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Small-scale fisheries of San Miguel Bay, Philippines: social aspects of production and marketing

Edited by

Conner Bailey

INSTITUTE OF FISHERIES DEVELOPMENT AND RESEARCH, COLLEGE OF FISHERIES, UNIVERSITY OF THE PHILIPPINES IN THE VISAYAS;
INTERNATIONAL CENTER FOR LIVING AQUATIC RESOURCES MANAGEMENT; THE UNITED NATIONS UNIVERSITY

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Cover: *Upper:* Women and even children play an important role in the marketing and processing of much of the San Miguel Bay catch. *Lower:* Satellite view of the Bay, to the right of center. [Photo, NASA, U.S.A.].

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Preface

The research project "Small-Scale Fisheries of San Miguel Bay: A Multidisciplinary Analysis" was conducted jointly by the Institute of Fisheries Development and Research (IFDR) of the College of Fisheries, University of the Philippines and the International Center for Living Aquatic Resources Management (ICLARM), both based in Manila, Philippines.

San Miguel Bay is one of the more important fisheries of the Philippines, being a shallow productive body of water producing large catches of fish, shrimp and other crustaceans. It is located in the Bicol Region of the Philippines towards the southern end of the island of Luzon, approximately 400 km south of Manila, the capital city and major market for fishery products, especially shrimp.

In addition to the Bay's high biological productivity, there were several other reasons this site was chosen for this in-depth multidisciplinary study, the first of its kind in the Philippines, if not all of Southeast Asia. The Bicol Region is one of the more depressed areas of the country, with per capita incomes well below the national average. For this reason, and because of the potential for increased production from the agricultural sector, the Bicol River Basin Development Program (BRBDP), an integrated area development plan, was formulated in the early 1970s with the major purpose of building the necessary physical and social infrastructure to bring irrigation to the region's rainfed rice land. With its subsequent responsibilities expanding both geographically beyond the Bicol River basin and administratively to include activities other than rice, the BRBDP became interested in the potential for incorporating fishing communities into its development planning. The opportunity existed therefore for this IFDR/ICLARM research project to provide some of the basic biological and socioeconomic information on the fisheries that would make such planning possible.

This technical report analyzes the social linkages among fishing communities of San Miguel Bay, attitudes towards fish production, processing and marketing, economic role of women and children, variations in sharing systems by gear types, and socioeconomic aspects of the marketing system. It represents data gathered primarily from interviews with 641 fishing households, supplemented by participant observation conducted over approximately a two-year period, 1979-1981. Sociology team members were Luz Yater, Amelia Esporlas, Anita Villegas and Elma Villafuerte with assistance from ICLARM's Rural Sociologist, Conner Bailey.

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Field Research Methodology and Characteristics of Fishing Families

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YATER, L.R. 1982. Field research methodology and characteristics of fishing families, p. 1-13. *In* C. Bailey (ed.) Small-scale fisheries of San Miguel Bay, Philippines: social aspects of production and marketing. ICLARM Technical Reports 9, 57 p. Institute of Fisheries Development and Research, College of Fisheries, University of the Philippines in the Visayas, Quezon City, Philippines; International Center for Living Aquatic Resources Management, Manila, Philippines; and the United Nations University, Tokyo, Japan.

Abstract

The three phases of field research and the methodology employed in a study of social aspects of the small-scale fisheries of San Miguel Bay, Philippines—a broad survey followed by a detailed socioeconomic survey, and participant observation—are discussed. General characteristics of fishermen and their families are described.

The Study Area

San Miguel Bay is located in the southeastern extremity of Luzon Island known as the Bicol Region, the residents of which speak the Bicol language and are referred to as Bicolanos. Fishing is an important activity in the Bicol Region, a fact that can be appreciated by noting the relatively great length of coastline compared to land areas on what is essentially a long peninsula. There are several large embayments, including San Miguel Bay, Ragay Gulf, and Lagonoy Gulf, which serve to make the coastline one of the region's dominant physical features. Of these, San Miguel Bay is the most productive due to its shallow, protected, nutrient-rich waters, which support approximately 5,600 fishermen. A detailed description of the hydrographic features of San Miguel Bay is given in Mines et al. (1982).

The Bicol River enters San Miguel Bay at the middle of the Bay's southern base, dividing the municipalities of Cabusao and Calabanga. This river drains a broad alluvial plain devoted primarily to rice cultivation, as well as the surrounding hills and mountains on which are grown coconut trees and other upland crops. To a large extent, these hills and mountains have been cleared of forest cover, mostly during the past few decades. This has contributed to the rapid rate of sedimentation observed in the Bay, which contributes to its high productivity (Mines et al. 1982).

The high natural productivity is not the only reason why the fisheries of San Miguel Bay are important. The great advantage of San Miguel Bay over many other fishing grounds in the Philippines, especially those on the Pacific coast, is that it is sufficiently sheltered by surrounding hills and mountains to allow for continuous fishing with one kind of gear or another. The seasonality of fishing in the Bay is discussed in Esporlas (this report).

Administratively, the communities surrounding San Miguel Bay fall under the jurisdiction of Cabusao, Calabanga, Sipocot, Siruma and Tinambac Municipalities, all within the province of Camarines Sur, and the Municipality of Mercedes in Camarines Norte (Fig. 1). Municipal governments are subordinate to provincial governments but by law (Presidential Decree No. 704 of 1975) are able to act (or not act) with considerable independence in licensing and regulating small-scale or "municipal" fisheries. The Bureau of Fisheries and Aquatic Resources (BFAR), in the Ministry of Natural Resources, represents the national government's interest in fisheries. BFAR has exclusive jurisdiction over all "commercial" gears (defined as all vessels displacing more than 3 GT), and is primarily responsible for development programs designed to benefit both commercial and municipal fishermen. Small-scale or municipal fishermen are those who operate vessels displacing less than 3 GT regardless of engine size or gear type, or who use no vessel at all.

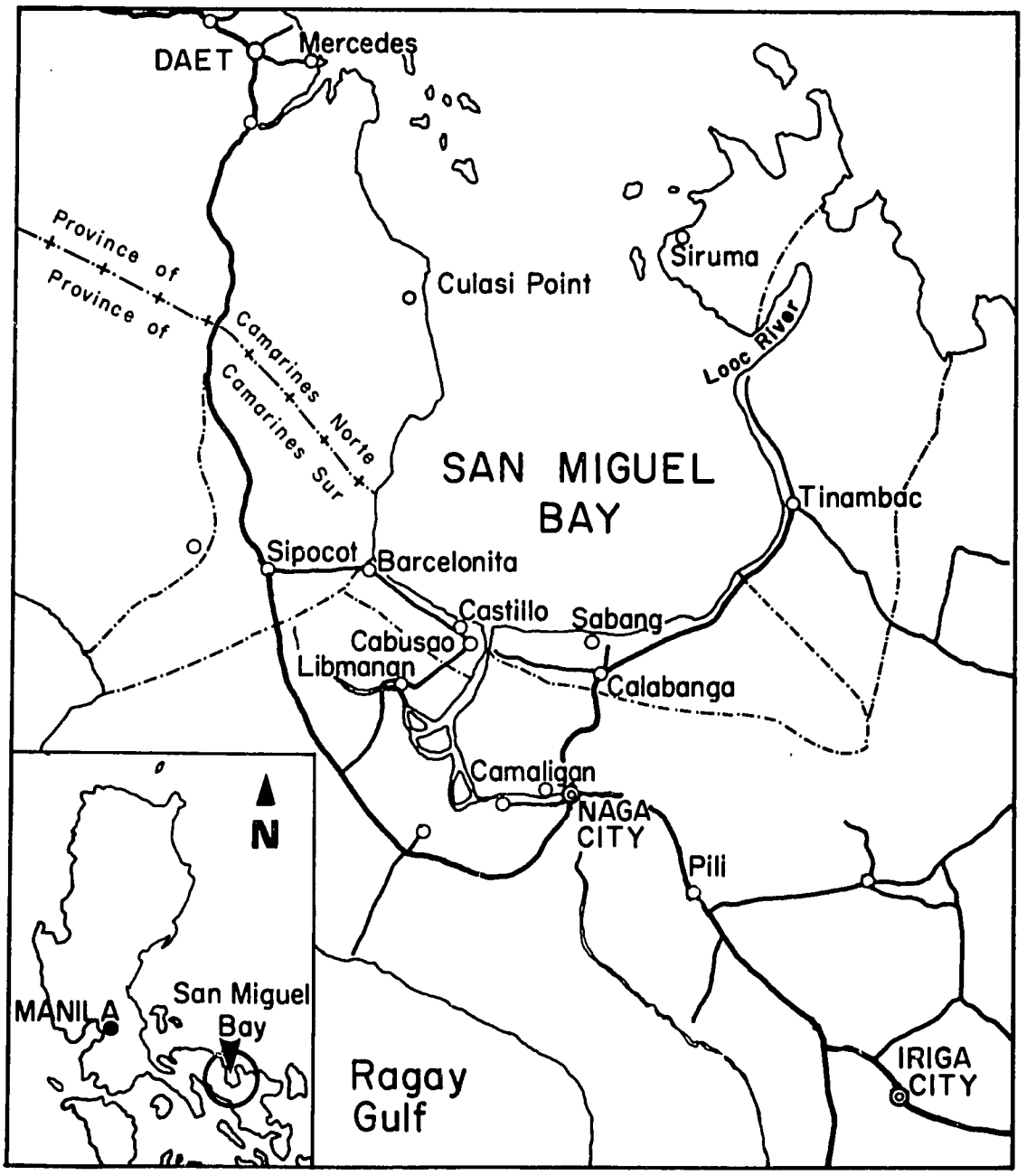

Fig. 1. Municipal and provincial boundaries in San Miguel Bay area, showing railway line and roads.

Numerous gear types are used to exploit the fisheries of San Miguel Bay, including gill-nets, stationary gears (fish corrals, filter nets, liftnets, fish traps), handlines, and various types of trawl gear (Pauly et al. 1982). The gear types used in the Bay require varying levels of investment which in turn affect relationships between owners and crewmen. Villafuerte and Bailey (this report) provide discussion and analysis of ownership patterns and systems of sharing found in San Miguel Bay.

A contribution by Yater (this report) considers the economic roles of women and children in the coastal fishing villages which surround the Bay, underscoring the need to look beyond fishermen to understand the dynamics of fishing communities. Another paper by Yater (this report) discusses problems faced by the fishermen of San Miguel Bay as they perceive them.

Field Research Methodologies

The field research upon which this report is based was carried out by a four-member team over 18 months from October 1979 to March 1981. Research was divided into three phases. The first phase (October 1979 to February 1980) was a general assessment of the 41 fishing communities in the San Miguel Bay area. The total population of these communities as of the 1980 census is shown in Table 1. Fig. 2 shows their location. During this initial phase the research team gathered secondary information available on these communities and made an inventory of the various facilities available, including roads, utilities and other public services. Information on the range of available private services, such as retail shops and markets was collected. Attention was devoted to the types of boats and gear used by fishermen in varous parts of the Bay as well as marketing patterns for fish and other local products. Lists of active fishermen for most of the communities around the Bay were also collected during this phase.

The communities are known as *barangays*, which may be translated as villages or communities, and include both settled areas and the surrounding areas. All of the territory within a municipality

Table 1. Populations of fishing communities surrounding San Miguel Bay.

Barangay	Population	*Barangay*	Population
1. Apuao*	272	21. Santa Lutgarda	673
2. Quinapaguian*	531	22. Balongay*	794
3. Cariñgo*	600	23. Punta Tarawal	314
4. Cayucyucan*	674	24. Sabang*	3,053
5. Masalongsalong	578	25. Belen	796
6. Mambungalon*	1,170	26. Bonot-Sta Rosa*	1,124
7. Matoogtoog*	750	27. Sibobo*	828
8. Hinipaan	941	28. Cagsao	807
9. Culasi	1,154	29. Bagacay*	1,709
10. Hamoraon	922	30. Caaluan	446
11. Lalawigan	1,043	31. Salvacion	785
12. Lanot*	734	32. Sogod*	1,016
13. San Vicente	817	33. Union	670
14. Cotmo	877	34. Buenavista*	1,867
15. Calampinay	450	35. Magtang	529
16. Manga*	858	36. Cagliliog*	1,158
17. Barcelonita*	2,147	37. Bani	806
18. Pandan*	1,138	38. Daligan*	851
19. Castillo*	2,666	39. Sulpa*	682
20. Santa Cruz	806	40. Cabugao	797
		41. Vito*	1,333
		Total	40,166

Source: 1980 Census of the Population (Camarines Norte and Camarines Sur).
Note: Communities marked with asterisks were those chosen for the socioeconomic survey.

is divided into a number of contiguous *barangays*. Local municipal and *barangay* officials were interviewed along with fishermen in the communities visited. This first phase of the field work enabled the team to gain a general understanding of conditions in the San Miguel Bay area and an appreciation for the diversity to be found therein. A number of preliminary descriptive reports were written on the basis of these initial investigations. The understanding obtained during this phase provided important background information necessary for the second phase.

Phase two involved the design, testing and administering of a detailed household socioeconomic survey. This survey was to provide basic information not only for sociological purposes but for the use of the economics and stock assessment teams as well. The efforts of these two teams were directed towards gathering detailed information from a limited number of communities. The socioeconomic survey, by collecting data from 22 of the 41 communities surrounding San Miguel Bay (see Table 1 and Fig. 2), broadened the geographical scope of the study and provided information which allowed the other two teams to compare their results with conditions elsewhere in the Bay.

The selection of communities surveyed was done purposively rather than randomly. Several of the larger and more important fishing communities were intentionally chosen together with a representative sample from those that remained. The criteria for this selection included types of

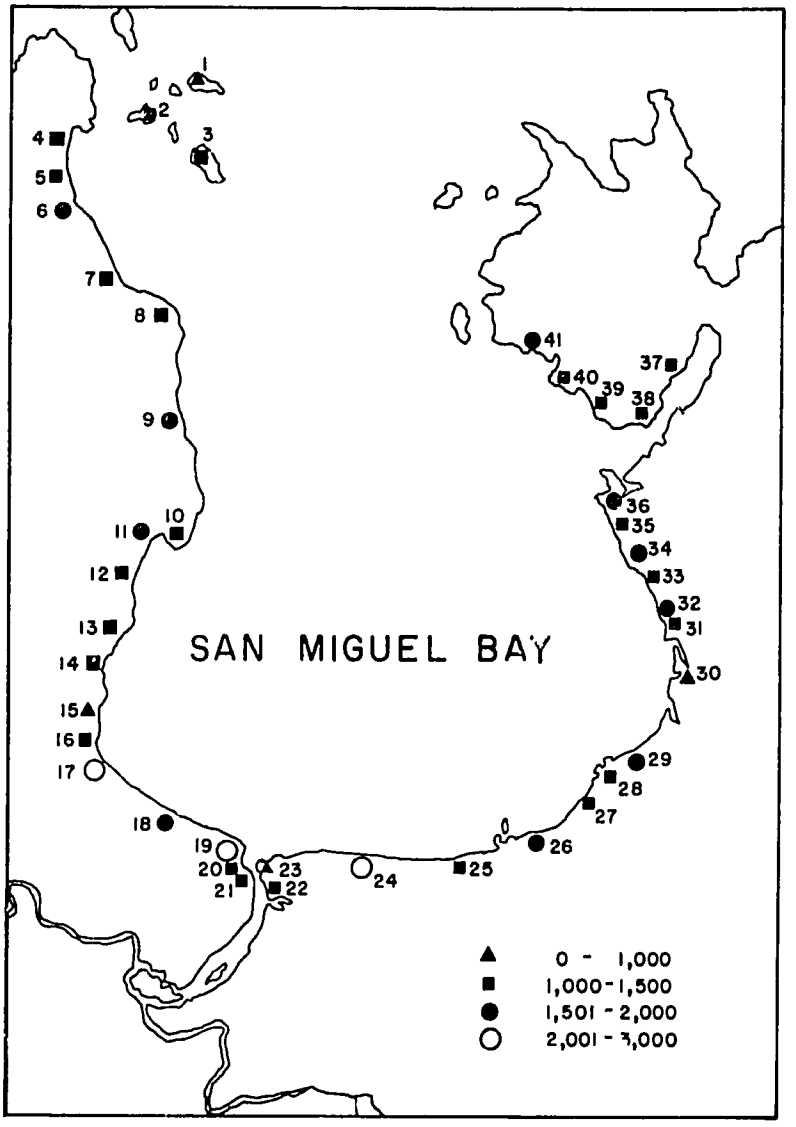

Fig. 2. Location of fishing communities surrounding San Miguel Bay, indicating relative population size. *Barangay* names corresponding to numbers are given in Table 1.

gear in use and marketing patterns, basing decisions on information gathered during the first phase. It was also attempted to distribute the sample communities evenly around the Bay, reinforcing the other criteria noted above.

From each of these 22 communities a 30% sample of active fishermen was chosen to become respondents, working from updated lists originally collected during phase one. Altogether there were 641 respondents.

The survey itself was conducted over a seven-month period, May-December 1980. The work was scheduled to take into account seasonal weather conditions which affected the ability to travel to different parts of the Bay. In-depth interviews with key informants were also made. Respondents were limited to active fishermen, but to obtain a fuller understanding of the fishing communities it often was necessary to interview fish buyers and processors, local village officials, owners of boats who were not active fishermen, and others. Each team member in turn was given the responsibility of developing community profiles based on these interviews and general observations, while other members of the team were engaged primarily with more formal interviews for the survey. These formal interviews lasted an average 45 to 60 minutes, although when the respondent was willing to extend discussions beyond the confines of the survey questions, this was encouraged.

Early in phase two, each member of the team chose a specific topic to write on for the final report. Near the end of this second phase and before data from the survey had been coded, preliminary reports were prepared and presented at an in-house seminar. This forced the team to assess what had been learned on the basis of in-depth interviews and general observations but without the benefit of the survey data. The resulting reports provided a framework for analyzing the survey data and highlighted issues which required further investigation during phase three.

The third phase of field research was conducted in the community of Sabang, Calabanga using the participant-observation research technique over a period of one month, during which time the team members lived in the community and gathered information relevant to their respective assignments. Sabang was selected because it is the largest fishing community of San Miguel Bay and, as home port to most of the Bay's small and medium trawlers (known locally as "baby" trawlers), is also the most important in terms of total catch landed from the Bay. Fishermen using a number of other gear types also operate out of Sabang. In addition, two other members of the project (from the stock assessment team) had worked there for over one year; they were able to assist in establishing good contacts in the community, and to provide important information.

To guide the informal technique of participant observation, the members of the team developed an outline of objectives related to their substantive interests. A mixture of in-depth interviews and general observations was adopted, and observations recorded in small notebooks. At the end of each day the notes were transferred into larger notebooks which contained fuller descriptive accounts of the day's activities. These notebooks were regularly read by ICLARM's rural sociologist who made comments on the observations and suggested means of following up on leads.

During phase three, the survey data collected and coded earlier were punched onto computer cards and preliminary tabulations of the results prepared. Data analysis then was conducted primarily through simple cross-tabulations of variables.

General Characteristics of Fishing Families

The respondents were those employed either full-time or primarily as fishermen. Those who were employed only part-time as fishermen were not included. In many households more than one person (e.g., father and son) were engaged in fishing. In such cases the father was chosen as the respondent as head of the household. Where the father was deceased or not actively involved in full-time fishing (e.g., due to age or illness), the eldest son became the respondent. Interviews typically were conducted in respondents' homes and frequently the wife or mother was present and

took part in answering the questions. This often proved beneficial as women control household finances (see Yater, this report) and were better prepared to answer some of the questions. Table 2 shows the distribution of total fishing households in the 22 *barangays* surveyed.

Married heads of household constituted 90.5% of our respondents; 9.5% were single and included both the head of household (e.g., wife had died) or the oldest fisherman in the household (usually an unmarried son). The youngest respondent was 17 years of age and the oldest was 76; the mean age was 38. Most respondent fishermen were between 25 and 30 years old.

The mean age of respondents was not the same as the mean age of all fishermen operating in San Miguel Bay, since it is common for both father and any sons old enough to go to sea (which may include those as young as 12 years of age). From observations in the field, it was apparent that a large number of adolescent males were engaged in fishing. Based on the survey sample, the mean age of all fishermen, including both respondents and other members of their households, was 33. The age distribution of these fishermen is shown in Fig. 3.

