

---

## CULTURAL FISH CULTIVATION IN FLOATING NETWORK IN KELURAHAN BELAWAN SICANANG KOTA MEDAN

Salmiah<sup>1\*</sup>, Charloq<sup>2</sup>, Thomson Sebayang<sup>3</sup>  
<sup>123</sup> Faculty of Agriculture University of North Sumatra

### Abstract

Grouper is one of the non-oil and gas export commodities that has the potential to be developed. As fish, fish consumption is much needed for restaurants and luxury hotels. The weight range of 500 - 100 grams / head, especially in living conditions, has a high price compared to in the form of dead fish.

In 1999, research and development for multi-species hatchery carried out jointly by the Gondol Marine Aquaculture Research Center with JICA first successfully produced mass of duck grouper seeds, *cromileptes altivelis* and tiger grouper seeds (Kawahara, *et. Al.*, 2000; Sugama *et.al.*, 2001). Whereas to mass produce sunu grouper seeds in 2005. Technology development has been disseminated to government and private hatcheries, so that the production of duck grouper seeds has increased dramatically and more than 1 million seeds in 2001 (Kawahara and Ismi, 2003). This technology is also applied to the production of tiger grouper seeds, *Ephinephelus fuscoguttatus* by private hatcheries. In 2002, tiger grouper seed production was more than 2.6 million. For sunu groupers up to now, more than 0.5 million in 2006.

Belawan Sicanang Village Medan Belawan District Medan City is an island surrounded by several tributaries which empties into the Deli River. 40% of the population are fishermen who are looking for shrimp or fish in the river and land pond farmers. Grouper is one of the fish that lives naturally in the waters of Belawan Sicanang Village which has high economic value. But environmental damage such as logging of mangroves due to the low alternatives of community livelihoods, changes in the function of land, continuous capture of the land causes the grouper population to continue to decline.

The use of the river for floating cages in grouper aquaculture can reduce the reduced supply of groupers from the natural habitat of fishermen's catches produced by this region. Cheaper cost analysis compared to terrestrial aquaculture can improve the welfare of fishermen and support culinary commodities in the development of Mango Sicanang ecotourism which is being promoted by the community and the local government.

**Keywords :** river, cultural fish, high economic

## 1. INTRODUCTION

Grouper is an international trade commodity which is expensive and has high demand. Most of the grouper production from Indonesia is a natural catch. However, along with the decline in water quality and overfishing, there has been a decrease in catch. To be able to meet the needs of groupers, the efforts to increase the results of cultivation must be encouraged.

Grouper fish is Indonesia's leading non-oil and gas export commodity, in addition to seaweed, shrimp and tuna. Indonesia is the world's largest grouper exporter, especially the export of live fish. In 2000 Indonesia began exporting groupers from aquaculture by 9.38% of Hong Kong's needs. Hong Kong is the world's largest live grouper export destination market in addition to China, Taiwan, Japan, Thailand, Singapore, Malaysia, the United States, Europe and Australia.

There are seven genera of groupers that are spread in Indonesian waters, namely *Aethaloperca*, *Anyperodon*, *Cephalopholis*, *Chromileptes*, *Epinephelus*, *Plectropomus* and *Variola*. Not all of the 7 genera of groupers can be cultivated properly. Grouper commodity species that have been cultivated and have economic values include duck grouper (*Chromileptes altivelis*), tiger grouper (*Epinephelus fuscoguttatus*), mud grouper (*E. Coioides*), kertang grouper (*E. Lanceolatus*) and several types of hybrid grouper.

Sweep fish has a high economic value compared to other fish, because the price is higher, around Rp. 100,000-200,000 per kilogram at the Cultivator level. The utilization of grouper cultivation land in Indonesia is not optimal, from the potential cultivation area of 3,776,000 Ha, only 45,676 Ha is used (1.21%).

The small utilization of this potential is due to a number of things, including lack of availability of seeds due to poor mastery of seed technology, the amount of capital needed for cultivation, the difficulty of changing habits

from catching to cultivation and lack of experience in cultivation.

because of that, this community service aiming for Enhancing interest in entrepreneurial community with farming with floating cages system, enhancing public revenue through cultivation of grouper, creating employment through skills in farming grouper, and supporting cultivation and culinary attraction in ecotourism mangrove Sicanang Island.

### Target and Output

The target of community service is the community of Belawan Sicanang Village, especially the Sicanang Island Mangrove Ecotourism Tourism Group which has been very dependent on grouper fish supply outside the village and only relies on mangrove forest natural attractions. Output from circuit service people are given is the grouper cultivation business that is being cultivated by the Belawan Sicanang Village community that has a selling value, increases income, can be consumed to increase the family's nutritional value, becomes a tourist attraction and is a supporter of culinary tourism in the Ecotourism Mangrove of Sicanang Island.

## 2. METHOD OF ACTIVITY

### A. Target Community Groups

The target community group of the grouper cultivation activities is the Belawan Sicanang Village community. There were 60 participants who participated in grouper cultivation activities in Belawan Sicanang Village. This grouper breeding demonstration was held on Saturday 2 June 2018 located on the River Ecotourism Mangrove in Sicanang Island, where the river conditions are very suitable for grouper cultivation.

