The Philippines Squid Fishery: A Review

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ABSTRACT—There are several fishing grounds in the Philippines in which squids can be fished all year round. Most squids caught are from coastal and interisland waters. No exploitation is being undertaken in waters adjacent to or beyond the contiguous or economic zone in which lies a potential fishery for oegopsid squids. The major gears used to catch squids are otter trawls for demersal fishing and purse seine, basnig, and scoop nets aided with lights for night pelagic fishing. Also discussed is the present squid fishery using available statistical data, review papers, and current research that deals directly or indirectly with squids.

Introduction

Squids were among the important commercial fishes landed in the Philippines in 1976, representing about 2.08 percent or about 11,000 t (24,250,600 pounds) in the multispecies fishery which prevails. Despite ever increasing squid production, it cannot meet the increasing demand of local, national, and foreign markets.

The amount by which the Philippines can increase its squid production is unknown. Voss (1973) estimated the squid resource for the western central Pacific continental shelf (which includes Hong Kong, Taiwan, Malaysia, Thailand, and the Philippines) at 500,000 t (1,102,300,000 pounds). The Philippines' probable productivity may well be over 25 percent of that estimate. Unknown to us is the possible (and probably larger) stocks of squid in the relatively unexplored outer shelf. This potential stock remains unharvested.

Little has been written about the squid fisheries of the Philippines. Voss (1963) wrote the first extensive report on the taxonomy of Philippine cephalopods. The other important paper is that of Flores (1974) which surveyed traditional Philippine squid fishing grounds. There has been no extensive study on the geographical distribution and abundance of Philippine cephalopods. Likewise, a biological study of a single species of squid has not yet been attempted. Even a review of the Philippines' squid fishery has been lacking. Thus, this report surveys and provides some useful information on the present status of Philippine squid fisheries.

The Squids

Squids harvested in the Philippines belong to the order Teuthoidea, with the suborders Myopsida and Oegopsida. The myopsids, being neritic, are the ones subjected to exploitation, owing to the fishermen's habit of fishing within the interisland and coastal waters of the Philippine archipelago. On the other hand, the oegopsids, being oceanic, are not now being exploited and will not be discussed here.

Four genera and seven species of the Loliginidae have been caught by various fishing gears. Research since 1976 has identified these squids. In the Visayas Sea, Ed Enderez[1] provided the identification with subsequent confirmation from the Department of Zoology, University of the Philippines. In the other research studies, the identification was made by the senior author. In identifying the species, we have relied extensively on Voss (1963).

The local names for *Loligo*, *Sepioteuthis*, and *Doryteuthis* are "pusit" (widely used), "panus" (Southern and Western Tagalogs), "locus" (Visayan), and "bomagto" (Ilocano). *Uroteuthis bartschi* fished in the Palawan waters is commonly named by fishermen as "sputnik" because its body shape is likened to a slim rocket ship[2].

Squid Production

Landings of "squid" have been recorded since the start of the Philippine Fisheries Statistics in 1940 by the Philippine Bureau of Fisheries. Here, the term "squid" will be used to connote either squid, cuttlefish, and octopus unless otherwise specified. Similar records have been kept also by the Food and Agriculture Organization of the United Nations.

Table 1 shows the squid production trend for 1957-76. The total commercial catch can be characterized by a gradual increase with a few declines spaced between several successive years. This upward climb may be due to the increase in the use of otter trawls, purse seines, and beach seines. While the bagnet occupies an important role in the fishing industry, and is a very productive gear at that, the number has been fluctuating. This may indicate additional production with an increased number of gears or lower production with less bagnets (Tables 2, 3).

Municipal (also called sustenance or artisanal) fisheries, an important factor in the Philippines' national fish production, lacked detailed figures on its squid catch until 1976. The municipal sector then contributed as much as 50 percent, in which squid, cut-

[1] Ed Enderez, Fisheries Division, Development Bank of the Philippines, Makati, Philippines. Personal commun.

[2] Antero Belnas, Bureau of Fisheries and Aquatic Resources, Intramuros, Manila. Personal commun.

Table 1.—Total commercial squid catch in metric tons for the Philippines, 1957-76. Source: BFAR, 1957-76.

Year	Quantity (t)	Year	Quantity (t)
1957	154	1967	4,782
1958	203	1968	9,222
1959	356	1969	6,366
1960	281	1970	5,862
1961	254	1971	5,714
1962	1,363	1972	7,451
1963	2,913	1973	7,174
1964	3,629	1974	9,265
1965	4,964	1975	13,704
1966	5,604	1976	10,560

Table 2.—Numbers of commercial fishing gear in the Philippines. Source: BFAR (1957-76).

Year	Bagnet	Beach seine	Purse seine	Otter trawl	Round haul seine
1967	1,002	45	197	593	108
1968	883	44	202	653	85
1969	796	41	253	667	69
1970	858	49	245	653	76
1971	743	35	265	652	61
1972	650	44	320	690	53
1973	791	41	470	794	50
1974	584	51	280	767	38
1975	713	77	313	763	27
1976	656	75	342	786	20

Table 3.—Catch percentage by type of fishing gear on squid. Source: BFAR (1957-76).

