1999

Grouper culture

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Surtida, M. B. (1999). Grouper culture. SEAFDEC Asian Aquaculture, 21(1), 22-24.

http://hdl.handle.net/10862/2747

Grouper culture I. In ponds

By **MB Surtida**

Groupers are widely distributed in the tropical and subtropical coastal waters. They are of great economic value and form a major component of the coastal artisanal fisheries in the tropics.

Declining catch from the oceans has made grouper and other fish culture a popular method of increasing fish production.

Below are the steps in grouper culture in brackishwater ponds recommended by SEAFDEC / AQD:

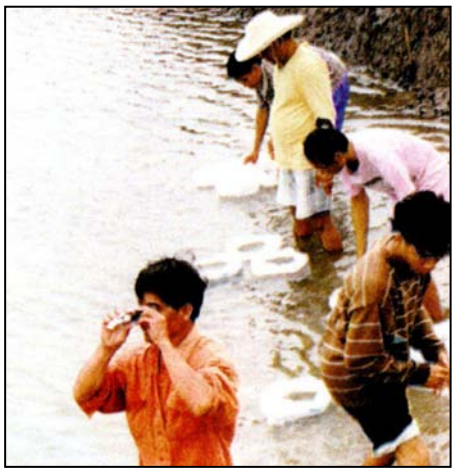
1 POND PREPARATION

Ponds for grouper grow-out may be prepared following protocol for milkfish pond preparation.

2 STOCKING

Stock grouper fingerlings (7.2 cm or more) at 5,000 per ha. Do this one month after releasing adult tilapia (5,000-10,000 per ha) in the pond to allow them to reproduce. The tilapia fingerlings would be food for the grouper juveniles.

When stocking, gradually acclimate fry to pond conditions by adding pond water slowly to the plastic bags holding grouper fry



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3 CARE OF STOCK

Feeding

Aside from the tilapia fingerlings, give chopped trash fish every other day at 5% of total grouper biomass. Give half of the daily feed requirement in the morning and the other half in the afternoon. Place one part of the feed onto a feeding tray for monitoring purposes and broadcast the rest. Determine the biomass and daily feed requirement of the grouper stock by sampling monthly. Measure the length and weight of grouper caught by a cast net. Return the sample stock to the pond.

Water change

Change 50% of pond water twice weekly. Constantly monitor the water parameters: water depth, 0.6-1.3 m; water temperature, 24-31°C; salinity, 21-41 ppt; and dissolved oxygen, 4.9-9.3 ppm (values from AQD runs in Bacolod City).

Groupers take 5-7 months to attain the marketable size of 400 to 800 g.

4 HARVEST

Selective harvesting when most of the stock reach 400-600 g is best for grouper culture. A drag net is placed at the farthest end of the pond and dragged slowly towards the other end in the early morning. For a 0.5 ha pond, four men may drag the net.

As the net is drawn towards the opposite side of the pond and groupers have already been encircled, the fish are transferred to a holding net. Grading starts here. Groupers that do not reach the required size for the market are placed back in the holding tank to be later released in the pond.

In case there are no immediate buyers, the grouper may be kept in production net cages at 20 fish per m^3. The grouper may be kept for not more than one week in the production netcages. The grouper may be fed with trashfish at 5% of biomass every other day while waiting for buyers.

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PHOTOS BY R BUENDIA

To harvest grouper: *A net is dragged across the pond (A) and the fish caught in the drag net are placed in a holding hapa net (B-C) where the fish are size-graded. To keep the grouper alive while preparations for packing and transport are being made, groupers are temporarily held in conditioning wooden tanks (D). A market-sized grouper weighs 400-800 g (E)*

Packing

Groupers are marketed live, hence packing is critical.

From the ponds, groupers are placed in conditioning tanks for at least one hour. Gradually reduce the water temperature to about 18°C by gradually adding packed ice.

Place 3-5 (depending on size) groupers inside double sheet plastic lined styrofoam boxes (30 x 30 x 20 cm) and place just enough water to cover the nostrils. Close the plastic lining and place crushed ice on top of the plastic bags to maintain coolness during transport. ###

II. In cages

Grouper may be cultured in net cages in sheltered coastal waters, particularly in areas where there are fishing villages. Two commercially important species are cultured in the Philippines -- *Epinephelus malabaricus* and *E. coioides*. There are very slight differences between the two species in appearance. *E. malabaricus* has smaller, dark blackish brown spots than *E. coioides* which has reddish brown or brownish orange spots. *E. malabaricus* has irregular white spots on the head and body while *E. coioides* has none.

Groupers are popularly known as *lapu-lapu.*

1 CHOOSING THE SITE

Place your grouper cage farm in areas with good water quality and adequate water exchange, no predators, and protection from strong wind and waves.