During the survey, information was sought both on current members of the household and on those sons and daughters no longer living with the respondent. Current household members typically were limited to the immediate family, although other family members (e.g., aging parents, siblings and cousins) were occasionally present and were included in the survey. In this report, family members living with respondents constitute the "household"; where members no longer living with the respondent are included, the broader term "family" is used.

During the survey, information on a total of 3,691 family members in addition to the 641 respondents was collected. Of this total, 640 family members were no longer living with the respon-

Table 2. Distribution of respondents in the socioeconomic survey of San Miguel Bay, by *barangay* and municipality, 1980.

Municipality	*Barangay*	Total fishing households	30% sample
Cabusao	Barcelonita	173	52
	Castillo	282	84
	Pandan	77	23
Calabanga	Balongay	55	16
	Bonot-Sta. Rosa	105	31
	Sabang	300	90
	Sibobo	95	28
Mercedes	Apuao	36	10
	Cariñgo	84	25
	Cayucyucan	35	10
	Lanot	53	16
	Mambungalon	115	34
	Matoogtoog	37	11
	Quinapaguian	84	25
Sipocot	Manga	83	25
Siruma	Sulpa	68	20
	Vito	121	36
Tinambac	Bagacay	49	15
	Buenavista	67	20
	Cagliliog	69	20
	Daligan	89	27
	Sogod	78	23
Total	22	2.092	641

dents (Table 3), leaving a total of 3,692, or an average of 5.8 persons per household. Table 4 shows the distribution of family members according to their relation with the respondents. The age distribution of these family members is presented in Table 5.

It is interesting to note from Table 4 that daughters were more likely to have left the respondents' households than were sons. The total numbers of sons and daughters were nearly equal and their distribution by age (Table 5) offers little insight as to why 144 more daughters than sons had left their home. There are, however, a number of possible explanations. Daughters tend to marry at an earlier age than sons. Moreover, employment prospects for sons in the home village (i.e., fishing) are more attractive than those available to daughters, who may find employment elsewhere as household helpers or factory workers.

The educational background of respondent fishermen is shown in Table 6. Some 86% had some elementary schooling and 54% had completed primary school. Very few reached high school or college.

Table 7 shows educational attainment of all family members, including children not yet of school age, who account for the large number of responses recorded as not applicable. Of those who had attended or were currently attending school, the average period of enrollment was 5.6 years.

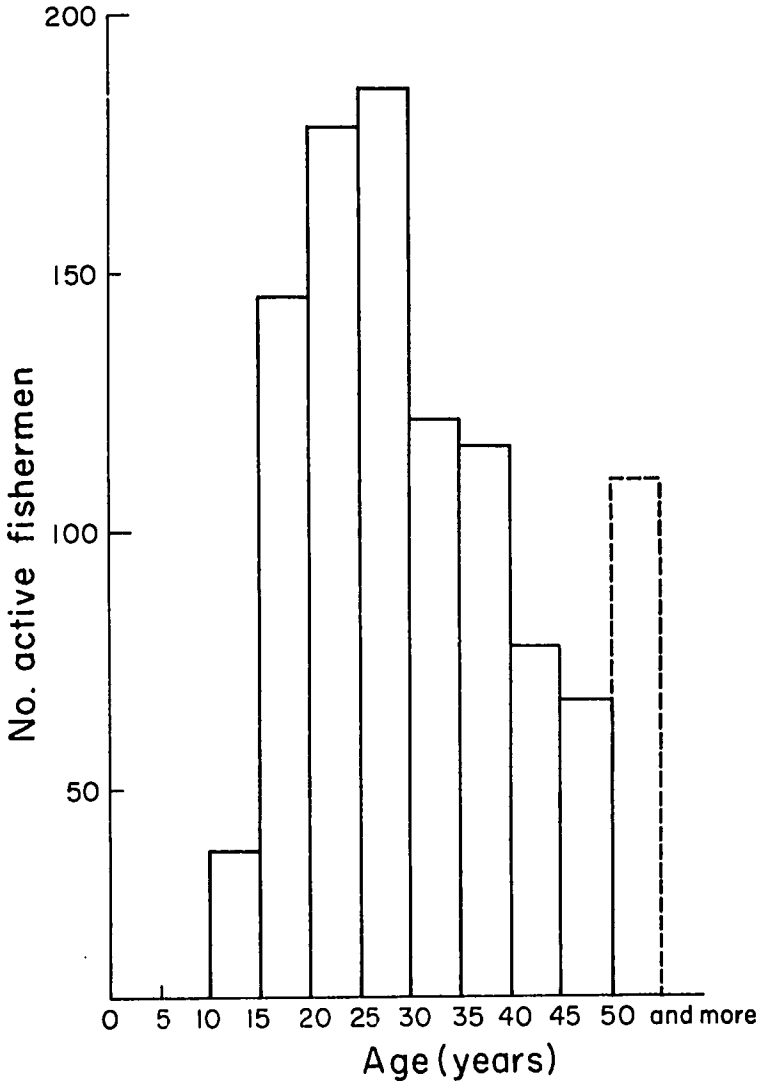

Fig. 3. Age distribution of active fishermen including respondents and other household members in the socioeconomic survey sample, San Miguel Bay (N = 1,036).

Table 3. Status of family members with respondents of the socioeconomic survey, San Miguel Bay, by residence.

Sex		No. of members living with respondent	No. of members not living with respondent	Total
Males	No.	1,311	247	1,558
	%	(43.0)	(38.6)	(42.2)
Females	No.	1,740	393	2,133
	%	(57.0)	(61.4)	(57.8)
Total	No.	3,051	640	3,691
	%	(100.0)	(100.0)	(100.0)

Table 4. Status of family members with respondents of the socioeconomic survey, San Miguel Bay, by residence and relationship.

		No. of members living with respondent	No. of members not living with respondent	Total
Father/ mother	No.	81	1	82
	%	(2.7)	(0.1)	(2.2)
Wife	No.	578	2	580
	%	(19.0)	(0.3)	(15.7)
Sons	No.	1,143	240	1,383
	%	(37.5)	(37.50)	(37.5)
Daughters	No.	997	384	1,381
	%	(32.7)	(60.0)	(37.4)
Other relatives	No.	251	13	264
	%	(8.2)	(2.0)	(7.2)
Total	No.	3,050	640	3,690*
	%			

*The total number of cases differs slightly from Table 3 due to the different method of computation.

Table 5. Distribution of family members with respondents of the socioeconomic survey, San Miguel Bay, by relationship and by age (in year-groups).

	Age group (in years)										
	1-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51 & above	Total*
Father/mother	–	–	–	–	–	2	8	6	18	40	76
Wife	–	1	31	96	125	82	88	61	49	54	585
Sons	653	245	206	129	76	39	26	8	1	–	1,383
Daughters	686	220	170	133	85	46	23	10	2	–	1,375
Other relatives**	76	49	49	36	11	11	8	7	7	10	264
Total No.	1,415	515	456	394	297	180	153	92	77	104	3,683
%	(38.4)	(14.0)	(12.4)	(10.7)	(8.1)	(4.9)	(4.2)	(2.5)	(2.1)	(2.8)	(100.0)

*The total number of cases differs slightly from Table 3 due to the different method of computation.

**Included in this figure are a small number of unrelated household members employed as full-time helpers who live and take their meals in respondents' houses.

Table 6. Educational attainment of 641 respondent fishermen in the socioeconomic survey, San Miguel Bay.

Municipality	Elementary								High School				College				Total
	0	1	2	3	4	5	6	7*	1	2	3	4	1	2	3	4	
Cabusao	3	1	–	7	21	15	88	10	6	4	4	–	–	–	–	–	159
Calabanga	4	–	2	12	24	15	78	9	8	3	6	1	1	2	–	–	165
Mercedes	3	2	4	4	21	19	59	6	9	2	3	–	–	–	–	–	132
Sipocot	1	–	2	1	3	2	13	1	2	–	–	–	–	–	–	–	25
Siruma	–	–	2	1	12	9	26	–	1	3	1	–	–	–	–	–	56
Tinambac	3	1	1	1	15	12	49	5	6	3	5	1	2	–	–	–	104
Total No.	14	4	11	26	96	72	313	31	32	15	19	2	4	2	–	–	641
%	(2.2)	(0.6)	(1.7)	(4.1)	(15.0)	(11.2)	(48.8)	(4.8)	(5.0)	(2.3)	(3.0)	(0.3)	(0.6)	(0.3)			(100.0)

*Before Independence of the Philippines in 1945, some primery schools included a seventh year.

Table 7. Educational attainment by sex of all family members in the socioeconomic survey sample, San Miguel Bay.

	Male	Female	Total
Grade 1	94	84	178
Grade 2	77	73	150
Grade 3	107	90	197
Grade 4	189	143	332
Grade 5	211	152	363
Grade 6	682	674	1,356
1st yr. high school	83	94	177
2nd yr. high school	73	59	132
3rd yr. high school	50	47	97
4th yr. high school	56	85	141
1st yr. college	4	9	13
2nd yr. college	10	13	23
3rd yr. college	3	2	5
4th yr. college	9	15	24
Graduate school	–	1	1
Vocational school	–	–	–
Not applicable or did not know	554	597	1,151
Total	2,202	2,138	4,340

Females had slightly more education, with an average of 6.4 years compared to 5.4 years for males. One reason for this difference may be the relatively greater income lost by fishing households in allowing male children to pursue their education instead of joining their fathers at sea.

Education is highly valued by all Filipino families, including those of the San Miguel Bay area, as it is seen as the most promising avenue towards better employment and higher incomes. For residents of many coastal fishing communities, however, there are major obstacles. Most of the smaller communities do not have complete elementary schools, offering only grades one to four. Children from such communities would have to continue their studies at a different school, which may prove impractical as travel to and from these communities is often possible only by boat. Similar problems exist for those students who wish to pursue a high school education. High schools are located in only a few of the larger coastal fishing communities, and it becomes necessary for students from other communities to commute daily where this is possible or take up lodgings at or near the closest available high school. The expense involved in either of these two options is prohibitive to most families.

Dependence on Fishing

A substantial majority (66%) of respondents reported total or nearly total reliance upon fishing for their family's income. The reasons for such heavy reliance on this single activity included lack of access to agricultural land and limited opportunities in the local manufacturing sector. Detailed discussion is given in Bailey (1982).

Table 8 presents data on the primary occupation of all males, including respondents, who lived in respondents' households. Table 9 presents parallel information for females.

The heavy reliance on fishing indicated in Table 8 in part reflects the selection criteria used in choosing the respondents, but it also indicates that many of the respondents' sons have followed their fathers to sea. Limited alternative employment prospects are also reflected in Table 9 where the vast majority of females not enrolled in school were reported to be engaged primarily in housekeeping. The most important income-earning activities of women in the communities studied were in fish marketing and processing. However, the involvement of women in the local economy of fishing communities is considerably broader than indicated in this Table (Yater, this report). Heavy

Table 8. Primary occupation by age group for male household members of the survey sample, San Miguel Bay.

Age group	Student	Fishing	Farming	White collar job**	Blue collar job***	Respondent did not know	Total*
1-10	207 (38.9)†	–	–	–	1 (0.6)	–	208 (11.7)
11-15	184 (34.6)	38 (3.7)	1 (4.0)	–	10 (6.7)	–	233 (13.2)
16-20	51 (9.6)	145 (14.0)	3 (12.0)	–	26 (17.3)	2 (22.2)	227 (12.8)
21-25	13 (2.4)	178 (17.2)	4 (16.0)	1 (5.3)	30 (20.0)	4 (44.4)	230 (13.0)
26-30	11 (2.1)	185 (17.9)	4 (16.0)	5 (26.3)	22 (14.7)	1 (11.1)	228 (12.9)
31-35	9 (1.7)	121 (11.7)	–	2 (10.5)	14 (9.3)	–	146 (8.2)
36-40	16 (3.0)	116 (11.2)	–	2 (10.5)	19 (12.7)	1 (11.1)	154 (8.7)
41-45	15 (2.1)	77 (6.5)	2 (8.0)	4 (21.0)	6 (4.0)	1 (11.1)	105 (5.9)
46-50	11 (2.1)	67 (6.5)	8 (32.0)	1 (5.3)	10 (6.7)	–	95 (5.5)
51 and over	15 (2.8)	109 (10.5)	3 (12.0)	4 (21.0)	12 (8.0)	–	143 (8.1)
Total No.	532	1,036	25	19	150	9	1,771
%	(30.0)	(58.5)	(1.4)	(1.1)	(8.5)	(0.4)	(100.0)

*Total excludes pre-schoolers (aged 1-6 years) and persons unemployed due to physical or mental disability.
**Includes teachers, accountants, clerks, secretaries, etc.
***Includes fish buyers, processors, porters and factory workers.
†Percentage of vertical columns.

Table 9. Primary occupation by age group for female household members of the survey sample, San Miguel Bay.

Age group	Student	Fishing	Farming	Housekeeping	White collar job**	Blue collar job***	Respondent did not know	Total*
1-10	185 (43.4)†	–	–	1 (0.1)	–	4 (2.2)	–	190 (12.0)
11-15	189 (44.4)	–	–	50 (5.3)	–	1 (0.5)	1 (50.0)	241 (15.3)
16-20	43 (10.1)	–	–	124 (13.1)	–	53 (28.8)	1 (50.0)	221 (14.0)
21-25	7 (1.5)	–	–	197 (20.8)	1 (6.7)	39 (21.2)	–	244 (15.4)
26-30	1 (0.3)	2 (40.0)	–	181 (19.2)	4 (26.7)	30 (16.3)	–	218 (13.8)
31-35	1 (0.3)	–	–	107 (11.3)	4 (26.7)	20 (10.9)	–	132 (8.4)
36-40	–	3 (60.0)	1 (50.0)	97 (10.3)	4 (26.7)	19 (10.3)	–	124 (7.8)
41-45	–	–	1 (50.0)	65 (6.9)	2 (13.3)	7 (3.8)	–	75 (4.7)
46-50	–	–	–	54 (5.7)	–	6 (3.3)	–	60 (4.0)
51 and over	–	–	–	69 (7.3)	–	5 (2.7)	–	74 (4.7)
Total No.	426	5	2	945	15	184	2	1,579
%	(26.9)	(0.3)	(0.1)	(59.8)	(0.9)	(11.6)	(0.1)	(100.0)

*Total excludes pre-schoolers (aged 1-6 years) and persons unemployed due to physical or mental disability.
**Includes teachers, accountants, clerks, secretaries, etc.
***Includes fish buyers, processors, porters and factory workers.
†Percentage of vertical columns.

reliance on income earned from fishing presents major problems during seasons when the catch is poor. During such times expenditures of fishing families are limited to immediate consumption requirements and any family savings are likely to be spent to meet basic food needs.

Some Measures Regarding Satisfaction with Present Life

It is often said that fishermen are bound by "the call of the sea" and are reluctant to adopt alternative occupations despite the relatively low incomes usually associated with small-scale fishing (Gordon 1954). To ascertain the veracity of this proposition, respondents were asked if they would be willing to change both their occupation and community of residence if such a move offered the opportunity of earning higher incomes. They were also asked whether they would encourage their children to move away from their home community in order to obtain more remunerative employment. The responses are shown in Tables 10 and 11.

Forty-four percent of the respondents indicated a willingness to move to a different municipality within the same province to obtain better paying employment and 39% were willing to move across

Table 10. Willingness of respondents in the socioeconomic survey, San Miguel Bay, to leave fishing and present home village to take up an occupation other than fishing (N = 641).

Response	Different municipality		Different province	
	No. fishermen	%	No. fishermen	%
Yes	285	44.5	251	39.2
No	190	29.6	220	34.3
It depends	155	24.2	160	25.0
Don't know	11	1.7	10	1.5

Table 11. Willingness of respondents in the socioeconomic survey, San Miguel Bay, to let children take an occupation other than fishing elsewhere (N = 641).

Response	Different municipality		Different province	
	No. fishermen	%	No. fishermen	%
Recommend to leave	539	84.1	534	83.3
Recommend to stay	21	3.2	23	3.6
It depends	26	4.1	29	4.5
Don't know	17	2.6	17	2.6
No children in family	38	6.0	38	6.0

provincial boundaries. Roughly one-third of respondents said that they would not be interested in such changes in occupation and residence. Nearly one-quarter of the respondents were unsure, saying their decision would depend on circumstances. Considerably higher percentages (over 80%) of respondents indicated they would encourage their children to seek better employment opportunities elsewhere, regardless of whether the move was within the same province or to a different province.

The issues of occupational and geographical mobility are examined by Bailey (1982), who shows that this stated willingness to accept change reflects actual behavior as high rates of out-migration from the coastal fishing communities surrounding San Miguel Bay have been recorded. This out-migration reflects considerable dissatisfaction regarding the income-earning potential of fishing in the Bay.

This dissatisfaction was not reflected in answers to a number of questions posed to respondents, which were designed to measure satisfaction with their life (Table 12). A majority of respondents said that their household "gets everything it needs" and that "generally, the economic life of the people in this community is good". The responses generally reflected a positive assessment of life in their community, especially as compared to life in the city. The only negative opinions expressed concerned the lower rate of price increases for fish as compared to other commodities, and the lack of adequate support by local officials.

The general satisfaction with life indicated in Table 12 stands in contrast to stated willingness to leave the home community and to actual out-migration patterns (Bailey 1982). It may be that the respondents answered the questions listed in Table 12 in the way they did because an outsider and stranger—the interviewer—was the one who posed them. The responses may have been calculated to present an image of community solidarity to the outside world. This in itself is significant, however, as an indication of identification with the community and a desire to maintain the community's "good name". This sense of community is a hopeful sign that if the collective energies of fishermen in San Miguel Bay could effectively be mobilized and organized, they could play a role in shaping and implementing future development in the area.

Table 12. Responses to selected statements on satisfaction with life by respondents in the socioeconomic survey, San Miguel Bay (N = 641).

Response	Q1*	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
Agree (%)	54.6	8.0	80.5	20.0	87.7	46.2	78.2	5.1	35.9	4.4	5.6	54.3
(No.)	(350)	(51)	(516)	(128)	(556)	(296)	(501)	(33)	(230)	(28)	(36)	(348)
Disagree	15.9	79.5	8.0	69.1	4.0	39.6	6.4	84.2	50.9	88.8	88.1	8.6
	(102)	(508)	(51)	(443)	(25)	(254)	(41)	(540)	(326)	(569)	(565)	(55)
Neither agree	28.9	12.5	10.1	10.1	8.6	11.7	14.8	9.0	12.8	6.0	3.9	35.6
nor disagree	(185)	(80)	(65)	(65)	(55)	(75)	(95)	(57)	(82)	(38)	(25)	(228)
Don't know	0.6	0.3	1.4	0.7	0.7	2.5	0.7	1.7	0.4	0.9	2.3	1.6
	(4)	(2)	(9)	(5)	(5)	(16)	(5)	(11)	(3)	(6)	(15)	(10)

Key:
*Q1 — My household gets everything it needs.
2 — We do not get along well with our neighbors.
3 — For me, this village is the ideal community.
4 — In times of need, the people in this community never help one another.
5 — Fishing is what makes this community develop.
6 — This community is not well supported by local officials.
7 — In terms of work, we rely a lot on fishing.
8 — All things considered, life in the city is better than life in this barrio.
9 — We cannot afford to save some of our income now.
10 — The prices of our fish went higher than the prices of commodities.
11 — It is better for parents to let their children work for a living and save as soon as they can rather than let them study and earn later.
12 — Generally, the economic life of the people in this community is good.

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The Seasonality of Fishing, Marketing and Processing

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Abstract

The seasonality of the San Miguel Bay, Philippines fishery is discussed in relation to weather patterns and the presence of hills and mountains which shelter different parts of the Bay during the two monsoonal seasons, allowing for year-round fishing. The seasonal nature of fishing, nonetheless, commonly makes necessary a shift from one gear to another to take advantage of the various fishing grounds and fisheries. This in turn affects marketing patterns and the activities of fish processors. Marketing relationships and constraints are related to community size, number of buyers present, and availability of road transportation. The seasonal role of processors is assessed relative to weather conditions, availability of fish, and impact on price levels during seasons of peak supply.

Introduction

The focus of this paper is the effect of seasonal variations on fishing activities and on marketing and handling of the fishermen's catch. The seasonality of fishing follows a predictable pattern. The gears that are used, the species of fish that are caught, how and to whom the catch is sold, and what options are available for processing those species of fish not normally sold fresh, all vary from season to season. The importance of seasonal fluctuations in fishing is hard to overstate. It affects incomes and standards of living, affects the price of fish for fishermen and consumer alike, complicates household budgeting and investment strategies, and encourages involvement in alternative economic activities (Bailey 1982). Beyond such human concerns, an understanding of seasonality is of considerable importance in measuring levels of fishing effort. This paper provides a detailed description and analysis to complement the work of the Project's economics team (Smith and Mines 1982) and the stock assessment team (Pauly and Mines 1982).

