

# Aquaculture: Vannamei shrimp farm & hatchery

## Investment pitchbook

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KEARNEY



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# Executive Summary

## Attractive Investment Destination

- **Pakistan** is emerging as a regional powerhouse, with a **reformed economy** (inflation stabilized at lower level in the past 50 years and GDP expected to cross USD 3.3T by 2050) and **vibrant talent** (7<sup>th</sup> largest workforce with 64% under the age of 30)
- **Investors can expect strong support** for aquaculture growth from both public and private stakeholders — with the Fisheries Development Board promoting best practices, private players launching pilot projects, and the SIFC facilitating investment

## Strategic Relevance

- Pakistan ranks among the **top 10 global producers of key agricultural products**, including wheat, rice, sugarcane, cotton, milk, and dairy, offering significant opportunities to reduce inefficiencies, scale up food production, and enhance output quality
- **Pakistan's strategic location, particularly its proximity to the GCC**, makes it well-positioned to meet the region's growing food demand, offering strong relevance for GCC investors

## Aquaculture Competitive Advantage

- Pakistan offers **abundant land** and a favorable climate for **scaling aquaculture**, with a 1,000 km coastline and approximately 7 million acres of inland saline land ideal for shrimp farming
- **Limited disease exposure of shrimp** due to early-stage development, with farming cycles supporting disease-free conditions
- **Opportunity to achieve globally competitive costs** through low labor rates, renewable energy potential, and a strong private sector driving seed and feed scale-up
- **Strong institutional backing** in the form of government backed pilot farms and existence of private sector availability to cover the gap of inland aquaculture infrastructure and provide hatchery support
- **Strong support of Government-backed pilot farms and existence of private sector** (Dhabeji Aqua Foods, Aquahatch, Arsala Seafoods, etc.) to cover the gap of inland aquaculture infrastructure and hatchery support



# Pakistan is emerging as a high-potential investment destination, with a growing economy, strategic location, pro-business reforms, and a young, skilled workforce

## GROWING ECONOMY



- USD 330B+ GDP<sup>1</sup>, on track for USD 3.3T<sup>2</sup> by 2050
- World's **second best-performing**<sup>3</sup> stock market in 2024
- **Improved Credit Rating** from CCC- to B- in 2025<sup>4</sup>

## FRIENDLY BUSINESS ENVIRONMENT



- **Top 10 in Business Entry Regulations** ranking<sup>5</sup>
- Up to **100% foreign equity** allowed<sup>6</sup>
- **Robust tax incentive packages**<sup>6</sup>
- **Private Sector involvement** for Hatchery and pond pilots

## IMMENSE HEADROOM IN SEAFOOD SECTOR



- Pakistan contributes less than 1% to global shrimp trade despite **1,000 km coastline** and **~6.7 million acres of inland saline area** well suited for shrimp<sup>7</sup>
- Pakistan produces **3/6 largest aquaculture species**: Vannamei, Grass Carp, Silver Carp
- Inland saline farming with water replacement cycles and **disease-free zones**

## GOVERNMENT SUPPORT



- **4,000 acres reserved by Punjab**<sup>9</sup>, target 100,000 acres; **3,400 acres also reserved in Sindh/Balochistan**<sup>10</sup>
- **Implementation of QC protocols** to ensure biosecurity
- **Provision of aquaculture expertise** in rural areas

## INVESTMENT FACILITATION











- **A Special Investment Facilitation Council** has been set up to bridge the gap between foreign and domestic investors to identify and address lucrative investment opportunities in Pakistan that are pivotal to drive economic growth<sup>6</sup>

**Pakistan is open for business – a rising economy with strategic reforms, investor-friendly policies, and large untapped potential**

Investors have an opportunity in the nascent shrimp sector of Pakistan with exceptional growth prospects

