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भारतीय मानक मसौदा
उत्तम मत्स्यपालन व्यवहार रीतियों की अपेक्षाएं – इण्डिया जीएक्यूपी
समुद्री मछली हैचरी

Draft Indian Standard
Requirements for Good Aquaculture Practices – India GAqP
Marine Finfish Hatchery

ICS 67.120.30

Fish, Fisheries and Aquaculture
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FOREWORD

(Formal clause will be added later)

Mariculture is the fastest growing sub-sector of aquaculture in the world. Cage farming technology is widely recognized as the most important technology in mariculture for increasing fish production to meet the food fish demand. One important aspect hindering the rapid progress of mariculture in the country is the availability of quality seeds of high value fin fishes. However, in recent years, success in breeding and seed production technology of several high value commercially important finfishes has resulted in good production. Marine finfish seed production has to be up-scaled for meeting the stocking demand of the cages. However, keeping in view the huge demand of stockable sized seeds, multiple satellite hatcheries and satellite nursery rearing centres need to be developed in all maritime states.

Evidently, this very important sector needs special attention to ensure the supply of good quality seed-stock and in turn, ensure the sustainability of marine finfish farming in India. This can be achieved following the proper management guidelines by developing good aquaculture practices (GAqPs). GAqPs are necessary for broodstock management, egg and larval rearing, fry nursing and fingerlings grading, and water quality management. Whenever GAqPs are not followed, losses in the hatcheries increase. In view of this, standard on Good Aquaculture Practices for Marine Finfish Hatchery is being brought out for hatchery operators and technicians, in providing them the required technical knowledge on large-scale marine seed production for orange spotted grouper and Indian pompano.

Such standards envisaging focused approach for implementing good aquaculture practices, traceability etc. through appropriate infrastructure, record keeping and monitoring would reap following broad benefits:

- a) Development of basic infrastructure at the field level,
- b) Build up culture for good aquaculture practices by the farmers,
- c) Uniform approach across farms regardless of their sizes
- d) Increased awareness among the producers as well as the consumers about the need for consumption of good quality and safe food,
- e) Traceability through complete integration of food chain,
- f) Improvement in the environment
- g) Worker safety and welfare.
- h) Reputation in the international market as a producer of good quality and safe produce.
- j) Overcoming the Technical Barriers to Trade (TBTs).

This Standard is part of a series of Indian Standards on Good Aquaculture Practices. Considerable assistance has been provided by ICAR-Central Marine Fisheries Research Institute, Kochi, in formulation of this standard.

1 SCOPE

This Indian Standard covers the control points and compliance criteria necessary to be followed by the hatchery operators (individual operators and/or members of a operators group) of marine finfish hatchery.

2 TERMINOLOGY

For the purpose of this standard, following terminologies shall apply:

2.1 Good Aquaculture Practices - Practices that address environmental, economic and social sustainability for on-farm processes, and result in safe and quality food and non-food aquaculture products.

2.2 Applicant operators / operators group - Individual/organization that has applied for certification to India GAqP certification body.

2.3 Individual operators - A person/organization legally responsible for hatchery, who retains ownership of all the produce covered in the India GAqP license.

2.4 Inspection - An examination of all aquaculture practices in order to verify compliance to requirements specified in this standard.

2.5 Record - Document showing objective evidence of the tasks performed and results achieved.

2.6 Traceability - The ability to trace the history, use or location of a product (i.e., the origin of materials and parts, processes applied to the product, or its distribution and placement after delivery) by means of a record.

2.7 Worker - Any person on the farm who has been contracted to carry out a task. This includes farm owners and managers.

2.8 Operator group - A recognized group of operators applying for certification with an internal procedure and internal control of all the members registered to the India GAqP requirements, and complying the requirements as specified in this standard.

2.9 Field - Separate unit of land within a farm.

2.10 Farm - A farm is an agricultural production unit or group of agricultural production units; covered by same operational procedures, farm management.