Year	Total catch (kg)	Bagnet	Otter trawl	Beach seine	Purse seine	Round haul seine
1971	5,713,480	6.16	92.73	0.24	0.80	0.08
1972	7,439,370	33.34	62.81	—	2.51	1.35
1973	7,174,460	25.49	63.12	—	10.81	0.58
1974	9,264,660	8.93	84.14	—	6.82	0.10
1975	13,603,090	13.11	82.94	0.03	3.88	0.03
1976	10,553,560	11.59	77.39	—	10.31	0.71

Table 4.—Major Philippine squid fishing grounds based on production (in metric tons). Source: BFAR (1957-76).

Year	Asid Gulf	Bohol Sea	Guimaras Strait	Lamon Bay	Manila Bay	Ragay Gulf	Samar Sea	San Miguel Bay	Sulu Sea (N)	Tay-abas Sea	Visayas Sea
1971	8.1	85.0	115.7	645.5	480.2	363.5	203.9	185.0	1,144.8	134.1	2,733.3
1972	0.4	101.6	99.2	1,309.8	532.6	467.9	975.2	975.2	321.8	—	3,168.6
1973	50.5	96.3	298.1	167.3	594.1	26.6	117.2	1,039.2	109.0	155.3	2,977.4
1974	389.9	1,302.8	128.4	594.0	433.8	56.6	117.8	333.5	79.6	124.8	5,769.7
1975	835.2	16.2	356.4	961.7	1,202.4	9.5	276.6	246.3	158.8	219.8	7,161.1
1976	782.0	42.2	302.8	—	531.7	8.5	833.6	229.0	0.05	113.7	6,621.9
$\bar{x}$	344.4	274.0	216.8	613.1	629.1	125.4	334.7	451.4	302.3	124.2	4,738.7

tlefish, and octopus, grouped separately, were estimated at 13,079 t (28,833,963 pounds) compared with 10,560 t (23,280,576 pounds) from the commercial fishermen.

There are about 47 known fishing grounds in the Philippines, of which 6 areas lack catch records (BFAR, 1957-76). Table 4 shows production of the important fishing areas for squids. Several areas not shown have at one time produced more than 100 t (220,460 pounds) of squid per annum (BFAR, 1957-76). However, on the average, their production is quite low compared with the top 11 fishing grounds (Table 4).

The squid catch of the 11 major fishing areas follows a generally variable or downward trend. Only the Samar Sea and the Bohol Sea have shown an increase in the squid catches. To assess whether a fishing ground is underexploited, fully exploited, or overfished, an evaluation of the catch per unit effort under a number of years must be analyzed (Simpson, quoted by SCSP, 1976). Four independent variables are needed, which can be used separately, and consist of the numbers of: 1) Vessels operating on the fishery, 2) days fished, 3) trips, and 4) hours fished. On the last three requirements, Yamamoto (1973) stated that there is very little data that can be gathered from the Bureau of Fisheries' "Monthly Fish Caught Report."

The following paragraphs were based on a series of BFAR/SCSP[3] Workshops (SCSP, 1976-79) which gave a general review on the status of resources and the potential yield of squid by fishing grounds.

The first workshop covered the fishing areas between Luzon and Mindanao Islands, the Sibuyan and the Visayas Seas (Fig. 1). It is the most heavily fished area in the Philippines, producing over 50 percent of the total catch by municipal and commercial fisheries for the whole country. Included in these areas are the Tayabas Bay, Samar Sea, Ragay Gulf, Asid Gulf, Guimaras Strait, and other fishing grounds.

This first workshop made use of the catch per trawler to obtain the estimated total fishing effort. Squid as well as cuttlefish were treated as one. Between 1965 and 1974, statistics showed increasing effort but with the total catch increasing very little (Fig. 2). It was surmised that the area is fully exploited and the maximum yield is expected to be around 1,200 t. The Visayan Sea and Guimaras Strait contributed much to the production of squid while the rest produced a minor quantity. It seems that the Samar Sea has been overlooked. Trawl and basnig (bagnet) are the main gears but jigging by municipal vessels does occur (Table 5).

The second workshop did not mention squid in particular but the areas analyzed, including the Sulu Sea, Bohol Sea, and Moro Gulf, are rich grounds for pelagic fishes.

The third workshop dealt with the coastal Pacific side of the Philippines. This area, comprising five regions, has a rugged coastline and an extensive continental shelf extending over 1,500 km (900 nautical miles). San Miguel Bay, the most productive fishing ground in the Philippines per unit area, is located here. The northern or upper region (Region II) was excluded in this discussion. Four regions (IV-A, V, X, XI) produced 90 percent squid among the cephalopod groups. Basnig was the most productive in the commercial and municipal sector and, on the other hand, the scoop net with light and ringnet are the second and third most productive fishing gears (Table 5).