This contribution is based on both structured and unstructured interviewing. Taking into consideration variations in levels of fishing, marketing and processing, 22 fishing communities from six municipalities surrounding San Miguel Bay were included in a broad socioeconomic survey. In addition to the formal questionnaires used in this survey, in-depth interviewing and participant-observation techniques of field research were used. These less formal research tools were particularly useful during one month's residence in Sabang, Calabanga and allowed for close observation of interactions

within the market, strategies used by buyers and sellers, and for understanding the distribution patterns of fresh and dried fish. Interviews with knowledgeable fishermen regarding the seasonal nature of fishing grounds and the advantages of various gear types also were conducted.

The San Miguel Bay Fishery

Prevailing winds during the year are determined by the northeast and southwest monsoons. During the southwest monsoon (May-October) the waters along the southern and western sides of the Bay are protected by the mountains of the Bicol National Forest to the west and the nearby hills along Ragay Gulf to the southwest. During this season, fishing is concentrated along Mercedes and Sipocot on the west and Calabanga and Cabusao in the south (see cover photo and Fig. 1).

Conversely, during the northeast monsoon, the waters along the southern and western sides of the Bay are directly exposed to the wind and become rough. During this season the eastern coast is protected by Mt. Isarog (1,976 m) and the hills of Siruma and Tinambac Municipalities. Thus, San Miguel Bay is sufficiently sheltered to allow for year-round fishing, though it is often necessary for fishermen to shift to different fishing grounds and to use different types of gear. The frequency distribution of gear types found in the Bay is summarized in Table 1. Details on their use are given in Smith et al. (1980) and Pauly and Mines (1982).

Fishermen, in order to remain active throughout the year, must change from one gear to another. Since few fishermen own more than one kind of gear (see Villafuerte and Bailey, this report), it is often necessary for owner-operators of one type of gear to work as crewmen for others during certain seasons.

Table 1. Gear types used in San Miguel Bay (1980).

Gear type (local name)	Number[1]	Percent of total
Gill-net (various types)	1,515[2]	42.7
Scissor (push) net *(sakag)*	634	17.9
Hook and line *(banwit)*	424	12.0
'Mini' trawl *(itik-itik)*	188	5.3
Stationary liftnet *(bukatot)*	171	4.8
Fish pot *(bubo)*	106	3.0
Longline *(kitang)*	103	2.9
'Baby' trawl[3]	95	2.7
Fish corral *(bakiad)*	89	2.5
Crab liftnet *(bintol)*	71	2.0
Filter net *(biakus)*	60	1.7
Spear gun *(antipara)*	51	1.4
Mobila bag net ('baby' *basnig*)	17	0.5
Beach seine *(sinsoro)*	11	0.3
Fish weir *(sabay)*	5	0.1
Round haul seine	4	0.1
Stationary tidal weir *(ambak)*	2	–
Cast net[4]	1	–
Total	3,547	100

[1]Gears counted between November 1979 and March 1981.

[2]These 1,515 gill-nets are used on approximately 350 gill-net fishing units.

[3]See text for distinction between small and medium trawlers which together comprise the so-called 'baby' trawlers in the Philippines. Of these 95 trawlers, 75 are small (<3 GT).

[4]Probably underestimated.

The diversity of gear types reflects the multispecies nature of San Miguel Bay fisheries and the varying conditions found in different parts of the Bay. Differences in gear used and species caught directly affect methods of marketing and processing, as do weather patterns and access to transportation facilities.

Marketing and Handling in Small Fishing Communities

Marketing and handling of fish and shrimp require efficient and reliable transportation to external markets. There are many small communities around the Bay which are not served by roads, especially along the western and northeastern coasts. The problems in marketing and handling that these communities face are distinctly different from those of communities which are served by roads.

Along the western coast (Mercedes and Sipocot Municipalities), passengers and cargo, including fish and shrimp, depend on irregular transport services by pumpboats which move from one community to another. Generally, those communities north of Culasi Point send their catch and agricultural products to Mercedes, while those to the south send cargo towards the road terminus at Barcelonita, Cabusao. Travel to this latter destination is complicated by the need to time arrival during high tides, as the broad mud flats at Barcelonita preclude landing at other times. Some fishermen bring their catch directly to Barcelonita or Mercedes, especially if their fishing grounds during a particular season are near these sites and if the value of their catch (e.g., shrimp or groupers) warrants the added expense. Often, however, the distances and expense involved discourage marketing of fresh fish except in the immediate and sparsely populated hinterland and the bulk of the catch is salted and dried. After leaving enough dried fish for household consumption needs during periods of poor fishing, the remainder is sold, usually to local buyers who transport the product to the next market.

In Siruma and several of the northwestern communities of Tinambac a similar situation obtains. An important difference is that several large passenger launches based in Bagacay, Tinambac serve these communities. Their schedule of operations is affected by tides but their service is more regular and less affected by rough weather. Moreover, their cargo capacity is considerably greater and permits the shipment of ice is used for packing shrimp to isolated fishing communities. The more regular transport services on this coast offer a wider range of options in marketing and handling, but the cost of ice is prohibitively expensive for most fish species. Consequently, most of the fish landed is for local consumption in the immediate area, with the remainder salted and dried for other markets through Bagacay.

A common problem faced by these isolated communities is lack of competition among buyers. It did not prove possible to collect careful information on marketing margins, as was done for Castillo by the Project's economics team (Smith and Mines 1982), but from observation it appears likely that the absence of competition has an adverse effect on prices received by fishermen. There tend to be only a few buyers in each of these isolated communities and their influence is strengthened by their roles in providing credit for both production (e.g., boats and nets) and consumption purposes.

Small fishing communities with access to roads also face problems associated with limited numbers of buyers. However, the existence of roads and transportation services provided by jeepneys offers alternative marketing channels which limit the ability of local buyers to offer low prices for the catch. Where fishing communities are linked to urban markets by road it becomes possible for fishermen's wives to sell the catch directly to consumers or to market retailers. Moreover, the presence of roads tends to coincide with relatively densely populated agricultural communities located in close proximity to these coastal fishing communities, offering greater options for local marketing.

Marketing and Handling in Large Fishing Communities

The three most important fish landings in the San Miguel Bay area are Castillo and Sabang, both located along the southern base of the Bay, and Mercedes, located on the northwest coast at the

mouth of the Bay. Each of these major landings is accessible by land transportation and supplies fish and shrimp to such local urban markets as Sipocot, Libmanan, Naga City and Daet, as well as more distant markets including Manila. Detailed information on marketing from Castillo is reported by Yater et al. (1982). In this section the social relationships affecting fish marketing are described and analyzed, including the various types of buyers present at the landings, the role they play in the distribution of fishery products to final retail outlets, and the level of satisfaction of the fishermen themselves with existing marketing arrangements.

A number of different types of middlemen can be observed at the major fish landings, including petty retail traders, "buy-and-sell" middlemen, wholesale traders, brokers and fish processors. The presence of each type depends on which species are landed, the volume of catch, and general market conditions. Only at major landing areas are all types of buyers likely to be represented; in other smaller landings, the range as well as the absolute number of buyers is quite limited.

Brokers are found only at Mercedes, Castillo and Sabang, where large volumes of fish are landed and must be disposed of quickly. The broker may either be the boat owner or his representative. Once the catch is landed, the broker accepts whispered bids from the assembled buyers and presumably takes the highest offer. This type of secret bidding, known as *bulungan*, typically takes only a few minutes, including the time taken by the buyers to assess the approximate weight of the fish displayed either in baskets or piled on the ground and to consider current market conditions.

In this manner even large catches may be sold within ten or fifteen minutes from the time they are landed. Brokers charge commissions of five to seven percent for their services, which include collecting money from the actual buyers. Where the buyers are fish processors (especially common in Mercedes), payment may not be obtained for one or even two weeks. Since fishermen usually require immediate payment for operational expenses, brokers must have enough working capital to pay the fishermen on or near the day of the sale. This financial aspect of the broker's role, combined with his knowledge of local buyers' credit worthiness and of market conditions, justifies in the minds of the fishermen the broker's commission.

There are two types of middlemen who buy from brokers. One group of these buyers, the buy-and-sell middlemen, bid on bulk sales offered by the brokers and break down their purchases into smaller lots for resale to small-scale retailers known as *rigaton*. Such transactions typically are limited to small relatively inexpensive food fish preferred by local consumers. The second group, known as *factorador*, concentrate on the purchase of first-class species, especially shrimp, which they sell to urban retailers both in local markets and in Manila. Some *factorador* also retail their purchases in local urban markets.

By far the most numerous type of middlemen are the *rigaton*. At major fish landing sites such as Sabang and Mercedes, *rigaton* usually purchase fish from buy-and-sell middlemen, though they also buy from individual fishermen. In smaller fishing communities *rigaton* buy directly from the fishermen or the fishermen's wives (see Yater, this report). Most *rigaton* are women who sell fish in nearby agricultural communities or small urban centers. The numbers and distribution of these various middlemen in the sampled *barangays* are shown in Table 2.

This marketing pyramid with brokers at the apex functions by distributing quickly the large volumes of fish landed by trawlers from Sabang and bag-net vessels which operate out of Mercedes during the southwest monsoon. The catch of gill-netters or other small-scale gear, however, rarely follows this pattern, even in the larger landing areas where brokers operate. Instead such fishermen sell either directly to *rigaton* or to *factorador* who specialize in certain species, most commonly shrimp but also first-class food fish. High quality fish usually are marketed in Manila while shrimp are exported. Small quantities of first-class fish and shrimp are marketed locally, especially if too small for export.

Bulungan, or secret (whisper) bidding, was first introduced from Navotas, Rizal, soon after the Bicol Region was linked to Manila by road in 1959. The market of Mercedes was the first to adopt the new system, which facilitated the rapid sale of large volumes of fish landed by bag-netters *(basnig)*

Table 2. Number of middlemen and processors per sampled *barangay* in San Miguel Bay and method of sale and processing used.

Barangay	Method of sale	Number of fresh fish middlemen	Number of shrimp middlemen	Number of processors	Method of processing
Barcelonita	by weight, open bidding	20 *rigaton*	3	4 5	fish drying *balao* salting
Castillo	secret bidding	34 *rigaton*	7	13 27	*balao* salting fish drying
Pandan	open bidding by pile	0	0	0	–
Balongay	open bidding by pile	2 *rigaton*	0	0	–
Bonot-Sta. Rosa	open bidding	15 *rigaton*	0	7 4	fish drying *balao* salting
Sabang	secret bidding	170 *rigaton* 30 buy and sell 3 *factorador*	10	40 14 2	fish drying (1) *balao* salting (2) comb. of 1 & 2
Sibobo	by weight	2 *rigaton*	2	0	–
Apuao	open bidding	0	0	0	–
Caringo	open bidding	2 buy and sell	0	0	–
Cayucyucan	open bidding	0	0	0	–
Lanot	by weight, open bidding	2 buy and sell	2	2	fish drying
Mabungalon	open bidding	0	0	0	–
Matoogtoog	open bidding	6 buy and sell	0	0	–
Quinapaguian	open bidding		0	0	–
Manga	by weight, open bidding	buy and sell *rigaton*	7	4	fish drying *balao* salting
Sulpa	by weight, open bidding	4 buy and sell	1	2	fish drying
Vito	by weight, open bidding	2 buy and sell	2	1	fish drying
Bagacay	by weight, open bidding	4 buy and sell	4	4	fish drying
Buenavista	by weight, open bidding	3 buy and sell	3	3	fish drying
Cagliliog	by weight, open bidding	2 buy and sell	2	2	fish drying
Daligan	by weight	2 buy and sell	2	2	fish drying
Sogod	open bidding	6 buy and sell	6	6	fish drying

based there during the southwest monsoon. From Mercedes *bulungan* spread to Sabang in 1971 and to Castillo in 1975. In both Sabang and Castillo a few large-scale buyers dominated local marketing and the smaller buyers successfully pressed for the adoption of the *bulungan* system as a means of increasing their competitive position.

The *bulungan* system has won the support of boat owners, brokers, and the buy-and-sell middlemen. *Factorador*, however, would prefer to buy on the basis of weight, since this would

facilitate their calculation of marketing margins. Small-scale retailers *(rigaton)* who purchase their fish from buy-and-sell middlemen would prefer to bid directly for small quantities (e.g., 15 kg). Brokers, however, do not accept such small bids and the *rigaton* usually must buy from the buy-and-sell middlemen. The *rigaton* complain that these middlemen simply bid on fish offered by a broker and immediately resell the fish to the *rigaton* at a profit, often without even moving the fish. Moreover, these middlemen are known to obtain discounts on their announced winning bids to the brokers which increase their profits. When they learn of such discounts, *rigaton* attempt to pressure buy-and-sell middlemen to accept the discount as their profit margin and sell the fish at the announced bid price. Tensions between buy-and-sell middlemen and *rigaton* are also created by preferential treatment given by these middlemen to certain *rigaton* who are special friends.

Marketing relationships between middlemen and fishermen tend to be longlasting and are characterized by the concept of *suki. Suki* relationships are informal but regular ties based on trust which underlie virtually all marketing arrangements in rural areas of the Philippines (Cuyos and Spoehr 1976; Jocano and Veloro 1976; Smith et al. 1980; Szanton 1972).

In the case of fish marketing, *suki* relationships provide fishermen with an assured outlet for their catch and the buyer a source of steady supply. *Suki* relationships often are strengthened by the provision of credit by buyer to fisherman. In such circumstances the buyer becomes known as "consignee", and the obligation of the fisherman to sell to a particular buyer is more binding. Such credit may take the form of cash for operational expenses or even the capital necessary to purchase gear. Occasionally credit is extended to fishermen to meet emergency needs.

This informal credit mechanism has certain advantages for fishermen, who are able to continue operations even after a period of poor fishing or who may not have enough capital to purchase new nets. Such credit relationships bring into play a "debt of gratitude" *(utang na loob)* which ties the fisherman to the buyer. Often the price paid by buyers to fishermen who have received loans is lower than the prevailing market price by as much as 10%. This margin can be considered both as interest on the loan and as a means of gaining repayment on the principal. Separate deductions are made to repay the outstanding principal when the catch is good, but when the catch is poor no repayment is expected.

Whether this type of relationship between buyer and fisherman is exploitative remains an open question. Often, especially in larger fishing communities, the potentially large numbers of buyers to whom a fishermen can establish *suki* or consignee relationships acts as a barrier against excessive marketing margins. Even in smaller communities where buyers are relatively few, social and kinship ties exert a modifying influence over monopsonistic tendencies. Certainly the issue of fairness in these marketing relationships is an important issue deserving careful micro-level analysis. Major government development efforts, including the *Biyayang Dagat* (Bounty of the Sea) loan program and the establishment of marketing cooperatives, are predicated upon the assumption that exploitative marketing patterns are a major cause of poverty among small-scale fishermen.

In the San Miguel Bay area most sales of fish and shrimp are to a specific *suki* or consignee buyer. The 641 respondent fishermen were asked to whom they sold each of the various species they caught. This was done because marketing channels sometimes vary by season and species landed. On the average the respondents reported capturing over seven species of fish and shrimp, giving a total of 4,798 transactions.

As may be seen in Table 3, some 55% of all transactions in the survey sample were to specific buyers, which refers to *suki* or consignee buyers. Thirty-six percent of all transactions were concluded with "any buyer," indicating competitive bidding is the norm. In several fishing communities of Mercedes Municipality, the Area Fish Marketing Cooperative at Mercedes played an important role in marketing, though in overall terms the numbers of fishermen involved and transactions recorded were rather small. A small number of transactions also was recorded where the owner bought the catch. This was common in the case of *balao* (a small shrimp), where the owner or other member of his family mixes the *balao* with salt before selling, earning a small additional profit. An even smaller number of transactions was reported to involve direct retail sales. This figure (1.8%) probably under-

Table 3. Reported transactions with first buyers (in %), by sampled *barangay* in San Miguel Bay (N = 4,798).

Barangay	Specific dealer	Any dealer	Cooperative	Directly retailed	Owner of boat and gear
Barcelonita	66.6	32.6		0.8	
Castillo	52.5	47.5			
Pandan	33.6	20.0		40.0	6.4
Balongay	26.1	56.5		14.5	2.9
Bonot-Sta. Rosa	53.0	35.0		11.4	
Sabang	73.7	25.6	0.7		
Sibobo	60.8	36.1		3.2	
Apuao	8.2	52.6	39.2		
Caringo	14.7	48.8	9.5	27.0	
Cayucyucan	–	100.0			
Lanot	61.0	39.0			
Mambungalon	12.8	63.1	20.7		
Matoogtoog	71.2	3.8	25.0		
Quinapaguian	17.4	41.1	41.6		
Manga	63.3	33.0		3.7	
Sulpa	98.0	2.0			
Vito	88.0	12.0			
Bagacay	80.7	12.0		3.6	
Buenavista	95.5	1.8			
Cagliliog	65.2	13.5		19.3	
Daligan	47.7	52.3			
Sogod	19.9	78.3			
Frequency of responses	2,618	1,714	215	88	163
Percentage of responses	54.6	35.7	4.5	1.8	3.4

represents the importance of such direct sales to consumers because the figures used in Table 3 are not weighted by the relative value of a particular species. Fishermen whose primary catch is sold directly may also catch small volumes of shrimp, which follow a different marketing chain. Yet, for purposes of Table 3, both types of transactions are accorded the same weight. However, the large numbers of transactions classified as "specific dealer" and "any dealer" lead to greater confidence in those figures which are consistent with present understanding of marketing relationships in the Bay.

The figures presented in Table 4 indicate that the majority (73%) of fishermen-respondents were reasonably satisfied with existing marketing patterns, though there was considerable dissatisfaction voiced in some communities. The highest rates of dissatisfaction were recorded in such isolated fishing communities as Cayucyucan, Vito, Cagliliog and Sulpa, where there is limited competition among local buyers. However, even in some of the larger communities where more buyers are present and where access to road transportation exists (e.g., Sabang, Barcelonita, Bonot-Sta. Rosa and Sibobo) considerable dissatisfaction was noted.

In comparing the figures presented in Tables 3 and 4, it is interesting to note that where fishermen are involved in marketing through the Area Fish Marketing Cooperative in Mercedes, relatively high rates of satisfaction regarding marketing arrangements were recorded. The exception to this pattern is the community of Matoogtoog. This may be explained in part by the fact that in Matoogtoog over 70% of the species transactions continued to be handled by "specific dealers" a rate

Table 4. Percentages of sampled fishermen in *barangays* of San Miguel Bay reporting satisfaction/dissatisfaction with present marketing system.

	Satisfied	Not satisfied	Sometimes satisfied, sometimes not
Barcelonita	60.6	31.7	7.6
Castillo	81.9	18.1	–
Pandan	88.2	11.8	–
Balongay	100.0	–	–
Bonot-Sta. Rosa	69.1	30.9	–
Sabang	61.7	34.0	4.3
Sibobo	68.4	31.6	–
Apuao	100.0	–	–
Caringo	93.1	3.2	–
Cayucyucan	34.1	65.9	–
Lanot	79.1	20.9	–
Mambungalon	78.9	21.1	–
Matoogtoog	61.2	38.7	–
Quinapaguian	87.2	12.8	–
Manga	79.2	20.8	–
Sulpa	63.4	36.6	–
Vito	55.8	44.2	–
Bagacay	74.7	25.3	–
Buenavista	84.7	15.3	–
Cagliliog	56.0	44.0	–
Daligan	73.8	20.8	5.4
Sogod	78.7	21.3	–
Weighted averages	73.0	25.6	1.4

significantly higher than that of Apuao, Caringo, Mambungalon, or Quinapaguian, which also belong to the Cooperative. In those four communities a higher percentage of species transactions were concluded with the dealer who offered the higher price. It may be that the presence of the Cooperative in these communities has served to diversify marketing channels while in Matoogtoog special circumstances (e.g., the influence of local buyers) prevented a similar development. Generally, however, for the 22 communities sampled, where specific dealers dominated local markets, relatively high rates of dissatisfaction were recorded and where specific dealers exerted less control, rates of satisfaction increased.

