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# Fry fishing gears and the fishing practice

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evident in this area. Singapore has become an import market for neighboring Indonesia, Malaysia, and Thailand, reflecting a steady increase in imports of fresh/frozen shrimp.

In 1988, Singapore imported 22,457 tons of shrimp from Burma, Thailand, Malaysia and China. A substantial volume of Indonesian shrimp is either processed or re-packed in Singapore for re-export to other destinations. Singaporean processors buy shrimp from the neighboring Johore state of Malaysia where some Singaporeans have also invested in shrimp farms. Shrimps are also imported by truck from Thailand via Malaysia for domestic consumption as well as for exports. Because of stringent quality assurance, Singapore has the advantage of processing value-added shrimp and shrimp in consumer packs.

Hong Kong is another important market. Imports increased from 23,372 tons in 1984 to 71,622 tons in 1988. Its major supplier is, of course, China (exports being re-exported) followed by Vietnam, Indonesia, and Macau. Hong Kong is a re-processing center, too. Domestic consumption of shrimp among the ethnic Chinese community is also substantial.

The over-supply situation followed by plummeting prices of shrimp and a disappointing Japanese market in 1989 have served as a good lesson for Asian shrimp producers. Producers are now for the first time taking a closer look at the world supply situation. Certain countries now also realize that the development of domestic markets is very important as are market diversification and product development.

Source: Fatima Ferdouse. "Asian shrimp situation," *INFOFISH International*, No. 1/90, January/February.

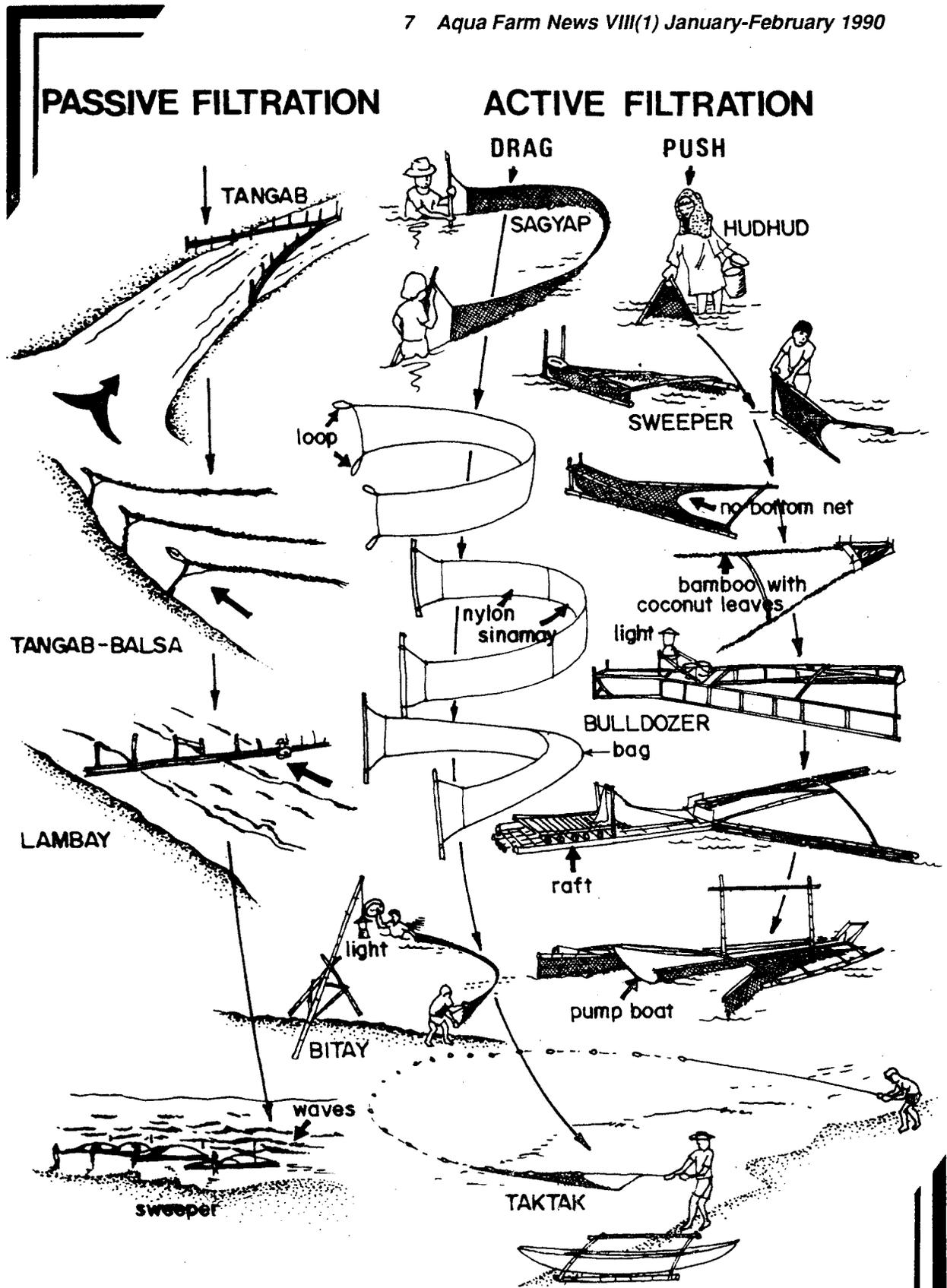
## FRY FISHING GEARS AND THE FISHING PRACTICE

The various fishing gears of Panay Island, Philippines and their modifications are summarized in the accompanying figure. The figure suggests the following tendencies in the development of the gear: increase in gear size and wing opening, extension of area of operation to offshore waters, and reduction of the bottom net (in the *sweeper*).