Opportunity overview and key highlights

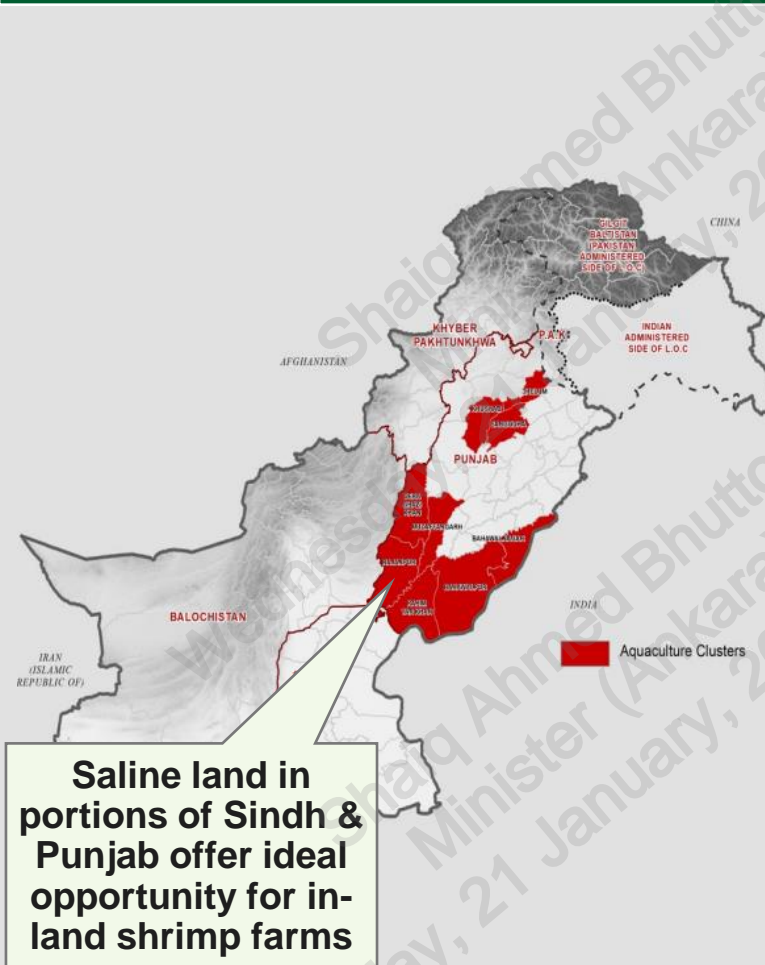
Opportunity Description		Value Proposition	
<div><div>Opportunity Description</div><div><ul style="list-style-type: none"><li>Nascent sector in Pakistan with ideal conditions to offer immense growth potential</li><li>Transform brackish farmland into shrimp farms</li><li>Unlock exports to large Asian markets</li></ul></div></div>		<div><div>High-Level Opportunity Facts</div><div><div><div>A</div><div>Project Details</div><div><div><div><div>Hatchery along the coast</div></div><div><div><div>Shrimp farming in Punjab</div></div><div><div><div>Export of disease free, cost-effective shrimp</div></div></div></div><div><div><div>B</div><div>Target market</div><div>Serve international markets (UAE, Kuwait, China, Thailand, etc.)</div></div><div><div>Target operations</div><div><div>~5k shrimp ponds (~12k acres)</div><div>~80-100k MT shrimp production</div></div></div><div><div><div>C</div><div>Return Profile</div><div>~15-25% IRR (USD)</div></div><div><div>Estimated Project Cost</div><div><div>USD 60-80Mn</div><div>PKR 20-30B</div></div></div></div></div><div><div>Value Proposition</div><div><div><div><ul style="list-style-type: none"><li>Saline in-land areas identified already and 4,000 ha defined for shrimp farms</li><li>Hatcheries to provide PL for downstream value add products</li></ul></div><div><div><ul style="list-style-type: none"><li>Disease free shrimp zones due to nascency; expected to continue as disease free due to option for water replacement between farming cycles</li></ul></div><div><div><ul style="list-style-type: none"><li>Deeper penetration into existing markets by accelerating exports in China, Japan, UAE, etc.</li><li>In-land farming may open up US market</li></ul></div><div><div><ul style="list-style-type: none"><li>Eventual revenue diversification opportunity by developing shrimp processing capabilities close to farm</li></ul></div><div><div><ul style="list-style-type: none"><li>Participation of significant private sector partners in piloting In-land farms and hatcheries i.e., Garbisons, Dhabeji, Arsala Seafoods</li></ul></div></div></div></div></div></div></div></div></div></div></div></div></div>	

## A | Opportunity overview: Rising salinity in Punjab and Sindh is driving farmers toward inland shrimp farming – turning environmental challenges into new commercial opportunities

Pakistan's shrimp industry is evolving from wild-caught fishing to organized aquaculture – a shift toward scalable, predictable production

## Pakistan's Shrimp Farming Sector

### Shrimp Supply and Demand Breakdown Pakistan (MT, 2022)



### Key Drivers



- **Encouraging success** in shrimp sector driving confidence and **faster market expansion**:
- **Government pilot project exceeded targets**: Produced 120 MT of shrimp in 104 days
- **Major players investing heavily** – Al-Karam (Dhabeji Foods) and Garbisons (Aquahatch) deploying capital shrimp farms and hatchery respectively
- **Private sector momentum**: Arsala Seafoods achieved first-ever export to Vietnam, signaling market maturity

### Enabling environment



- **Subsidized land access** – Government offering 4,000 hectares on 15-year leases at <125K<sup>1</sup> PKR/acre (Punjab)
- **Public sector support** – Interventions to improve infrastructure and upskill aquaculture workforce<sup>2</sup> have resulted in private projects like Dhabeji AF & Aquahatch
- **Established export channels** – Pakistan's top trade partners (China, Japan, Thailand, UAE) represent large shrimp markets for higher market share