2.11 Environment - Surroundings in which an activity takes place including air, water, land, natural resources, flora, fauna, humans, and their interrelation.

2.12 Certification - All actions leading to the issuance of an India GAqP licence.

2.13 Standard Operating Procedure - A written document which details an operation, analysis, or action whose mechanisms are prescribed thoroughly and which is commonly

accepted as the method for performing certain routine or repetitive tasks.

2.14 Major requirement - The mandatory requirement that shall be fully complied with. In case of non-compliance, it will seriously affect the quality of marine aquatic animal as well as safety for consumers. It means that the requirement shall be complied with relevant laws and regulations as well.

2.15 Minor requirement - The requirement that shall be mostly complied with. In case of non-compliance, it will affect the health of marine aquatic animal or product quality.

3 CONTROL POINTS AND COMPLIANCE CRITERIA

3.1 Control Points and Compliance Criteria required to be followed by the applicant producer (individual producer and/or member of a producer group) for independent verification of the aquaculture practices that have gone into the production of the produce are given in Annex A. In addition, the applicant producer (individual producer and/or member of a producer group) shall demonstrate compliance with all applicable statutory and regulatory requirements.

3.2 These criteria are marked as ‘Major’ or ‘Minor’ or ‘Reco’. The criteria marked as ‘Major’ have a definite effect on the safety and quality of the produce and shall, therefore, be complied with, or shall give adequate assurance about the safety and quality of the produce. The criteria marked as ‘Minor’, though have a bearing on quality, and are those which, if implemented, would provide an advantage to the assessment for India GAqP certification. The criteria marked as ‘Reco’, are those, which though may not have direct bearing on safety and quality of produce but may have other benefits to the producer and are recommended for implementation and are advisory in nature.

3.3 For the purpose of verification, a grading pattern given below shall be followed for grant of India GAqP license:

Category of Licence	Compliance of Major Requirements	Compliance of Minor Requirements
India GAqP — A	100%	90%
India GAqP — B	100%	80%
India GAqP — C	100%	75%

4 BIS INDIA GAqP CERTIFICATION

4.1 BIS India GAqP certification shall be as prescribed under the provisions of Bureau of Indian Standards Act, 2016 and Rules and Regulations framed thereunder. The details of the conditions under which the licence may be granted to producer (individual producer and/or member of a producer group) may be obtained from the Bureau of Indian Standards.

ANNEX A
(Clause 3.1)

CONTROL POINTS AND COMPLIANCE CRITERIA

Sl. No.	Item	Compliance Level	Requirements	Inspection method
A-1	HATCHERY AND SEED PRODUCTION			
A-1.1	Hatchery registration	Major	Hatchery shall be registered with Coastal Aquaculture Authority of India	Verification of registration certificate and allied documents.
A-1.2	Hatchery site and location	Major	Hatchery shall be constructed at an environmentally suitable area, legally permitted coastal regulation zone (CRZ)	Verify that land has been selected based on CRZ Rules, 2019 and registration certificate.
A-1.3	Hatchery layout	Minor	Various sections of the hatchery, such as quarantine, broodstock, larval rearing, live feed, laboratory, water intake, water treatments, effluent treatment, biological waste disposal, etc. should be identified from the layout map.	Verification of layout map through visual inspection.
A-1.4	Hatchery infrastructure	Major	Different production systems in the hatchery shall be physically isolated to prevent cross contamination.	Examine the layout of farm. Visual inspection.
A-1.5	Biosecurity	Minor	Entrance to the hatchery should be restricted to the personnel assigned to work exclusively in this area and a record of personnel entering the facility should be maintained by the security personnel.	Visual inspection. Verify visitor policy.

