

ORGANIC AQUACULTURE PRODUCTION

1. Organic Management Plan

During the registration of the farm by the accredited Certification Body, the producer has to present an organic management plan to the accredited Certification Body which requires to be verified during the inspection. This plan should be updated annually and shall apply to all aquatic organisms cultured in fresh and brackish water ponds and open water bodies in estuaries and sea. (Black tiger shrimps, Indian major carps, freshwater prawns and bivalves) for production, processing and certification under these standards.

2. Conversion period

- i. Adoption of organic aquaculture requires an interim period, 'the conversion period'. Commencement of the conversion period shall be taken as the date of first inspection by the accredited Certification Body.
- ii. The conversion shall take into account the species-specific needs like the husbandry practices and management system, past use of the site with respect to waste and sediment, and water quality for welfare of the animal. Adequate separation between the organic and non-organic production unit should be maintained.
- iii. The length of the conversion period would vary depending on the species, method of production, location and local conditions. Generally, for drainable systems where cleaning and disinfection is carried out, the conversion period shall be 6 months/ one crop whichever is longer and in case of drainable and fallowed, the conversion period shall be 12 months. In case of non-drainable systems which can not be disinfected, the conversion period shall be 24 months (freshwater prawn, carps). In case of open water farming, the conversion period shall be considered as 3 months (bivalves).

- iv. In a hatchery/farm practicing parallel production, the producer shall keep the organically produced and in-conversion animals separate and maintain adequate records to show the separation.

3. Ecosystem management

- i. Conversion of mangrove ecosystem to aqua pond is prohibited. Mangrove destruction is also prohibited while constructing water intake channels, approach road etc for farming.
- ii. In existing coastal farms, where ever possible, due consideration may be given for planting mangroves as a means for ecosystem restoration and conservation.
- iii. Care shall be taken during construction of the ponds so as not to create water logging condition in the adjacent area that would affect surrounding ecosystems or result in conditions not conducive for
- iv. A buffer zone of at least 10 m should be left between farms following organic farming principles and conventional farming. The size of the buffer zone could be increased based on the natural situation, water distribution system, tidal flow, the upstream and downstream locations of organic production unit. The buffer zone could be a barren piece of land or a pond/cultivated land. The production of this buffer zone shall follow organic principles but the produce will be treated as conventional.
- v. Salination of adjacent agriculture land and drinking water sources by way of organic shrimp farming is strictly prohibited. Wherever saline water culture is adopted, a buffer zone of around 200 m should be left between the pond and adjacent agriculture land/drinking water source.
- vi. Exposed area of the farm should be planted with native vegetation to prevent soil erosion and to enhance natural ecosystem dynamics. Farms located in areas free from vegetation (dunes, desert) may be excluded from this requirement.
- vii. Adequate steps are required to minimize nutrient discharge and/or suspended solids to water bodies especially during harvesting.
- viii. Release of toxic or otherwise harmful substances in the pond, channels or the banks should be prevented. Care should be taken while handling equipments

and machineries such as pumps, generators and aerators to avoid any leakage of fuels and lubricant.

- ix. Care should be taken so that the materials and substances used in the construction should not affect the biodiversity and environment.
- x. Specific measures should be adopted to minimize negative environmental impact including escape of farmed stock.
- xi. Killing predatory birds and animals are prohibited. Scaring devices/protective fencing etc, are allowed to save crops.

1. Selection of site

- i. In selecting the site, ensure that the surrounding aquatic and terrestrial ecosystems are not adversely affected through modifications brought about by construction of the farm.
- ii. Areas with known record of contamination with heavy metals or industrial pollution may be avoided. Testing is required to be carried out for record of the contaminants in an ISO17025 approved and APEDA /recognized laboratory.
- iii. Soil quality should be conducive for culture and extreme conditions like high saline or acid soil may be avoided.
- iv. Forest area or land with thick vegetation should not be used for construction of new farms.
- v. In developing new farms or expanding existing farms, the producer should ensure that the natural vegetation is protected. Care should be taken to have significant coverage of bund area with vegetation.
- vi. Use of ground water for the culture purpose of tiger shrimps is prohibited. For other species the groundwater should be avoided.
- vii. In case of the bivalve farm, the location of the farm should be as close as possible to the sea to ensure maximum circulation of sea water.
- viii. The bivalve farm site should meet the criteria as per **Annex 1** in terms of general water quality, trace metal contents, biotoxin levels and microbial loads (within the optimum range of pH, salinity, temperature etc.)

