



Vismar Aqua

Comprehensive Feasibility Study

Shrimp Farming and Hatchery Design in Pakistan

December 2024

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Executive Summary

This feasibility study examines the establishment of a state-of-the-art shrimp farming facility in Pakistan, combining modern aquaculture technology with sustainable practices.

Project Highlights:

Metric	Value
Target Annual Production	80 tonnes
Hatchery Capacity	1 million post-larvae/month
Total Investment Required	\$1.45 million
Facility Size	5 hectares (20 ponds)
Water Recovery Rate	90%
Technology	Biofloc + RAS

The project leverages cutting-edge biofloc technology and recirculating aquaculture systems (RAS) to maximize productivity while minimizing environmental impact. With an integrated hatchery producing disease-free post-larvae and sustainable water management systems recovering 90% of water, this facility represents the future of aquaculture in Pakistan.

Project Overview

Facility Specifications

- **Species:** Pacific White Shrimp (*Litopenaeus vannamei*)
- **Production Capacity:** 80 tonnes annually from 20 grow-out ponds
- **Total Area:** 5 hectares dedicated to shrimp production
- **Hatchery Output:** 1 million post-larvae per month
- **Technology Platform:** Biofloc systems with recirculating aquaculture integration

Advanced Technology Integration

- **Biofloc Technology:** Converts waste into protein-rich feed, reducing costs and environmental impact
- **Recirculating Systems:** 90% water recovery through mechanical and biological filtration
- **Integrated Aquaculture:** Tilapia farming for natural water treatment and additional revenue
- **Disease Management:** Biosecure hatchery with SPF (Specific Pathogen Free) broodstock protocols
- **Automation:** IoT sensors for real-time monitoring of water quality parameters

Sustainability Commitment

- Water conservation through 90% recovery and reuse
- Zero-discharge system minimizing environmental footprint
- Natural waste processing via integrated tilapia production
- Reduced dependency on wild-caught feed inputs
- Energy-efficient aeration and circulation systems

Infrastructure & Investment

Capital Investment Breakdown

Component	Investment (USD)
Hatchery Construction & Setup	\$500,000
Grow-out Pond Systems	\$600,000
Equipment & Machinery	\$250,000
Water Treatment Systems	\$75,000
Contingency & Working Capital	\$25,000
Total Capital Required	\$1,450,000

Monthly Operating Expenses

Expense Category	Monthly Cost (USD)
Feed & Nutrition	\$12,000
Labor & Salaries	\$6,500
Utilities (Power, Water)	\$3,200
Maintenance & Supplies	\$1,500
Quality Control & Testing	\$800
Miscellaneous	\$200
Total Monthly Operating	\$24,200

Revenue Model & Projections

Primary Revenue Streams

Revenue Source	Annual Revenue (USD)
Shrimp Sales (80 tonnes @ \$8/kg)	\$640,000
Post-Larvae Sales (12M @ \$6.40-8/1000)	\$76,800 - \$96,000
Integrated Tilapia Production	\$45,000
Total Annual Revenue	\$761,800 - \$781,000

Return on Investment Projections

Metric	Year 1	Year 2	Year 3
Gross Revenue	\$640,000	\$761,800	\$781,000
Operating Expenses	\$290,400	\$290,400	\$290,400
Net Operating Income	\$349,600	\$471,400	\$490,600
ROI (%)	24.1%	32.5%	33.8%

Note: Projections assume 90% production efficiency in Year 1, improving to full capacity by Year 3.

Sustainability & Technology

Environmental Stewardship

Water Conservation: The facility achieves 90% water recovery through advanced mechanical and biological filtration, dramatically reducing freshwater consumption compared to traditional farming methods.

Zero-Discharge System: Integrated tilapia production naturally treats and purifies water from shrimp ponds, creating a closed-loop system that eliminates environmental discharge.

Biosecurity Excellence: Disease-free SPF broodstock protocols and strict quarantine procedures ensure healthy production while eliminating the need for antibiotics and chemicals.

Energy Efficiency: Modern aeration systems and optimized circulation reduce energy consumption by 40% compared to conventional setups.

Technology Innovation

- Real-time water quality monitoring with IoT sensors
- Automated feeding systems optimized for growth rates
- Data analytics for predictive health management
- Mobile app integration for remote facility monitoring
- Traceability systems ensuring food safety compliance

Implementation Timeline

Phase	Activities	Duration
Phase 1: Planning & Permits	<ul style="list-style-type: none"> • Site surveys and soil testing • Environmental impact assessment • Regulatory permits and approvals • Final engineering designs 	2-3 months
Phase 2: Construction	<ul style="list-style-type: none"> • Site preparation and earthworks • Pond construction • Hatchery building construction • Utility installation 	4-5 months
Phase 3: Equipment Installation	<ul style="list-style-type: none"> • Filtration and water treatment systems • Aeration equipment • Hatchery equipment setup • Automation and monitoring systems 	2-3 months
Phase 4: Staff Training & Testing	<ul style="list-style-type: none"> • Hire and train technical staff • System commissioning • Water quality testing • Trial runs 	1-2 months
Phase 5: Pilot Production	<ul style="list-style-type: none"> • Initial stocking • Process optimization • Market development • Full commercial ramp-up 	3-4 months

Total Project Timeline: 12-17 months from planning to full commercial production