The development of the traditional *sagyap* into the *taktak* exemplifies increase in gear size and operation area. The development of the *sweeper* into the *bulldozer* demonstrates increase in gear size, extension of area of operation offshore, and loss of the bottom net. Coupling of the kerosene lamp with many of the gears has made night operation possible. All these trends of development reflect most obviously the economics of fry fishing and less clearly the behavior of the fry. First of all, the fishermen want to increase the catch to increase their income so that the gear structure and operation are made as extensive as possible, the use and cost of materials are seriously considered, and competition is avoided by varying the gears and the area of operation.

It is usually asked: How efficient are the various gears? Which one is the best?

It is very difficult to answer these questions and misleading to compare the catching efficiency of different fry gears. Each type has properties and advantages that cannot be equated with those of another. The different gear types operate under different, and rather specific, conditions as have been described. The physical effort involved in the operation differs from gear to gear, and for one gear, from place to place, from time to time. This is because the shore profiles of the fry grounds differ; so do the weather and sea conditions from day to day. Even if all the gear types were operated in the same fry ground at the same time a comparison would still be questionable because milkfish fry, it seems, are not homogeneously distributed in shore waters. The catch depends heavily on where the gear is and where the fry are at a particular moment. A gear can catch from zero to several thousands. Catch data show that the *sweeper* had the smallest mean hourly catch among the three gears tested (*sagyap*, *sweeper*, and *bulldozer*). Nevertheless, it



The milkfish fry fishing gears: modifications and apparent trends of development.

would not be valid to say that the sweeper is the least efficient of the three. The *sweeper* in Hamtik (wings 4 m long, 3.5 m wide) requires only one person to operate, quite comfortably. The *sagyap* requires two fishermen, and the dragging could be strenuous (average duration of operation, 3.4 hours) considering the 6-7 m long net. The *bulldozer* requires two fishermen, is strenuous to push (average duration of operation, 3.3 hours), is operated at night, can cover a wider area, etc. The point is that evaluation of gear efficiency involves serious consideration of input and output. Comparison of the efficiency of different gears could be complicated.

The gears presently used are in themselves **practically fully developed** as far as actively fishing the fry is concerned. The main problem is in the proper use and operation. Use of a particular gear should be based on its suitability to the shore profile, currents, and such conditions as may affect its effective operation.

Moreover, the gears should be properly operated so that the fry are not only caught alive but healthy. Ten days operation of the *sweeper* in April-May 1980 between 6:00 A.M. and 6:00 P.M., showed that mortality rates during the fishing operation range from 2.6 to 41.2%, with mean of 14.3%. Examination of newly caught live fry showed a high percentage of injured ones irrespective of gear type, place, and sea conditions. Smith (1978) estimated that 5.3% of the available fry resources in the Philippines is lost during the gathering process and 8.7% during storage. These figures seem rather small but all point to a need for improving the fishing operation. Capture is very stressful to the fry. With improper handling and severe injury at capture, the fry easily succumb to stress during storage. Ways and means to reduce fry mortality during capture should be studied. A few suggestions are in order in the meantime:

- 1 The *tangab* should be set where the current is strong, but not where it is too swift that it plasters the fry against the bag net, causing high mortality. The *tangab* should not completely block the river or creek mouth such that turbulence would occur and mortality would result. Milkfish fry should be allowed access to these coastal wetlands that serve as natural nurseries.

2. During the operation of any of the gears, drifting and floating debris should be removed as much and as often as possible so that they would not be scooped with the fry. Otherwise, their pressure against the fry can injure or kill the latter. Scooped debris presents sorting problems to the fishermen and more stress to the fry. This problem is especially serious and important in the case of the gear with lamp wherein nocturnal crustaceans overwhelm the fry.

Gear innovations that would make the fry fishing operation less strenuous and more profitable for the fishermen are also necessary. Two modifications of the *sweeper* were tested - one with wings of frame only and another with wings of coarse mesh (mesh 2 cm) dark-colored netting - and one modification of the *sagyap*, that is, with wings of coarse mesh dark-colored netting. The modifications were based on the premise that milkfish fry could be caught by driving and therefore the fine-mesh netting at the wings of the gears could be done away with, in favor of coarse-mesh ones which would enable the fishermen to move the gear through the water more easily, and to use larger gears for bigger catch. In terms of catch, tests failed to prove this premise but the fishermen who operated the gears agreed that the modifications were easier to handle. In any case, all gear improvements and development should consider at least three factors: structure and operation of the presently used gears; conditions of the fry fishing grounds, i.e. shore profile, currents, etc.; and behavior of milkfish fry.

Source: **A study on the milkfish fry fishing gears in Panay Island, Philippines** by S. Kumagai, T. Bagarinao, A. Unggui. Technical Report No. 6, September 1980, SEAFDEC Aquaculture Department, Tigbauan, Iloilo.