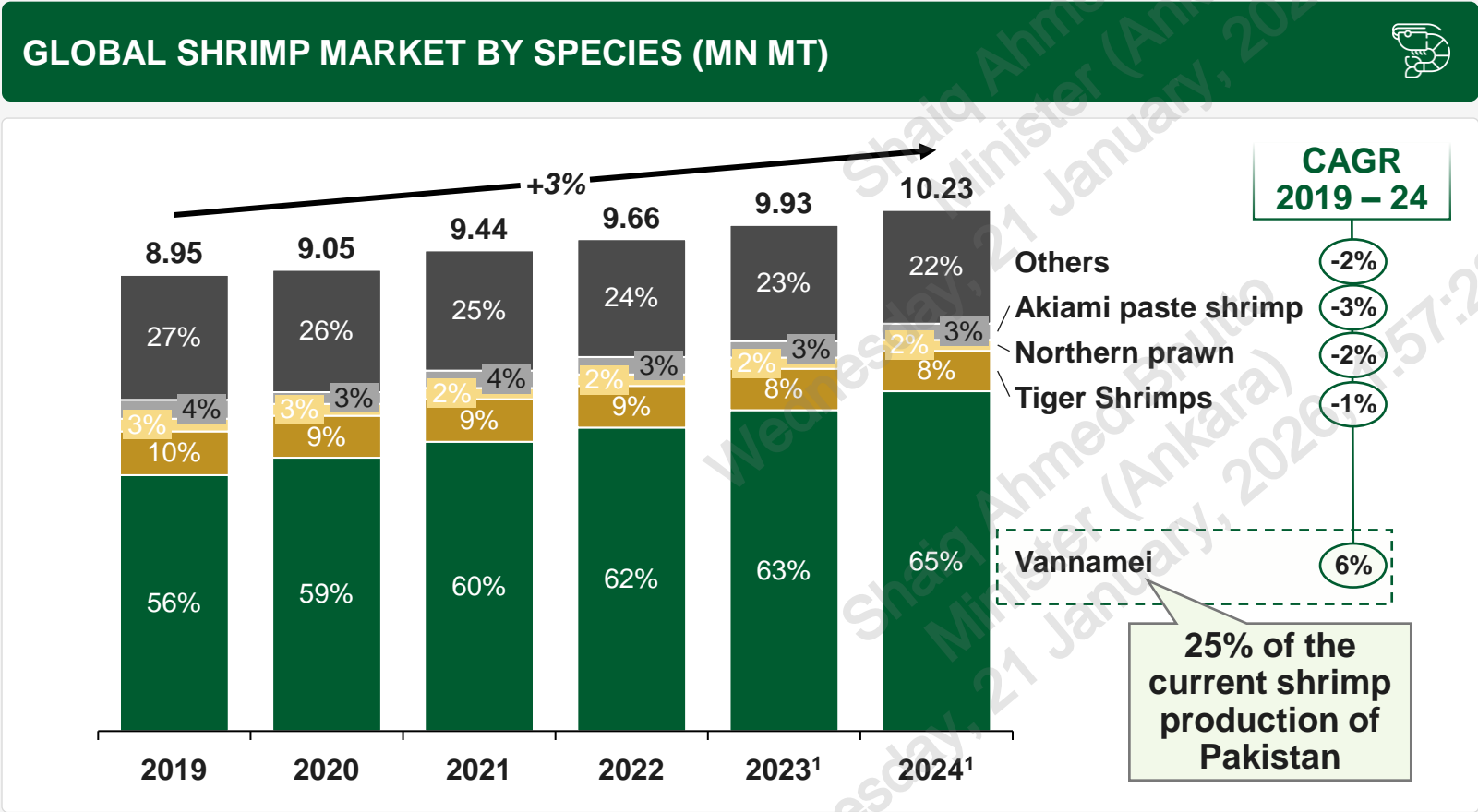
### Variety in focus



**Pacific White Shrimp**  
*Litopenaeus Vannamei*



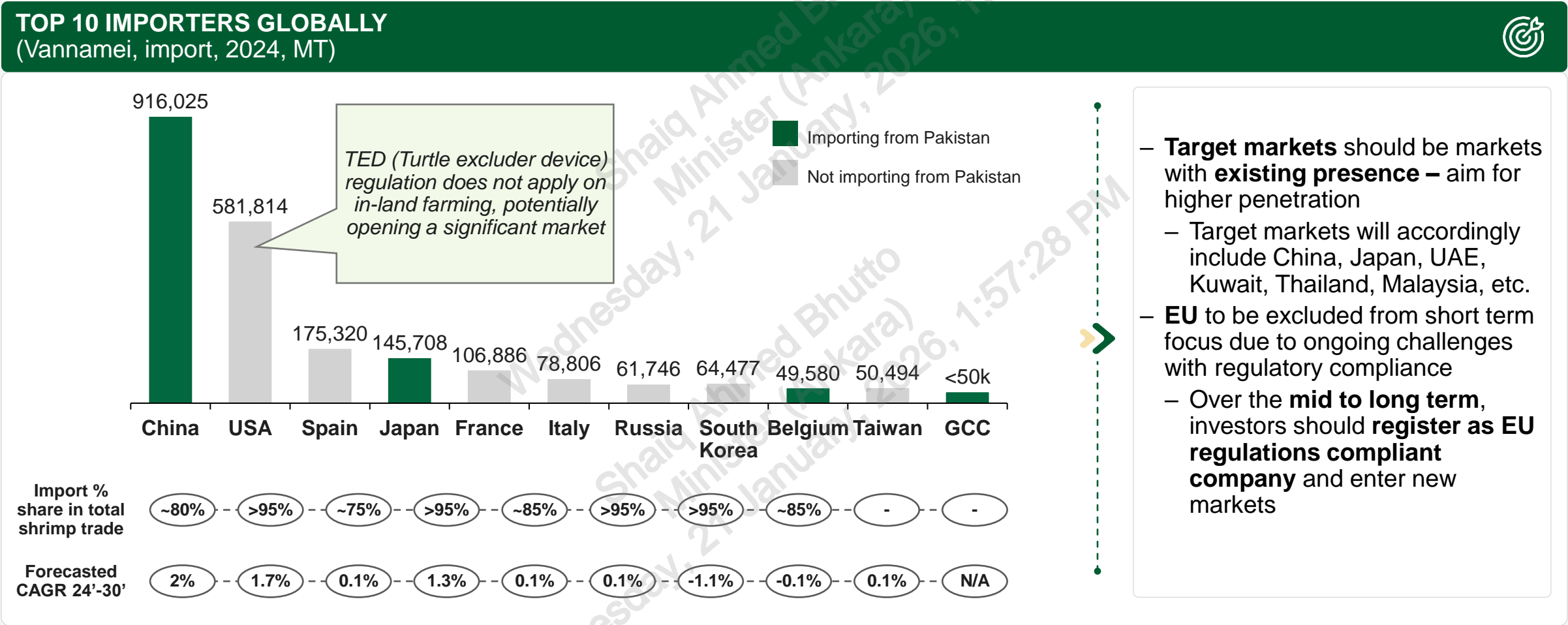
B | Market assessment: Vannamei dominates global shrimp markets with growing share—making it Pakistan's strategic production priority



**KEY INSIGHTS**

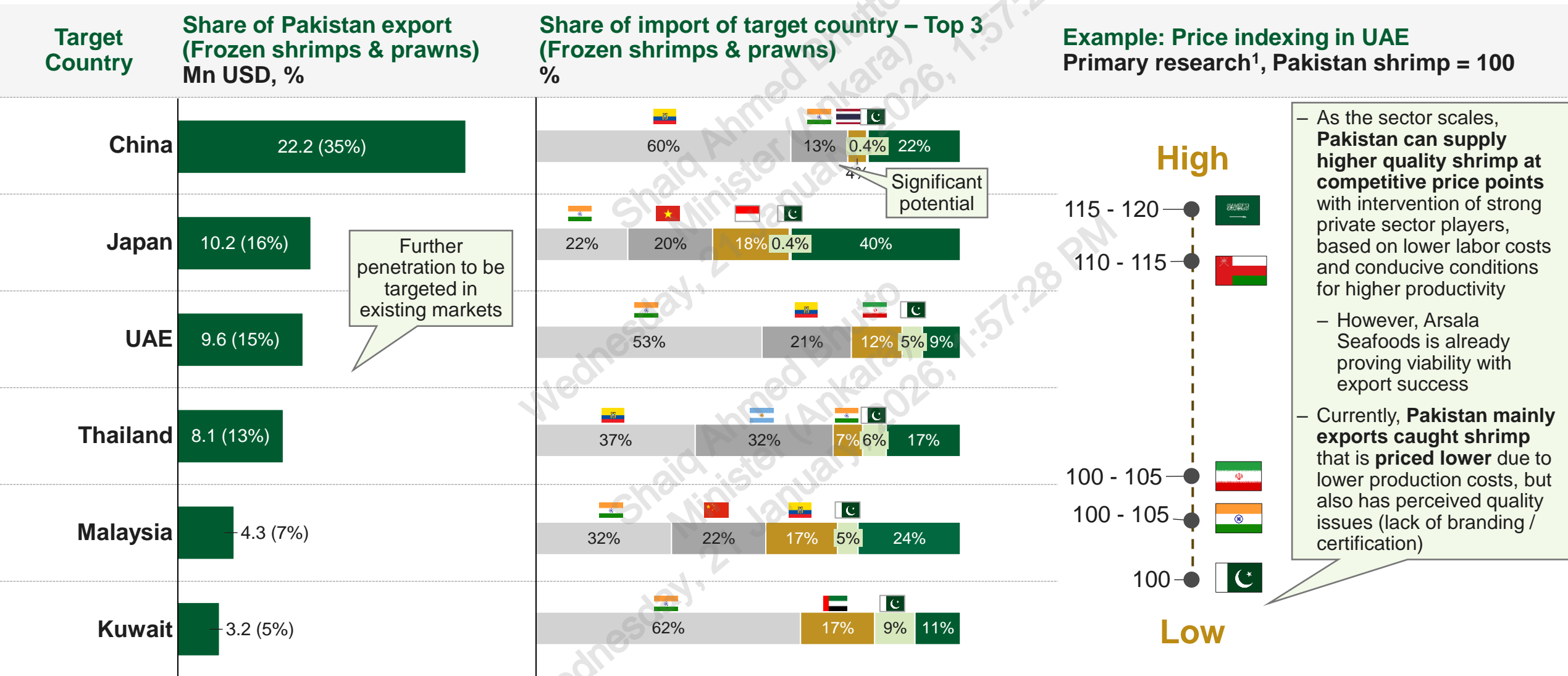
- Vannamei dominates global shrimp due to:
  - **Rapid harvest cycles:** Ready in ~3 months versus longer cycles for alternative species
  - **Superior yield:** Higher stocking density and survival rates attract farmers
  - **Proven scalability:** Ecuador and India demonstrate cost-effective large-scale production through economies of scale
- Vannamei's robust characteristics position it as the **anchor for Pakistan's emerging shrimp industry** expansion