[3]Bureau of Fisheries and Aquatic Resources and South China Sea Programme.

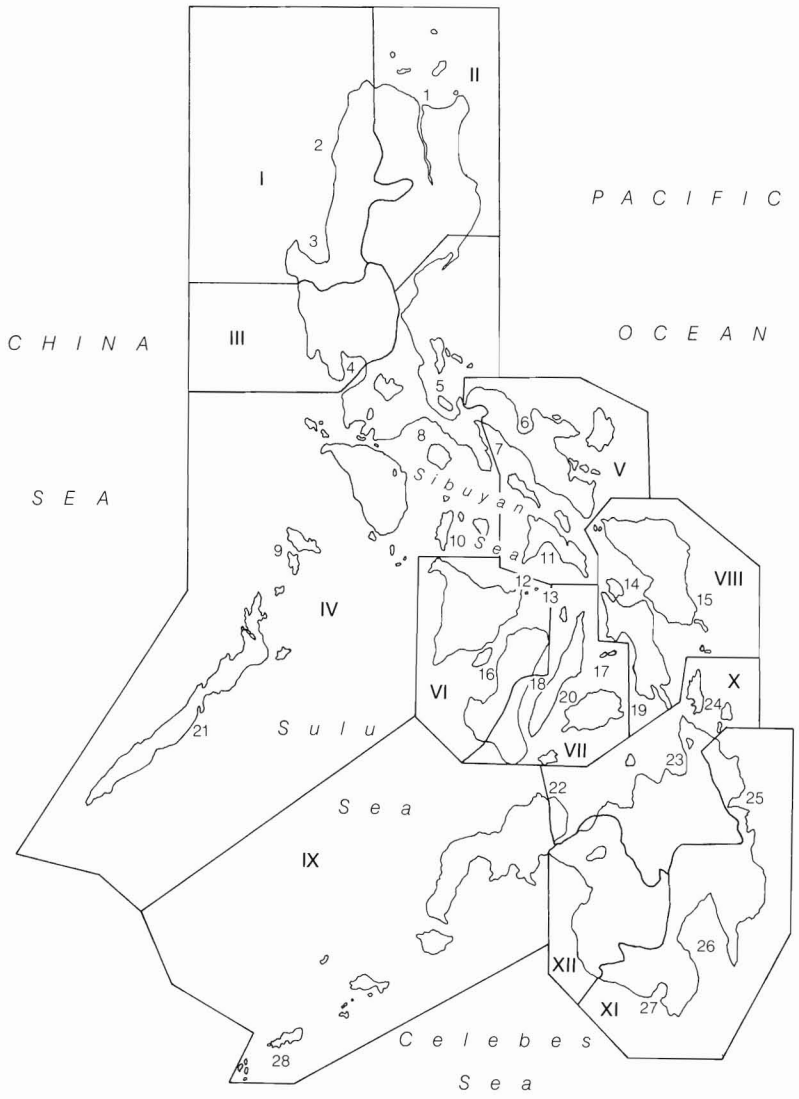

Figure 1. — The Philippines showing Fishery Regions I-XII and squid fishing grounds: 1 = Babuyan Channel; 2 = Ilocos Region; 3 = Lingayen Gulf; 4 = Manila Bay; 5 = Lamon Bay; 6 = San Miguel Bay; 7 = Ragay Gulf; 8 = Tayabas Bay; 9 = NW Busuanga; 10 = South Sibuyan Sea; 11 = Asid Gulf; 12 and 13 = Visayas Sea and western part; 14 = Samar Sea and adjacent Carigara Bay; 15 = Matarinao Bay; 16 = Guimaras Strait; 17 = Camotes Sea; 18 = Tañon Strait; 19 = Cañigao Channel; 20 = Bohol Strait; 21 = Village Bay; 22 = Murrielagos Bay; 23 = Butuan Bay; 24 = Dinagat Sound; 25 = Lianga Bay; 26 = Davao Gulf; 27 = Sarangani Bay; and 28 = Manok Mankaw.

The fisheries in these areas are governed by the northeast monsoon which greatly reduces the number of fishing days between December and March. Consequently the amount of fishing possible could vary considerably from year to year (SCSP, 1978). One cannot, therefore, depend much on the number of boats as an index of fishing effort. The last three variables previously mentioned are advocated as a better substitute. However, these data are not available, and therefore any satisfactory estimate of the resource and potential annual yield cannot be undertaken at this time. Speculation about the stocks of pelagic species off the Pacific coast have been mentioned.

The northern and western coast of Luzon were the last areas assessed. Similar problems like those of the previous workshop were encountered. Data for analysis on potential yield and status of stocks are incomplete in the previous years. There is a strong belief that a large quantity of squid abounds off the western Philippine coast. Again squid are caught by trawls, and at night by lift nets with lights to attract these myopsids. Harvesting is by hook and line, including jigs.