2. Choice of breeds and strains

- i. Endemic species is preferred over exotic species. If exotic species are to be selected, their impact on endemic species and environment should be ascertained.
- ii. Any kind of genetically engineered stock is prohibited. Stocks obtained through selective breeding are permitted, but seed production in this case should be based on organic principles.

3. Source of seed and breeding

- i. Breeds and the breeding techniques appropriate for the species, environment, production systems and local conditions should be followed for minimizing stress to the brood stock.
- ii. Collection of wild seed for selective stocking is prohibited (except for bivalves). In traditional farming systems passive entry of wild seeds is allowed as it ensures species diversity in farming operation.
- iii. Organically certified seed should be used. When organic seed is not available, the certifying body would prescribe a time limit for use of non-organic seed depending upon the species.
- iv. For carps and fresh water prawns, the maximum percentage of non-organically produced juveniles allowed to be introduced to the farm shall be 80 %, 50 % and 0 % by second, third and fifth year from the year of notification.
- v. Collection of natural brood stock for tiger shrimp is permitted until domesticated brood stock is commercially available in the country.
- vi. As a rule physical manipulation of animals for obtaining egg/larvae as in the case of eye stalk ablation in tiger shrimp are not encouraged. This practice will be allowed up to five years from the date of notification, by when it is expected that the on-going R & D programs in the country would lead to the development of technology for natural spawning of captive brood stocks on commercial scale.

- vii. The certified organic hatchery should source the initial stock from natural water bodies to raise them as brood stock with organic protocol at least for three months before their breeding.
- viii. Maintain documents to ensure traceability of brooders and all other inputs for hatchery operation.
- ix. Synthetic hormone application for artificial propagation is not allowed.
- x. Since exogenous hormone supply is an essential requisite for induced spawning of carps, use of pituitary gland may be accepted.
- xi. To avoid stress to the animal, thermal manipulation for accelerated larval development/growth or maturation, beyond natural range is prohibited in hatcheries.
- xii. In carps, pre- and postponement of brood stock maturation through thermal/hormonal manipulation and their subsequent breeding is not permitted for seed production in certified organic hatchery.
- xiii.** The disinfection and cleaning in the hatchery should not have any impact on the surrounding environment. Only approved disinfectant and cleaning agents should be used ensuring that there will not be residues. (**Annex 2**)
- xiv. Use of antibiotics is prohibited (**Annex 3**), but use of probiotics is allowed.
- xv. The soil and water quality parameters of the environment of the vicinity of the hatchery/farm should be monitored and recorded to ensure no adverse impact.
- xvi. Proper sanitation and hygiene of the hatchery/farm and its surroundings should be maintained. Entry of stray animals such as dogs, cats, cattle etc., should be avoided by proper fencing.
- xvii. Transport practices shall ensure the welfare of the animals
- xviii. A hatchery may convert in full or partial for the production of organic seed. The hatchery shall maintain organically and conventionally produced seed in separate units and maintain adequate records to show the separation.
- xix. Hatchery/farm producers shall possess the necessary basic knowledge and skills as regards to the health and the welfare needs of the cultured species.
- xx. In case of bivalves, collection of natural brood stock is permitted, but use of chemicals as a means of triggering spawning is not allowed.

- xxi. The bivalve seeds can be sourced from natural bed using spat collectors or from organic hatchery. Remote setting is allowed, but use of chemicals for spat settlements is prohibited. The producer shall maintain records
- xxii. for source of the wild seeds to trace back the collection area.

4. Culture practices

Husbandry practices, including feeding, design of installations, stocking densities and water quality shall ensure that the developmental, physiological and behavioral needs of animals are fully met.