B | Market assessment: Top 10 importers globally drive 70%+ of global Vannamei demand; critical for Pakistan to assess which of these markets it wants to target



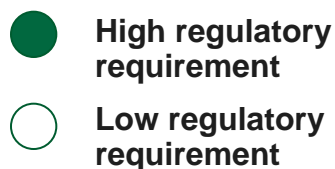


B | Market overview: Pakistan offers attractive pricing across all key export markets, indicating significant competitive advantage














1. Results driven by inputs received from interviews conducted of shrimp wholesalers in UAE  
Source: WITS, Primary research

**B | Market overview:**  
However, Pakistan will need to adhere to quality and disease checks as per target market requirements, in addition to competitive prices



## Target market comparison

Target market	Key rationale	Regulations & barriers
<b>China</b> 	<ul style="list-style-type: none"> <li>– <b>High requirements related to virus prevention</b>; PCR tests required for WSS<sup>1</sup></li> <li>– <b>Strict guidelines on quality</b> incl. labelling, chemical/antibiotic usage &amp; packaging inspected by AQSIQ<sup>2</sup></li> <li>– Increased regulation expected to <b>reduce local production &amp; increase imports</b></li> </ul>	
<b>USA</b> 	<ul style="list-style-type: none"> <li>– <b>90% farmed shrimp import</b> due to stricter TED enforcement for caught shrimp</li> <li>– <b>FDA approved facilities &amp; HACCP enforcement</b> are required to supply shrimp</li> <li>– <b>Imports tested and blocked</b> if banned antibiotics are detected</li> </ul>	
<b>South Korea</b> 	<ul style="list-style-type: none"> <li>– <b>Stringent quality requirements</b> (tests for disease &amp; use of chemical/antibiotics)</li> <li>– <b>Audits conducted</b> by the government on farms &amp; exporting country regulations</li> </ul>	
<b>Spain</b> 	<ul style="list-style-type: none"> <li>– <b>High certification requirements &amp; emphasis on traceability and sustainability</b> driven by increasing awareness of the end consumer</li> <li>– <b>Detailed labelling &amp; packaging</b>, absence of <b>chemical residue and antibiotics</b> as per EU legislations</li> </ul>	
<b>France</b> 	<ul style="list-style-type: none"> <li>– <b>Less stringent requirements on chemical treatments</b> compared to Asia</li> </ul>	
<b>UAE</b> 	<ul style="list-style-type: none"> <li>– <b>Halal Food Certificate</b> required by a UAE approved Islamic Center</li> <li>– <b>Labelling requirements in compliance with ESMA</b> standards</li> </ul>	
<i>Pakistan players (e.g. Aquahatch, Dhabeji) in process of adopting HACCP, Halal and PCR quality control standards across inland systems that should see these barriers reduced overtime</i>		



## C | Target Operations: Initially, two parts of value chain are more suitable to enter into the shrimp farming sector in Pakistan

Value chain	Hatchery		Farming	Processing
Description	<b>Breed parent shrimps to produce nauplii</b> <i>(Nauplii = newly hatched shrimp)</i>		<b>Grow out PL to full size shrimps</b> <i>(10-40g at time of harvest)</i>	<b>Sort, freeze and package shrimp for export</b>
Production timeline	<b>5-10 days</b> (with ablation) <b>100-250k</b> eggs per spawn <b>60-80%</b> egg fertility		<b>3-4-month</b> cycle <b>60-80%</b> survival rate	<b>2-5 days</b> - depends on volume, technology, and freezing method
Production potential (annual)	<b>1000 pairs</b> of broodstock <b>4-5 B</b> nauplii production		<b>25-50k MT</b> shrimp production	<i>same as farming output; adjusted for losses</i>
Geographic restrictions	MUST be <b>near the coast</b>		<b>Preferably near coast</b> but also readily made inland	<b>NA</b>
Proposed business model	<b>Hatchery on Sindh coast</b> <ul style="list-style-type: none"> <li>Develop hatchery of capacity to fulfill PL requirements of target state shrimp farm</li> <li>Ramp up broodstock based on in-house/external demand</li> <li>Consume majority of PL produced in-house, and sell excess production to shrimp farmers in Sindh and Punjab</li> <li>Coastal farms aligned with best practice</li> </ul>		<b>Farm in Punjab</b> <ul style="list-style-type: none"> <li>Pilot 100 ponds in year 1 and scale ponds on success basis</li> <li>Capitalize on optimal OPEX by improving infrastructure</li> <li>Initially sell to domestic traders and gradually shift towards direct exports</li> </ul>	<b>Not recommended in near term</b> <ul style="list-style-type: none"> <li>High value add but requires scale; to be explored upon successful growth of hatchery + shrimp model</li> </ul>