In almost all the workshops, we see that the squid, including cuttlefish and even the octopus, were given recognition as an important stock contributing to major production.

Fishing Methods

Though the present squid fishery is limited to sustenance fishermen (Flores, 1974), many loliginids are taken from otter trawls, basnig, purse seine, round haul seine, and scoop nets. Statistical data on myopsid squid at the municipal level are available only after 1975. Table 3 shows squid catches by five commercial fishing gears.

In Figure 3, the most common squid jigs used by sustenance fishermen are shown. Operation of the shrimp-type jig and the cylindrical-type jig are limited to one line, so fishermen, to increase their catch, should set at least three or four lines while fishing. The Tañon Strait jigs are used in waters 200 m (656 feet) deep while the cylindrical type with the whole fish bait is a bit similar to the second type. The difference is that the hooks have a wider spread. Table 5 shows Region VIII which includes the northern and eastern Samar Sea as the area where squid jigging is most prevalent.

Figure 4 shows the commercial and municipal squid fishing seasons. Generally, the fishing by municipalities is continuous throughout the year with peak seasons occurring at different places.

Rasalan and Datingaling (1953) reported on the fishing gears which use lights. This section will briefly describe the fishing methods and some of the following account on the seines

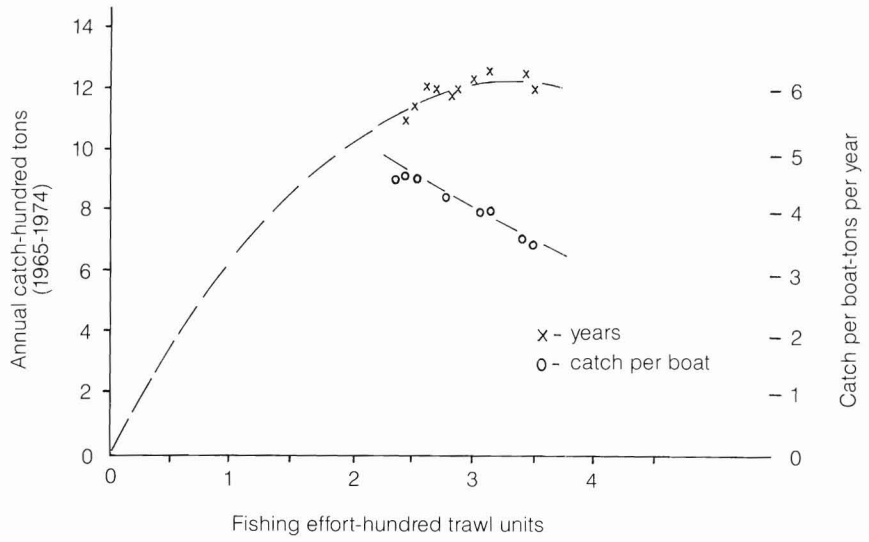

Figure 2.—Profile of Philippine squid catch per unit effort. Region VI. Source: SCSP (1976).

Table 5.—Philippine squid and cuttlefish catch in 1976 separated according to region and gear (in metric tons)[1]. Source: SCSP (1978).

Gear	Fishery[2]	Region IV-A	V	VIII	X	XI	Total	Percent
Bagnet	C	16	247	—	—	—	263	4
	M	—	22	971	636	—	1,649	28
Ring net	M	4	—	777	—	166	947	16
Beach seine	M	—	—	—	—	886	886	15
	C	12	67	—	—	—	79	1
Trawl	M	—	—	—	—	—	—	—
Spear gun	M	—	380	—	—	55	435	1
Scoop net with light	M	—	1,348	—	—	—	1,348	23
Jigger	M	—	—	194	—	—	194	3
Scoop net	M	—	30	—	—	—	30	1
Not classified	M	81	—	—	—	—	81	1
Totals	C	28	314	0	0	0	342	6
	M	85	1,780	1,942	636	1,107	5.550	94

[1] Workshop on the Fishery Resources of the Pacific Coast did not include Region II.
[2] C = Commercial; M = Municipal.

(except purse seine) are extracted from that paper.

The round haul seine is an indigenous commercial gear locally known as "sapyaw." The sapyaw can be operated during daytime or nighttime. At nighttime it is usually aided by a third boat which also acts as a tow vessel. This boat usually carries a light and leads the attracted school between the two boats where the net awaits the catch. This gear is bulky and requires several hands. Thus, it may become a costly operation as there is less profit when employing a larger crew. More are converting to basnigs which are cheaper to operate than sapyaw. The popularity of the round haul seine (Table 2) is declining.

The least productive of the commercial/municipal methods of fishing is the beach seine. Common to fishing villages, the beach seine is operated once or twice a day or at night, and the work is done by the villagers. During the dark phase of the moon, the boats equipped with lights go out to attract the fish, bringing them nearer to shore and the net. Hauling time to shore usually averages 3 hours or more, depending on the currents and the mode of operation. Catch per season is sometimes insignificant due to the presence of trash fauna, especially ophiuroids and jellyfishes. There are more people involved at one time with this single gear than with any other method now in use.