The Seasonality of Fish Processing

Approximately 30% of all fish landed in the San Miguel Bay area are processed before being sold to consumers. The marketing channels for processed fish are somewhat different than those for fresh fish and generally middlemen specialize in one or the other. Fresh-fish marketing depends on speed in distributing a highly perishable commodity. Processed fish may be marketed in a somewhat more leisurely fashion since the processed product is storable, although those species dried whole will last but a few weeks at ambient temperatures (Orejana 1982).

The most common form of fish processing is salting, usually in a brine solution, and sun drying. For this process, two conditions must be met, an adequate supply of fish and adequate sunshine. Fish-drying activities are concentrated during the period March through October when large volumes of fish are landed and weather conditions are favorable. Processing part of the catch during these months prevents oversupply of fresh fish in local markets and provides a source of fish during months when fish production declines. Fig. 1 presents data on the monthly volume of fish landed at Castillo from February 1980 to January 1981.

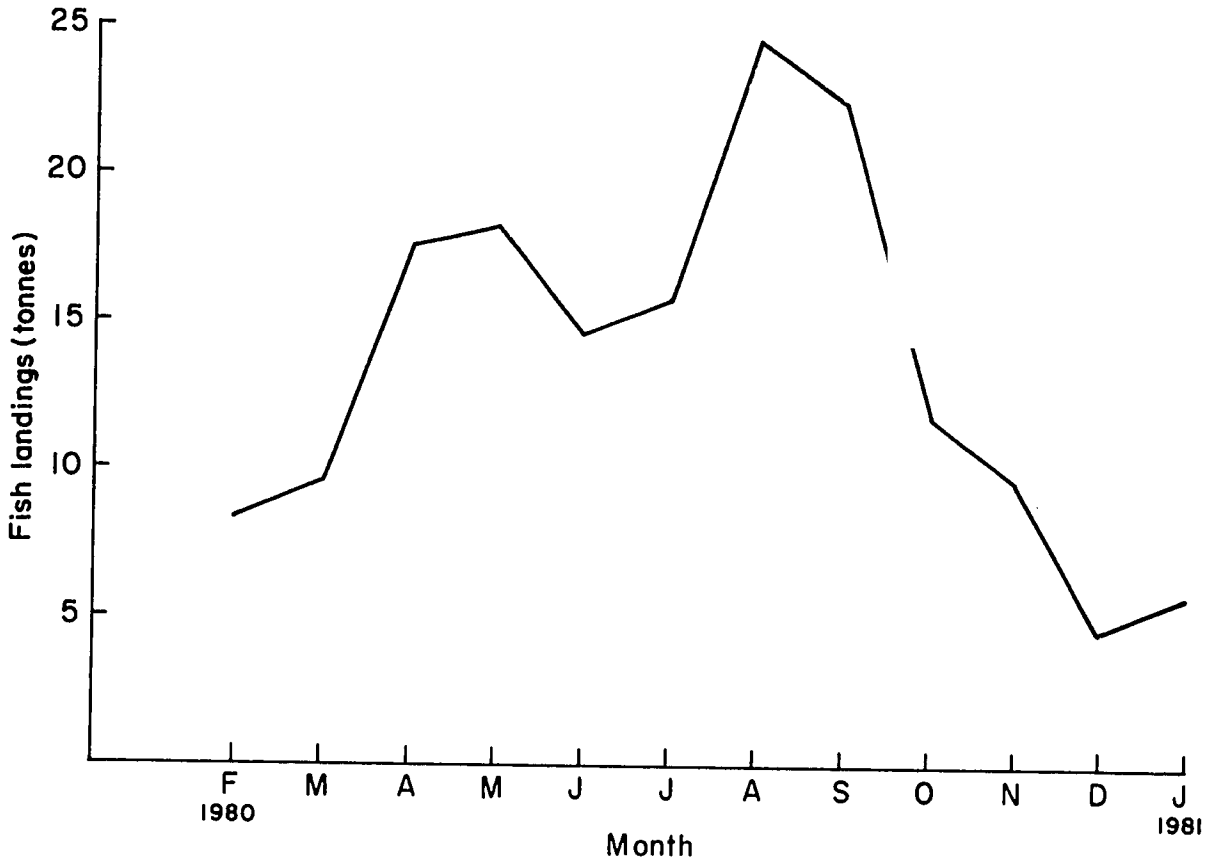

Fig. 1. Total weight of fish catch landed in Castillo, San Miguel Bay, February 1980 to January 1981.

Fish processing operations vary in scale from individual fishing families drying small amounts of fish for personal consumption during months of poor fishing, to large-scale processors employing scores of laborers. Small family operations exist in virtually every fishing community and are particularly important in isolated areas. This is so because of the difficulties in marketing fresh fish in the absence of road transportation and the inability to bring in fresh fish from other areas (e.g., the Ragay Gulf) for local consumption during lean seasons.

Small-scale family processing operations are also active in communities which are served by roads and produce dried fish both for personal consumption and for sale. In several of these communities there are families which specialize in fish processing and purchase their supplies from local fishermen. Occasionally one or two helpers are employed to assist the family in such operations.

There are also a few large-scale fish processing establishments based at the major fishing communities of Sabang and Mercedes. In Sabang, the trawler catch includes large volumes of croakers, herrings, anchovies and undersized fish which are dried for fish meal. During October through March, when trawlers concentrate on the capture of shrimp and there is a decline in the volume of fish landed at Sabang, large-scale processors buy fish for processing from commercial fishermen operating in Ragay Gulf. However, their operations are limited during these months due to the typically rainy conditions associated with the northeast monsoon. The largest single processor in Sabang is also the owner of the largest fleet of trawlers. Other trawler operators sell part of their catch to local large- and small-scale processors.

In Mercedes, fish processors depend on the seasonal activities of *basnig* fishermen, who arrive in March/April and leave in September/October. During these months large volumes of round scads, herrings and other small pelagic species are landed at Mercedes. Most of these fish are salted and

dried, with a smaller volume smoked. The main market for these processed products is Manila. Processors in Sabang also sell to Manila although their marketing outlets are somewhat more diversified and include such urban centers in the Bicol Region as Naga, Iriga and Legaspi.

Processors provide an alternative outlet during seasons of peak supply, which serves to stabilize prices received by fishermen. The relationship between supply and price of the croaker *Otolithes ruber*, the most important fish species landed in San Miguel Bay and a species commonly used by fish processors, is shown in Fig. 2. During the months of January and February the price was relatively high, reflecting limited supply after the lean months of October, November and December. After a weakening of prices in March the price recovered in April despite more than a doubling of volume landed. April is the first full month of the dry season when processors are most active. Thereafter both volumes and prices declined. Since croakers are a relatively low valued species, it is not economically feasible to ship excess local supply to such distant markets as Manila as fresh fish. Were it not for the activities of processors, it is probable that prices would have experienced a major decline in April due to overabundant supply.

The relationship between price and supply for *balao* follows a similar pattern. *Balao* are most abundant from November to March and yet the highest prices also are obtained during these months (Tulay and Smith 1982). When large volumes of *balao* are landed numerous processors compete to obtain supplies. When the catch declines most processors withdraw from the market. *Balao* spoils quickly but when mixed with salt it lasts for several weeks, and longer if stored in a cold room. Salted *balao* is a popular commodity used in a wide variety of dishes and may be fermented to form a sauce known as *bagoong. Balao* paste *(dinailan)* is another product, though this is usually made

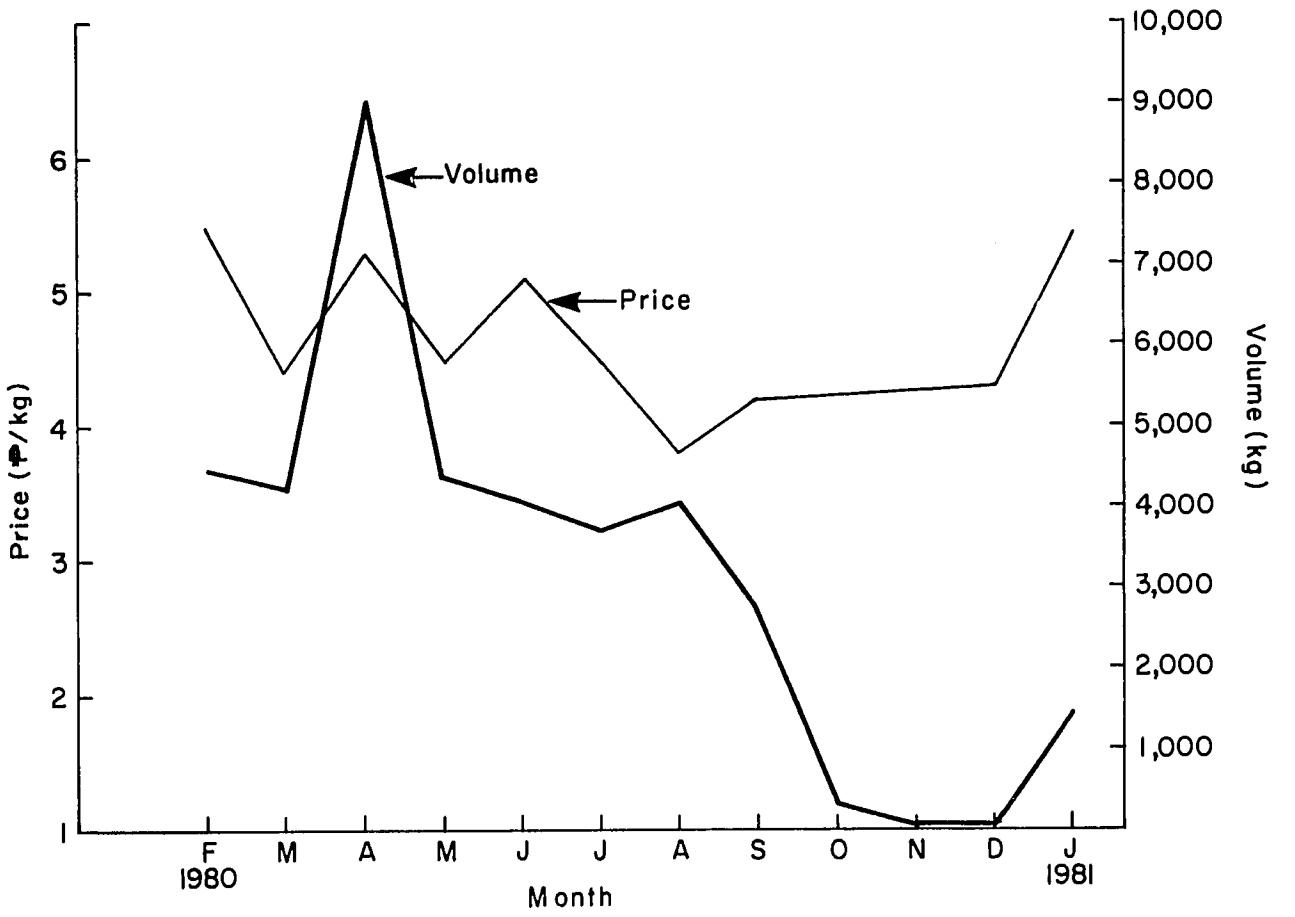

Fig. 2. Landings and monthly average price per kg for *Otolithes ruber* at Castillo, San Miguel Bay, February 1980 to January 1981.

only after the peak season. The making of *dinailan* requires adequate sunshine to dry the *balao* at various stages of what is a labor-intensive process. Simple salting of *balao* does not require drying, which is fortunate as the peak season coincides with the typically rainy months of the northeast monsoon.

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Systems of Sharing and Patterns of Ownership

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Abstract

Sharing systems and patterns of ownership of several common small-scale gears are analyzed and compared with those of the small and medium trawlers operating in San Miguel Bay, Philippines. Significant differences between these two groups were found in concentration of ownership, presence of non-economic social relationships between owners and crewmen, and flexibility of sharing arrangements. These differences are discussed in terms of existing legal definitions of "municipal" and "commercial" fisheries.

Introduction

The small-scale fishermen who live in municipalities surrounding San Miguel Bay (Cabusao, Calabanga, Mercedes, Sipocot, Siruma and Tinambac) use a wide variety of boats and gear, each of which represents different levels of investment. It is not surprising that there are different systems of sharing between owners and non-owners for various types of fishing boats and gear. The essence of a sharing system is the meshing of capital and labor in a hopefully efficient and equitable manner, one which encourages maximum utilization of existing productive assets and provides all concerned with an adequate return to their respective contributions. Systems of sharing and patterns of ownership reflect the relative values placed on labor and invested capital and provide insights regarding broader socioeconomic relationships.

Owners and Non-owners

Owners of boats and gear may be divided into two categories, those who take part in fishing and those who do not. Among the 641 respondents of the Project's socioeconomic survey, 58% were classified as owner-operators (Table 1). A further 26% of respondent fishermen owned neither boats nor gear and worked as crewmen on boats owned by others, while 16% of respondents were part-owners and worked with others to establish a complete fishing unit.

Table 1. Category of fishermen by age in the socioeconomic survey, San Miguel Bay (N = 641).

Age	Total No.	Full owner No.	Full owner %	Part-owner No.	Part-owner %	Crewman No.	Crewman %
20 and below	22	10	45.4	3	13.6	9	40.9
21-25	84	31	37.0	6	7.4	47	56.0
26-30	124	61	49.2	25	20.1	38	30.6
31-35	85	48	56.5	12	14.1	25	29.4
36-40	92	54	58.7	17	18.5	21	22.8
41-45	67	50	74.6	7	10.4	10	15.0
46-50	66	49	74.2	10	15.2	7	10.6
51-55	44	36	81.8	2	4.5	6	13.6
56-60	29	23	79.3	2	6.9	4	13.8
61-65	13	11	84.6	1	7.7	1	7.7
66-70	12	11	91.7	–	–	1	9.1
above 70	3	3	–	–	–	–	–
Totals	641	387	60.4	85	13.3	169	26.4

Note: Sampling was based on fishermen who are household heads. These figures thus underestimate the total number of younger fishermen engaged in the fishery (see final paper, this report).

Depending on the labor requirements of the particular type of gear used and the available manpower of each household, owner-operators may or may not need to recruit additional crew members. Due to seasonal variations requiring a diversity of gear types to enable year-round fishing (Esporlas, this report), it is reasonable to assume that during certain seasons some of these owner-operators also work as crewmen or share-operators.

Owners of boats and gear who do not take an active part in fishing operations were underrepresented by our sampling frame, which focused primarily upon active fishermen. Observations in the field indicated that many such owners were ex-fishermen who for a variety of reasons (health, age, involvement in other economic activities) preferred to let others go to sea and were content to earn the return to capital represented by the owner's share.

Those fishermen who owned neither boats nor gear tended to be younger fishermen just entering the fishery. Their primary constraint was lack of capital to invest in such productive assets. In other cases non-owning fishermen may have invested in activities other than fishing. Employment as a crewman was not limited to those with no investments in boats and gear. In some cases fishermen who owned boats and gear appropriate for one particular season, worked as crewmen with other fishermen during other seasons. It is likely that the figures presented in Table 1 underestimate the number of fishermen who at any given time work as non-owning crewmen. Similarly, the figures on numbers of fishermen who were part-owners of boats and gear represented only their reported status, which may vary from season to season. It is not likely, however, that our figures underestimate the numbers of owner-operators since recorded ownership of boats and gear defined this category.

The distribution of gear types used by fishermen in San Miguel Bay is presented in Esporlas (this report). The most common gear types used by small-scale fishermen in the Bay are various gill-nets, followed by the simple scissor net and the hook and line. Though few, the small and medium trawlers popularly known as "baby" trawlers are highly significant in terms of production, accounting for nearly half of the total landings from San Miguel Bay (Pauly and Mines 1982). In addition to the above there are various types of stationary gear, including fish corrals, filter nets, and stationary liftnets.

Costs of Investment for Fishing Gear

Table 2 shows the approximate investment cost (1981/82) of the different types of fishing gear used by small-scale fishermen within San Miguel Bay. It is clear from Table 2 that the level of investment required to become an "owner" varies tremendously. For example, a small trawler (displacing just under 3 GT and typically powered by a 135-hp diesel engine) costs ₱55,000. The slightly larger (over 3 GT) and more powerful (engines up to 210 hp) medium trawlers cost ₱70,000.

Municipal governments are responsible for licensing all fishing boats displacing less than 3 GT. By definition, small trawlers are classified as "municipal" or small-scale fishing units, though the level of investment required to build and equip even a small trawler (much less a medium trawler) is well beyond the means of small-scale fishermen. At the other end of the investment spectrum are fishermen using scissor nets or hook and line and non-motorized boats, who need to invest only ₱200-500 to become full owners. Other combinations of boats and gear, for example, a motorized boat and gill-net, require significantly greater investment (₱13,000).

Table 2. Investment costs (1981/82) in pesos of important gears used in San Miguel Bay.

Type of gear	Investment cost per unit (₱)
Small trawler	55,000
Medium trawler	70,000
Mini trawler	9,200
Motorized gill-net	13,000
Non-motorized gill-net	3,500
Liftnet	12,200
Fish corral	9,100
Scissor net	250
Non-motorized hook and line	500

Source: Smith and Mines (1982). US$1.00 = ₱8.00 (1981).

Number of Fishing Units Owned

Very few respondents owned more than one fishing unit (Table 3). Thus, it was readily apparent that although not all fishermen owned the means of their production, there was no substantial concentration of fishing assets among fishermen-respondents.

An important exception to this image of widespread ownership was found in Sabang, Calabanga, where most of the small and medium trawlers are based. As may be seen in Table 4, there was considerable concentration of trawler ownership. Of the 88 small and medium trawlers based in Sabang, one family owned 24 of these relatively expensive fishing units, representing over 27% of the total fleet. Two other families each owned six trawlers. Information on trawler ownership was based on interviews and data provided by members of the Project's stock assessment team who lived in Sabang for a full year.

Table 3. Various fishing assets of respondents in the socioeconomic survey, San Miguel Bay, by number of units owned.

		1	2	3	>3	Total
Motorized boat	No.	169	0.2	1.0	NIL	172
	%	(8.3)	(1.2)	(0.6)	–	(100.0)
Engine	No.	188	NIL	NIL	NIL	188
	%	(100.0)				(100.0)
Non-motorized boat	No.	238	NIL	NIL	NIL	238
	%	(100.0)	–	–	–	(100.0)
Gill-net	No.	382	9.0	NIL	NIL	391
	%	(97.7)	(2.3)	–	–	(100.0)
Stationary liftnet	No.	18	2.0	NIL	NIL	20
	%	(90.0)	(10.0)	–	–	(100.0)
Mini trawl	No.	17	2	NIL	NIL	19
	%	(89.5)	(10.5)	–	–	(100.0)
Other types of gear	No.	212	28	13	NIL	253
	%	(83.3)	(11.1)	(5.1)	–	(100.0)
Total	No.	1,224	43	14	NIL	1,281
	%	(95.6)	(3.4)	(1.1)	–	(100.0)

Note: Engines include those used in column for motorized boats. Note that respondents owned more engines than motorized boats.

Table 4. Distribution of ownership of small and medium trawlers at Sabang, San Miguel Bay, as reported by this Project's stock assessment team.

Number of baby trawlers owned	Number of owners	Total number of trawlers	Percentage
24	1	24	27.3
6	2	12	13.6
4	2	8	9.1
3	4	12	13.6
2	5	10	11.4
1	22	22	25.0
Total	36	88	100.0

Manner of Acquiring Boats and Gear

The majority of fishermen-respondents acquired their fishing boats and gear through personal savings and investment (Table 5). Ownership of such productive assets typically occurred after a fisherman had worked a number of years as a crewman on boats owned by others.

Boats, engines, and particularly nets deteriorate and depreciate value. Because of this, there appeared to be little interest in acquiring second-hand fishing assets despite their lower cost. Old nets require more mending, old engines more repairs, and the marine plywood siding of old boats may not be capable of withstanding the pounding of waves at sea. Thus, there is a limited market for used boats, engines and gear, and fishermen interested in becoming owners are likely to invest in new equipment. New boats and gear, however, are becoming increasingly expensive as the prices of marine plywood, lumber, and nylon netting have increased in recent years.

Table 5. Fishing assets of respondents in the socioeconomic survey, San Miguel Bay, by manner of acquisition.

