masih tak balik dari
laut.sy nak p cari dia

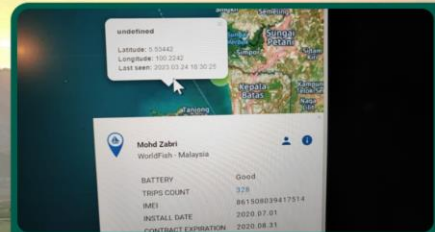
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Faizal Zabri Nelayan Penang Jaring Whatsapp

Salam hafiz
Boleh semak tak kedudukan transponder
sampan pps4414...

Mohd Zabri

5:03 AM



Latitude: 5.53442, Longitude:
100.2242, pada 24 March 2023, 6.30
ptg

5:34 AM ✓✓

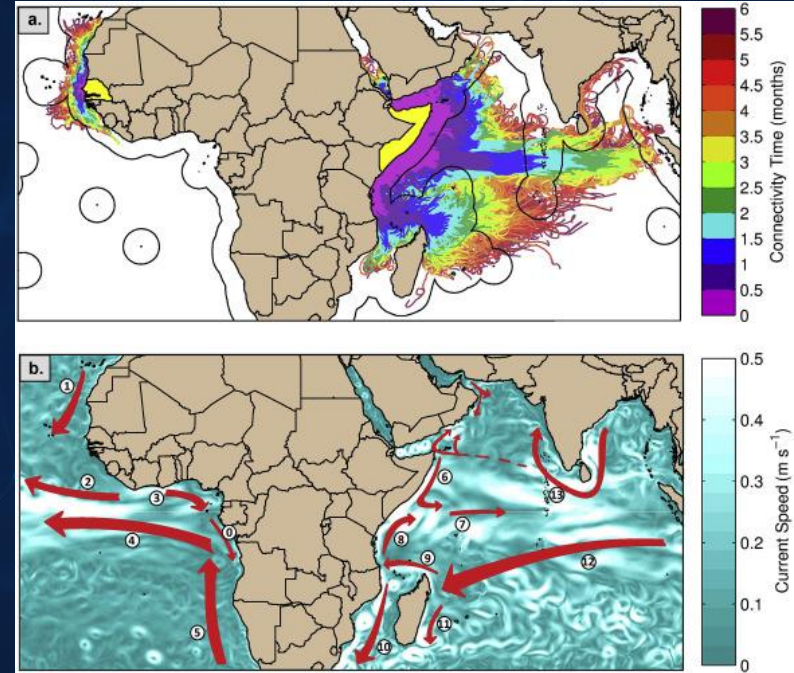
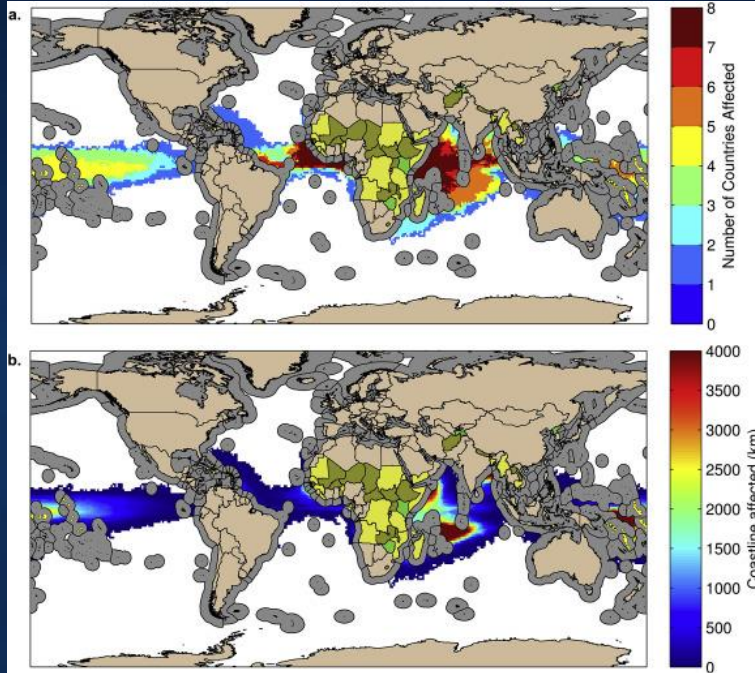