The purse seine, using artificial lights, was first introduced in the Philippines in 1962 (Ronquillo, 1972). This gear has now surpassed the trawl in total productivity for several years, though there are more than twice as many otter trawls (Table 2). This gear, when operated at night with light to attract fish, catches from 35 to 100 t (from 77,161 to 220,460 pounds) of fish. Rasalan (1968) reported catches of 100 t (220,460 pounds) in the Palawan waters. This gear might well be the most productive squid fishing gear although it is not solely designed for squid fishing.

Probably more has been written about fishing with the basnig in the Philippines than any other fishing gear (Rasalan, 1959; Rasalan and Villadolid, 1955; Spoehr, 1968; Manacop and Laron, 1953; and Ronquillo, 1972).

The basnig is an indigenous gear that originated in northern Panay and adjacent areas. Although this gear ranks as the third most productive fishing gear, it does not contribute to the export market. The catches are immediately landed in local markets because the boats do not have refrigeration facilities. But, in catering to local markets, it helps to alleviate shortages of fish in rural areas. Otherwise, the catches would be mostly distributed in urban and semiurban areas.

The basnig, a totally night fishing gear, is operated near submerged shoals and reefs, using lights to attract fish to the net (Manacop and Laron, 1953). This gear, along with the purse seine and round haul seine employing lights, accounted for about 23 percent of the Philippines' total commercial fish production in 1976.

Basnig boats proceed before twilight to their destination where they set their nets once or twice in the night. The net, which resembles an inverted box-type mosquito net, is hung under the boat

(Fig. 5). Net size can be determined by adjusting the lengths of booms or outriggers. Several lights on the sides of the boats are dimmed when the net is about to be hauled. The ropes attached to the basnig are pulled manually. Due to its unmechanized setting and hauling, large and fast moving fishes can easily escape the net. The boats return before sunrise to avoid spoiling the catch.

The otter trawl is the most important fishing gear that contributes to the squid fishery. The municipal fisheries have small trawlers, less than 3 gross tons, which, collectively, can equal the catch by the commercial fishery. The trawl which was originally conceived to catch demersal fishes of high market value like *Caranx* sp., *Formio* sp., and shrimps, have been catching squid as well. While certain species of fish appear in certain seasons, squids are caught year-round on almost all fishing grounds.

On the average, the trawl contributes 75 percent to the overall squid catch. Because the trawlers are mainly concentrated inside the territorial waters, it is expected that catch will maintain a slow, gradual production increase unless more vessels are recruited. At this stage the shift to oceanic resources is still in the future. The major constraints to this shift in fishing areas are the high capital investment and the risk in unexploited fishing grounds. Mainly, the problem would be locating the new fishing areas. Catch increases in the next 5 years are likely to be slow due to the use of traditional fishing methods.

The estimated landings of the western central Pacific by Voss (1973) was 100,000 t (220,460,000 pounds). The Philippines contributed about 23 percent to this estimation based on the combined municipal and commercial fisheries. This catch however is minimal when compared with potential catches.