### B. Implementation Activities Cultivation Fish Grouper

The Community Service Activity on Grouper Fish Cultivation is basically carried out in two stages, namely the first stage concerning the

Introduction and Training of making floating net cages, Technical Management of Grouper Cultivation and Making Demonstration Plots for Cultivation. For the next stage, it will be carried out several months later, after production, training and demonstration of grouper harvesting are carried out

### Introduction to Grouper Cultivation

Introduction process cultivation fish grouper this explained to participants by the LPPM-USU Team and supported by partners. Approach that is informal approach and the approach formal. Informal approach is with do briefing in the form of FGD to society about benefits advantages and ways work cultivation enlargement fish grouper. A formal approach is carried out in the form of manufacture training and workshop cage buoyancy and technique cultivation enlargement fish grouper.

### Grouper Cultivation Technical Training

After the introduction of grouper aquaculture was carried out to the participants, then a demonstration training was conducted to make floating sprouts.

Floating sprouts are frame-shaped rafts equipped with buoys to tie waring or nets. For one raft unit, a buoy is needed from used drum material or a 200-liter plastic drum, styrofoam and fiberglass drum. Before use, a bit of carbide is added into the floating drum.

The raft used is 8x3 m in size which is divided into four sections 3x3 m in size and made of waterproof wood and bamboo. In its operation, the raft is equipped with 4 anchors weighing 25-50 kg along with anchor ropes with a length of 3-4 times the depth of the water, a board to stand and 12 styrofoam to float it.

The net used is made of polyethelene with a size of 0.5 Inch jarring, the size of the net yarn is D12 and D21 with the size of the pockets in the flushing phase. While in the enlargement phase

use a net bag measuring 3 x 3 x 3 meters with a mesh size of 1-1.25 inches.

To hold the raft so that it is not carried away by the water current, anchors made of cement block are used. The weight of the anchor shape is adjusted to the conditions of the local waters. At least 4 anchor units per unit need to be weighed 25-50 kg, which is placed so that the raft remains in position.

After the floating sprouts are finished then the seed spreading process can be carried out, before the seeds are sown, it needs to be adapted first to the conditions of the cultivation environment. Some things that need to be considered in this adaptation process are the time of stocking (preferably morning or evening, or when the weather is shady), the cannibalistic nature which tends to increase at high densities, and acclimatization, especially temperature and salinity.



Figure 1. Installation of floating net frames

In making net nets buoyancy, then the materials and tools used for material Wooden beams as frame / frame rafts , boards as coatings for frame raki t, boards as floor rafts , mines as binders for raki t, plastic drums as raft buoys , 1.25 "polyethylene nets as fish culture containers ,

Salmiah. et al. Cultural Fish Cultivation In Floating Network In Kelurahan Belawan Sicanang Kota Medan.

anchors as raft anchors . While for a lat  
Chainsaws as papa n cutting tools , drill boards ,

nails and bolts , hammer , pliers , Machete /  
knife , paint and brush (2 ")



Figure 2. The Process of Making Floating Nets and Net

### **Cultivation of Grouper With Floating Net Method**

In Indonesia, this mouse grouper is also known as duck grouper or in the world of international trade is nicknamed the panther fish because all over its body are decorated with small round black spots.

#### **a. Distribution Fish Grouper**

One of them indicator existence fish grouper is waters coral. Indonesia has waters coral sufficient large so that potency resource fish tidiness very big

#### **b. Grouper Life Cycle**

There is generally grouper young life in the water coral beach with depth of 0.5 - 3 m.

#### **c. Ecological parameters suitable for growth fish grouper**

Temperature between 24 - 31°C, Salinity between 30 -33 ppt, womb oxygen dissolved > 3.5 ppm and pH between 7.8 - 8. Water with condition as this, in general found in the waters reef coral.

#### **d. Factor Hydrology of Sea Water**

*Factor Physics* , which includes Temperature or temperature waters , namely 27 ~ 32 ° C , with fluctuations daily small from 5° C , Depth waters minimum of 5 meters (3 m high) nets cages, 2 m distance between basic nets with basic waters, Brightness waters should clear namely minimum brightness 5 meters, speed current , i.e. ideally 15~30cm/sec, Elementary waters special for fish grouper tiger, basic waters must be rocking or sandy.

*Biology Factors*, covers animals the sea savage, like dog sea, fish large, bloated fish, and also animals land as birds, total colonies bacteria, this parameter usually happen in waters polluted ingredients organic. Total colonies bacteria for cultivation fish grouper not may exceed 3,000cells/m<sup>3</sup>.

#### **e. Cultivation Method Fish Grouper**

##### *1. Election Seed*

Criteria seed Good grouper, is its size uniform, free disease, movement swim quiet and not make movements that don't irregular or nervous but will move active when arrested, response to feed good, color scale bright, eyes bright, scales and fins complete and not disabled the body.

## 2. Spread Seed

Spread process seed very take effect to continuity life seed.