A-1.6	Water treatment	Major	Standard intake water treatment protocol should be used. Source water for the hatchery should be filtered and treated to prevent entry of disease vectors and any pathogens. Initial treatment should be through filtration, by slow sand filter or rapid sand filters, and should be stored in reservoir tanks. Following settlement, it should be treated either with ozone or chlorine followed by de-ozonisation or de-chlorination. After de-ozonisation, water should pass through the charcoal bed and then filtered through 1-5 µm cartridge filters. Each functional unit should have separate water treatment system.	Verify the water and test the samples as per applicable coastal aquaculture authority guidelines. Visual inspection of water treatment facilities.
A-1.7	Discharge treatment system	Major	Wastewater from each facility shall be released into special concrete or lined sedimentation tanks. From there, it shall overflow into treatment tanks where the water shall be treated either with ozone or chlorine.	Verify the report of discharge water analysis. Visual inspection.
A-2	BROODSTOCK MANAGEMENT			
A-2.1	Broodstock procurement	Major	Adult fish of more than 3 kg (Indian pompano, <i>Trachinotus mookalee</i>) or 2 kg (Orange spotted grouper, <i>Epinephelus coioides</i>) should be collected, either from the wild or from the pond or cage (farmed) for broodstock development.	Visual inspection and verification of records.
A-2.2	Broodstock transportation	Minor	Collected fish should be transported in covered tanks, containing aerated or oxygenated water mixed with approved fish sedatives, such as 2 phenoxyethanol @ 50 ppm, for reducing stress and for easier handling of the fish.	Visual inspection and interview with hatchery operators.

A-2.3	Broodstock Quarantine	Major	<p>Well maintained quarantine facility with separate water and aeration facility shall have to be created. Collected Indian pompano should be given a bath treatment of formalin in freshwater at the rate of 30 mg/l for 15 min, once in four days for a period of 3 to 4 weeks.</p> <p>Collected orange spotted grouper should be given a bath treatment of formalin in seawater at the rate of 200 mg/l for 30 min, followed by 5 minutes dip in freshwater, once in three days for a period of 1 to 2 weeks.</p>	Inspection and Interview with hatchery operators.
A-2.4	Broodstock feed management	Minor	<p>Gender identification should be carried out by anaesthetizing and covering the eye with wet cloth.</p> <p>Fish should be tagged and the record of the individual fish is to be maintained.</p> <p>Broodstock tank for orange spotted grouper broodstock development should have a minimum depth of 2.0 m.</p> <p>Broodstock tanks of appropriate capacities, round in shape, and preferably of grey in colour, connected with RAS (Recirculatory Aquaculture System) possessing a minimum of 300% water circulation, should be used for broodstock development - cum spawning tank.</p> <p>Broodstock density should not be more than 1 kg/m³ and the sex ratio should preferably be 1:2 (female : male).</p> <p>Adult orange spotted grouper should be implanted with cholesterol-based pellet containing 17α methyl testosterone and Letrazole at the rate of 5 and 0.2 mg/ kg</p>	Visual inspection and interview with hatchery workers. Verification of feed management plan, if any.

			<p>body weight for converting female to male.</p> <p>Broodstock should be fed at least once in a day till satiation with balanced diet supplemented with Vitamin A, C, E and mineral-mix.</p>	
A-2.5	Procedure for Induced or natural breeding	Minor	<p>Farmers shall follow the standard operating procedure for induced or natural spawning.</p> <p>Optimal rearing condition for the orange spotted grouper brooders should be provided to perform natural spawning.</p> <p>Matured Indian pompano (with ova size >500 µm and oozing male) shall be induced either with hCG or GnRH in appropriate dose in the sex ratio of 1:2 (female : male).</p>	Verification of records and existing SOP's.
A-2.6	Procedure for spawning and larviculture	Minor	<p>Measures shall be in place to disinfect eggs. Eggs after eyed stage should be collected through 500 µm net and washed under clean steady seawater; the collected eggs should be treated with 20 ppm iodophore for 10 minutes. The eggs should be washed again and stocked in aquarium or tank from where only surface floating eggs are collected and stocked in larval rearing tanks for larval rearing.</p> <p>Farmer shall follow the standard operating procedure for larval rearing.</p> <p>De-oxygenated or de-chlorinated water of minimum 30 ppt salinity should be used for larval rearing.</p> <p>Water quality parameters should be maintained optimal for the larval requirement.</p> <p>Only surface floating eggs should be used for larval rearing.</p> <p>In case of orange spotted</p>	Verification of records and existing SOP's.

