

Comprehensive Agriculture & Fisheries Quality Assurance Framework

Standard Operating Protocols, Technical Matrix & Investment Brief for Integrated Crop-Fisheries Production in Bangladesh

Target Audience: Seed Growers, Integrated Farmers, Commercial Agribusinesses & International Investors
Regulatory Standard Alignment: SCA | BRRI | BARI | DAE | DoF | BFRI | Ministry of Agriculture

Executive Summary

This technical framework outlines the official quality assurance standards, field protocols, and regulatory requirements governing the production of certified seed crops and aquaculture fingerlings in Bangladesh. Designed under the national guidelines of the Seed Certification Agency (SCA), Bangladesh Rice Research Institute (BRRI), Bangladesh Agricultural Research Institute (BARI), Department of Agricultural Extension (DAE), Department of Fisheries (DoF), and Bangladesh Fisheries Research Institute (BFRI), this document serves as a unified reference for farm management, field inspection, and strategic enterprise investment.

1. INSTITUTIONAL ARCHITECTURE & GOVERNANCE

Agricultural and fisheries governance in Bangladesh relies on a coordinated multi-agency network to manage research, breeding, certification, and extension:

Agency	Full Name	Core Mandate & Statutory Function
SCA	Seed Certification Agency	Field inspections, laboratory seed analysis, lot tagging (White/Blue tags), market monitoring, and enforcing Seed Act compliance.
BRRI	Bangladesh Rice Research Institute	Development, evaluation, and nuclear/breeder seed production of high-yielding and stress-tolerant rice varieties.
BARI	Bangladesh Agricultural Research Institute	Breeder seed maintenance and variety development for non-rice crops (pulses, oilseeds, tubers, vegetables, maize).
DAE	Department of Agricultural Extension	Downstream technology transfer, farmer training, block-level advisory, and commercial seed plot demonstrations.
DoF	Department of Fisheries	Regulatory enforcement, hatchery licensing, fingerling quality monitoring, extension services, and export certification.
BFRI	Bangladesh Fisheries Research Institute	Genetically improved broodstock research, breeding technology, aquaculture feed protocols, and fish disease control.

2. CROP SEED & FIELD QUALITY STANDARDS

According to the *Seed Act 2018* and *Seed Rules 2020*, seed production is categorized into Foundation, Certified, and Truthfully Labeled Seed (TLS) classes. All lots must comply with strict laboratory and field thresholds.

A. Seed Standard Matrix (Laboratory Quality Control)

Quality Factor / Parameter	Foundation Class	Certified Class	Truthfully Labeled (TLS)
1. Pure Seed (Min. % by weight)	97.0%	97.0%	96.0%
2. Inert Matter (Max. % by weight)	2.0%	2.0%	3.0%
3. Other Crop Seed (Max. Count per Kg)	5 / kg	5 / kg	10 / kg
4. Total Weed Seed (Max. Count per Kg)	8 / kg	8 / kg	10 / kg
5. Germination Capacity (Min. %)	80.0%	80.0%	80.0%
6. Moisture Content (Max. %)	12.0%	12.0%	12.0%

B. Field Standard Matrix (In-Situ Plot Inspection)

Field Inspection Parameter	Foundation Class	Certified Class	Truthfully Labeled (TLS)
1. Isolation Distance (Minimum distance)	3.0 meters	3.0 meters	3.0 meters
2. Other Crop Plants (Max. % by count)	0.1%	0.2%	0.2%
3. Other Varieties / Off-types (Max. %)	0.1%	0.5%	0.5%
4. Obnoxious Weed Plants			
• Wild/Red Rice (ঝরা ধান/বন্য ধান)	0.01%	0.02%	0.02%
• Barnyard Grass (শ্যামা ঘাস)	0.01%	0.02%	0.02%
5. Seed-borne Diseases (Max. infected plants)	10.0%	20.0%	20.0%
6. General Crop Condition	Fields severely damaged by lodging, extreme weather, or exhibiting irregular flowering that impedes purity verification will be immediately rejected.		

3. FISHERIES & AQUACULTURE TECHNICAL STANDARDS

Under the *Fish Hatchery Act 2010* and *Fish Feed and Animal Feed Act 2010*, quality standards for fish broodstock, fingerling health, and water parameters are strictly enforced by DoF to ensure high survival and growth rates.

