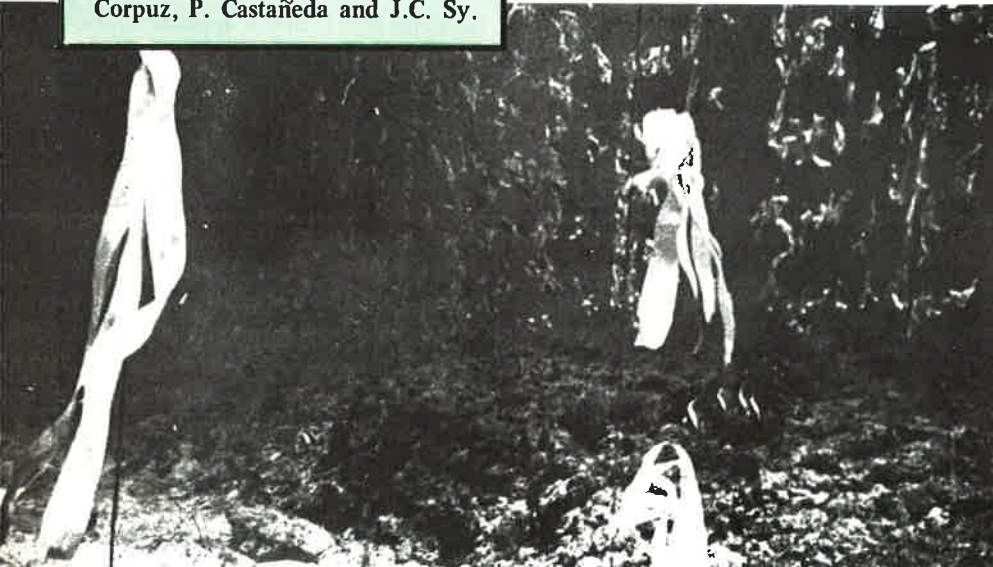


# Traditional Muro-ami, An Effective But Destructive Coral Reef Fishing Gear

This article is drawn from two excellent articles in Vol. 12, No. 1, 1983, of the Fisheries Newsletter of the Philippine Bureau of Fisheries and Aquatic Resources: "Muro-ami" (p. 2-13) and "A modified muro-ami scareline" (p. 14-18), both by BFAR researchers V.T. Corpuz, P. Castañeda and J.C. Sy.



Above: Non-motorized boats (called *bancas* or *barotos*) ferrying the fisherman from the mother ship to the fishing area. Left: Muro-ami scare lines.



The muro-ami is a Japanese gear, introduced by Okinawan fishermen to the Philippines in the 1930s. It is very effective in catching elusive reef fish but has destructive elements.

The gear typically consists of a large bag net, 37 m long x 10 m deep, held open by the current. Two detachable wings (100 m x 10 m) guide the fish towards the bag net. The gear is set over coral reefs in depths of 13 to 30 m and marked with flagpole buoys. Swimmers holding scarelines converge towards the net. The scarelines are ropes with plastic strips tied at intervals and stone weights of 3-5 kg on the end. The swimmers jig the scarelines up and down on the corals as they progress.

Reef damage is caused by the scareline weights hitting fragile coral. The problem would be insignificant if few swimmers were involved. However, a commercial muro-ami operation has from 200 to 300 swimmers in the water, each operating a scareline. The gear has earned such notoriety due to this damage that some local authorities have prohibited its use in inshore waters.

## Commercial Activities

In the Philippines, two companies provide the mainstay of this industry. In 1982, these companies had about 26 groups of fishermen totalling some 7,000 persons contracted for muro-ami fishing. Each group consists of a master fisherman, four or five assistant

master fishermen and 200-300 "plain soldiers", swimmers who set up the gear and drive the fish.