Message





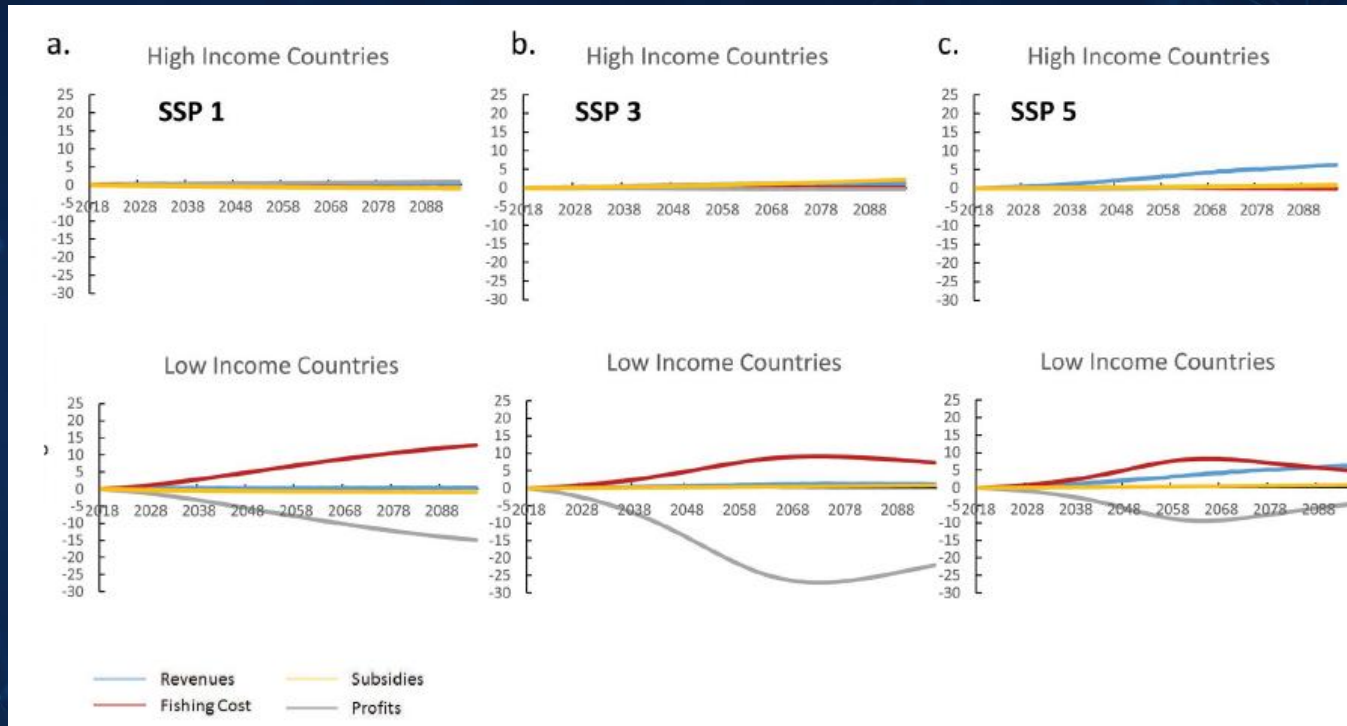
Factoring in Ecological Connectivity for Sustainable Seafood



The Whale in the Room: Climate change

Climate change impacts	Impact on fisheries	Implications for food security
Physical changes		
Temperature rise	<ul style="list-style-type: none"> <input type="checkbox"/> <i>Direct:</i> affects physiological process <input type="checkbox"/> <i>Indirect:</i> affect upwelling along the Gulf of Guinea 	<ul style="list-style-type: none"> <input type="checkbox"/> Significant decline in fish stock in most of Bangwa Rivers >> less fish available for consumption
Sea level rise	<ul style="list-style-type: none"> <input type="checkbox"/> Salt stresses on fish <input type="checkbox"/> Negative impacts on coastal habitats (spawning and nursery grounds) <input type="checkbox"/> Fishing facilities (jetties, storage facilities etc) 	<ul style="list-style-type: none"> <input type="checkbox"/> Negative impact on fish production <input type="checkbox"/> Limited access to food (fish)
Increasing salinity	<ul style="list-style-type: none"> <input type="checkbox"/> Affects the ability of organisms to osmoregulate <input type="checkbox"/> Habitat destruction (e.g. destruction of >60% of mangrove areas in Senegal) 	<ul style="list-style-type: none"> <input type="checkbox"/> Less fish production <input type="checkbox"/> Limited access to fish (physical)
Ocean acidification	<ul style="list-style-type: none"> <input type="checkbox"/> Physiological process (e.g. growth of calcified structures, impaired fertilization etc) 	<ul style="list-style-type: none"> <input type="checkbox"/> Lower productivity <input type="checkbox"/> Tremendous impact on mollusc population (socio economic impact)
Biological changes		
Changes in 1 ⁰ production	<ul style="list-style-type: none"> <input type="checkbox"/> Lake Taganyika: 20% reduction in 10 production (30% decrease in yields) over the past 80 yrs) <input type="checkbox"/> Thermal stability 	<ul style="list-style-type: none"> <input type="checkbox"/> Lower productivity <input type="checkbox"/> Mainly in densely populated regions of the world (large lakes)
Changes in fish distribution	<ul style="list-style-type: none"> <input type="checkbox"/> Changes in the migration patterns <input type="checkbox"/> Esp. low latitude countries <input type="checkbox"/> ~40% drop in the tropics 	<ul style="list-style-type: none"> <input type="checkbox"/> Reduced landing <input type="checkbox"/> Limited access (economically prohibitive to follow fish stock)

