

Aquaculture Research Center

Overview

The **Aquaculture Research Center** at NARA Headquarters represents the cutting edge of aquaculture innovation in Sri Lanka. Established to enhance the food fish, ornamental fish, and marine invertebrate farming sectors, the center focuses on development of technical knowledge and livelihood improvement for breeders and farmers nationwide.

Located at NARA's Crow Island facility in Colombo 15, the center serves as a hub for applied aquaculture research, technology transfer, and training. With modern facilities and expert staff, the center bridges the gap between laboratory research and commercial aquaculture practice.

Location

Aquaculture Research Center

NARA Headquarters
Crow Island, Mattakkuliya
Colombo 15, Sri Lanka

Mission & Vision

Mission:

To develop and disseminate aquaculture technologies that enhance productivity, sustainability, and profitability of aquaculture enterprises while improving livelihoods of farming communities.

Vision:

To be recognized as the premier aquaculture research and development center in Sri Lanka and the region, contributing to food security, economic development, and environmental conservation through aquaculture innovation.

Key Objectives

Research & Development

1. Enhancement of food fish farming sector through applied research studies
2. Development and introduction of induced breeding technologies for ornamental fish industry
3. Advancement of marine invertebrate farming (sea cucumbers, molluscs, crustaceans)
4. Innovation in feed technology and nutrition
5. Disease management and biosecurity protocol development

Capacity Building

1. Strengthening institutional frameworks for applied aquaculture research
2. Widening research opportunities for undergraduate and postgraduate students
3. Training of farmers and entrepreneurs in modern aquaculture techniques
4. Skill development for aquaculture technicians and extension workers
5. International capacity building and technology exchange

Technology Transfer

1. Demonstration of commercially viable aquaculture technologies
2. Provision of quality brood stock to farmers
3. Technical support and troubleshooting for commercial operations
4. Extension services connecting research with practice
5. Industry partnership development

Research Areas

Ornamental Fish Aquaculture

The center leads Sri Lanka's ornamental fish research, focusing on:

KOI Carp Breeding

- Selective breeding for color quality and pattern
- Development of new color varieties
- Genetic improvement programs
- Brood stock management and maintenance
- Distribution of high-quality breeding stock to farmers

Angel Fish Varieties

- Breeding of multiple angel fish varieties (Gold, Silver, Marble, Black Lace, Koi Angel)
- Consistent production of show-quality specimens
- Development of new color mutations
- Larval rearing optimization
- Commercial production protocols

Fighter Fish (*Betta splendens*)

- Breeding for vibrant colors and finnage
- Development of different tail types (Halfmoon, Crowntail, Plakat)
- Color breeding programs

- Conditioning and spawning techniques
- Market-oriented production

Other Ornamental Species

- Rosy barb selective breeding
- Sword tail variety development
- Tin foil barb culture
- Malawi cichlid breeding
- Guppy strain development
- Molly breeding programs

Research Focus:

- Genetics and selective breeding
- Larval nutrition and feeding protocols
- Disease prevention in breeding operations
- Water quality management for breeding
- Packaging and transport technology
- Export quality standards

Food Fish Aquaculture

Species Under Investigation:

- Tilapia (*Oreochromis* spp.) - strain improvement and culture optimization
- Common carp - selective breeding and polyculture
- Catfish species - intensive culture systems
- Snakehead fish - high-value species culture
- Giant freshwater prawn (*Macrobrachium rosenbergii*)
- Freshwater shrimp culture

Research Areas:

- Feed formulation using local ingredients
- Integrated multi-trophic aquaculture (IMTA)
- Biofloc technology for intensive culture
- Recirculating aquaculture systems (RAS)
- Cage culture technology
- Pond design and water management
- Hatchery management for food fish

Marine Invertebrate Farming

Sea Cucumber Aquaculture

This is a flagship program of the center addressing:

- Holothuria scabra (sandfish) hatchery technology
- Broodstock conditioning protocols
- Spawning induction techniques
- Larval rearing and metamorphosis
- Settlement substrate optimization
- Nursery and grow-out systems
- Feed development for sea cucumbers
- Disease management in hatcheries

Given your professional interest in sea cucumber export business, this facility represents the core research supporting commercial sea cucumber farming in Sri Lanka.