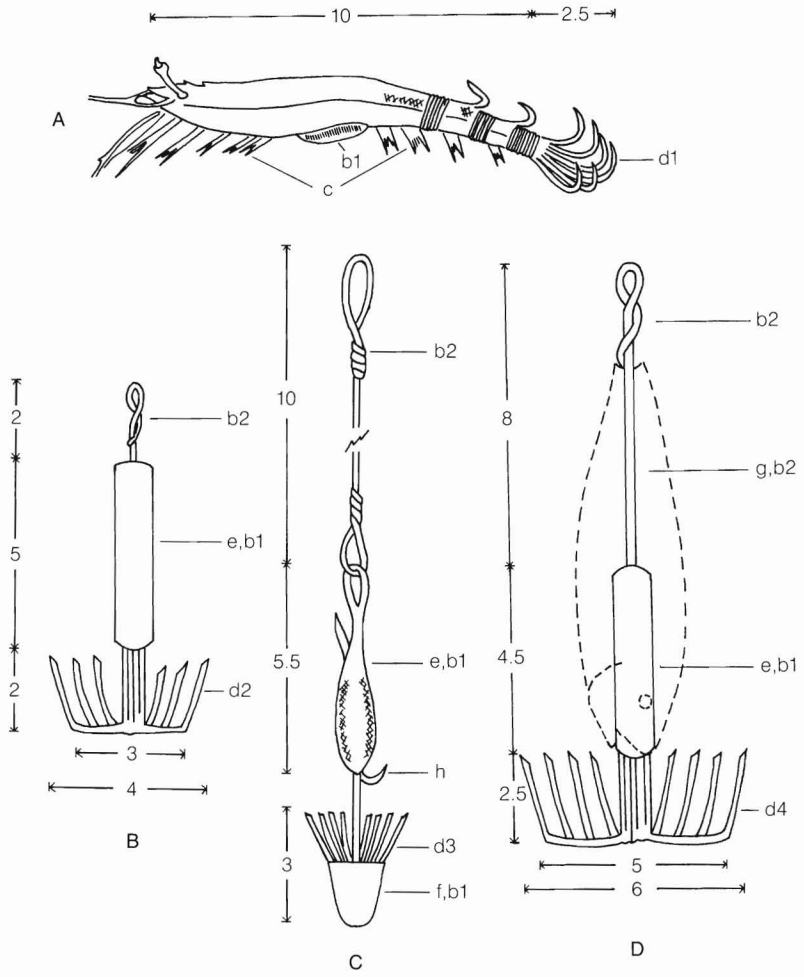

Figure 3.—The most common Philippine squid jigs. A=Shrimp-type jig; B=Cylindrical-type jig; C=Tañon Strait cylindrical jig with bait attachment; D=Cylindrical-type jig with whole fish bait; a=plastic ball "eye"; b1=lead weight; b2=stainless steel; c=nylon monofilament "appendages"; d1=barbless hooks, 12 pcs stainless wire 200-pound test; d2=barbless hooks, 12 pcs stainless steel; d3=barbless hooks, 14 pcs stainless steel; d4=barbless hooks, 16 pcs stainless steel; e=body; f=cone; g=shaft; h=hook for bait attachment. All measurements are in centimeters. Source: Flores (1974).

Research

Some of the research presented here did not include or involve squid research because they were generally stock assessments of demersal fishes. However, trawling gear was used and loliginids were also taken and recorded. This section presents results of studies conducted in the different interisland seas most of which contain useful squid fishery data.

At the height of a growing clamor for closures of certain traditional and productive fishing grounds for management and regulation purposes, several fishing areas in the Philippines were designated for assessment and investigation to determine whether these are potential fishing grounds or whether they are depleted of marine resources. (The Malampaya Sound, located in the northwestern portion of Palawan, was closed in 1973 under Fisheries Administrative Order III.)

Virginia Aprieto, former Director of the Institute of Fisheries Development and Research, initiated early in 1974 sustained studies on the fisheries, biology, and ecology of traditional and nontraditional fishing grounds. So far