Potential fish landing and projected revenue, cost and profits = stranded assets?

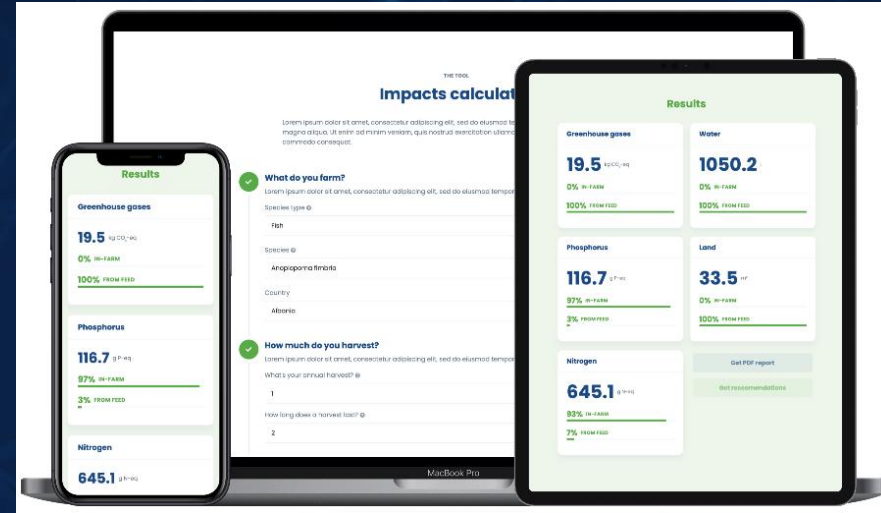


Can we reverse
the trend and
realise a
prosperous
future for all?

Mitigation opportunities: a low carbon pathway to meet growing demand for food.



- Aquatic food systems emit much lower GHGs relative to land-based food production systems.
- Egypt: The G9 strain of Tilapia demonstrated up to **36%** reduction in environmental impacts (including GHG emissions).
- The use of low-fuel gear, can reduce GHG emissions in some fisheries by **61%**, while reducing feed usage and switching to deforestation-free inputs can reduce emissions from aquaculture by **50%**.



<https://fishscores.com/>

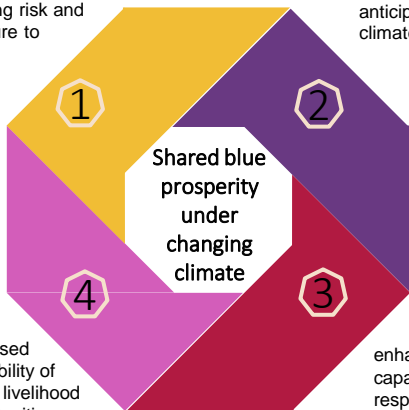


Investment in hilsa fish restoration yield 9 to 11 times more benefit in Myanmar and Bangladesh respectively.



- (i) enhances water and land use efficiency,
- (ii) reduces climate-induced risks
- (iii) adaptable, for diverse fish species
- (iv) helps rehabilitate degraded landscapes,
- (v) offers a viable livelihood opportunity under changing climate.

reducing vulnerabilities by reducing risk and exposure to hazard

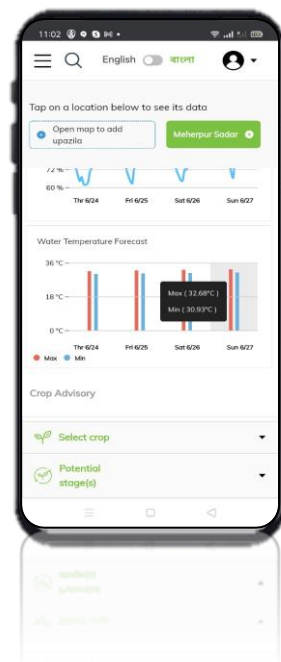


increased ability to predict or anticipate climate hazard

increased availability of viable livelihood opportunities.