Type of asset		Own finances	Owned	Given	Made	Leased	Total
Motorized boat	%	75.6	21.5	1.2	1.2	0.6	100.0
Engine	%	56.4	38.3	3.2	–	2.1	100.0
Non-motorized boat	%	88.5	5.7	3.3	–	2.5	100.0
Gill-net	%	90.8	8.2	1.0	–	–	100.0
Mini trawl	%	84.2	15.8	–	–	–	100.0
Stationary liftnet	%	85.0	15.0	–	–	–	100.0
Other types of gear	%	86.9	9.1	1.0	1.0	2.0	100.0
Total	%	82.6	14.1	2.0	0.4	1.3	100.0

Over the years, the Philippine government has adopted a number of programs designed to facilitate acquisition of boats and gear by small-scale fishermen. These programs are reviewed in Smith et al. (1980). Of particular interest for the San Miguel Bay area are the programs of the Development Bank of the Philippines (DBP), suspended due to a nationwide 94% non-repayment rate, and the current *Biyayang Dagat* ("Bounty of the Sea") program with loans from local rural banks and technical supervision provided by the Bureau of Fisheries and Aquatic Resources (BFAR). A substantial number (approximately 100) of former DBP loan recipients operate out of Sabang, Calabanga. Most of them no longer own their nets but instead use gill-nets provided by a shrimp buyer.

The *Biyayang Dagat* program has been slow in implementation due to the reluctance of local rural banks to provide small-scale fishermen with unsecured loans, even though the government is underwriting 80% of their exposure. As of April 1981, a total of ₱1.8 million had been released to 119 recipients in the San Miguel Bay area.[2] Many of these loans, though unsecured by collateral, were counter-signed by guarantors. Most of the loans appear to have been granted for the construction

[2]Information supplied through the courtesy of BFAR, Region V, Naga City.

of small trawlers. In Cabusao, for example, 26 out of 31 loans have been given to fishermen organized into groups and for the construction of small trawlers; the remaining five loans were for gill-nets and pumpboats. In Camaligan, all six loans granted were for small trawlers. *Biyayang Dagat* loans are limited to ₱15,000 per recipient. By grouping five or six fishermen together, sufficient funds are available for the construction and outfitting of one small trawler. From interviews, however, there was a clear indication that the guarantors of such loans would be the effective owners, not the people in whose names the loan was issued.

In addition to the 119 recipients of *Biyayang Dagat* loans (as of April 1981), a further 169 applications were in file. Because the funds are used for trawlers, it is likely that in the San Miguel Bay area this program will, despite the relatively small number of recipients, significantly increase the level of fishing effort exerted on the fisheries.

Both the DBP loans and the *Biyayang Dagat* program were designed in response to the perceived need of freeing small-scale fishermen from the constraints imposed by inadequate investment capital and the consequent need to borrow money for investment purposes from fish buyers. Since relatively few fishermen are likely to be accommodated by government loan programs, it is unclear to what extent this goal will be achieved.

Local fish buyers offer a more personal and less formal source of funds to small-scale fishermen. Often buyer and fishermen reside in the same community and are involved with each other in a wider range of social interactions than the marketing of fish and shrimp. Particularly in many of the smaller and more isolated communities, ties of kinship are of importance. Familial relationships do not dictate economic relationships, but certain minimal rights and obligations governing fair dealing and assistance in time of need do apply. Even when the buyer is from a different community, long-standing ties often lead to trust and friendship. Fishermen who sell their catch on a regular basis to one particular buyer are able to call on that buyer not only for loans for boats and gear but also for family emergencies.

Buyers, on the other hand, are intimately familiar with potential debtors and their willingness and ability to repay loans. Moreover, since buyers are in a position to know on a day by day basis the value of catch landed by fishermen to whom they have extended loans, they are also in a position to collect on their debts. If the catch is poor, no deduction is made from the proceeds to repay the principal of the loan, since the fisherman must have enough to meet operational expenses for the next day's fishing. During a prolonged period of poor fishing, loans may be extended by the buyer even for these expenses. Only when the catch is good will deductions be made for repayment of the outstanding principal. Fish buyers who operate in this fashion operate in both small isolated communities, where they dominate the marketing of fish, and at larger landings, where they deal with a specialized and high-value commodity, such as shrimp.

It is clear from the above that buyers often provide a number of useful services otherwise unavailable to small-scale fishermen. The other side of the coin is that these buyers exert monopsonistic control over the price paid to fishermen. These prices are from five to ten percent lower than the prevailing market price obtained by fishermen who are not tied to a particular buyer. Such a price differential may be considered as "interest" on the loan. It is an open question beyond the intent of this paper whether such marketing relationships are exploitative. The fact remains that fish buyers provide many important services to small-scale fishermen, not the least of which is the financing of investment in fishing assets.

Sharing Systems

Sharing systems determine the distribution of proceeds from the catch to labor and capital. Sharing systems among small-scale fishermen in the Philippines have attracted the attention of a number of authors, including Jocano and Veloro (1976), Herrin et al. (1978), Baum and Maynard (1976) and Nimmo (1972).

For all types of gear, the most common system of sharing calls for an equal division of the proceeds of the catch between owner and crew, after operational expenses have been deducted. These operational costs vary from gear to gear (Smith and Mines 1982), as do the particular demands of the work involved. For some types of gear, specialized skills and responsibilities involve an extra share to certain crew members, modifying the basic 50-50 division of shares. In other cases less formal variations in the sharing system exist, especially when the parties involved are closely related. The diversity in sharing systems found in the San Miguel Bay area is indicated in Tables 6 and 7.

SHARING SYSTEM OF THE GILL-NET

The most common type of gear used by small-scale fishermen of San Miguel Bay is the gill-net, comprising 23% of the total number of fishing units (Esporlas, this report). Two or three men are required to operate a gill-net. Often, the owner of the boat and net will take an active part in fishing, in which case he earns both the owner's share and his share as crewman. In some cases this owner-operator will be accompanied by a member of his household, usually an unmarried son, in which case the question of "sharing" is not relevant, since all of the proceeds from the catch accrue to the family.

The basic sharing system for gill-nets calls for an equal division between labor and capital, after subtracting operational costs, as is illustrated in Fig. 1.

Table 6. Owner's share (%) of net revenue from fishing, San Miguel Bay 1980, after deducting operating expenses, by type of fishing unit.

Owner's share		Total	Drift net	Liftnet	Mini trawl	Other types of gear
Total	No.	764	239	40	44	108
	%	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)
10%	No.	3	1	–	–	–
	%	(0.4)	(0.4)			
20%	No.	17	4	1	–	5
	%	(2.2)	(1.7)	(2.5)		(4.6)
30%	No.	23	7	1	–	4
	%	(3.0)	(2.9)	(2.5)		(3.7)
40%	No.	115	46	3	1	17
	%	(15.0)	(19.2)	(7.5)	(2.0)	(15.7)
50%	No.	564	161	35	43	81
	%	(73.8)	(67.4)	(87.5)	(98.0)	(75.0)
60%	No.	12	5	–	–	1
	%	(1.6)	(2.1)			(1.0)
70%	No.	28	14	–	–	–
	%	(3.7)	(5.9)			
80%	No.	2	1	–	–	–
	%	(0.3)	(0.4)			
90%	No.	–	–	–	–	–
	%					
100%	No.	–	–	–	–	–
	%					

Table 7. Crew's share (%) of net revenue from fishing, San Miguel Bay 1980, after deducting operating expenses, by type of fishing unit.

Crew's share		Total	Drift net	Liftnet	Mini trawl	Other types of gear
Total	No.	788	254	41	46	87
	%	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)
10%	No.	–	–	–	–	–
	%					
20%	No.	–	–	–	–	–
	%					
30%	No.	4	1	–	–	–
	%	(0.5)	(0.4)			
40%	No.	40	18	–	–	4
	%	(5.1)	(7.1)			(4.6)
50%	No.	518	160	35	43	45
	%	(65.7)	(63.0)	(85.4)	(93.5)	(51.8)
60%	No.	81	41	3	–	6
	%	(10.3)	(16.1)	(7.4)		(6.9)
70%	No.	62	14	1	1	13
	%	(7.9)	(5.5)	(2.4)	(2.2)	(14.9)
80%	No.	28	6	1	–	8
	%	(3.6)	(2.4)	(2.4)		(9.2)
90%	No.	–	–	–	–	–
	%					
100%	No.	55	14	1	2	11
	%	(6.9)	(5.5)	(2.4)	(4.3)	(12.6)

In Fig. 1 and the figures which follow, the peso value of the catch, operating expenses, net revenue, and income for both owner and crew represent average income per month during the 1980-1981 season for each respective gear. Though the catch varies from month to month, these figures provide some indication of earnings from the various gears. They are presented here, however, primarily for illustrative purposes. More detailed information on income and seasonal variation is found in Smith and Mines (1982) upon which these figures are based.

The owner of a boat and gill-net who actively participates in fishing receives 75% of the net proceeds of the catch. In such cases, it may be assumed that the owner acts as "captain" and assumes primary responsibility for each day's fishing. Whether the owner or someone else operates the boat, no additional share is assigned to the "captain". Fishing with a gill-net is sufficiently simple that there is no rigid specialization of tasks among the two or three men who comprise the crew, and each takes an active part both in operations at sea and in mending nets on land.

There are a number of variations in the sharing system for gill-nets. For example, when both boat and net are new, owners sometimes obtain 60% of the net revenue, leaving only 40% for the crew's share. This is done so that the owner may more quickly recover some part of the investment costs. Since new boats have fewer mechanical problems and new nets are more efficient in capturing fish and shrimp than older nets, there are advantages for the crew to balance against this reduced

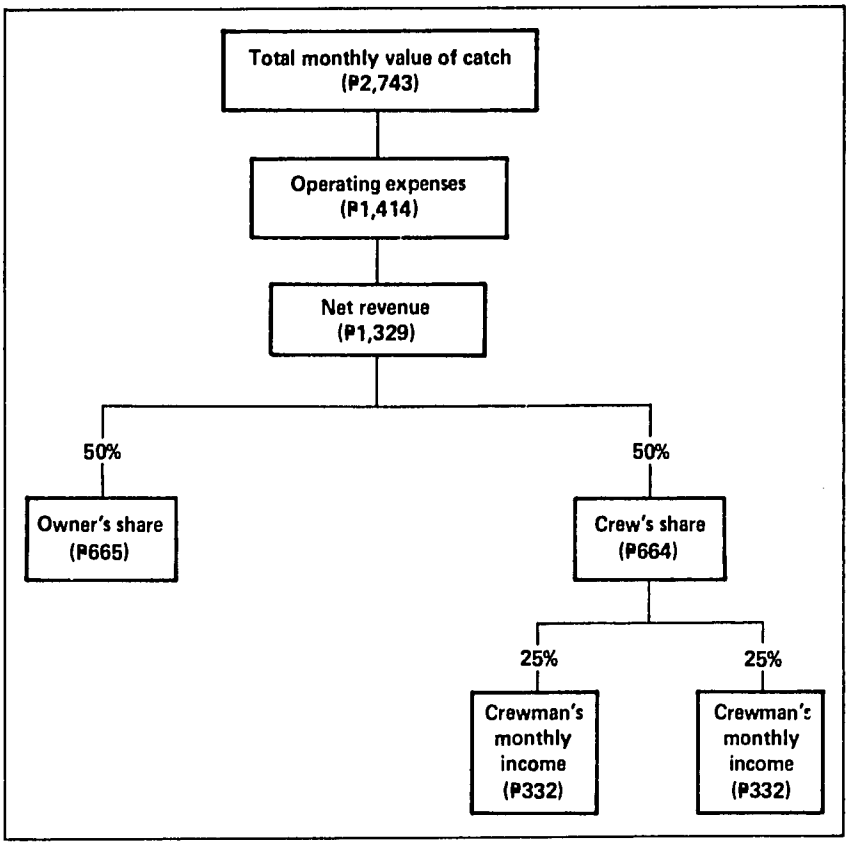

Fig. 1. Sharing system of a gill-netter with two crewmen in San Miguel Bay (1980-1981). Total monthly value of catch is from Yater (1982), but calculations here are different from Yater's because hypothetical crew size is three in Yater and two here. Crewman's monthly income in the above calculation is therefore 50% higher than in Yater's presentation.

share. Usually after three or four months, the more standard equal division of net revenues between the owner and crew is adopted as the inevitable process of wear and tear on the net reduces efficiently to a point where the owner's extra share is no longer justified.

There are also cases where the crewmen receive 60% of the net proceeds. This variation is most common in Sabang, Calabanga and appears to be directly related to competition for crewmen between trawlers and gill-netters or other small-scale gear. Crewmen who work on small or medium trawlers stand to earn higher incomes (compare Tables 8 and 9), though they work longer hours and spend on average three nights a week at sea. Gill-netters, on the other hand, leave early in the morning and return by mid-afternoon each day. For crewmen on trawlers, the balance between regular separation from their families and opportunity to earn higher incomes appears to be attractive, which makes it difficult for gill-netters to man their boats. Thus, a higher share is offered by gill-net operators in Sabang than in other communities around San Miguel Bay.

In addition to these two variations, a wide range of informal sharing arrangements may be found between gill-net owners and crew, especially when they share ties of kinship. A father or grandfather may allow his son or grandson to use boat and gear for a smaller than standard share or even for free. In other cases, the share may be a variable amount, as when an owner-operator gives a larger than agreed upon share to his brother or close friend when fishing is poor and subsistence needs are threatened.

Table 8. Hypothetical monthly income in pesos for small-trawler owners, *maestros* and crewmen based on 1980-1981 net revenues and on different sharing systems prevailing in San Miguel Bay, 1960-1981.[1]

Period	Owner's monthly income[2]	Captain's monthly income	Crewman's monthly income
1960-75	4,403	1,139	759
1975-81	5,487	843	562
1981	5,768	938	469

[1]Based on data from Figs. 4, 5 and 6.
[2]Before deducting fixed costs.

Table 9. Comparison of monthly incomes in pesos for owners, captains and crewmen of three common small-scale gears, San Miguel Bay, 1980-81.[1]

Gear	Owner's monthly income[2]	Captain's monthly income	Crewman's monthly income
Gill-net	665	n.a.	332
Mini trawl	665	385	350
Liftnet	589	228	163

[1]Based on data from Figs. 1, 2 and 3. There is no special share for captain of a gill-netter.
[2]Before deducting fixed costs.

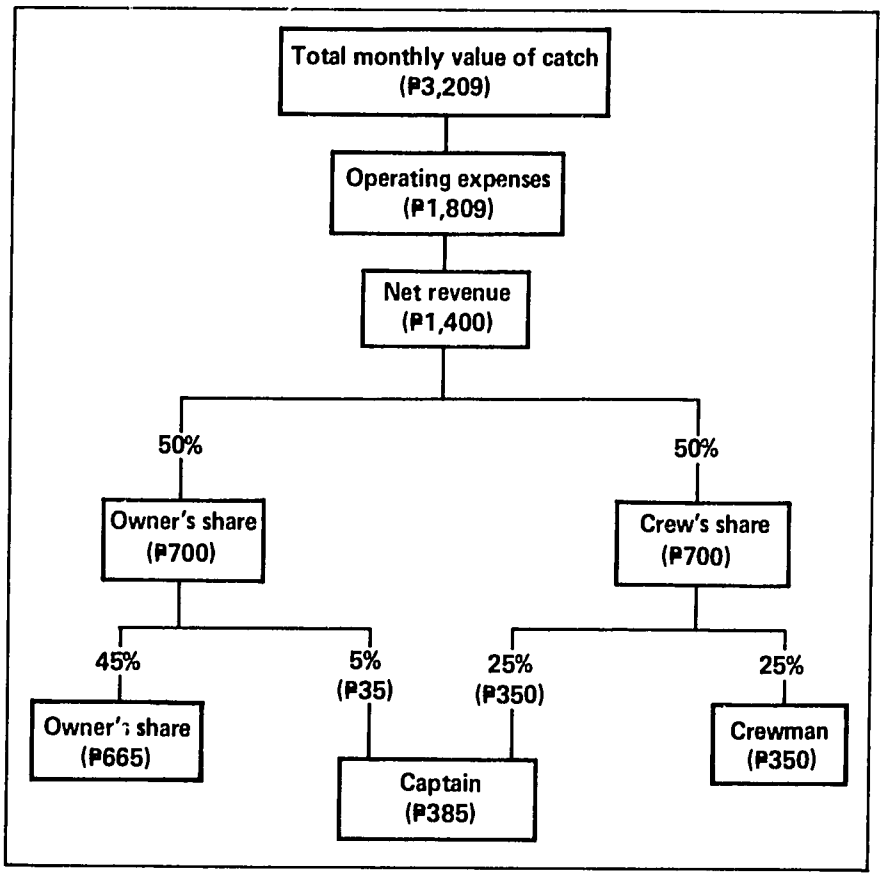

Fig. 2. Sharing system of mini trawlers in San Miguel Bay (1980-1981), based on Tulay and Smith (1982). Monthly incomes may differ slightly due to differences in the share that the owner gives to the captain.

SHARING SYSTEM OF OTHER SMALL-SCALE GEARS

The sharing systems used for other small-scale gear in the San Miguel Bay area are quite similar to that of the gill-net. The most important difference is the payment by the owner from his own share of an extra share as bonus to the captain of the crew.

Fig. 2 illustrates the sharing system used for mini trawlers. Mini trawlers are rigged to capture *balao,* a small sergestid shrimp. Mini trawlers operate longer hours than gill-netters, returning late in the afternoon. Part of the operational expenses of the mini trawler is the midday meal for the crew. The captain (or more accurately a female member of his household) takes responsibility for cooking this meal. The job of a mini trawler captain is more strenuous than that of the gill-netter captain. After arriving at the fishing grounds and casting their net, captain and crew operating gill-nets have little to do but wait until it is time to pull in the net, which is done several times during the day. The captain of a mini trawler, however, must man the tiller for as many as ten hours a day while his assistant is able to relax. Very little effort is needed to sort a catch of *balao* since the slow trawling speed precludes capture of other than a few stray fish, sea snakes or crabs. The bonus paid by the owner to the captain of a mini trawler reflects the greater demands of this job compared to that of an ordinary crewman.

The sharing system for the stationary liftnet *(bukatot),* shown in Fig. 3, is similar to that of the mini trawler except that the fishermen's share is divided between four (or sometimes more) fishermen and the captain receives a bonus of 10% of the owner's share, double that of the mini trawler captain. The higher captain's share is due to his responsibility in coordinating the efforts of the crew and giving the critical command to lift the net once a sufficient concentration of fish has been attracted to the net by the powerful lights used in this night-time operation. The *bukatot* is used during the southwest monsoon season when the sea is relatively calm and only during moonless nights, when the lights most effectively attract such pelagic fishes as anchovies. Captain and crew all work together in hauling the net, sorting the fish, and maintaining the nets and other equipment.

As in the case of gill-netters, an important criterion governing crew composition of mini trawlers, stationary liftnetters, and other small-scale gear is kinship or other close personal relationships. Owners must be concerned with earning sufficient income to cover depreciation and replacement costs as well as a reasonable return to their capital investment. Economic relationships between owners and crewmen, however, are frequently modified by non-economic factors and in practice formal sharing systems exhibit considerable flexibility. Owners of small-scale boats and gear may provide small loans to their crewmen or give them a larger share of the proceeds from the catch during lean seasons or other times of need. In return they may expect and receive assistance in any number of small matters (e.g., house repair) or support in local community politics. In most cases owners and non-owners live in the same community in the same type of house, eat similar foods and wear the same style of clothing. If there is a major distinction to be drawn between them it is that of age, since younger fishermen often have not yet had the opportunity to amass sufficient savings to join the ranks of owner-operators.

SHARING SYSTEM OF SMALL AND MEDIUM TRAWLERS

Small and medium trawlers are sufficiently different from other types of gear which operate within San Miguel Bay to require separate discussion. As noted previously, investment costs for these trawlers are significantly greater than those of other types of gear and ownership is concentrated in the hands of relatively few families.

These trawlers also may be differentiated from other gear types by a more complex division of labor between owners and crew and among the crew itself.

The owner assumes direction of shore-based activities, including selling the catch and supervising the men who specialize in repairing trawl nets. When the catch of a trawler is landed, the owner or his agent acts as broker, taking whispered bids and collecting the money from the various buyers.