A. Fish Seed & Broodstock Quality Indicators

Parameter	Standard Level	Technical Requirement & Impact
Broodstock Age	Min. 2 – 3 Years	Immature broodstock leads to poor egg viability and high offspring mortality.
Broodstock Weight	Carp species: 2.5 – 4.0 kg+	Ensures optimal fecundity, egg size, and robust fry development.
Fry Survival Rate	≥ 80%	Target survival rate from hatchery hatching to nursery stocking.
Physical Deformity	0% Tolerance	Mandatory culling of spinal defects, operculum deformities, or fin abnormalities.
Health & Pathogen Status	100% Pathogen Free	Must test negative for <i>Aeromonas</i> , epizootic ulcerative syndrome (EUS), and parasites.
Inbreeding Coefficient	< 1%	Maintained via wild broodstock replenishment and systematic rotational breeding.

B. Water Quality Thresholds for Integrated Aquaculture

Water Quality Parameter	Optimal Threshold	Field Management & Corrective Action
Water Temperature	25°C – 32°C	Regulate water depth (1.2–1.5m); apply surface shade during thermal spikes.
pH Value	6.5 – 8.5	If pH < 6.5, apply agricultural limestone (CaCO ₃) at 1–2 kg/decimal.
Dissolved Oxygen (DO)	≥ 5.0 mg/L	Operate paddle-wheel aerators during low DO periods (early morning).
Total Ammonia Nitrogen (TAN)	< 0.05 mg/L	Reduce feed ration, apply zeolites, or flush top water layer during spikes.
Water Transparency	25 – 40 cm	Measured using Secchi Disc; apply lime for high turbidity, stop fertilizer if hyper-green.

4. INTEGRATED FARMING OPERATIONAL PROTOCOLS (ICS + IAAS)

- **Isolation & Boundary Buffer:** Maintain a strict 3-meter physical buffer zone around seed production plots to eliminate cross-pollination. Plant marigolds or pulse crops along dikes to serve as natural pest barriers.
- **Systematic Crop Roguing:** Execute three roguing rounds: (1) Pre-flowering vegetative phase, (2) 50% Flowering stage (remove off-types, wild rice, barnyard grass), and (3) Pre-harvest stage (remove diseased plants).
- **Refuge Trench Construction in Rice-Fish Fields:** Excavate perimeter/central trenches covering 10–15% of the paddy field area (depth 0.8–1.0m) to provide sanctuary for fish during field drainage or summer heat.
- **Integrated Pest & Chemical Management:** Synthetic organophosphates are strictly prohibited in rice-fish fields. Utilize bio-pesticides (Neem extract) and biological control (fish feeding on stem borer larvae).
- **Seed Moisture & Post-Harvest Drying:** Sun-dry seed lots uniformly on clean tarpaulins until moisture reaches ≤ 12.0%. Store in hermetic air-tight bags (e.g., GrainPro) to preserve germination above 80%.

5. COMMERCIAL BRIEFING FOR INTERNATIONAL DEALERS & INVESTORS

Key Agribusiness Investment & Regulatory Opportunities

1. Market Entry & Licensing: Foreign enterprises can enter Bangladesh's seed and aquaculture sectors via joint ventures or fully owned subsidiaries registered under the Companies Act and licensed by SCA/DoF. Seed varieties for notified crops require National Seed Board (NSB) registration, while non-notified hybrids benefit from an expedited registration process.

2. Quality Certification & Traceability: Certified seeds receive color-coded official tags from SCA laboratories (Gazipur NSTL and regional labs), adhering to ISTA-aligned testing methods. Aquaculture export products adhere to strict EU/FDA traceability standards (HACCP, GAP certification).

3. High-Growth Investment Focus Areas:

- High-tech Recirculating Aquaculture Systems (RAS) and Biofloc commercial hatcheries.
- Industrial aqua-feed and poultry-feed processing plants with automated quality testing.
- Cold-chain infrastructure, temperature-controlled seed warehousing, and logistics.
- Climate-resilient hybrid seed production (saline-tolerant rice, heat-tolerant vegetables).

Official Regulatory Authorities & Reference Statutes:

- **Seed Certification Agency (SCA):** Joydebpur, Gazipur | sca.gov.bd
- **Department of Fisheries (DoF):** Matshya Bhaban, Dhaka | fisheries.gov.bd
- **National Research Institutes:** BRRI (brr.gov.bd), BARI (bari.gov.bd), BFRI (fri.gov.bd), DAE (dae.gov.bd)
- **Statutory Acts:** *Seed Act 2018, Seed Rules 2020, Fish Hatchery Act 2010, Fish Feed and Animal Feed Act 2010.*