Other Marine Invertebrates:

- Oyster culture technology
- Mussel farming methods
- Crab fattening techniques
- Sea urchin aquaculture potential
- Seaweed cultivation

Breeding Technology Development

Induced Breeding Research:

- Hormonal induction protocols
- Environmental manipulation for spawning
- Artificial fertilization techniques
- Gamete handling and preservation
- Synchronization of spawning
- Fry production optimization

Hatchery Technology:

- Water quality management in hatcheries
- Live feed culture (phytoplankton, rotifers, artemia)
- Larval feeding strategies
- Disease control in hatchery systems
- Survival rate improvement

- Cost reduction in hatchery operations

Facilities & Infrastructure

Breeding & Hatchery Facilities

Broodstock Conditioning Tanks

- Temperature-controlled systems
- Separate tanks for different species
- Quarantine and health management areas
- Optimal water quality maintenance
- Natural spawning environments

Spawning & Fertilization Areas

- Controlled spawning tanks
- Egg incubation systems
- Fertilization success monitoring
- Egg disinfection facilities

Larval Rearing Tanks

- Multiple tank sizes for different life stages
- Flow-through and recirculating systems
- Aeration and water quality control
- Light and temperature regulation
- Easy cleaning and maintenance design

Live Feed Culture Units

Phytoplankton Culture

- Microalgae production for larval feeding
- Species: *Chlorella*, *Nannochloropsis*, *Isochrysis*
- Outdoor and indoor culture systems
- Continuous production protocols

Rotifer Culture

- Mass culture of *Brachionus* spp.
- Enrichment protocols for nutritional enhancement
- Harvesting and storage systems

Artemia Hatching & Enrichment

- Artemia cyst hatching facilities
- Enrichment tanks for nutritional quality improvement
- Harvesting and storage

Copepod Culture

- Experimental production of copepods as live feed
- Species selection and culture optimization

Water Quality Laboratory

Testing Capabilities:

- Temperature, pH, dissolved oxygen
- Ammonia, nitrite, nitrate
- Alkalinity and hardness
- Salinity and conductivity
- Turbidity and suspended solids
- Microscopic examination of water samples

Equipment:

- Water quality test kits
- Electronic meters and sensors
- Microscopes for plankton examination
- Sampling and preservation equipment

Research Laboratory

Facilities for:

- Genetic analysis and selective breeding studies
- Nutritional analysis of feeds
- Disease diagnosis and treatment research
- Water chemistry analysis
- Reproductive biology studies
- Growth performance evaluation

Demonstration Facilities

Training Areas:

- Classroom for theoretical training
- Hands-on demonstration areas

- Broodstock selection training
- Breeding operation demonstrations
- Feed preparation training
- Disease recognition and treatment

Visitor Facilities:

- Guided tour routes
- Informational displays
- Aquarium exhibits of cultured species
- Technology showcase areas

Growout & Production Systems

Pond Systems:

- Experimental earthen ponds
- Concrete tanks for research
- Different pond sizes for various species
- Water inlet and drainage systems

Intensive Systems:

- Concrete raceways
- Tank-based systems
- Recirculating aquaculture systems (RAS)
- Biofloc technology systems

Services Offered

Technology Demonstration & Training

Farmer Training Programs:

- Basic aquaculture principles
- Species-specific culture techniques
- Brood stock selection and management
- Spawning and hatchery management
- Feed preparation and feeding strategies
- Disease prevention and management
- Water quality management
- Business planning for aquaculture

- Marketing and value addition

Duration: Programs range from one-day workshops to week-long intensive courses

Target Participants:

- Small-scale farmers
- Commercial aquaculture entrepreneurs
- Extension officers
- NGO field workers
- University students
- International trainees

Brood Stock Supply

Quality Assurance:

- Genetically selected brood stock
- Disease-free certification
- Known breeding history
- Performance records

Species Available:

- KOI carp - various color varieties
- Angel fish - multiple varieties
- Fighter fish - selected lines
- Other ornamental species based on availability

Distribution System:

- Registration of interested farmers
- Scheduled distribution events
- Technical guidance with brood stock provision
- Follow-up support

Research Opportunities for Students

Undergraduate Level:

- Industrial training placement (3-6 months)
- Final year research projects
- Short-term research attachments
- Laboratory skill development
- Field experience in aquaculture

Postgraduate Level:

- Masters thesis research
- Doctoral dissertation research
- Collaborative research projects
- Access to facilities and expertise
- Co-supervision arrangements with universities

Student Benefits:

- Hands-on experience with cutting-edge research
- Access to modern facilities and equipment
- Mentorship by experienced scientists
- Opportunity to publish research findings
- Networking with aquaculture professionals