5. Pond preparation

- i. For elimination of unwanted fishes, sun drying, netting or application of plant derivatives like tea seed cake (*Camellia sinensis*), mahua oil cake (*Bassia latifolia*), derris root powder (*Linchocarpus sp.*) and Neervalam (*Crotalaria tigilum*) are permitted. Use of any synthetic herbicides and pesticides are prohibited.
- ii. Use of agricultural lime, dolomite or quick lime is permitted for disinfection and acidity corrections.
- iii. Fertilization with locally produced manures/ nutrients (organic types – farm yard manure, vermicompost) for maintaining good phyto and zooplankton and a stable pond environment should be followed. Biodegradable processing by-products of plant or animal origin may be used depending upon the feeding behavior of the cultured organisms. The list of inputs for nutrient management should be followed as per annex 2. Integrated farming system can be adopted for recycling of the nutrients.
- iv. Cowdung/poultry manure/farm yard manure/vermi-compost may be used as nutrient source for carp farming. Intermittent application of cowdung/poultry manure during culture operation should be in the fermented form. The manure to be used should be from organic sources.

6. Stocking

- i. The production systems have to follow single-stocking unless it is defined as a

polyculture system.

- ii. Stocking density to be limited so as not to compromise with the animal well being, ecological capacity of the site and species-specific physiological need and animal behavior.
- iii. For shrimp farming, the maximum stocking density is 6 no.s/m² and biomass in the pond shall not exceed 1400 kg/ha/crop and for freshwater prawns the stocking density up to 2.5 no.s/m² and biomass in the pond shall not exceed 800 kg/ha/crop.
- iv. For nursery rearing of freshwater prawns, the maximum stocking density of 20 no.s/ sq.m is permitted.
- v. For carp fry and fingerlings production in nursery, the maximum stocking density is 2 million spawn/ha (200 no.s/m²) and 0.1 million fry/ha (10 nos/ m²), respectively.
- vi. For grow-out production of carps, maximum stocking density of 4,000 fingerlings/ha (0.4 nos/ m²) may be followed and the maximum biomass should not exceed 3 tonnes/ha at any point of time.
- vii. In case of carp farming, polyculture of compatible carp species is preferred over monoculture in order to utilize the ecological niche effectively.

7. Pond management

- i. Ponds are required to be designed to maintain suitable environment most befitting with the natural behavior of the stock. The water quality must be conducive for the species to live in (within the optimum range of pH, salinity, oxygen, temperature, nitrogen fractions, BOD etc) during the production cycle.
- ii. For cleaning and disinfections, only substances from approved list shall be used.
- iii. Periodic monitoring of water quality parameters (dissolved oxygen, pH, salinity, temperature, ammonia etc) is to be undertaken to maintain optimum water quality and plankton

- iv. Effluent water quality (nutrient load, suspended solids, ammonia etc) has to be closely monitored at least twice in a crop (mid way and during harvest).
- v. In case of carp farming, floating vegetation cover with 10-15% of the water surface should be provided in the production pond.
- vi. Energy requirements for aeration, heating, pumping etc, should be kept to the minimum. Data regarding energy consumption may be documented and subjected for inspection.
- vii. The energy requirement for pumping and aeration may be met from renewable sources like wind, solar power etc., if possible.
- viii. Measures of aeration must not be used in the pond to raise the stocking density above the permitted level. Aeration is permitted only under exigencies of culture conditions to save the stock.
- ix. Use of substrate for periphytic growth is permitted for enhancing the natural food availability in the pond. Use of plastics or any other synthetic materials may not be permitted for this purpose.
- x. As far as possible avoid use of plastics except for most essential items such as nets, crates, floats etc.
- xi. Placing hideouts such as tiles, bamboo twigs, earthen pipes etc., are allowed for freshwater prawns for protection during moulting.

8. Bivalve farming

- i. In the case of bivalves like mussels and oysters, the grow-out methods permitted are off- bottom racks, rafts, long-lines and stakes using ropes and nets.
- ii. Production shall take place within areas delimited by posts, floats or other clear demarcations and shall as appropriate be restrained by net bags, cages or other man-made means.
- iii. In case of mussels, the stocking density should not exceed 2 kg/m rope and the production should not exceed 15 kg/m rope.
- iv. Biofouling organisms shall be removed by physical means and appropriately returned to the sea away from the farming site. Biological control measures are allowed.