2 MATERIALS FOR CAGES

In the Philippines, floating cages are more popularly constructed with wood, bamboo poles and polyethylene netting material at 25-50 mm diameter. The net cage is formed by two types of net panels; 4 side panels forming the walls of the netcage and one bottom panel. The net is secured to the raft structure (bamboo poles) by ropes. The rope system holds the bamboos together onto which the nets are attached. Buoyancy is provided by empty plastic drums attached to the wooden and bamboo frames.

3 STOCKING

Grouper fry/fingerlings (2.5-7.2 cm) can be stocked into the nursery net cages. Density can range from 100-150 fish per m^2 net bottom area. A net of 2 x 2 x 2 m would be able to hold 400-600 fingerlings. Sorting must be done every week and stock sampling every 15 days. Grouper should be held there until they reach about 16 cm when they are thinned out and transferred to transition nets at about 44 fish per m^2. A transition net 5 x 5 x 5 m can hold 1,100 fish. The fish arc finally transferred to a production net after 2-3 months.

4 CARE OF STOCK

Feeding

Grouper juveniles are fed chopped trash fish (to be chopped as finely depending on the size of fish) once or twice daily at 10% of total biomass. Feeding must be done in the morn-

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A grouper cage farm in Capiz(top) where the grouper grow-out industry started, led by pioneering fishfarmers Elmer Blasurca (lower left) and Policarpio Altamia Jr.

ings and towards evening and at slack tides so that minimal feed are swept away by the tidal current.

The amount of feed given to the fish depends on fish size. Each fingerling may be given up to 10% of its body weight daily: a 50 g fingerling should receive 5 g trash fish daily; a 100 g fish should receive 8% of body weight daily; 300 g fish should be given 5% of its body weight; and 500 g fish, 3% of its body weight daily.

Fish conversion ratio is estimated at 4.5:1 ratio.

Yield

Groupers reach 400 - 600 g in 6 - 8 months.

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Some problems of the grouper grow-out industry in the Philippines

The grouper industry in Capiz started in the early 1980s. Two grouper cage farmers were interviewed regarding the operation of their farms in Cagay and Aguho, Capiz in central Philippines. They both raise groupers in net cages.

Cagay has the most number of grouper cages in the Philippines, occupying a 1.2 km stretch (28,000 m^2 area of grouper cages) of coastal area. The cages are owned by 65 small operators who formed a grouper growers cooperative in 1991, the Bangbang Inland Fishfarmer Multipurpose Cooperative.

Mr. Policarpio Altamia, Jr. is the cooperative's farm manager. He said that in his experience, *Epinephelus malabaricus* grow fast but are not tolerant to salinity changes. If salinity dips to 10-15 ppt for more than 24 hours, the fish die. He also experienced fish kills in June and July, 1996 (70% of stock perished). The affected fish had tail rot, red lips, and melting fish scales. He later learned that bacterial count rose because of high temperature. He has also learned that it is not correct to assume that the water can clean itself and that the farm must not exceed the carrying capacity of the area. Aside from these considerations, he follows the protocol described above in rearing his groupers.

But he says that the government is still neglectful of the fisherfolk. He says that 75% of the population of Capiz are fisherfolk and yet they do not have insurance in case of destruction due to natural causes such as storms or too hot weather. He also wants the government to maintain some sort of a seed bank for aquaculture and fisheries. He said this would help the industry a lot.

Mr. Elmer Blasurca has been operating his grouper cages since 1990. The first problem he identified is the absence of cargo planes to ship his stock to the market live. Saying that grouper production in the country has only supplied 10% of market demand, he cannot increase his production because he would pay a lot for shipping if he hires his own transport facilities. He said there used to be cargo planes in the early 90s but it stopped operating.

He offers a few innovations. He says he feeds once daily at 6 in the morning. The fish grow as fast as those fed twice daily. He says, however, that dried pellets are not good for tiny grouper fry.

He relates of a seasonal occurrence (during very hot weather annually) that has baffled him. He says that for almost 4 years now in April and May, very tiny jellyfish ("lobo-lobo" type) appear in his area. They are as small as a mung bean. If it appears during very hot weather followed by rains, the grouper in his cages would die the next day. He has yet to figure out what the jellyfish are and why they cause mortality.

He also thinks that the Land Bank of the Philippines should offer credit facilities for fishery and aquaculture. He says this will improve the industry and improve the quality of life of the fisherfolk.

Bobby Sanson, also a grouper grower in Negros Oriental, cannot be too pleased. He converted his tiger prawn ponds to grouper ponds since 1996 and has been continuously increasing his production. He says that the market should first be established before one thinks of expanding production. He operates nine hectares of grouper ponds, gets a return-of-investment of 60% and a 2 years payback period. So far he has not had problems in trash fish supply, fry supply, and even market. In the beginning of this operation, SEAFDEC / AQD extended technical assistance.

-- By MB Surtida