## C | Target Operations: Targeted policy interventions to drive sector development and growth

### ENABLING ENVIRONMENT AND GOVERNMENT INITIATIVES

#### FEDERAL GOVERNMENT



**Identify locations** to set up and scale aquaculture projects: hatchery, farm, processing, feed mill, R&D unit etc.

**Develop training programs** to increase availability of skilled labor

**Fisheries Development Board and Marine Department** to support QC rollout

**Define and track KPIs** in line with best-in-class aquaculture ecosystems

#### PROVINCIAL GOVERNMENT



**Spread awareness** to local farmers on aquaculture as an opportunity

**Establish model farm** demonstrating QC best practices to farmers

**Mobilization of key resources** to facilitate execution e.g., farming land, water, energy, seed, feed etc.

**Build infrastructure** (e.g., cold chain) to reduce value chain wastage

### GLOBAL QC COMPLAINTS IS CRITICAL FOR OFFTAKE

QC Standard	Scope	Market focus
<b>HACCP</b> (Hazard analysis and critical control points)	Food Safety	<b>All target markets</b>
<b>IFS</b> (International Featured Standards)	Traceability and food safety	<b>High importance for EU markets</b>
<b>Global GAP</b> (Global Partnership for Good Agricultural Practices)	Labor, sustainability & food safety	<b>EU markets</b>
<b>ISO</b> (International Organization for Standardization)	Food safety and quality management	<b>High importance for most markets</b>
<b>Halal Food Mark</b>	Religious concerns	<b>UAE</b>
<b>BAP</b> (Best Aquaculture Practices)	Food safety traceability sustainability and	<b>Optional</b> – potential for higher price realization
<b>ASC</b> (Aquaculture Stewardship Council)	Environmental concerns	<b>Optional</b> – potential for higher price realization
<b>BRC</b> (British Retail Consortium)	Food safety and quality	<b>UK</b>






## C | Target Operations: Investors in the venture can expect an IRR of 15-25% over 5 years, with an investment of USD 60-80 Mn

Business model expected to deliver consistent ROI — investors can replicate success across multiple farm locations for diversified, scalable returns












## BUSINESS CASE FOR EACH FARM

<b>RETURN PROFILE</b> 	Expected IRR	15-25% USD based	<ul style="list-style-type: none"> <li>– <b>Robust IRR profile</b> indicative of a highly attractive investment suggesting robust profitability and efficient use of capital.</li> <li>– Equity payback period of <b>3 – 4 years</b> is expected to be attractive for any equity investors</li> </ul>
	Payback Period	c.a. 3 – 4 years	
<b>OPERATIONS</b> 	Average Revenues	USD 80-100M over 5 years	<b>Steady state production</b> <ul style="list-style-type: none"> <li>– 4-6 B nauplii → 2-3 B PL → 25-30k MT of shrimp</li> <li>– <b>Shrimp cost:</b> 3 - 4 USD/KG; <b>PL cost:</b> &lt;0.4 cents/piece</li> </ul>
	Avg. EBITDA margins over 5 years	15-25%	<ul style="list-style-type: none"> <li>– Gross margin in PKR at <b>40-60% in maturity</b></li> <li>– Initially pilot <b>100 ponds</b>, scale up to <b>~5,000</b> over 5-6 years</li> </ul>
	Farming ponds	~5,000 Over 5-6 years	
<b>INVESTMENT</b> 	Buildings and Infrastructure	PKR 20-30B USD 60-80Mn	<ul style="list-style-type: none"> <li>– <b>Farming ponds</b> will be the key CAPEX driver for investments into the project</li> <li>– <b>Hatchery will become feasible</b> only with a captive farming network to guarantee PL offtake (in-house or external)</li> <li>– Current model assumes <b>100% equity investment</b></li> </ul>
	Machinery and Equipment	PKR 0.5-1B USD 3-5 Mn	

## C | Target Operations: The government has actively implemented measures to reduce the negative effects of the identified risks on investors