Technical Advisory Services**For Existing Farms:**

- Site visits and problem diagnosis
- Water quality assessment
- Disease diagnosis and treatment recommendations
- Feed formulation advice
- Production optimization strategies

For New Ventures:

- Feasibility assessment
- Site selection guidance
- System design recommendations
- Species selection advice
- Business plan development support

Applied Research for Industry**Commissioned Research:**

- Feed trials for commercial products
- Species culture protocol development
- Disease outbreak investigation
- Water quality problem-solving
- Production efficiency improvement

Industry Partnerships:

- Collaborative research and development
- Technology validation
- Product testing and evaluation
- Knowledge exchange

Current Research Projects

Ornamental Fish Breeding Enhancement

- Genetic improvement of popular species
- New variety development
- Reduction of inbreeding in captive populations
- Disease resistance selection
- Growth rate improvement

Sea Cucumber Hatchery Technology

- Optimization of larval survival rates
- Feed development for post-larvae
- Nursery system design
- Farmer training program development
- Commercial hatchery establishment support

Sustainable Feed Development

- Local ingredient evaluation for fish feeds
- Nutritional requirements determination
- Feed formulation optimization
- Cost reduction strategies
- Alternative protein sources research

Disease Management

- Common disease identification and diagnosis
- Treatment protocol development
- Biosecurity measures for farms
- Probiotic and immunostimulant research
- Vaccine development potential

Integrated Aquaculture Systems

- Fish-vegetable integration (aquaponics)
- Multi-species polyculture
- Waste recycling in aquaculture
- Integrated agriculture-aquaculture
- Sustainable intensification

Major Achievements

- Establishment of successful sea cucumber hatchery technology
- Development of selective breeding programs for ornamental fish
- Training of thousands of farmers in improved aquaculture practices
- Production and distribution of high-quality brood stock
- Research collaboration with local and international institutions
- Publication of research findings in scientific journals
- Technology transfer to commercial aquaculture sector
- Contribution to ornamental fish export industry growth

Collaboration & Partnerships

National Institutions

- **Universities:** Research collaboration and student training
- **National Aquaculture Development Authority (NAQDA):** Coordinated aquaculture development
- **Department of Fisheries:** Extension and farmer outreach
- **Export Development Board:** Market linkage and quality standards

International Institutions

- Foreign universities and research centers
- Regional aquaculture networks
- International training programs
- Technology transfer partnerships
- Research exchange programs

Private Sector

- Fish exporters and importers
- Feed manufacturers
- Hatchery operators
- Commercial aquaculture farms
- Aquarium industry

Future Expansion Plans

International Research Platform

The center plans to expand research opportunities to the **international level**, becoming a regional hub for aquaculture research and training. This expansion will include:

International Training Programs:

- Short courses for regional participants
- Specialized workshops on specific technologies
- Exchange programs with international institutions
- Online training modules
- Certification programs

Research Collaboration:

- Joint research projects with foreign institutions
- Hosting international researchers
- Participation in regional research networks
- Comparative studies across countries
- Technology adaptation for regional conditions

Facility Enhancement:

- Expanded hatchery capacity
- Advanced research laboratories
- Modern training facilities
- Accommodation for visiting researchers
- Conference and seminar facilities

Technology Priorities

- Recirculating aquaculture systems (RAS) for land-limited areas
- Offshore cage culture technology
- Marine fish hatchery development
- Biofloc technology for intensive culture
- Automation and sensor technology
- Genetic improvement programs
- Climate-resilient aquaculture systems

Contribution to National Development

Food Security

- Increased fish production from aquaculture
- Year-round availability of fish
- Reduced dependence on capture fisheries
- Nutritional security through fish protein

Economic Development

- Foreign exchange through ornamental fish exports
- Employment generation in aquaculture sector
- Income opportunities for rural communities
- Value chain development
- Investment attraction to aquaculture

Environmental Conservation

- Reduced pressure on wild fish stocks
- Sustainable production methods
- Conservation aquaculture for threatened species
- Environmental education and awareness

Social Development

- Livelihood improvement for fishing communities
- Women's participation in aquaculture
- Youth employment opportunities
- Community-based aquaculture initiatives
- Inclusive development

Contact Information

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For training programs, brood stock availability, research collaboration, or student placement inquiries, please contact NARA administration or the relevant research division (Inland Aquatic Resources and Aquaculture Division).