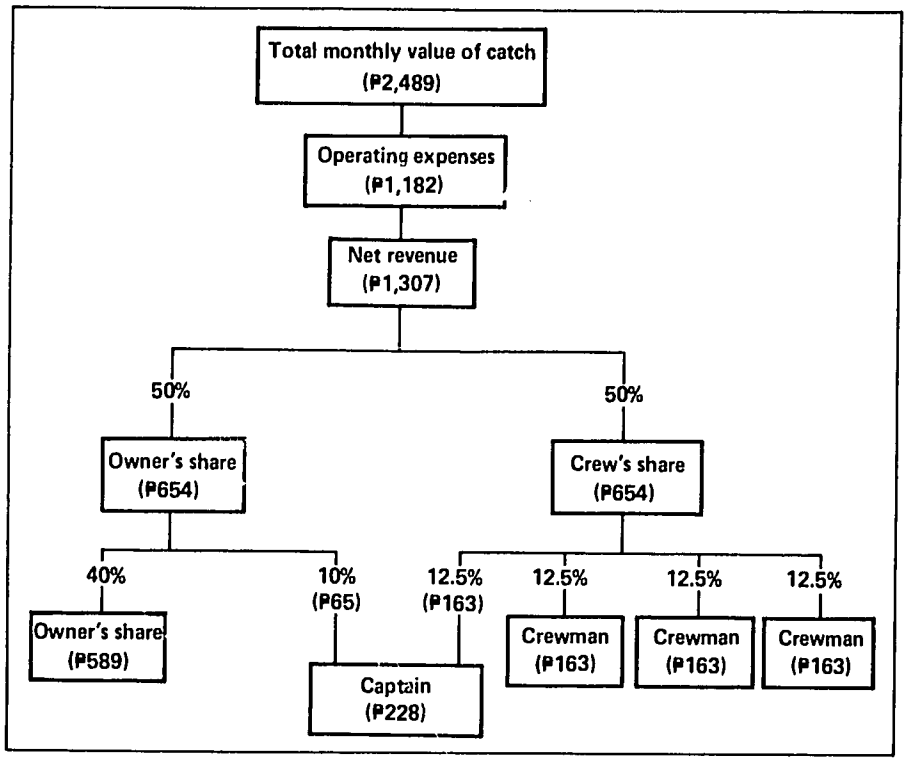

Fig. 3. Sharing system of stationary liftnet in San Miguel Bay (1980-1981), based on Supanga and Smith (1982). This gear operated for only four months during 1980-1981 due to rough seas early in the season. Incomes would probably be higher in a more "normal" year.

The catch from most trawlers is sold by the owner/broker so that the usual 5% commission could be considered as additional income for the owner. When owners hire brokers they keep for themselves 2% and give a commission of 3% to the hired broker. The owner or an assistant keeps the accounts of operating expenses and proceeds from the sale of fish and distributes shares to the crewmen once a week, usually on Sunday. (Weekly sharing on Sunday is also the common arrangement with other gear types).

The *maestro* or captain of a small or medium trawler plays a vital role in fishing operations. Both the owner and the crew depend on this man, whose luck and skill determine whether operations will be profitable and harmonious. The captain is primarily responsible for hiring the crew and assuring their efficient interaction. It is he who pilots the boat to productive fishing grounds and avoids obtructions which could snag and damage the net.

The *maestro* is also the owner's representative on board. It is relatively easy (and not uncommon) for trawler crews to sell part of their catch to other buyers since trawlers operate over most of the Bay and can land at a number of ports. If this happens, the owners stand to lose their share from the sale. Owners are aware of this problem and seek to discourage such sales by giving special incentives to their captains in the form of sizeable extra shares. It takes years of experience and an intimate familiarity with local fishing grounds to become a good *maestro.* Owners seek to retain the services of those trawler captains whose operations return a regular profit, another reason for providing the captain with an extra share.

Both small and medium trawlers also have a machinist who is responsible for maintaining the engine in good running condition. A machinist may or may not take part in the hauling of the nets or the sorting of fish, depending on the size of the crew and the amount of work to be done. His main responsibility is the engine and he receives a small bonus, usually from the *maestro* but sometimes from the owner.

In addition to the *maestro* and the machinist, each trawler has a complement of three or four ordinary crewmen whose task is to set and haul the net and sort the catch by size and species. During those nights when these trawlers are moored off Sabang, it is common practice for one crewman, chosen on a rotational basis, to remain on board. This is necessary due to the danger of theft of fishing gear at night and to guard against accidental swamping in rough seas.

In addition to this relatively complex division of labor, small and medium trawlers may be distinguished from the small-scale gear types found in San Miguel Bay by their owners' active discouragement of hiring relatives as crew. Trawlers are operated as commercial enterprises and owners feel that hiring kinsmen may lead either to inefficiency in operation or tensions among the crew due to favoritism. Relatives may also ask for extra shares or loans from the owner. If an ordinary crewman is related to the owner he may shirk some of his responsiblities and it would be difficult for the *maestro* to maintain control over him.

The sharing system applied to small and medium trawlers has changed over the years. Prior to 1960, crewmen working on trawlers received a fixed share of the gross income from the catch. No deduction of operating expenses was made in calculating the crew share. In that year, however, a more complex sharing arrangement was introduced. This sharing system, which was in force during the period 1960-1975, is illustrated in Fig. 4.

The sharing system used for trawlers underwent small changes during these years. In 1975, a major change took place when trawler owners began to deduct 10% from the gross income for maintenance and replacement costs of the engine. The effect of this new sharing system is illustrated in Fig. 5. Previously, there had been no separate share for the engine. Regular engine maintenance

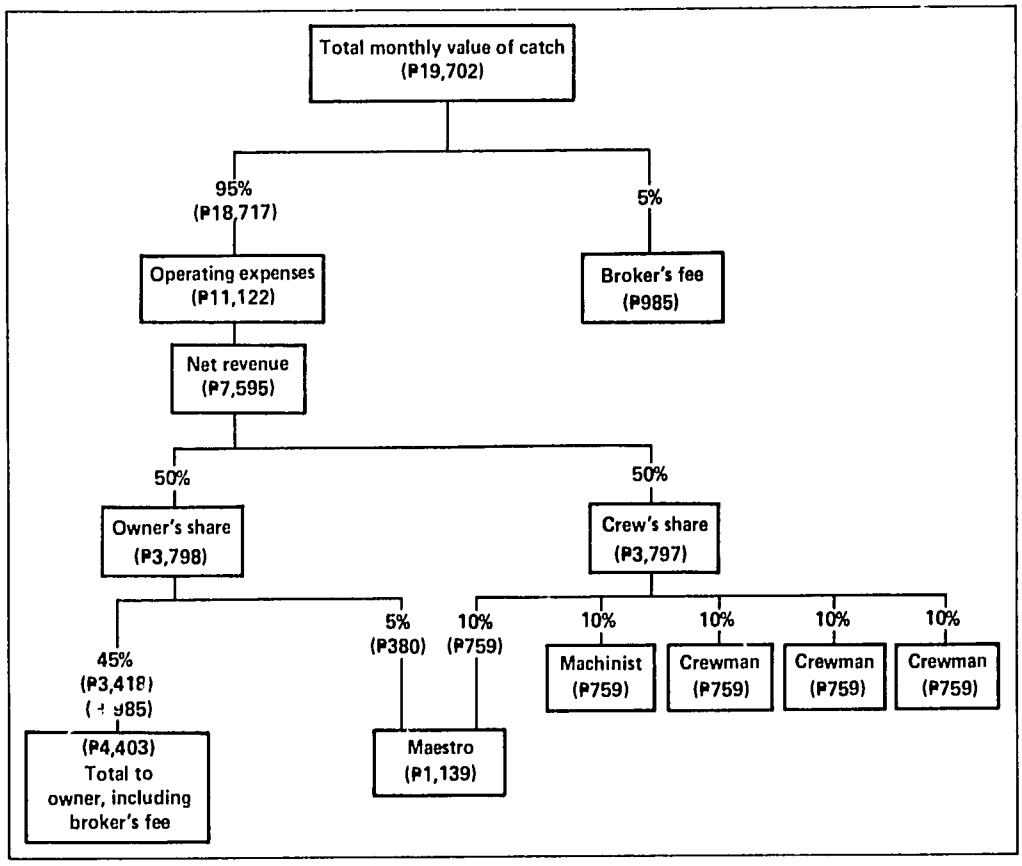

Fig. 4. Sharing system for small trawlers in San Miguel Bay (circa 1960-1975). The figures used here are based on the value of catch and operating expenses recorded for small trawlers during 1980-1981 by Navaluna and Tulay (1982). They are used here for illustrative purposes and to facilitate comparability with more recent variations of the sharing system for small and medium trawlers. The total owner share assumes that the owner acts as his own broker.

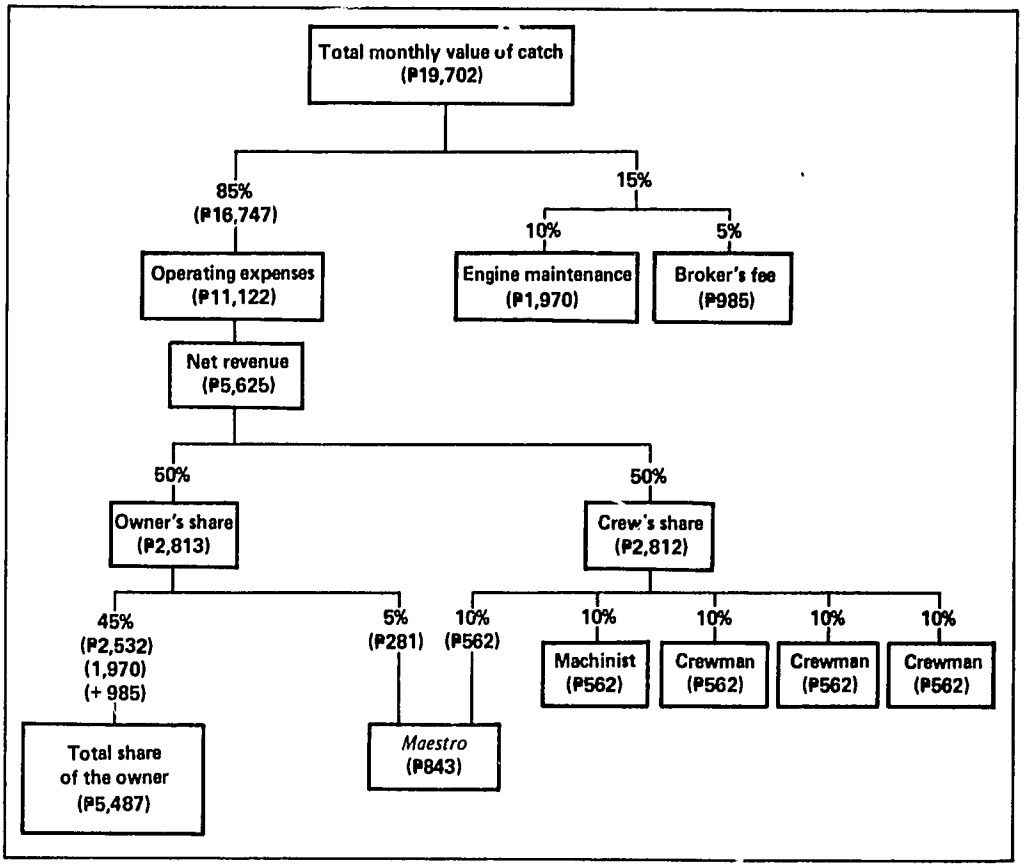

Fig. 5. Sharing system for small trawlers in San Miguel Bay (1975-1981). The figures used here are based on the value of catch and operating expenses recorded for small trawlers during 1980-1981 by Navaluna and Tulay (1982). They are used here for illustrative purposes and to facilitate comparability with more recent variations of the sharing system for small and medium trawlers. The total owner share assumes that the owner acts as his own broker.

was considered part of normal operating expense. Depreciation and replacement costs had been shouldered exclusively by the owners. In 1975, however, this cost began to be charged "off the top", substantially increasing the owner's total income. Since this 10% deduction is to cover the costs of engine maintenance, these expenses are no longer included under operating costs. However, based on interviews with owners, it seems that this 10% of gross income more than covers maintenance and replacement costs for the engine and that this new arrangement has resulted in a larger effective share for owners.

A further modification in sharing was introduced in January 1980 by the largest owner of trawlers in Sabang. In this modified sharing system (Fig. 6), the *maestro* gets a double share. Instead of the total crew share being divided into five shares, one for each man including the *maestro,* the new system divides their total share into six parts, two of which are for the *maestro.* Under this arrangement, the *maestro's* extra share is paid out of the crew share instead of the owner's share. As of the middle of 1981, this system had not yet been adopted by the other trawler operators.

For medium trawlers, which require a crew of six, the standard sharing is slightly different, as illustrated in Fig. 7. The larger boat and crew increase the responsibility of the *maestro* and result in a larger share for him. Each of the six-man crew receives 16% of the total crew share. The remaining 4% is a bonus to the *maestro* who also receives 10% of the owner's share. Incomes for medium trawlers were lower than small trawler incomes due to the former's higher operating expenses.

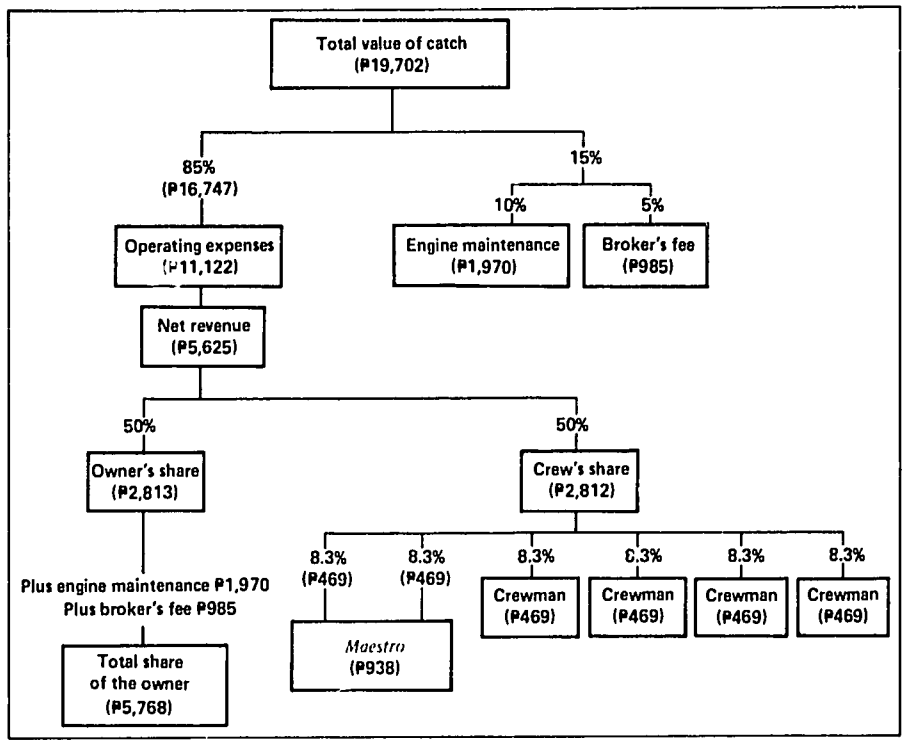

Fig. 6. A modified sharing system for small trawlers in San Miguel Bay (1980-1981). The figures used here are based on the value of catch and operating expenses recorded for small trawlers during 1980-1981 by Navaluna and Tulay (1982). They are used here for illustrative purposes and to facilitate comparability with other variations of the shering system for small and medium trawlers. The total owner share assumes that the owner acts as his own broker.

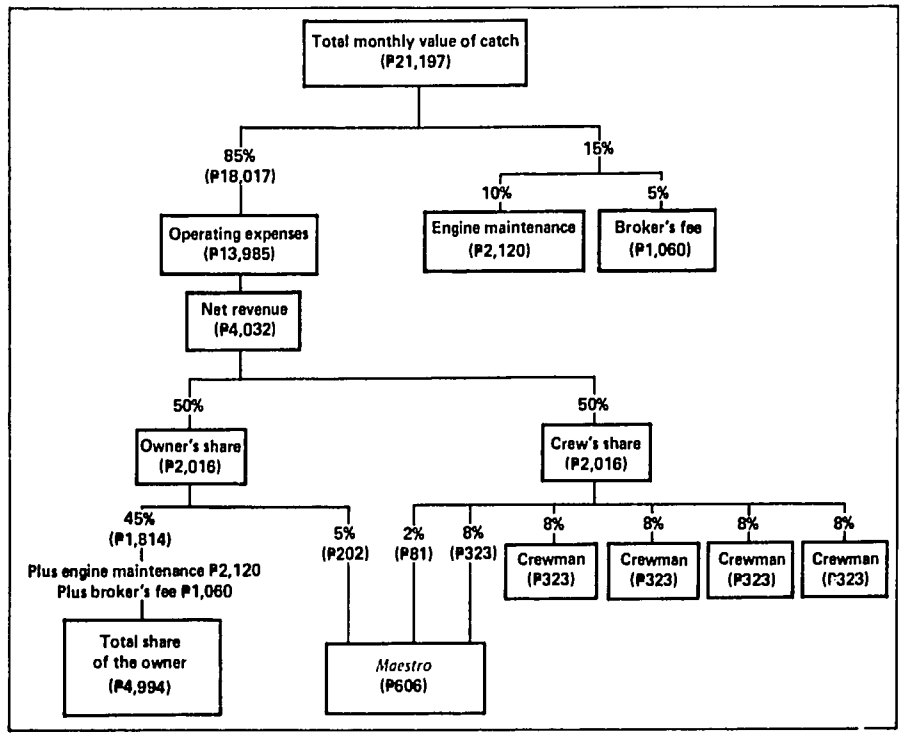

Fig. 7. Sharing system for medium trawlers, San Miguel Bay (1981). The figures used here are based on the value of catch and operating expenses recorded for small trawlers during 1980-1981 by Navaluna and Tulay (1982). They are used here for illustrative purposes and to facilitate comparability with other variations of the sharing system for small and medium trawlers. The total owner share assumes that the owner acts as his own broker.

Comparing the sharing systems applied to small trawlers illustrated in Figs. 4-6, there is a trend towards increasing total income accruing to owners at the expense of their crewmen (Table 8). The actual peso values are inexact for the years prior to 1980, since the data are based on real values (e.g., prices for fish and shrimp, operational expenses, and volume of landing) for the period 1980-1981. Nonetheless, it is clear from Table 8 that owners have modified the sharing system in a manner which provides them with an increased proportion of the total proceeds. By comparing Tables 8 and 9, it can be seen that crewmen on small trawlers still earn higher incomes than crewmen on gill-netters, mini trawlers and liftnets.

Discussion

This analysis of ownership patterns reveals a major difference between small-scale fishermen, where ownership of boats and gear is relatively widespread, and the operators of small and medium trawlers, where ownership is more highly concentrated. Levels of investment per unit differ widely, as do the roles played by owners. Trawler owners do not go to sea, remaining on land and concentrating their efforts on marketing and management of their fishing enterprises. In the small-scale sector, owners commonly take part in fishing operations. Their incomes are necessarily larger than those of crewmen due to costs of maintenance and depreciation plus the necessity of earning a return to their investment. Inequalities of income in the small-scale sector exist, but they are not as great as between owners of small and medium trawlers and their crewmen.

Differences in ownership patterns in turn are reflected in sharing systems. The various sharing systems used for small and medium trawlers are, on the whole, much less flexible than are those of the small-scale sector. In the latter case, owners and crewmen are of the same socioeconomic class and their economic relationships are tempered by kinship and other factors. In contrast, the incomes and standards of living among trawler owners are so different from those of their crewmen that these two groups may be regarded as separate socioeconomic strata. Trawler owners may on occasion grant loans or give support in time of need to a regular crewman, but they strive to restrict such requests by dealing with individual crewmen through their respective *maestros* and maintaining a careful distance in social affairs.

This distance between owners and crewmen is illustrated by the weekly distribution of shares from the proceeds of the catch. Among gill-netters and users of other small-scale gear, owners and crewmen are in direct contact, often making the calculations together. The calculation of gross and net income and the respective shares of the owners and crewmen for baby trawlers usually are managed by the owner or his bookkeeper, either in the presence of the *maestro* or not. *Maestro* and crew alike have the right to check the computations. It is the *maestro,* however, who collects the crew share from the owner and distributes it among the crew. Regular interaction between owner and crew is in this manner limited. Owners prefer to follow a "chain of command" which places an intermediary, the *maestro,* between them and their crew.

The relative ease by which small-scale fishermen can become owner-operators also affects sharing systems. Small-scale gears require relatively small investment compared to small and medium trawlers and most fishermen can reasonably aspire to become owners if they choose. This limits the ability of owners to impose unilateral changes in the sharing system. The cost of small and medium trawlers, however, is prohibitively high for all but a few. Owners exert greater power in determining the sharing system and over time have increased their proportion of the gross receipts.