### Key investment risks and mitigation measures

RISK TYPE 	DESCRIPTION 	DEGREE OF RISK 	INVESTOR MITIGATION ACTIONS 	PUBLIC SECTOR SUPPORT 
DEMAND / REVENUE 	Risk of not achieving projected revenues or sales targets	<b>Low</b> Consistent demand and supply imbalance pointing to structural ( <i>i.e., sticky</i> ) demand	Tailor marketing plans and promotional activities to increase penetration in key target markets	Support demand through overall promotion of shrimp farming (e.g., conferences, advertising in trade journals, etc.)
MACROECONOMIC CONDITIONS 	Risk of inflation or currency depreciation affecting profitability	<b>Medium</b> Recent track record of currency and inflation volatility but strong stability shown over last 12 – 18 months	Global export business mitigate risk of currency devaluation on top line Local developer to create farms Local OPEX ( <i>e.g., payroll, supplies</i> )	Facilitate access to local currency loans
INFRASTRUCTURE 	Delays in utilities or access roads affecting timely operations	<b>Medium – Low</b> Strong road connectivity in South Punjab where farms are expected to be set up	Assess site readiness and secure cold chain / transport for farms	Ensure timely provision of approvals along with supporting infrastructure such as roads, utilities, etc.
REGULATORY / LEGAL 	Risk of sudden policy changes impacting contract or taxes	<b>Low</b> Recent reforms and deregulation trend suggesting commitment to private sector partnerships	Include independent jurisdiction ( <i>e.g., UK</i> ) in contract; include robust stabilization and early termination clauses	SIFC (Special Investment Facilitation Council) built as the one-window solution to facilitate investments incl. legal protections and international arbitration where needed

**C | Target Operations:**  
**Additionally, Pakistan is in the process of developing a robust aquatic health policy that will ensure maximum access to export markets**

### **Robust Governance Framework Harmonized Standards**



The policy will align Pakistan's legal framework for aquatic animal health with **international standards**, covering licensing, disease control, and import/export regulations via:

- Strengthened enforcement
- Tighter regulation of inputs

### **Advanced Health Surveillance Diagnostic Capabilities**



New focus on early detection of health issues and the **promotion of best practices** at the production level to enhance efficiency and product quality through:

- National disease surveillance and reporting program
- Enhanced national diagnostic labs

### **Biosecurity Proactive Risk Management**



Focus on **preventing disease introduction** and spread, thereby protecting investments and ensuring production continuity:

- Science driven import controls
- Effective border inspection and quarantine controls

### **Innovation Capacity Building**



Ensures the long-term **sustainability and competitiveness** of the sector through targeted investment in human capital, infrastructure, and research including:

- Targeted R&D
- Human Capital Development

# Thank you

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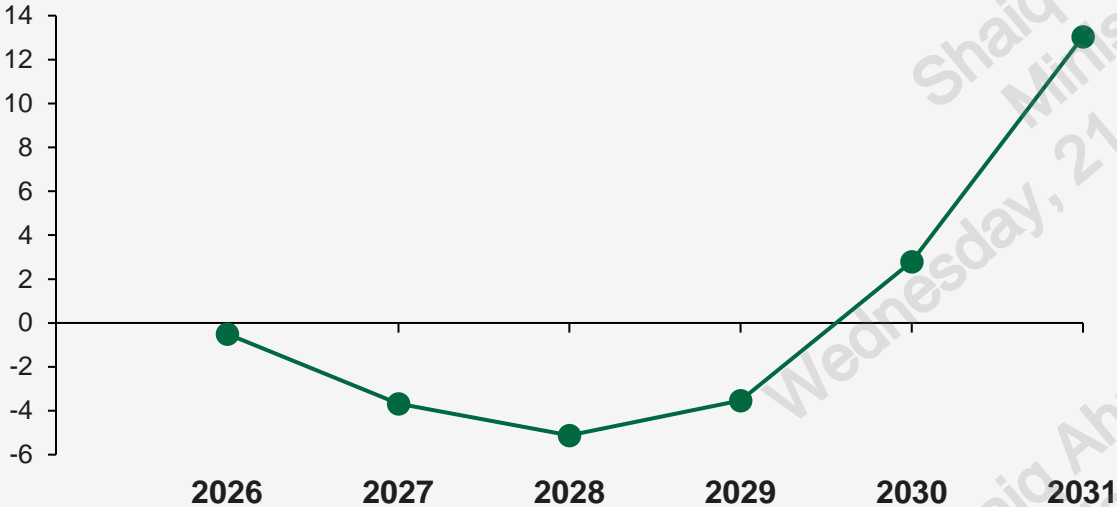