12. Supplementary Feeding

- i. Maximum advantage of the natural productivity of the pond should be exploited in order to reduce the dependence on supplementary feed.
- ii. The natural feeding behaviour of the animal should be explored to meet the nutritional and dietary need of the species for all its life stages. To meet requirements beyond the portion met by the natural productivity, certified organic feed should be provided. The non-organic feed is permitted only if organic feed is not available till initial one year of farming. Record should be maintained regarding the source of the feed/ingredients.
- iii. Farm made feeds can be used provided that the ingredients are from organic sources. The accredited Certification Body shall verify the record of the authenticity of the ingredients.
- iv. Ingredients from Genetically Modified Organism (GMO) shall not be used .
- v. To ensure environmental sustainability use of aquatic animal protein and oil in feeds should be minimum and from verifiable source.
- vi. In case of tiger shrimp and freshwater prawn, the fish meal content in the feed should not exceed 20 % and the total protein content of animal origin should not exceed 25%.
- vii. In case of carp farming use of animal protein including fish meal in supplementary feed should be avoided.
- viii. Feed prepared from certified organic ingredients avoiding possible entry of antibiotics/ pesticides/ heavy metals/ antioxidants/ preservatives/growth hormones during the process is to be used for supplementary feeding. Excess feeding should be avoided. Check trays may be used for assessing feed intake.
- ix. Minerals, trace elements, vitamins or pro-vitamins to be used in the feed shall be of natural origin as far as possible. Growth promoters and synthetic amino acids are not permitted
- x. An organic feed mill may convert in full or partial for the production of organic feed. The feed mill shall maintain organically and conventionally produced feed separate and maintain adequate records to show the separation.
- xi. The daily ration should be distributed in accordance with the feeding habit of the cultured organisms and should be closely monitored and recorded.

- xii. Culture of live fish food organisms, like algae, rotifers, artemia etc., for shrimp hatchery may be carried out in accordance with principles of organic agriculture wherever possible, otherwise permission should be obtained.

13. Health Management

- i. Use of human excrement and sewage should be prohibited. There should be routine health monitoring of stocked animals and this should be documented.
- ii. 'Prevention is better than cure' should be the guiding principle for seed production as well as grow-out farming.
- iii. Chemotherapeutics with allopathic veterinary drugs, and other harmful chemicals are prohibited (**Annex 4**). Herbal formulation and homeopathic medicines are allowed.
- iv. Yeast based organic preparations and probiotics of certified origin are permitted to improve water/animal-rearing condition and to control pathogens. GMO based preparations are not permitted.

14. Harvest and Transportation

- i. Harvesting method shall be humane and aquatic animals shall be subject to minimum stress during harvest
- ii. Harvesting should be carried out by repeated netting or by draining the pond water slowly. Sufficient care is taken that non-target organisms like aquatic birds, reptiles and mammals are not accidentally killed.
- iii. Care should be taken that the harvesting practice should not harm the natural system and surroundings.
- iv. Animals sold live should be transported with minimum stress. Others should be chill killed at farm site itself.
- v. Use of chemicals like sodium metabisulphate is prohibited, however ascorbic acid is allowed to stop discoloration. (Annex 2 & 3 for approved & restricted inputs and methods)

15. Processing

- i. Pre-processing and processing of the animals is not to be carried out at the farm site.
- ii. The post-harvest handling including storage and transport should be carried out hygienically.
- iii. Processing and packaging of the organic produce shall be carried out in the Organic certified processing units. Defined measures shall be taken to maintain the organic integrity of the processed product. The limit of permitted and prohibited substances for use in aquaculture processing is at **Annex 5**.

16. Mandatory visit for the Accredited Certification Bodies

- i. Accredited Certification Bodies shall inspect the units during the production cycle.
- ii. Bivalve production units shall be inspected before and during maximum biomass production by the accredited Certification Bodies.