The comparison of ownership patterns and sharing systems between small-scale fishermen and operators of small and medium trawlers has indicated major differences in the form and content of relationships which govern production and the distribution of income. This suggests that even though small trawlers (which outnumber medium trawlers 75 to 20) are legally and administratively categorized as part of the municipal or small-scale sector, they are in essence part of the large-scale or commercial sector, which includes the medium trawlers. This division of gear types into two sectors—

small-scale and trawler—more accurately reflects social and economic reality in the San Miguel Bay area than the existing arbitrary division based on vessel displacement. The division based on social and economic relationships of production coincides with the viewpoint of fishery biologists working the field of stock assessment, including those in the San Miguel Bay Project. In Pauly and Mines (1982), it was found that considerable competition exists between these two sectors, which exploit many of the same species. This competition raises serious questions of resource allocation which need to be addressed by national policymakers.

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The Fisherman's Family: Economic Roles of Women and Children

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Abstract

Productive roles of women and children in the small-scale fisheries of San Miguel Bay, Philippines, were divided into those which generate cash income and those which do not. Economic values were placed on the latter category which were essential for the material well-being of the household, the primary productive unit. Non-quantifiable but important roles performed by women were as manager of family finances, in determining daily consumption patterns and in influencing investment decisions. In addition, a wide range of income-earning occupations, mostly related to the fisheries, were found to exist for women. The contribution of adolescent males to household income as fishermen, in porterage or other fishery-related occupations is discussed.

Introduction

Women and children usually are considered to be dependents of fishermen. Yet, they perform many productive tasks, generating cash income and providing essential services without which the family could not function as a productive unit.

Studies of fishing usually focus on fishermen, and concentrate on the types of gear used, methods of fishing, the sharing system, and technological changes which may lead to improved productivity. An exception to these was the study of Malaysian households by Firth (1976). Fishing typically is a male occupation due to the physical strength required and the possible dangers of work at sea. In the developing world, of which the Philippines is a part, the desire to improve standards of living in fishing communities is a major motivating factor in the study of their life and occupation. However, as this paper will attempt to show, the focus must be broadened beyond fishermen alone to take account of the productive roles that women and children perform.

In contrast to fishing communities, the role of women in agriculture and rural development has received some attention from researchers in recent years (e.g., Pala 1976; PAG 1977; Acharya 1978; Singh 1978; Blake and Goonatilake 1980; Consignado-Rixhon 1980). An annotated bibliography of documents on women in development in the Economic and Social Commission for Asia and the

Pacific region can be found in APCWD (1980). A search of the literature has found only occasional mention of the role of women in fishing communities and these are for communities outside Southeast Asia (Dewes 1982; Kalvathy 1983).

This contribution is based on data gathered through a variety of means over a period of nearly two years (1979-1981) as described in the introductory paper by Yater (this report). The final month of field work was spent living in one fishing community using participant observation and in-depth interview research techniques. For this topic, this final phase of field research was particularly illuminating as it was possible to observe women's and children's participation in community affairs. Six family cases were selected and a regular schedule of visits was followed. Presence within the household for an extended period of time enabled the author to understand the dynamics of the various households. Where necessary, observations and discussions with this small sample were continued beyond the house itself and into the streets and working places of the community.

Women and children are productive both in activities which generate income and in those which do not. Both are of vital importance to the family. Retail fish marketing and fish processing are examples of the kinds of activities which involve women and children and which are important sources of income for many families. Less obvious to a casual observer but no less important to an adequate understanding of the dynamics of small-scale fishing communities is the fact that women control the family's finances and play a key role in all economic decisions.

Non-Income Generating Activities

THE VALUE OF DOMESTIC LABOR

Housekeeping and child-rearing are tasks primarily associated with women. Fifty-eight percent of the wives of our respondent fishermen were reported to work only in the home. The traditional and well-understood roles of wife and mother include such chores as purchasing the family's daily needs, cooking food for the family, washing and ironing clothes, sweeping and scrubbing the floor, cleaning the house and compound, and caring for the children. Cooking food for the family is a major concern since fishermen do not go to sea hungry or without a packed lunch.

In raising children, mothers often are assisted by their older children. Child care is quite time consuming. It would be meaningless to put an exact value on such efforts, but it is fair to say that family life is based on the rearing of children who not so many years after their birth will take their place as productive members of the household.

Breastfeeding is commonly practiced in the Bay's fishing communities. This is done until the child is one to two years old during which time the child gradually is weaned by supplementing mother's milk with solid foods beginning with rice. Breastfeeding in public is not considered immodest and does not seriously interfere with a woman's normal activities at home or in the community.

By the age of seven, most children assist their mother in various housekeeping chores. This is true for both males and females. Boys usually gather firewood, fetch water from the well, and feed pigs and chickens. Girls usually cook, care for younger siblings, and purchase household necessities from a nearby store or market.

Table 1 indicates the most common household services provided by women and children and the cost of hiring someone else to do these chores in the San Miguel Bay area. These costs do not include the necessity of providing such a helper with snacks or meals. For a permanent househelper who assists with general housekeeping chores this extra cost may include all meals each day and occasional extra money for clothing and incidental expenses.

Costs of cooking and caring for children are not included in Table 1 as no single case was found where families hired helpers only for those tasks, though they are commonly included in the duties of a hired househelper. The most common type of assistance housewives seek is for laundry and ironing, time consuming tasks which are especially tiresome for women engaged in some type of

Table 1. The value of common household activities in pesos, March 1981.*

Household activities	Prevailing rate	Monthly expenses	Annual expenses
Laundry	70/month	70	840
Ironing	50/month	50	600
Fetching water	0.35/gallon container (4 containers/day)	42	504
Househelper	70/month	70	840

*US$1 = ₱8.00 (1980).

regular economic activity. Illness, advanced pregnancy or recent childbirth are other reasons a family may decide to pay for assistance with such household chores. The presence of adolescent daughters tends to reduce this need for outside help as they begin to take a larger part in domestic activities. Occasionally women who are friends or relatives will assist one another in times of need, especially if there is an illness in the family. This cooperation between women is quite common and often extends to other social and economic activities.

Fetching of water for a family's daily needs is a chore commonly accomplished by one or more of a family's children. In many coastal fishing communities, the source of water is at a considerable distance and families fetch their own or buy water from water delivery men or boys. In fishing communities where most men spend the day at sea, there is considerable demand for this kind of heavy labor. Unless a family has sons available to bring water home, it will be necessary to pay for this basic commodity.

As may be seen in Table 1, a family whose women and children are able to provide the essential services required for smooth household operations are worth literally thousands of pesos per year. There is no question that although such activities do not generate cash income, they are in a real sense productive.

FINANCIAL MANAGEMENT

During interviews, the central role women play in handling the family's finances became apparent when many of fishermen-respondents could not answer queries regarding costs of major household items or even fishing boats and gear. Women are family financial managers and control the household economy. Money earned by the husband or any other household member is turned over to the woman of the house. She then allocates the money for food, water, fuel for lighting and cooking and the other necessities of the household. She gives her husband his pocket money. If there are older children who have contributed to the family's income, they also will be provided with pocket money for recreation and perhaps for clothing. She also gives regular allowances for snacks to children still in school and occasionally a few centavos to a pre-schooler for a treat.

Women not only handle most household expenditures but family savings as well. This they may do in the form of cash, bags of rice, or a savings account in a bank. Sometimes, it was discovered, women were saving money without their husband's knowledge.

Besides these more usual forms of savings, there is a collective savings system known as *paluwagan* commonly practiced by women in the fishing communities surrounding San Miguel Bay as in most other parts of the Philippines. This saving scheme involves five or more persons who agree to contribute a fixed amount of money on a designated date. Each member of the group in turn receives the total (or major part of the) sum every collection date. In many cases, the sums involved are over ₱1,000. The *paluwagan* system enables each member of the group to obtain at one time a

relatively large sum of money which may be used for household repairs, educational expenses, or investment in livestock, boats, netting or other productive assets. If the group agrees that a minor part of the contribution (e.g., 5-10%) is to be saved, the person who organized the group is designated as treasurer. This group savings may be used for financing a Christmas party for the members or as an emergency fund available to any member in need.

Family savings controlled by women are used to meet emergency needs, investment purposes, and unusual expenses such as those which occur during the annual *barrio fiesta.* The *barrio fiesta* is an important social occasion as almost every family is involved in the preparation of special foods to serve friends and relatives, some of whom come from as far away as Manila. Women and children are primarily responsible for the housekeeping, marketing, cooking and other preparations for this occasion when family and social ties are renewed.

Control of the family's finances gives women an important role in family decisionmaking. Expenditures for most household needs are decided upon by the wife alone. Major expenditures, such as buying a new fishing boat, engine or nets or continuing the education of children through high school and college, must be decided upon by the husband and wife. Even though the husband may be more knowledgeable about the right kind of boat, engine or net, his wife is likely to be more knowledgeable about the family's ability to pay either in cash or by credit. Since men commonly have little knowledge of family finances, women have more than a *pro forma* role in deciding upon investments in boats and gear.

On lesser items, for example, simple household needs costing ₱50 or less, women rarely bother to consult their husbands. For items costing more than this amount both husband and wife and sometimes the children, especially if they earn part of the family income, take part in the final decision.

Income Generating Activities

ADOLESCENT MALES

Fishing communities offer diverse and, compared to agricultural or most urban communities, relatively attractive opportunities for adolescent males to begin employment at an early age. As early as age eleven or twelve, sons of fishermen begin to join their fathers at sea and earn the share of a regular crewman. If the family owns a boat and type of gear which can be operated by two men (e.g., gill-net or mini trawl, the two most common gear types found in San Miguel Bay), father and son working together earn for the family the entire net income. Those families who do not own boat and gear also benefit by the income earned by an unmarried son working as a fisherman. In such cases, the son's income will be the same as (or, if he works on a different boat, comparable to) that of his father. Obviously this represents a major increase in a family's income.

In addition to fishing, adolescent males in some communities have other opportunities for employment. Because San Miguel Bay is fringed by broad mud flats, porterage services are required to bring the catch in from and take supplies out to the boats.

In Sabang, Calabanga, teams of two to three males aged 9-18 work together to bring in the catch of the small trawlers based there. These small trawlers must anchor 100-200 m offshore. The teams of porters *(bangkeros)* paddle back and forth from the landing of the boats in small dugout canoes known as *bancas.*

Before docking, the catch is sorted out by species and placed in rattan baskets. The *bangkeros* transport these baskets to the landing area, where middlemen and trawler owners wait. On the average, four round trips are required to land the catch and to supply the trawlers with diesel fuel, water, a new set of nets, or other supplies. On each trip back from the boat, four to five baskets of fish are landed, each weighing approximately 40 kg. Since the boats they use are small (4 x 0.5 m), and the waves sometimes rough and choppy, considerable dexterity is required to negotiate a safe landing.

Bangkeros provide quick transportation of fish between trawlers and the landing area. Since a number of trawlers sometimes arrive at the same time, each boat has a particular group of *bangkeros* ready to fetch the catch.

Small trawlers typically return to Sabang every other day, making three landings per week. The *bangkeros* receive as payment for their services leftover fish, most of which will be sold as fish meal. Some of their share may include fish suitable for human consumption, in which case the *bangkeros* must decide whether to sell the fish to buyers at the landing or take it for home consumption. The sale of between one and three baskets of fish for fish meal plus a small quantity of good fish provides an income of between ₱30 and 100 per landing, which is divided equally between the *bangkeros.* Their only expense is boat rental of ₱2/day. Considering the number of hours worked, this level of income is attractive. However, this work provides at most part-time employment and limits the ability of the *bangkeros* to engage in other pursuits. If a trawler returns unexpectedly, the *bangkeros* are expected to drop what they are doing and unload the boat or risk losing their job.

Bangkeros and other related workers are found in many communities surrounding San Miguel Bay. In Barcelonita, young boys are hired to bring in the catch of gill-netters and mini trawlers. There, as in Sabang, broad mud flats make the landing difficult even for the shallow-draft pumpboats used by small-scale fishermen. Barcelonita lies at the end of three roads and porterage services are in constant demand by people coming from or going to the numerous coastal villages of Sipocot and Mercedes Municipalities which are accessible only by boat. Bagacay, in Tinambac Municipality, also serves as a transportation terminus for the coastal communities of Siruma which have no access to land transportation. In both Barcelonita and Bagacay, large volumes of copra or other bulky agricultural produce must be off-loaded from passenger boats and loaded again onto jeepneys headed for Naga City, Sipocot or other markets.

The opportunities for employment presented to adolescent males in fishing communities, and the important contribution they can make to family income levels, help to explain why so few continue beyond the sixth grade. Adolescent females are more likely to complete high school than their brothers (see Yater, this report). For both males and females, however, the number of children continuing their education beyond sixth grade is quite low, indicating that other factors may need to be considered besides differential employment prospects of school-age children. Existing high schools and colleges are located at considerable distance from most fishing communities, and the primary constraint to further education tends to be economic.

OPPORTUNITIES FOR ADULT AND ADOLESCENT FEMALES

Fishermen's wives and their daughters often contribute directly to family income through involvement in a variety of part-time or full-time occupations. Most, but not all of these activities are related to fishing, specifically marketing, processing and distribution of the catch.

In many of the smaller communities surrounding San Miguel Bay, wives meet their husbands at the beach and take charge of selling the day's catch. There are usually several outlets for the day's catch, including sale to a local middleman who acts as a bulking agent before the catch is transported to urban markets, sale to local small-scale retailers *(rigaton)* who service nearby communities and market places, or directly selling the catch to consumers. Most of the *rigaton* are women, as are many of the local middlemen.

In larger communities, several different levels of fish buyers may be encountered. A good example of this is in Sabang, Calabanga, where both retail *(rigaton)* and wholesale transactions are dominated by women. On the basis of their appearance alone, *rigaton* are easy to distinguish from other types of buyers at the landing area. *Rigaton* always carry rattan baskets and/or plastic buckets.

The capital required to begin work as a *rigaton* is quite small, from as little as ₱10 to as much as ₱200. Often the female *rigaton* will take the fish from fishermen or boat owners and pay them later. The volume of fish she is able to handle varies between 10 and 60 kg per landing time. Since fish are landed two times each day in Sabang, early morning and mid-afternoon, working as a

rigaton can be a full-time job. Some *rigaton* take their fish to the larger market places of Calabanga's *poblacion* (the town or community where municipal offices are maintained, usually the largest community within the respective municipality or to Naga City. Others take the fish from house to house and sell to regular customers. Often these regular customers are given short-term credit by the *rigaton* who supplies them with fish for home consumption. The *rigaton* receive payment for such credit the following day, after one week, or at any other time agreed upon by the *rigaton* and her customers. Most of the *rigaton* interviewed said that they prefer cash on delivery due to their distinctly limited capital and their need to repay fishermen or middlemen for the fish they retail. If necessary, payment in kind (e.g., rice, cooking oil, sugar, vegetables) may be accepted.

Several *rigaton* said that they started their business in 1980 with as little as ₱50. This initial capital came from personal savings, loans from a neighbor, the sale of a pig or rootcrops. When such small sums are from neighbors, no interest rate is charged by the lender. Most of those who found it necessary to borrow said they got it from one of their nearby relatives. In at least one case, a *rigaton* who borrowed money from a friend asked their friend to be her daughter's godmother, strengthening their bond of friendship. The assistance of the friend is reciprocated daily, according to the *rigaton,* by a special discount of half to one peso off the price of fish sold to the friend by the *rigaton.*

In addition to the numerous *rigaton,* there are two other types of fish buyers operating at the wholesale level whose ranks also are dominated by women. These are the *factorador,* who deal in shrimps and first class species of fish, and the *beneficiador,* who purchase lower valued species in large volumes for processing.

Just as one can easily recognize the numerous *rigaton* by their outward appearance, so too can the *factorador* be identified by her sophisticated clothing and her more confident manner. *Factorador* bustle about bidding on all available shrimps and first class fish (e.g., groupers and snappers). At the same time, she supervises the work of two or more assistants, usually young males, who are responsible for icing and packing the fishes into wooden boxes.

To become a *factorador* requires significantly greater capitalization than that of the *rigaton.* Some *factorador* may have ₱5,000 or more to pay past and present transactions, which range between 70 and 300 kg of highly valued fish and shrimp. Other *factorador* may have only ₱500 as operating capital.

Small-scale *factorador* limit themselves to selling to retailers in Naga City or other local markets. More heavily capitalized *factorador* also may sell locally, especially if the volume of their purchases on any given day is small. Otherwise, they prefer to send their fish and shrimp to Manila, where prices are reportedly 120-200% higher. Several *factorador* have their own jeepneys which are used to transport their daily purchases either to Naga City or to Manila. Besides capital, the crucial assets which *factorador* have are contacts, especially at the final market place. It is not surprising, then, that many *factorador* are not local residents. Most of them are from the *poblacion,* Naga City or from the area around Manila.

This is not true of the *beneficiador* whose homes and processing establishments are located close to the landing areas. *Beneficiador* look more like *factorador* in dress and behavior than their neighbors, the *rigaton.* While *factorador* deal in high valued species, *beneficiador* concentrate their attention on small croakers, mullets and herrings, lower valued species which are sun-dried usually after a brine bath. After processing, the fish are sold at various markets throughout the Bicol Region and as far away as Manila. Since a greater amount of time is taken in selling processed fish compared to fresh fish, *beneficiador* typically make their purchases on the basis of credit from the fishermen or, more commonly in the case of Sabang, from the broker who handles the sale.

The number of buyers active in any given landing is likely to vary from season to season or even day to day (Esporlas, this report). For Sabang, rather than count the number of buyers, four brokers were asked how many people were involved in the buying and selling of fish (see Table 2).

The dominance of women in fish marketing is apparent. Only in the case of *beneficiador* do men play an equal role, and this is usually as part of a husband-wife team. Since here as elsewhere

Table 2. Number and type of middlemen engaged in fish buying in Sabang, San Miguel Bay, March 1981.

Broker no.	Type of middlemen	No. of women	No. of men	No. coming from Sabang	Total no.
1	*Rigaton*	112	38	32	150
	Factorador	8	2	2	10
	Beneficiador	15	15	25	30
2	*Rigaton*	150	50	22	200
	Factorador	18	2	6	20
	Beneficiador	30	30	25	30
3	*Rigaton*	150	50	25	200
	Factorador	14	1	5	15
	Beneficiador	20	5	23	25
4	*Rigaton*	112	38	5	150
	Factorador	24	1	5	25
	Beneficiador	15	15	15	15

the wife usually controls the flow of money, she is at least a full partner in this family business.

Women also dominate petty business such as the neighborhood sundry-goods store, known locally as the *sari-sari* store, and small-scale trading in such local communities as copra, bananas and rootcrops. Often these two types of activity are combined, with the *sari-sari* store serving as a base for trading. This is especially common in some of the more remote island communities of Mercedes or the isolated communities of Siruma. The high cost and difficulty of transporting goods from such communities means that individual producers usually sell their products to local buyers who act as bulking agents. The combination of *sari-sari* store operator and buyer of agricultural or other commodities is a natural one since the movement of goods to major markets can be accomplished at the same time that provisions for the store are procured. Children and husbands are active partners of women in these establishments, but as a whole, it is the woman who plays the leading roles of treasurer and secretary in all business transactions.

Sari-sari stores range in size and diversity of stock from those operated out of a window of a house selling a few sweets, matches, cooking oil and other simple necessities to separate buildings with an inventory worth tens of thousands of pesos. Virtually anyone at anytime can start a *sari-sari* store. The margins of profit vary from item to item, but overall income is low due to considerable competition in such retail trading, which in turn contributes to low gross sales. Rarely, however, do families depend solely on the profitability of *sari-sari* stores for their income. Instead, such small-scale retailing usually is seen as a part-time occupation for the women and children of the house through which a few extra pesos a day may be earned.

A similar approach to part-time work which requires little capital to earn a few extra pesos a day is the preparation and sale of snack foods, using local ingredients like glutinous rice, cassava and bananas. Women either sell these goods themselves or ask their children to do the selling. In most communities, the sale of snack-foods depends on the success of fishing. When fishing is good, more women are engaged in selling snack foods. During seasons of poor fishing, however, very few women prepare snack foods because of weak demand. This is especially true in the smaller fishing communities of San Miguel Bay. In larger communities, however, more opportunities exist for this kind of enterprise. In Sabang, Castillo and the *poblacion* of Mercedes, for example, snack-food sellers appear whenever buyers and fishermen congregate. As early as 4 a.m., small stands are open to serve the departing fishermen. As the sun rises, the fishermen return and are met by fish buyers and other people. Towards the end of the landing time, almost all cooked snack foods are sold out.