enhanced capacity to respond

>100,000 fish farmers. A new web-based interface for authentic, localized, timely, actionable and simple climate information services was developed for fish farmers in Bangladesh



Fisheries management **Profit: 11X** at the center of disaster preparedness and relief strategies in **Vanuatu.**

Diverse adaptation skills through seaweed farming in **Bangladesh**

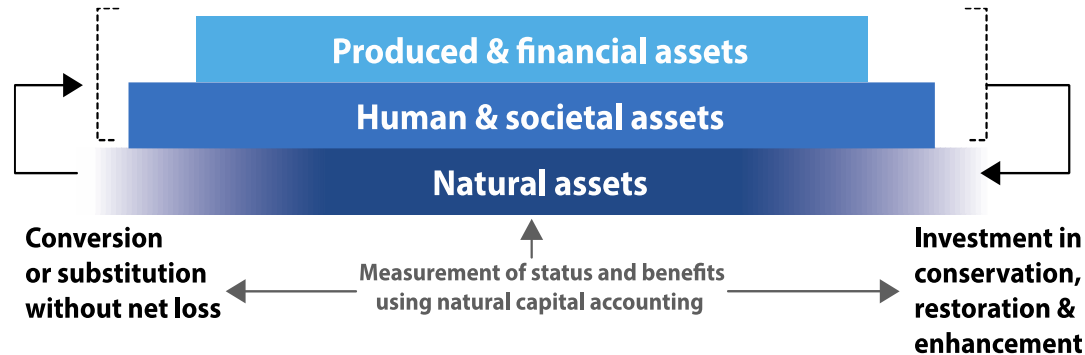


Circular economy: turning agricultural waste to fish feed



Intervention points: Money where it matters

- Most climate funds still focus on large-scale investments rather than local scalable projects.
 - >90% of GCF money is directed towards large/mega projects
- Investment in fish stocks and their habitats as an economic infrastructure
- Sectors that create highest employment and income opportunities

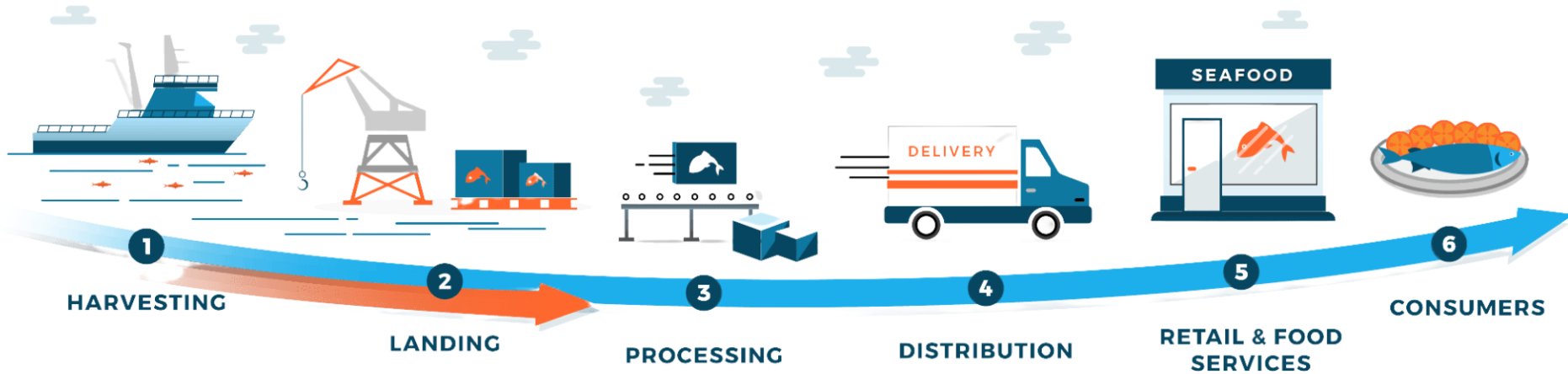


Supporting Sustainable Aquatic Food Production: A Collaborative Approach

Stakeholder	Key Roles & Responsibilities
Seafood Industry	- Direct Engagement & Fair Trade
	- Capacity Building
	- Market Access
Governments	- Policy Frameworks
	- Protection & Rights
	- Infrastructure Development
Multilateral Development Institutions	- Funding & Financial Support
	- Research & Development
	- Capacity Building
NGOs	- Advocacy
	- Education & Awareness
	- Partnership Building



Without sustainable aquatic management, inclusive market practices, and climate action, a secure seafood supply chain remains elusive.



Message?

By embracing technology, fostering collaborative approach, and reshaping market dynamics, the seafood industry can not only navigate the challenges ahead but also prosper in an era of change.



Thank You