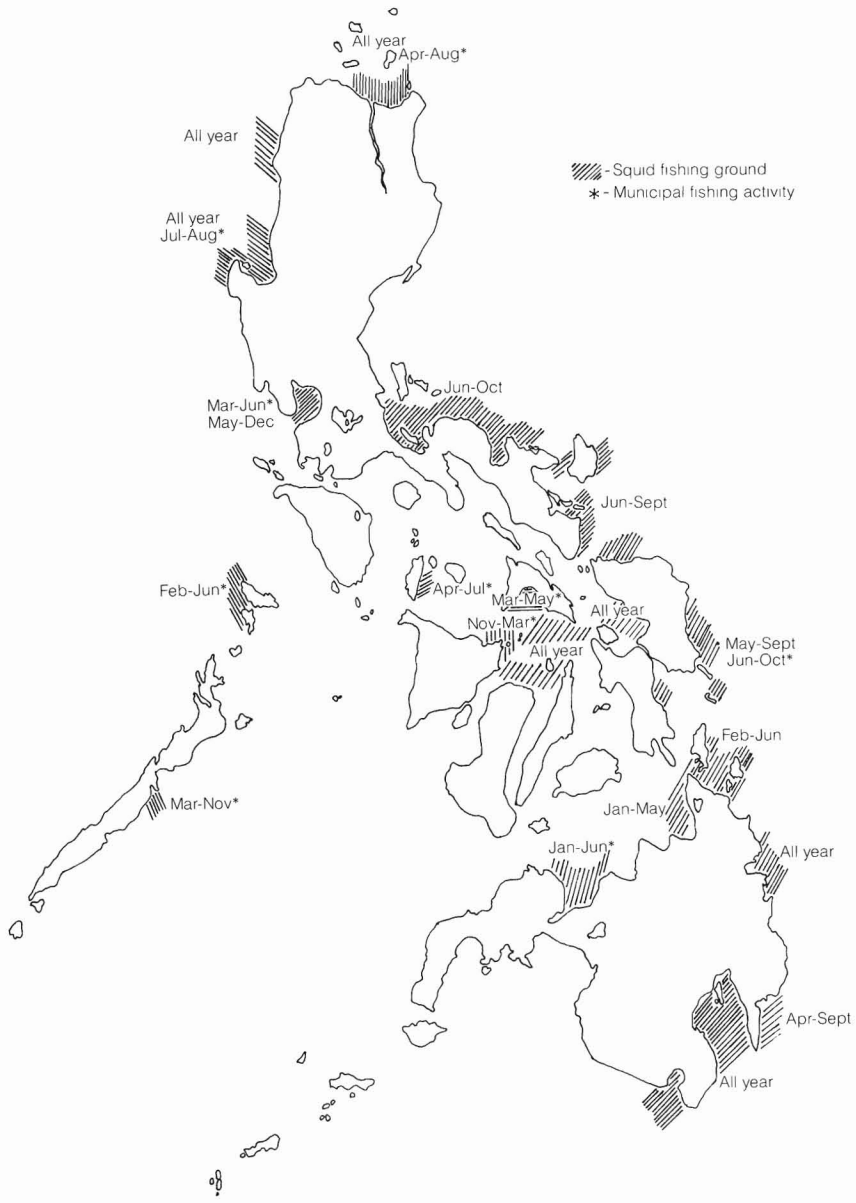

Figure 4. — Areas and main months in which Philippine squids and cuttlefish are caught (modified). Sources: SCSP (1976) and Flores (1974).

four papers have been published and more are being readied. The principal author has participated in some of this investigation and also discusses here a current project. The data or figures presented in this section are not final, until published separately. Summaries of this research follow.

The first in the series deals with echo surveys of northwestern Palawan waters (Aprieto et al., 1974). This area is adjacent to Malampaya Sound. Before the closure was enforced, it ranked in the top 10 fish producing grounds in the Philippines where the majority of the catch was taken from pelagic fisheries. To provide additional trawling areas and to break away from the traditional fishing grounds, new areas were explored. This 125,950 km^2 area representing a nontraditional fishing ground showed echographs of fishes. However, it further revealed steep slopes, peaks, and a rugged bottom. An experimental trawl in the area which is supposedly trawlable got snagged after 30 minutes. The total catch, one *Alectis* sp., three nemipterids, four *Loligo* spp., one *Scoliodon* sp., sponges, and alcyonarians, represented some of the probable stocks.

The senior author was only able to join two cruises in the Visayan Sea Project (conducted from 1976 to 1977). All 12 fishing tracks were positive for squid. The species present, in order of relative abundance, were: *Loligo* sp. (Voss, 1963); *L. duvauceli* and *L. edulis*; *Sepia pharaonis*[4], *Doryteuthis singhalensis*, and *Sepia esculenta*. *Sepioteuthis lessoniana* was caught in small numbers. Generally the Visayan Sea substratum is sandy-muddy as determined by systematic random samples.

Lingayen Gulf was the site of the third fishing ground investigated. Nine out of the twelve stations were set for a 2-hour standard tow. All tracks fished produced loliginid squids averaging 2.4 kg (5.3 pounds) per track. The squids caught were similar to those taken in the Visayan Sea. However, the most abundant was *Loligo duvauceli*, followed by sepiids *Sepia esculenta* and *S. pharaonis*. Occasional catches of *Sepioteuthis lessoniana* and *Loligo edulis* were noted. One *S. lessoniana* caught weighed 1.5 kg (3.3 pounds). In higher latitudes Choe (1961) noted specimens attaining 3.0 kg (6.6 pounds). Several *Octopus membranaceus* and other unidentified octopi were caught, some resembling the unknowns of Voss and Williamson (1972).

The loliginid catch consisted mostly of various sizes ranging from 3.5 to 14 cm (from 1.4 to 5.5 inches) with an average mantle length of 7.5 cm (2.9 inches). Most *Loligo duvauceli* were egg bearing at 5 cm (2 inches). On the basis of field observations the subsampled squid population does not spawn singly in a particular season but has

[4] *Sepia* is not a loliginid.

a protracted spawn year-round. *Doryteuthis singhalansis* were few in the trawling test but were observed to be present in the local market bordering the Lingayen Gulf.

Trawling investigations in the neighboring Samar Sea and Carigara Bay are currently being conducted by the Department of Marine Fisheries, College of Fisheries, University of the Philippines. There were 28 fishing tracks out of the original 34 plotted on the map. A standard 1-hour tow was made in each track per month. Five months of fishing had averaged 198 kg (435.6 pounds) per month. For the Samar Sea alone it was 158 kg (347.6 pounds) per month. There was an abundance of *Sepia pharaonis* and *Loligo duvauceli* with the latter species appearing more often. *Sepia esculenta* and *Sepioteuthis lessoniana* were also present in the fishing area. *Sepioteuthis lessoniana* were large with lengths reaching 30 cm (12 inches) while *Sepia esculenta* ranged from 7 to 10 cm (from 2.8 to 4 inches).

This relative abundance result seems to indicate that the Samar Sea is productive (Table 4). However, due to a Presidential decree banning trawlers within 7 km (4.3 miles) of shore, the fishing effort in the area was reduced. This might account for the large catch.