Before spread, necessary adapted especially first in conditions environment cultivation. Some things you need noticed in adaptation this, is  
(a) time stocking (in fact morning or evening, or when weather shade,  
(b) nature cannibalism that tends to increase on a high population density  
(c) acclimatization, especially temperature and salinity .

## 3. Nursery

Seed fish grouper size 4-5 cm long from results catch or from results hatchery, seeded especially first in nylon mesh measuring 1.5 x 3 x 3 meters with  $\pm$  500 tail density. A month then, grading (sorting size) is performed and nets is turnover. After that moved to nets big size 3 x 3 x 3 meters with optimum density of 500 animals for then moved to in cage

enlargement to reach size consumption (500 grams).

## 4. Feed and Giving

Cost feed is a cost operational the biggest in cultivation fish grouper in KJA. because of that, election type feed should truly right with consider quality nutrition, taste fish and the price. Giving feed cultivated for stocked as wide as maybe. At the stage nursery, feed given in a manner of *ad libitum* (arrived full). While for enlargement is 8-10% of total body weight per day, Feeding should be done in the morning and evening. For the amount of 1000 fish can be given 100 grams of pellets per day. After  $\pm$  3-4 days, the pellets can be mixed with trash fish.

## 5. Pests and Diseases

Type potential pests disturb business cultivation fish grouper in KJA is puffer fish, birds and turtles.



Figure 3.: USU LPPM Service Team

## 3. RESULTS AND DISCUSSION

Based on the process that has been carried out, it can be seen that so far in general it can be said that the service process went smoothly and received a good response from the community. Community participation and enthusiasm can be seen in every training activity.

At the beginning of the activity, it was an approach to the community by providing an understanding of fish farming in the sea using floating net technology, in addition to the cost of cheap cultivation, the production can also support marine food tourism in the Belawan ecotourism area. Sicanang, Medan. Most people help, making cages and floating nets according to directions and enthusiasm.

In the first stage of making cages, which they completed within a week, namely in the practice of making cages, it was seen that the community had a high curiosity to recognize the tools, materials and methods of making cages. With the main board material as a cage tool, and a plastic drum that is used as a tool to float the cage framework, which is quite familiar to fishermen, and a practical manufacturing process , at an affordable and inexpensive cost, the community can make ponds in the sea, as well as Groupers who have high value, and is very popular with tourists, in enjoying seafood, which they call ecotourism and seafood culinary.

Salmiah. et al. Cultural Fish Cultivation In Floating Network In Kelurahan Belawan Sicanang Kota Medan.

In addition, it also increases public awareness that activities carried out can increase people's income, to improve their welfare.

In the second stage , training was carried out, namely in conducting socialization and introduction of how to cultivate Groupers, by using power points, the public's curiosity was quite high, this was evidenced by the number of questions raised about Groupers such as how to feed, when to feed, and the types of feed will be provided in accordance with the conditions of food availability, which can be adapted to existing local resources in saving costs, and how to harvest results, ie when and at what age the fish can be harvested, how the condition of the fish to be harvested, the relationship of suitability between the age of normal weight fish that will be harvested. It was seen that the community was very happy with the service in the local area from the natural habitat of fishermen caught in the production of this area.

Cheaper cost analysis compared to terrestrial aquaculture can improve the welfare of fishermen and support culinary commodities in the development of Mango Sicanang ecotourism which is being promoted by the community and the local government.

#### 4. CONCLUSIONS AND SUGGESTIONS

##### Conclusion

Cultivation of grouper fish with floating sprouts is a simple cultivation technology that is easily mastered and accepted by the community/fishermen in the Sicanang Mangrove Ecotourism area located on Jl. Asam Jawa Ujung Lingkungan 13 Belawan Sicanang Village. This grouper cultivation business with floating sprouts can reduce the reduced supply of groupers from the natural habitat of fishermen caught in the production of this area.

Cheaper cost analysis compared to terrestrial aquaculture can improve the welfare of fishermen and support culinary commodities in the development of Mango Sicanang ecotourism which is being promoted by the community and the local government.

##### Suggestion

The effort to cultivate grouper fish in floating sprouts needs to be developed in coastal areas that have a climate in accordance with the growth of groupers. Efforts to accelerate business development need to be assisted and facilitated by related technical institutions, in this case, among others, the Livestock Service Office, the Water Service Office, and the local Agriculture Service.

#### 5. REFERENCES

- Kawahara, S., E. Setiadi, S. Ismi., Tridjoko dan K. Sugama. 2000. Successful mass fry production of humpback grouper, *Cromileptes altivelis*. *LOLIKANTA-JICA*.
- Sugama, K., Tridjoko, B. Slamet, E. Setiadi, K. Kawahara. 2001. Manual for the seed production for humpback grouper, *Cromileptes altivelis*. *Gondol Research Institutes for Mariculture and Japan International Cooperation Agency, Bali, Indonesia*
- Kawahra, S., S. Ismi. 2003. Grouper seed production statistics in Indonesia. *Japan International Cooperation Agency and Ministry of Marine Affairs and Fisheries of Indonesia*.