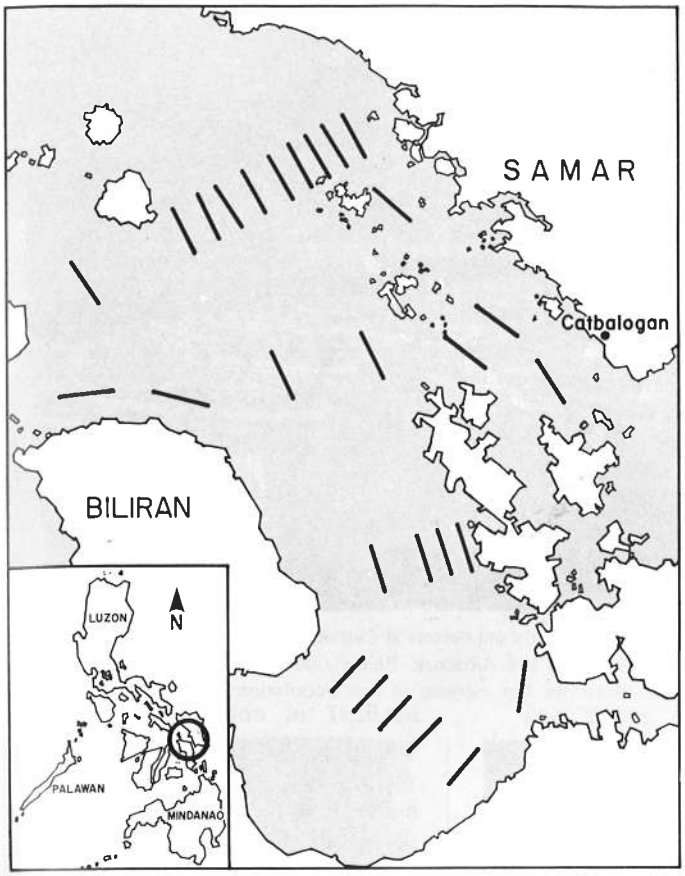
Do Trawling Bans Work in Tropical Waters?



Southern portion of the Samar Sea. Bars show the UP sampling stations.

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AMONG the many questions the article by Admiral Iman Sardjono *Trawlers Banned in Indonesia** may have prompted, a leading question is: What is the biological effect of a fishing ban in tropical waters?

For temperate waters, this question has been answered: the stocks do recover. Limitations of fishing effort have, in a comparatively short time, resulted in a more or less complete recovery of the stocks concerned and, consequently, in higher yields. This was demonstrated for the first time in the halibut fishery off California more than half a century ago. The same effect has been shown most dramatically in the herring fishery in the North Sea, where a total ban on fishing in recent years has led to a remarkable recovery of the stocks to the extent that a re-opening of the fishery is now under serious consideration. In fact, the recovery of many fish stocks during the two world wars, is well documented, especially in the North Sea area, where early post-war fisheries harvests were greatly enhanced.

Though the question is sufficiently answered for temperate waters, in which regulation and limitation of fishing effort in international waters are mere questions of political accomplishment among nations concerned, it has never been proven that limitation of effort in tropical waters would have the same effect, though theoretically it should be expected.

In the Philippines, fishing grounds have been closed for various reasons, usually when it was felt that the operations of commercial boats were a threat to a subsistence fishery.

These closure decisions were made on an ad hoc basis, without much insight into the status of the fish stocks and without monitoring possible changes the stocks may experience during the closed period.

Following complaints from small-scale fishermen in the Samar Sea about decreasing catches, this area among others was closed in November 1976 to all commercial trawlers, prohibiting them to operate closer than 7 km from the shoreline. Commercial trawlers are those over 3 GT. The Samar fishery remained open to so-called municipal fishing craft, vessels less than 3 GT, generally gill-netters, used by small-scale fishermen.

Despite the ban, a number of small commercial trawlers of about 15 GT, equipped with 150-180 HP engines, continued to operate in the region, working mainly out of Catbalogan.

Meanwhile, rising fuel costs and very low catches had forced most of the larger vessels to discontinue trawling the area by the beginning of 1979. These two factors, the ban and fuel prices, served to decrease considerably fishing effort in the Samar Sea.

To monitor possible changes in the fish stocks following the ban on trawlers, the University of the Philippines (UP) through the College of Fisheries launched a fishery survey of the Samar Sea, using the UP-owned research vessel *Albacore*. The *Albacore* is a 190 GT, multi-purpose training and research vessel of 31.6 m LOA and 600 HP. In March 1979, monthly investigations started at a number of fishery stations between 10 and 100 m depth, using a high-opening bottom trawl with a headrope of 46.3 m length and 4.5 m average vertical mouth opening. The average trawling speed was 3 knots.