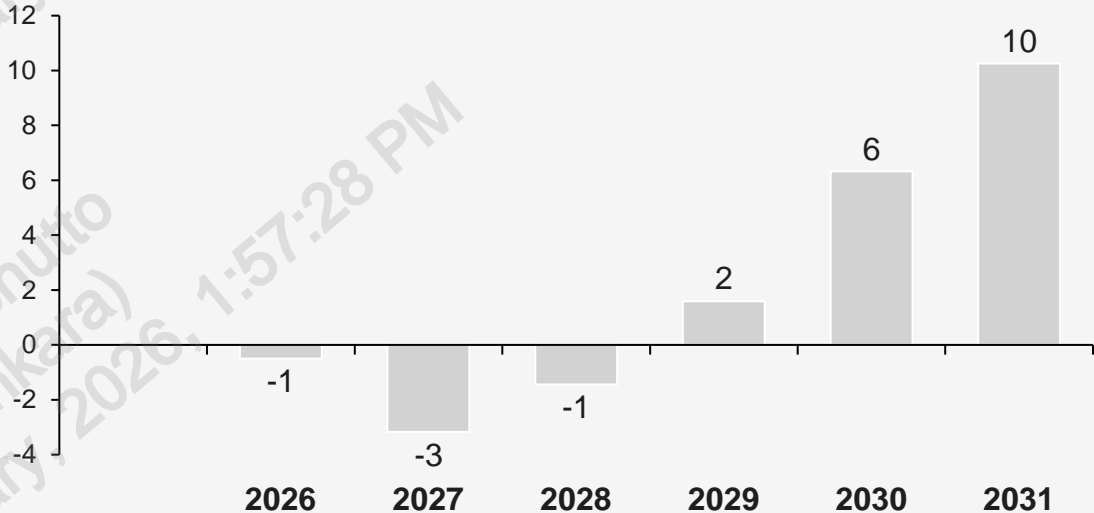
# Investor Cash Flows

## Investor cash flows, PKR Bn

Cumulative Cash Flow



Yearly Cash Flow (EBIDTA – CAPEX)










### Investor cash flows

- Upfront investment: PKR 0.5-1B
- IRR: 15-25%
- Payback period: 3-4 years

### Additional information

- Initial pilot to cover only 100 ponds for farming
- Hatchery to be set up based on the successful farming pilot
- Cashflows could vary based on timing of pond construction & operationalization, hatchery construction and broodstock import

# Learnings from benchmarks: Regional success stories provide strong proof of success for shrimp farming in emerging agricultural markets like Pakistan

Country	Aquaculture Societies Project 	Small-Scale Shrimp Farmer Capacity Building 	Small-scale Fish Farmers Project 
<b>Overview</b> 	<ul style="list-style-type: none"> <li>– Innovative grassroots approach to organize small-scale shrimp farmers</li> <li>– Evolved from 5-farm pilot in 2002 to 28 aqua clubs with 730 farmers by 2006</li> <li>– Focused on implementing Better Management Practices to combat disease and improve sustainability</li> </ul>	<ul style="list-style-type: none"> <li>– Targeted capacity building for 800 small-scale farmers</li> <li>– Emphasized cluster-based organization and risk-based BMPs</li> <li>– Aimed to enhance export market access through improved standards</li> </ul>	<ul style="list-style-type: none"> <li>– Walmart Foundation and IDH-funded initiative through Sustainable Fisheries Partnership</li> <li>– Promoted collaboration among 2,000 small-scale marine shrimp farmers</li> <li>– Focused on enhancing sustainable marine shrimp culture practices</li> </ul>
<b>Key players</b> 	<ul style="list-style-type: none"> <li>– Marine Products Export Development Authority (MPEDA)</li> <li>– Network of Aquaculture Centers in Asia Pacific (NACA)</li> <li>– Small-scale shrimp farmers</li> </ul>	<ul style="list-style-type: none"> <li>– Food and Agriculture Organization (FAO)</li> <li>– Department of Fisheries (DOF) Bangladesh</li> <li>– World Fish Centre (WFC)</li> <li>– Bangladesh Shrimp and Fish Foundation (BSFF)</li> </ul>	<ul style="list-style-type: none"> <li>– Network of Aquaculture Centers in Asia-Pacific (NACA)</li> <li>– The Food School (TFS): Local educational institution</li> <li>– Department of Fisheries (DOF), Thailand</li> <li>– Various shrimp farmer cooperatives and clubs</li> </ul>
<b>Private Sector role</b> 	<ul style="list-style-type: none"> <li>– Self-organization into societies of 20-75 members for collective action</li> <li>– Implementation of tailored BMPs and guidelines</li> <li>– Collaborative seed selection, testing, and purchasing for quality control</li> </ul>	<ul style="list-style-type: none"> <li>– Formation of farmer clusters for improved management and knowledge sharing</li> <li>– Production of export-compliant shrimp</li> </ul>	<ul style="list-style-type: none"> <li>– Establishment of six model farms to demonstrate best practices</li> <li>– Active participation from seafood manufacturers, hatcheries and feed mills</li> <li>– Engagement of farmer cooperatives and shrimp clubs in project implementation</li> </ul>
<b>Public sector role</b> 	<ul style="list-style-type: none"> <li>– Provided technical assistance and partial funding for society coordinators</li> <li>– Allocated USD 290K for implementing code of practices</li> <li>– Facilitated connections between farmers, research bodies, and industry</li> <li>– Enacted policy changes to support small-scale shrimp farmers</li> </ul>	<ul style="list-style-type: none"> <li>– DOF led project execution in partnership with other organizations</li> <li>– Provided comprehensive regulatory oversight from brood collection to processing</li> <li>– Coordinated inter-agency efforts (Water Resources, Land, Commerce)</li> </ul>	<ul style="list-style-type: none"> <li>– DOF provided support at both national and provincial levels</li> <li>– Coastal Fisheries Research and Development Centers (CFRDCs) offered specialized technical expertise</li> <li>– Implemented monitoring regimes and quality testing requirements</li> </ul>