Another activity even more directly affected by the seasonality of fishing is fish processing. Here too, women predominate, both as supervisors of work in progress and in providing the bulk of the labor requirements.

With the exception of large-scale fish-processing establishments in Sabang and the *poblacion* of Mercedes, most operations are small-scale and depend primarily on household labor provided by women and children.

The opportunities for earning cash incomes are somewhat greater in Sabang and Mercedes, though in both places fish processing is seasonal. In these two places, women work on a piece rate basis. The largest processing establishment in Sabang hires 15 to 25 women a day just for splitting and gutting fish. Another group of five to ten people (mostly young males) is hired on a monthly or daily basis to dry the fish under the sun.

In Sabang, the rate for splitting and gutting is ₱0.50/hundred, while in Castillo less than half this rate is paid (₱0.20). The higher rate in Sabang appears to reflect greater opportunities for employment by women in that community due to the relatively large volumes of fish landed by the trawlers based there. In Castillo, a smaller volume of fish is landed by gill-netters and mini trawlers. In Sabang, young males who dry the fish are paid ₱8-12/day plus one meal. No comparable figure is available for Castillo since this work is done by the family.

It is not only in Castillo and other small communities that fish processing is a family affair. Even in Sabang's larger establishments, it is common to find a mother and several of her children working together. The mother finds this advantageous since she can see to her children's welfare, discipline them if needed and collect their total earnings after the work is done.

One woman reported that she was able to earn a daily income of ₱10 for sorting fish in Sabang. She started work at around 9 a.m. after two of her children had left for school. Her two pre-schoolers were left with her mother-in-law, who lived nearby. She returned home at 11:45 a.m. to cook lunch for her family and went back to work at 2 p.m. Her work was finished at 5 p.m., just in time to see her children arrive from school and to cook the family's supper. On Saturdays and Sundays, she usually took her two school-age children to work with her. With their help, the work which would have taken her all day was finished in half the time. This allowed her to do other household chores which might have been neglected during the week.

Women and children also contribute in an important way to family incomes by taking primary responsibility for the raising of livestock. Women and children perform the major work of gathering and preparing feeds and take the responsibility of cleaning the pens and other areas occupied by the family's pigs, chickens and ducks. Pigs are the most common type of animal raised; over 40% of respondents had at least one pig. In most communities native breeds and cross breeds predominate, though improved breeds such as *dorok jersey* and *londres* are raised in some communities, especially where transportation facilities make possible sale to urban markets.

Preparation of feeds for pigs is quite labor intensive since some feeds, such as fruits and leaves, need to be chopped or pounded and others need to be cooked before being given to pigs. Feed preparation is time consuming but allows for productive use of local materials and family labor. A piglet purchased for ₱200-250 may be sold eight months later for ₱700 with very little additional cash input. The profit essentially represents a return to labor which is provided primarily by women and children.

In addition to the above-mentioned economic activities of women and their children in fishing communities, there are other types of employment available which, though less common, do provide supplementary incomes to a large number of families. Dressmaking and tailoring are examples of the skills possessed by some women which provide some employment, especially during the *barrio fiesta,* Christmas or Easter. In all but the smallest communities visited in the Project's survey, there were two or more tailoring shops. Such business is said to be good because when they are lucky at sea many of the younger fishermen buy themselves a new pair of pants. Business is especially brisk as *fiesta* time approaches, since all who can afford have at least one pair of pants tailored to be used for the dancing.

Earlier, the importance of the domestic services provided by women and children were discussed and monetary value on such services was placed by referring to the prevailing rate paid to others to perform similar services. Women and their adolescent daughters do take part in this form of hired domestic service both within their home community and in such places as Naga City or Manila. Work in Naga City or Manila is preferred due to higher salaries compared to those available closer to home.

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Problems in the Fisheries as Perceived by Fishermen

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Abstract

Problems affecting the small-scale fisheries of San Miguel Bay, Philippines, as perceived and expressed by fishermen-respondents, are discussed. Current volume of catch (1980) was compared to that of two years previous (1978). Opinions on the cause of alleged decline and possible solutions are presented. Perceptions of standards of living within the fishing community as compared to farming communities are reported with respect to different categories of fishermen: owner-operators, part-owners of a fishing unit and crewmen.

It was found that small-scale fishermen are faced with the critical problem of declining production. They attributed this to several factors, such as presence of small and medium trawlers, increased numbers of fishermen, improved gears being used by other small-scale fishermen, high frequency of bad weather conditions and simply bad luck.

In describing their problems, small-scale fishermen offered their own solutions. Solutions identified by the respondents were: (1) improvement of their fishing boats and gears, and (2) regulation of trawlers. They were aware of their limitations, i.e., (1) dependence on local middlemen for financial support, (2) weak control over pricing of their own catch and (3) lack of organization to oppose the trawlers who are few in numbers but financially and politically well connected.

Introduction

Fish provide the single most important source of animal protein for the overwhelming majority of all Filipinos; therefore, the nation's fisheries are a resource of critical importance. In the recent past, the bounty of the sea was considered practically limitless and government efforts were geared to increasing production rather than towards fishery management. Fishermen in both the municipal and commercial sectors responded by adapting new and more effective fishing techniques, placing increased pressure on a renewable but finite resource. The growing population of the Philippines assured ready demand for increased production, but in recent years there has been an increasing realization that opportunities to expand production are limited and that many important fisheries either have reached or are beyond maximum sustainable yields.

As a consequence, the Philippine government has begun implementing programs and policies concerning the use and management of fisheries and other aquatic resources (FIDC 1978). It was in the context of the realization of the need not only to develop but to manage fisheries that San Miguel Bay, which was said to be overfished, was chosen as the site for the study culminating in this series of papers. This paper discusses fishermen-respondents' perception of problems affecting the fisheries of the Bay. Data for this report came from interviews with 641 fishermen sampled in a socio-economic survey.

Problems Reported by Respondents

The single most important issue of concern for the fishermen of San Miguel Bay is the decline in their volume of catch. Respondents were asked how their current volume of catch compared to that of 1978, two years previous. The time frame of this question was deliberately limited because of the increased likelihood of error in memory for a more distant point in time.

Most (78.6%) of the respondents reported a decline in their catch over this period (Table 1). Approximately 10% reported higher catches while 8% reported that their catch was unchanged. Only 3% reported "don't know", which may have included a number of fishermen who recently entered the fishery. Some of those who reported improved catches may have recently obtained new gear or motorized their boats, which would account for their improved production. Nonetheless, the majority of the fishermen reported a decline in their catch. Higher prices for the fish they did land may have mitigated the economic impact of this decline in volume, though substantial increases in operational expenses (primarily due to higher fuel costs) probably led to an overall decline in income.

Those fishermen who reported a decline of their catch were asked for their opinion on the cause of the decline. This was an open-ended question and responses were categorized only after the entire survey was completed. Nearly two-fifths (39%) said the main problem was destructive fishing practices of trawlers (Table 2). They described the trawl net as "scraping even the bottom of the Bay

Table 1. Respondent fishermen's comparison of catch volume in 1978 and 1980 in San Miguel Bay (N = 641).

1980 Catch is	No. of respondents	Percentage
Higher	64	10.0
Lower	504	78.6
Same	52	8.1
Don't know	21	3.3
Total	641	100.0

Table 2. Respondent fishermen's reasons for lower 1980 volume of catch compared to that of 1978 in San Miguel Bay (N = 504).[1]

Reason for decline	No. of respondents	Percentage
Destructive trawlers	237	38.7
Increased number of fishermen	154	25.1
Bay is depleted	42	6.9
Other fishermen are using more improved gear	25	4.1
High frequency of bad weather condition	22	3.6
It depends on luck	5	0.1
Don't know	128	20.9
Totals	613	100.1

[1] Difference in sample size and total responses is due to the fact that some respondents identified more than one reason for the decline of their catch in 1980.

so that no fish can escape from the area of its operation". They also pointed out that the trawl net was indiscriminant and that, through the use of fine mesh or even screens in the cod end, even the smallest fish were captured. Fishermen using such gear as the gill-net to capture larger fish claimed they could not compete against the trawlers because many of the fish species they exploit are captured as juveniles by the trawlers. Analysis of the catch of small and medium trawlers confirms the presence of commercially valuable fish species in the large volume of undersized fish destined for processing as fish meal (Pauly and Mines 1982).

Twenty-five percent of respondents who reported declining production were of the opinion that the cause of this decline was the increasing number of the fishermen operating within the Bay. No data are available which directly measure the rate of increase of numbers of fishermen in the study area. Bailey (1982), however, in analyzing rates of population growth for the communities surrounding San Miguel Bay, shows an average annual growth rate of 2.04% during the period 1939-1980. While this rate of growth indicates only a slight increase in actual numbers of fishermen from 1978 to 1980, it was believed that these respondents are probably referring to the longer time frame since 1970 in which motorization of the non-trawl gears (especially gill-netters) and expansion of the trawl fleet has occurred. This increase in effective fishing effort has undoubtedly contributed to the belief that there has been an increase in numbers of fishermen. Increases in numbers of fishermen, even at a rate of 2% annually, makes any attempt at limiting entry more difficult. As long as alternative employment opportunities are limited, the sons of fishermen will follow the careers of their fathers, a situation mitigated only in part by out-migration (Bailey 1982).

A smaller percentage of respondents indicated that declining production was caused by the generally depleted condition of the fisheries which they did not attribute to any specific cause (7%) or attributed to bad weather conditions during 1980 (3.6%). Others (0.1%) attributed their declining catch simply to bad luck.

Some of the older respondents spoke of conditions during their youth when it was possible to use a simple hook and line from a boat close to shore and obtain a plentiful catch. Now, they said, it was necessary to operate further from shore, which could be done only with the use of motorized boats with the attendant increase in operational costs. Those unable to afford such costs would compete disadvantageously with motorized boats. A small number of respondents (4%) indicated that the competition from other small-scale fishermen using more effective gear was the primary cause of their declining catch.

Finally, 21% of respondents reported that they did not know why their catch had declined. The large number of such responses may have been caused by the circumstances of the interview itself, where the respondent was questioned on a potentially sensitive issue by a stranger. Most of the respondents showed no such reluctance and often were quite outspoken on the matter, especially when discussing the problems introduced by trawlers. It certainly is possible that a number of our respondents did not have a firm opinion, but it is also likely that reluctance to discuss these issues with strangers contributed to the high percentage of "don't know" responses.

Problems as They Affect Different Categories of Fishermen

To examine the possibility that different categories of fishermen (owner-operators, part-owners of a fishing unit and crewmen) have different perceptions of problems they face, a cross-tabulation of the four most commonly cited reasons for catch decline by category of fishermen was made (Table 3). For purposes of this table, the large number of "don't know" (128) responses were lumped with bad weather (22) and luck (5) responses.

From Table 3 it may be seen that fishermen from all three categories of ownership agreed on the ranking of problems causing a decline in catch. The most significant variation was expressed by crewmen, who were relatively less concerned by trawlers than the overall average (27.2% and 37.0%, respectively) and more concerned with the general increase in numbers of fishermen (27.0% compared

Table 3. Selected reasons for declining catch by category of fishermen in the socioeconomic survey, San Miguel Bay (N = 641).

Category of fishermen	Destruction of trawlers	Increase in fishermen	Problems Bay is depleted	Improvement of gear	Don't know/ bad luck/bad weather	Total
1. Owner-operator (complete set)	156 (40.3)	90 (23.2)	25 (6.5)	13 (3.4)	103 (26.6)	387 (100.0)
2. Crew: pilot/member	46 (27.2)	45 (2.6)	14 (8.3)	8 (4.7)	56 (33.1)	169 (99.9)
3. Owner-operator (incomplete set)	35 (41.2)	19 (22.4)	3 (3.5)	4 (4.7)	24 (28.2)	85 (100.0)
Totals	237 (37.0)	154 (24.0)	4 (6.6)	25 (3.9)	183 (28.5)	641 (100.0)

Table 4. Perception regarding standard of living in the socioeconomic survey, San Miguel Bay (N = 641).[1]

Type of fishermen	Opinion on standard of living High	Low	Same/Don't know	Total
1. Owner-operator (complete set)	82 (21.2)	188 (48.6)	117 (30.2)	387 (100.0)
2. Crew: pilot/ member	28 (16.5)	77 (45.6)	64 (37.9)	169 (100.0)
3. Owner-operator (incomplete set)	15 (17.6)	44 (51.8)	26 (30.6)	85 (100.0)
Totals	125 (19.5)	309 (48.2)	207 (32.2)	641 (100.0)

[1]Refers to standard of living compared to farmer in communities served by irrigation schemes which allow double cropping of rice per year.

to the average, 24.0%). It is possible that crewmen were most sensitive to the growth in numbers of fishermen due to competition among them to secure a place on fishing boats. Significant numbers of owners also recognized the problem of increasing numbers of fishermen, however. The variation in emphasis between the three categories of fishermen is less important than the broad agreement that there is a problem in declining catch which may be traced primarily to two factors: trawler operations and increasing numbers of fishermen.

Quality of Life

Respondents were asked how they perceived their standard of living in their present fishing community as compared to the farming communities around them where irrigation schemes allow a double rice cropping per year. Table 4 indicates that 48.2% regarded their standard of living as low while 19.5% regarded it as high. There was little variation between the three ownership categories used here to differentiate fishermen.

Respondents were also asked a number of other questions designed to measure their quality of life. The results are presented in Table 5 which record the number of positive responses to our

Table 5. Respondents' positive responses on questions measuring quality of life by category of fishermen in the socioeconomic survey, San Miguel Bay (n = 641).

Category of fishermen	Number and percentage giving *positive* response[1]															
	Price of fish went higher than other commodities (1)		Can save income from fishing (2)		Aware of ways/ programs for fishing (3)		Satisfied with job (4)		Willing to move for another job and municipality (5)		Willing to move for another job and province (6)		Would recommend children's move for another job and and municipality (7)		Would recommend children's move for another job and and province (8)	
1. Owner-operator (complete set)	17 (4.4)	(n = 387)	192 (49.6)	(n = 387)	235 (60.7)	(n = 387)	343 (88.6)	(n = 387)	161 (41.6)	(n = 387)	140 (36.2)	(n = 387)	321 (82.9)	(n = 387)	317 (81.9)	(n = 387)
2. Crew: pilot/member	3 (1.8)	(n = 169)	93 (55.0)	(n = 169)	90 (53.2)	(n = 169)	133 (78.7)	(n = 169)	77 (45.6)	(n = 169)	71 (42.0)	(n = 169)	144 (85.2)	(n = 169)	143 (84.6)	(n = 169)
3. Part-owner-operator	8 (9.4)	(n = 85)	41 (48.2)	(n = 85)	47 (55.3)	(n = 85)	67 (78.8)	(n = 85)	47 (55.3)	(n = 85)	40 (47.1)	(n = 85)	74 (87.1)	(n = 85)	74 (87.1)	(n = 85)
Total	28 (4.4)	(n = 641)	326 (50.9)	(n = 641)	372 (58.0)	(n = 641)	543 (84.7)	(n = 641)	285 (44.5)	(n = 641)	251 (39.2)	(n = 641)	539 (84.1)	(n = 641)	534 (83.3)	(n = 641)

[1]These are individual questions asked for all our respondents (641) completely worded as follows:

1. Did the prices of your fish go higher than the prices of commodities?
2. Can you save some of your income?
3. Are you aware of any institutionalized ways or programs to help fishermen like you, in any fishing problems?
4. Are you satisfied with your job (as a fisherman)?
5. If you had the opportunity to take up an occupation other than fishing in another *municipality* which promises a higher income and standard of living, would you be willing to leave fishing and your home-village?
6. What if such a move requires transfering to another *province*, would you be willing to move?
7. If your *children* had the opportunity to take up an occupation other than fishing in another *municipality* which promises a higher income and standard of living from them, would you recommend they leave this community?
8. If the opportunity presented to your children requires that they move to another province, would you still recommend such a move?

questions cross-tabulated by category of fishermen (see also Bailey 1982). Again, there was little variation among the three categories of fishermen. Only 4.4% reported that the price of fish was rising faster than that of other commodities, but 50.9% said they were able to save some of their income. A large majority (85%) said they were satisfied with their work as fishermen, but a substantial proportion indicated their willingness to change both occupation and residence if this would lead to higher incomes and standards of living. Note that the part-owner-operator fishermen group was the most willing to leave their home community for another job. This may be due in part to their partial (and lower) investment in gears and greater ability to accumulate savings (as against full owner-operator and crew, respectively), making such a move feasible. A large majority reported they would encourage their children to leave fishing and their home communities if better opportunities were available elsewhere.

Solutions and Constraints

Respondents often suggested possible solutions to declining production. One commonly expressed solution was to improve existing vessels and gears so as to compete better with other fishermen, including trawler operators. This hope was consistently expressed by fishermen using non-motorized boats, the operations of which are limited to the heavily exploited coastal waters. Fishermen using motorized boats also expressed the wish to improve their gear as a means of increasing their catch. By seeing a technical solution to individual problems of low catch, San Miguel Bay fishermen are little different from fishermen elsewhere whose gear upgrading would still not solve the group's problem but would only divide the pie differently.

The main constraint to such vessel and gear improvement is the limited availability of investment capital. Many respondents reported that they were dependent on local fish buyers or middlemen for credit to purchase boats and nets. Small-scale fishermen, however, realized they have little control over pricing of their catch if it is sold to the middlemen to whom they are indebted, and reported that they received a lower price than if they were free to sell to any middleman (Yater 1982; Tulay and Smith 1982). Often price differentials may reflect in part the opportunity costs of capital (i.e., interest) and the risks involved in lending money. This is an important question deserving future examination due to the important role played by middlemen in financing small-scale fishermen.

Various government credit schemes have been devised to provide financing to small-scale fishermen (see Smith et al. 1980), the most recent of which is known as *Biyayang Dagat* ("Bounty of the Sea"). These programs have benefited only limited numbers of fishermen in the past and repayment rates have been extremely low. Evidence to date indicates the same will be true of *Biyayang Dagat* (Bailey 1982). It is interesting to note that a number of credit recipients during the mid-1970s were by 1980 again tied to middlemen who provided replacements for worn gear (see Villafuerte and Bailey, this report).

Fishermen also expressed hope that action would be taken to regulate the activities of trawlers. Many respondents claimed that small and medium trawlers commonly ignored regulations set by Presidential Decree 704 (1975), especially if fishing for highly priced shrimps. Also, in the course of such illegal operations, trawlers were said to occasionally damage the nets set by small-scale fishermen. Operators of fish corrals also claimed that trawlers damaged their gear, especially when the trawlers were operating at night. It is difficult for small-scale fishermen to obtain restitution for their damaged gear, particularly if the trawler was not positively identified. Even with accurate identification the respondents claimed that they were lucky to receive half of the actual cost of the damage, and that taking their grievances to court was not a viable option because they have neither the time, money nor political connections to contest a case.

Most of the small-scale fishermen are aware of their limited influence. Despite their large numbers, they are not effectively organized, so their points of view are rarely heard. Occasionally, small groups of fishermen prepare and submit letters of petition to national authorities urging that

action be taken against illegal trawling. For example, a petition, translated by the author, was sent to the President of the Philippines in 1981 by a group of such fishermen in Camarines Sur and reads in part:

> "We . . . ask for justice with regard to Presidential Decree No. 704. Our municipal government is not doing anything to give us justice.
>
> Since May 1977, we have gone with some policemen out in the sea for four times to catch the illegal fishermen, the trawlers, fishing within municipal waters. But until now illegal fishing is still going on because our municipal government did not do anything about those caught for illegal fishing.
>
> We thank you for your attention to this matter and hope we can be granted our due justice."

Although often ineffective, petitions do occasionally bring the plight of the small-scale fishermen to the attention of national authorities. One year after the above petition, "commercial trawling" was banned completely from San Miguel Bay. However, medium trawlers (which come under the ban because they exceed 3 GT) were continuing in operation at the end of 1982. Small trawlers, which make up the bulk of the trawl fleet, were not affected by the ban because they are less than 3 GT and hence are considered to be part of the "municipal" fisheries (see Villafuerte and Bailey, this report). Despite the ban on commercial trawling within San Miguel Bay, the elements of competition between non-trawl and trawl gears remain to be reconciled.

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