Annex 1

Classification of Water bodies for Bivalve Farming

The site should meet the criteria of the 'approved' in terms of general water quality and microbial load as per the specification given below:

Class	Microbial standard	Post-harvest treatment
A	Live bivalve molluscs from these areas must not exceed 230 MPN <i>E. coli</i> per 100 g of flesh and intra-valvular liquid	None
B	Live bivalve molluscs from these areas must not exceed the limits of a five tube, three dilution Most Probable Number (MPN) test of 4,600 <i>E. coli</i> per 100 g of flesh and intra-valvular liquid	Purification, relaying in class A area or cooking by an approved method
C	Live bivalve molluscs from these areas must not exceed the limits of a five tube, three dilution Most Probable Number (MPN) test of 46,000 <i>E. coli</i> per 100 g of flesh and intra-valvular liquid	Relaying for a long period or cooking by an approved method
Prohibited	46,000 <i>E. coli</i> per 100 g of flesh and intra-valvular liquid	Harvesting not permitted

Approved List of Aquaculture Inputs

Piscicides of Herbal Origin

- Mahua Oil Cake (*Bassia latifolia*)
- Tea Seed Cake (*Camellia sinensis*)
- Neervalam (*Crotalaria tigrilum*)
- Derris root powder (*Linchocarpus* sp.)

Water/Soil reformers/conditioners

- Agri lime (CaCO_3)
- Quick Lime

Biofertilisers/manures/nutrients (from organic sources)

- Compost from FYM
- Vermi-Compost
- Cowdung
- Biodegradable processing by-products of animal/plant origin
- Micronutrients and essential chemical fertilizer for micro algal culture
- Mushroom spent wash

Chelating Agents

- EDTA

Disinfectants

- Iodine (IP Grade)

Live feed from hatchery

- Micro Algae
- Artemia

- Moina
- Branchionus
- Copepodes

Seed

- Seed material from Certified Organic Hatchery (as 1st choice)
- Seed from conventional hatcheries (in the absence of certified organic hatchery)

Feed

- Compounded feed from Certified organic feed-mill with certified ingredient from organic agriculture
- Live feed reared under the principles of organic agriculture/aquaculture

Processing

- *Cleaning Compounds*
 - Tea pol (Labolene)
- *Sanitizers*
 - Chlorine
- *Processing Additives*
 - Food Grade Oxygen (O₂)
 - Carbon Dioxide (CO₂)
 - Nitrogen (N₂)
- *Taste/Flavouring agents*
 - Table Salt

Prohibited List of Aquaculture Inputs

1. All synthetic weedicides, piscicides, pesticides and insecticides
2. Chemical fertilizers
3. Wild seeds and seeds from GMO's and their derivatives
4. Synthetic hormones
5. Processing chemicals such as Ethylene oxide, Methyl bromide, Aluminium phosphide, Hexachlorocyclohexane (HCH) Lindane, Pyrethrum extract and Sulphite

List of Prohibited Antibiotics and Pharmacologically Active Substances for Aquaculture

1. Chloramphenicol
2. Nitrofurans including Furazolidone, Nitrofurazone, Furaltadone, Nitrofurantoin, Furfurylamide, Nifuratel, Nifursoxime, Nifurprazine and all their derivatives
3. Nemoycin
4. Nalidixic Acid
5. Sulphamethoxazole
6. Aristolochia spp and preparations thereof
7. Chloroform
8. Chlorpromazine
9. Colchicine
10. Dapsone
11. Dimetridazole
12. Metronidazole
13. Ronidazole
14. Ipronidazole
15. Other nitroimidazoles
16. Clenbuterol
17. Diethylstilbestrol (DES)
18. Sulfonamide except approved sulfadimethoxine, sulfabromomethazine and sulfaethoxyrpyridazine
19. Fluroquinolones
20. Glycopeptides

List of Permitted & Prohibited Substances for Use in Aquaculture Processing

A. Processing Additives

Permissible additives

- Nitrogen (N₂) (**E941**)
- Carbon dioxide (CO₂) (**E290**)
- Natural vegetable substances for neutralization of unwanted components of taste upon explicit approved under this standards

Prohibited additives

- Sulphite (Sodium metabisulphite (E223) for stabilisation of colour
- Phosphate (for using in order to make fish fillets look better)
- Carbon monoxide (CO) for stabilization of colour

B. Processing Methods

Allowed methods

All common methods used for the treatment of aqua produce and for the production and preservation of the final products

Prohibited methods

The use of smoking process using smoke from the household fireplace with the product to be smoked hanging from the roof

- Black smoking
- Liquid smoke treatment
- Salting by injection