The project was funded by NSDB (National Science Development Board), through PCARR (Philippine Council

*ICLARM Newsletter 3(4): 3.

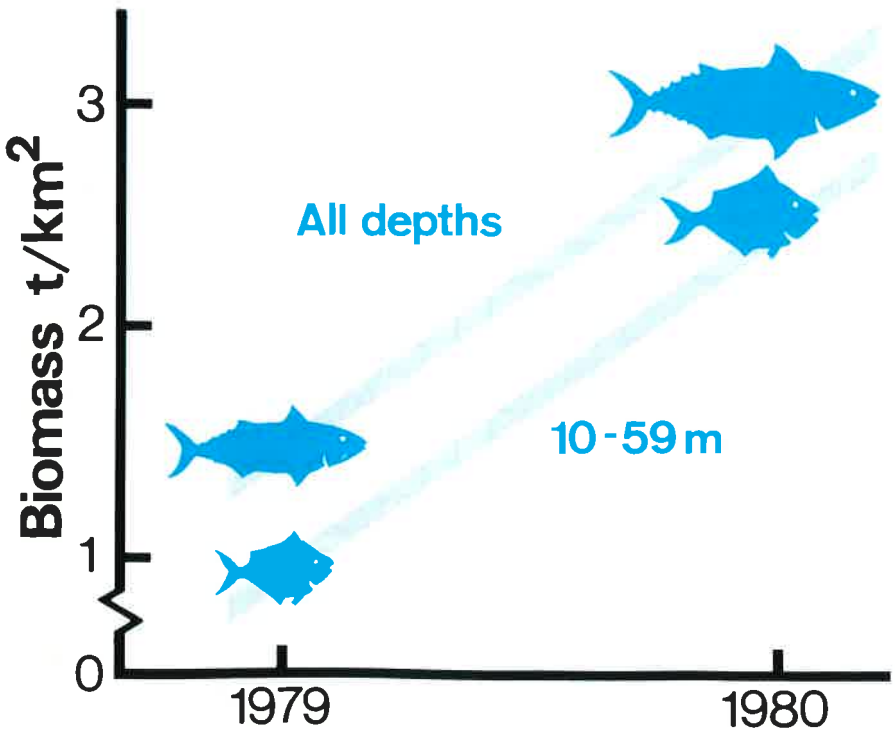
for Agriculture and Resources Research), and was part of the activities of the bilateral Philippine-German Fisheries Project at UP College of Fisheries.

During the months of March, April and May 1979, the mean biomass for all depths was found to be 1.52 t/km^2, with a mean biomass of 1.21 t/km^2 in the depth range 10-59 m. This depth range, which comprised about 60% of the whole survey area and fishing grounds, is to be considered as the main trawling area for both large and small commercial trawlers as well as for the municipal fishery using a variety of gears, including motorized outriggers (bancas) suitable for trawling.

These values indicate that the complaints about decreased catches seemed to be justified indeed, especially if the values are compared with the biomass of virgin stocks. In Southeast Asia, the biomass of virgin or untapped fishing grounds ranges generally between 5.0 and 6.0 t/km^2 in the continental shelf region. It is also generally agreed that the potential maximum sustainable yield (MSY) in Southeast Asian shelf areas is about 3-5 t/km^2/yr.

In spite of the ongoing activities of the small trawlers, the biomass of fish

Above: Municipal fishing vessels, mostly gill-netters at Catbalogan, Samar. Below left: Students working on trawl samples on board the *Albacore*. Below right: The *Albacore* hauling in the trawl net. Bottom: Graph illustrates the increase in fish populations in the Samar Sea from 1979 to 1980 ·



in the Samar Sea increased constantly during the survey period. During March, April and May 1980, the mean biomass of all depth categories combined increased to 3.09 t/km^2. For the depth range 10-59 m it increased to 2.80 t/km^2. That means that in one year the biomass over all depths doubled, while the most seriously affected depth range, 10-59 m, recovered to the extent that the biomass increased by more than 100%. It must be noted that the catch composition remained more or less unchanged during the investigation period.

This result clearly shows that the imposition of a trawling ban is a suitable tool in tropical waters to protect the vital interests of the sustenance fishery by helping heavily exploited fish stocks to recover.

Another survey in the area will be conducted in March and April 1981, to get a closer insight into the alterations the stocks may have experienced due to the trawling ban.