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Grouper hatchery and grow-out

Aquaculture Department, Southeast Asian Fisheries Development Center

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Is **GROUPE** AQUACULTURE profitable?

Live grouper sold in the market fetch a higher price compared to other fishes grown in Southeast Asia. The demand is year-round, and the live fish trade is expanding. However, the local supply has been very limited due to overfishing, destruction of habitats and higher price offered in the international market.

In the Philippines, the current local market price for live grouper is ₱350 per kg or higher.

Technical assumptions*

Size of net cage	5 x 5 x 3 m
Total number of net cages per module	6 units
Stocking rate per net cage	15-20 juveniles/m ³
Size of initial stock	2.5-3 in
Total number of stocks in 1 module	9,000 pcs
Culture period	5-7 months
Survival rate	85-90%
Average body weight at harvest	300-350 g
Croppings per year	1.5
Total harvest	720 kg-840 kg
Farm gate selling price	PhP 350.00
Feed conversion ratio	5:1

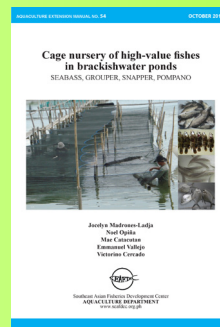
Costs-and-returns

Revenue (PhP)	302,400
Total variable cost (PhP)	153,066
Total fixed cost (PhP)	38,104
Return on investment (%)	59

* Grow-out culture in floating net cages

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AEM 54 Cage nursery of high-value fishes in brackishwater ponds (sea bass, grouper, snapper, pompano) JM Ladja et al. (2012)

This extension manual describes nursery pond requirements, nursery rearing procedures, common diseases of young marine fish, and economic analysis of cage nursery as an enterprise separate from hatchery and grow-out culture.

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GROUPE

Hatchery and Grow-out



Southeast Asian Fisheries Development Center
AQUACULTURE DEPARTMENT
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Why **GROUPE**R?

Groupers (*Epinephelus* spp.), locally known as *lapulapu* or *inid*, are high-value species with great potential in aquaculture. They are valued for their excellent texture and flavor. The demand for grouper in the local and international market is fast growing particularly in Hongkong, Japan, Taiwan, Korea and Singapore. Fry is also potentially available anytime of the year since broodstock spawn all year round.



Brown-marbled grouper or tiger grouper
Epinephelus fuscoguttatus



Orange-spotted grouper or green grouper
Epinephelus coioides

How to culture **GROUPE**R?

Grouper culture has three phases (1) the hatchery rearing where larvae are reared from hatching until 60 days, (2) the nursery rearing where fish is cultured for 1-2 months, and (3) the grow-out stage where fish is reared for 6-8 months. Grouper should be sorted and size-graded during the late hatchery and nursery stage to prevent cannibalism. Other routine procedures include feeding, net maintenance, stock sampling, and monitoring water quality. Groupers can reach the market-size of 300-350 grams in 5-7 months when 2.5-3 inches fry are stocked.



Trainee on Marine Fish Course holding grouper broodstock

Hatchery phase

- Stock 20-30 larvae/liter in 3-25 tons rearing tanks. Grouper larvae are available at SEAFDEC/AQD's marine fish hatchery
- Feed larvae with *Nannochlorum*, rotifer, *Artemia*, and artificial diet
- Transfer larvae to marine cages or to brackishwater ponds when larvae reach the length of 2-3 cm for nursery rearing



Collecting of grouper fry in rearing tanks



SEAFDEC/AQD's multi-species marine fish hatchery

Nursery phase

- Stock 2-3 cm fry in 1 x 2 x 1.5 m hapa nets at 75-100 fry/m³ set inside floating net cages. Uniform fry size should be strictly observed during stocking
- Install hover-type lamp to attract grouper prey such as copepods, mysids, young fishes, and crustacean larvae
- Feed fry with artificial diet or finely chopped frozen or fresh low value fish 4-6 times a day
- Transfer fry to grow-out cages or ponds after 45-60 days or when total length is 6-10 cm

Grow-out phase

- Stock 6-10 cm juveniles in ponds at 5,000-10,000 juveniles/hectare or floating net cages at 15-20 juveniles/m³
- Feed juveniles with fresh or frozen chopped fish daily at



Acclimatizing grouper juveniles in floating net cages

10% of average body weight (ABW) or artificial diet at 3% ABW, with half of the ration given early in the morning and the other half late in the afternoon

- When fish are about 200 grams, reduce feeding frequency to once daily with fresh or frozen chopped fish at 5% ABW or artificial diet at 2% ABW Feed should be given in small quantities, enough for fish to swallow when they come up during feeding
- Regularly check and immediately repair damaged nets
- Harvest fish after 5-7 months or when fish reach the market size of 300-350 grams



Grouper harvest in floating net cages

Site selection for:

Sea cages

- Minimal pollution
- Protected from adverse weather conditions
- Accessible but secure from poachers
- At least 3 m deep at lowest low tide and away from seagrasses & coral beds

Brackishwater ponds

- Sufficient source of seawater or brackishwater
- 18-32 ppt water salinity
- 27-30°C water temperature
- Dissolved oxygen of the water should be 4-8 ppm
- Soil substrate should be clay, clay-loam, or sandy-clay
- Minimal pollution
- Accessible but free from poachers



SEAFDEC/AQD's floating net cages in Igang Marine Station (top) and brackishwater pond in Dumangas Station (above)