			<p>grouper, if the egg hatching rate is less than 80%, it is better to discard that batch for fresh stocking.</p> <p>Larval rearing should be performed using green water system with appropriate combinations of live feed in terms of phytoplankton and zooplankton such as <i>Copepod nauplii</i>, rotifers, <i>Artemia nauplii</i> and artificial feeds.</p> <p>Combinations of feed should be checked regularly and supplemented optimally to avoid the differential growth during the larval rearing.</p>	
A-3	Hatchery inputs : probiotics, prebiotics, immunostimulants			
A-3.1	Appropriateness of biological and chemical inputs	Minor	Biological and chemical inputs applied shall be appropriate for the targeted disease or health condition. The current list of approved inputs from Competent Authority shall be available with hatchery personnel.	Verification of records.
A-3.2	Awareness of prohibited chemicals /antibiotic	Major	Hatchery personnel shall be aware of the prohibited chemicals and antibiotics.	Verification of Records and Interview with workers.
A-4	Storage of fresh feed, equipment, and other material			
A-4.1	Storage of fresh and dry feed	Major	Fresh feed should be kept at isolated and secured place. Only authorized personnel shall have access to the place. Different forms of frozen feeds should have separate freezers.	Visual inspection and interview with hatchery workers.
A-4.2	Hatchery equipment	Minor	All the equipments such as nets, sieves, etc shall be sterilized and kept in specific locations facilitating easy operation. Back up air compressors, pumps, motors, etc should be kept in a specific storage	Visual inspection and interview with workers

			rooms.	
A-5	Training			
A-5.1	Training to hatchery workers	Minor	Hatchery technicians shall attend periodic training conducted by Research Institutes or government departments to update the new knowledge, analytic al techniques, latest operational protocols, good management practices, etc.	Verification of Records and Interview with workers.
A-6	Transport			
A-6.1	Broodstock transportation	Major	Generally adult fish should be collected from nearby area as far as possible. The collected fish should be transported in covered tanks containing aerated or oxygenated water to reduce stress. Mild sedation, using approved sedatives can be used to reduce stress and make handling the fish easier and safer. If the fish is collected from the culture system, they should not be fed for the previous 24 h to avoid deterioration of water quality during transportation.	Visual inspection and interview with workers.
A-6.2	Seed packing and transportation	Minor	A designated place in the hatchery for seed packing must be there. Standard operating procedures for packing of seeds needs to be in place. Seeds in smaller size can be transported in oxygen packing with 1:2 ratio of water and oxygen in plastic packet with maximum packing biomass of 150g per litre for duration of 6-10 hrs.	Verification of records and visual inspection

			The nursery reared seeds can be transported in open container with oxygen supply.	
A-7	Hatchery Sanitation			
A-7.1	Personnel hygiene	Major	<p>Hatchery workers should enter through dressing room, where they remove their street clothes and take a shower before entering another dressing room to put on working clothes and boots. At the end of the working shift, the sequence should be reversed.</p> <p>Workers shall be vaccinated for endemic communicable Diseases and other immunization as required by regulatory authorities.</p> <p>There should be means provided for disinfection of vehicle tyres (tyre baths at the gate), feet (footbaths containing hypochlorite solution at >50 ppm active ingredient), and hands to be used upon entry and exit.</p>	Visual inspection and interview with workers.
A-7.2	Effluents/ discharges	Minor	<p>Effluents should be discharged to effluent treatment system and properly disinfected before discharging out to the receiving ecosystem.</p> <p>Infected stocks should be incinerated properly.</p>	Verification of records, visual inspection and Interview with hatchery workers.
A-8	Traceability			
	Traceability	Major	Record shall be maintained for hatchery stock for traceability purpose.	Verification of records