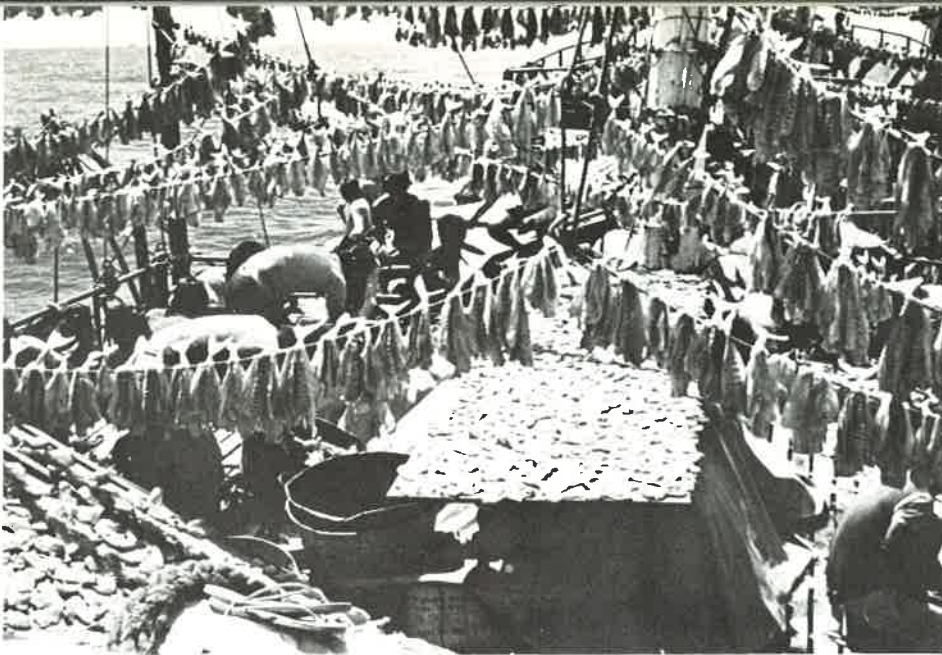
They operate from 9-m non-motorized bancas which ferry the fishermen to and from a 47-m mothership of 400 gross tonnes, with a capacity of about 180 t of fish. The major fishing grounds are fringing and shoal reefs off western Palawan and further west in the South China Sea (e.g., Paracels and Macclesfield Bank).

## The Catch

Fishes caught by muro-ami consist primarily of the shoaling or schooling herbivores and planktivores with Caesionidae (fusiliers or *dalagang-bukid*) and Acanthuridae (surgeon fishes or *labahita* and *bagis*) forming the main bulk of the catch. The muro-ami gear is highly selective as most of the bottom fishes (demersal) ignore the scarelines and only those nearest the net are caught.

A total of 1,032.5 tubs or 46,462.5 kg (45 kg/tub of fish) were caught during 25 fishing operations conducted by one vessel at the shoal reefs of Macclesfield Bank, South China Sea. The average catch per unit effort was 344.2 tubs/day and 41.3 tubs/fishing operation. The catch was dominated by Caesionidae, 83.61%; Acanthuridae, 7.7%; and the





Fish catches being sun-dried on the mother boat.

remainder were distributed among 16 other families of fish species.

#### Income Sharing

The net income from muro-ami fishing is apportioned on a share basis. The companies take 80% and the fishermen, 20%. Of this 20%, the master fisherman receives three shares; assistant master fishermen each receives two shares; and "plain soldiers" one share each. One share is equivalent to 0.07-0.1% of the net income.

#### "Fisherboys"

The fishermen come mainly from the Visayan region of the Philippines. The majority of the swimmers and divers are out-of-school boys and jobless residents whose ages range from 11 to 19 years. Seventeen percent are 10-14 years old, 53% are 15-17 years old, while most of the rest are under 25 years old. About 40% of the fishermen had been employed before in the farming sector, 17% in other fishing activities, 19% had been students and most of the rest were jobless.

The boys are recruited with their parents' consent. Some join their fathers or relatives to earn more money. These fishermen have no record or formal contract when recruited. All contracts are verbal by necessity, considering the fact that most of them are illiterate. The understanding is that once they have accepted the job, they have to work for 10 months under the supervision of a

master fisherman. The families or parents of these fishermen are given ₱200 to ₱600 as an advance payment which will be deducted from their earnings.

#### Small-Scale Muro-Ami Fishing

In Batangas near Manila, a small version of the gear is used by 20-70 fishermen with 3-4 small outrigger motor boats. Most of the fishermen join in on a part-time basis. Three operations per day are conducted on average four to five days a week.

In the sharing system, the master fisherman and net owners take two

shares of the net income, boat owners receive three shares while the "plain soldiers" receive one share each. The average income of "plain soldiers" is ₱10-25/day (\$1.00-2.50).

In eight days of fishing in 1981, 28 fishing operations yielded 905 kg or 32 kg per operation. As in commercial operations the catch was dominated by fusiliers and surgeon fish.

#### Minimizing Reef Damage

Researchers from the coral reef research unit of the Philippine Bureau of Fisheries and Aquatic Resources carried out a comparative study of the effects of different scareline weight types on reef damage.

Divers measured the areas of damaged corals and simultaneously photographed the damage. Trial hits were made on four basic coral types—branching, massive, encrusting and rose-like—using 11 types of modified scareline weights.

The modified scarelines were then used in small-scale and commercial muro-ami operations, observed by the research divers. Analysis of all the observations showed damage was related to shape rather than weight. The best modified weights, spindle lead weights with brass rings and "truncated 2-eye, 2-chain" weights, reduced damage by about 50%. Commercial fishermen preferred the chain weights since they are cheaper and readily available. ●

Diver assessing damage to corals.