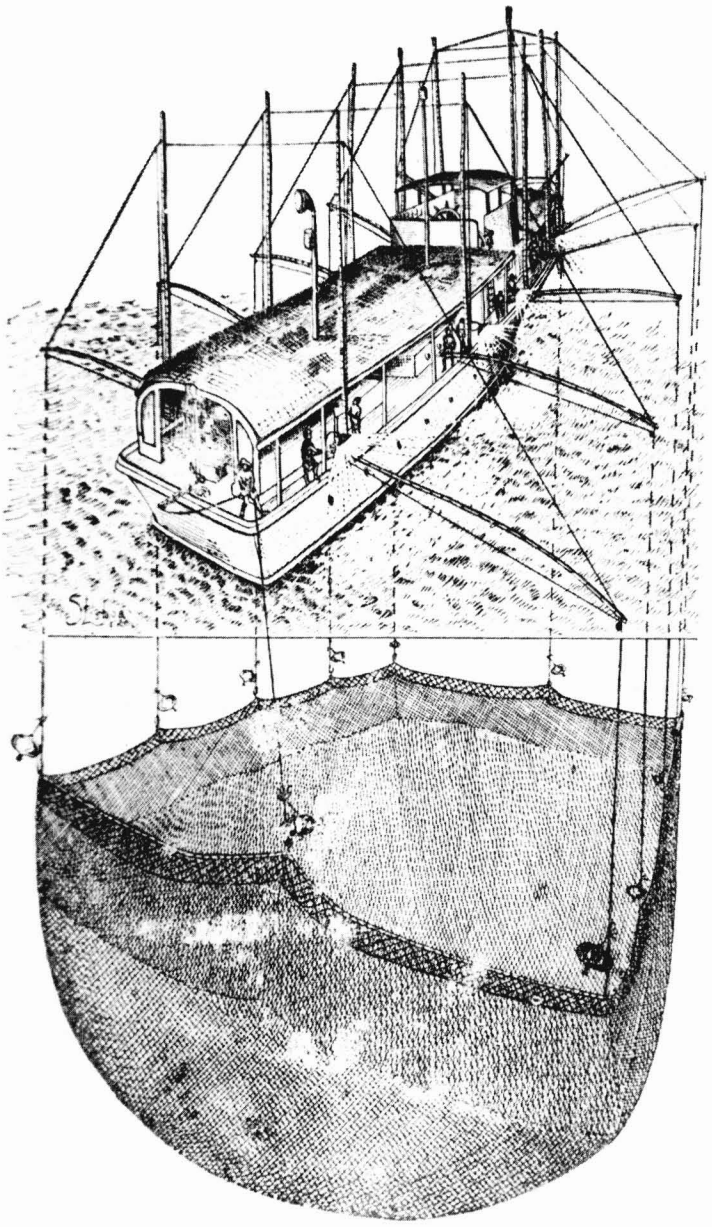

Figure 5.—A motor vessel basnigan in operation. After Manacop and Laron (1953).

Developments

From the above discussion, it can be concluded that the Philippine squid fishery has been given little attention. However, there is now a government program on the development of municipal fisheries which may well include squid fishing. For commercial fishing, the government relaxed its policy on the importation of secondhand vessels. This move was hailed by the fishing industry because it believes it can boost annual catch by 32,000 t (70,547,200 pounds) (Anonymous, 1979). These boats, however, will probably not introduce new technology as they will be used to increase the otter trawl and purse seine fleets.

Foreign aid has been contributing its share too. The ongoing Samar Sea/Carigara Bay Project testing the midwater trawl is done in cooperation with the German Technical Aid Program. No such gear has been used in the Philippines before. According to Peter Jarchau[5] some countries have met success with the midwater trawl and the Japanese have used it to catch squid. In practice, the new trawl can function both as a near-bottom and as a pelagic gear.

Conclusion

The Philippines has one of the most extensive coastlines and territorial waters in which a healthy economy could be built through fishing. Several spe-

[5]German technical adviser. Personal commun.

cies of cephalopods, especially squids, are available for which no potential stock measurement is yet known. Coastal, inshore, and territorial waters abound with myopsid and with some oegopsid squid. The fishing industry, with its numerous vessels, has so far limited itself to fishing in waters close to land and could, in time, overcrowd and overexploit that marine resource.

Trawling remains the most productive fishing gear for squid. However, only a small portion of the possible fishing grounds are available to the otter trawlers. What remains are larger nontrawlable areas where vessels using the purse seine, basnig, and scoop nets aided by lights can venture. By increasing the number of boats using lights with the above gear, we believe that the present production of squid can be doubled.

Jigging is the common method of squid exploitation in the municipal fishery. The number of people using this gear is unknown, but could be substantial in view of Smith's (1979) estimate of 500,000 municipal fishermen in the Philippines. Financial attention should be focused on the squid jiggers as they utilize inexpensive fishing gear and low technology.

Identification and geographical distribution data on squids are lacking so that species stock assessments cannot be properly conducted.

Local and foreign squid markets have grown. Thus, the Philippines must broaden its marine product exports to include canned fishery products because all canned squid and some canned fishes in the local market are import products in which the government loses hundreds of thousands of dollars annually.

Acknowledgment

We especially wish to thank Norman Reyes for the basnig picture.

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