

Fishing Practices of Kalagan Fisherfolks in Mati City, Davao Oriental: Its Implications to Coastal Resource Management

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Abstract

This study investigated the fishing practices of Kalagan fisherfolk in Mati, Davao Oriental, and their implications for coastal resource management. Specifically, it identified their fishing methods, problems and needs, and strategies for managing coastal resources. A descriptive research design was used, with questionnaires supplemented by personal interviews. Respondents were selected using Slovin's formula. Conducted from December 2003 to January 2004, the study involved 125 Kalagan fisherfolk. Most respondents were male, aged 25–44 years (64.14%), married (70.4%), and had elementary-level education (68.8%). Their daily income generally ranged from Php 50 to 150 (61.6%). Most (83.2%) went fishing daily, usually in the evening. Hook-and-line fishing (pasol) was the most common method, used by 90.4% of respondents. Nearly half (49.6%) owned a banca, while only 13.6% owned a motorized pump boat. The respondents identified declining fish catch as their primary problem because it reduced their income and made it difficult to meet their basic needs. Despite these challenges, the Kalagan fisherfolk were aware of the importance of conserving and managing coastal resources. They avoided illegal fishing practices as part of their efforts to protect marine habitats and sustain fishery resources while supporting their livelihoods. The study concluded that excessive fishing pressure contributes to the depletion and possible biological extinction of fishery resources. It recommended management strategies based on the respondents' experiences and the researcher's inputs to promote sustainable fishing and coastal resource conservation.

Keywords: Coastal, Fisherfolks, Fishing, Kalagan, Practices

Introduction

Most people around the world pursue fishing for food and as a recreational pastime or as a sport. Fish have long played an important part in man's economy since the world population has grown and the techniques of fishing have evolved from the prehistoric trap and spear to the deep-water trawlers and factory ships of today (Bayer, et al., 1997). Humans have always captured fish as food. Many large fish are important human food, and in some parts of the world, fish make

up a large part of the diet of the people. On the other hand, fish are also important to other animals in the food chain and to the overall balance of nature.

Fish is a vital part of the Filipino diet, being the cheapest source of protein. A significant number of people living in coastal areas depend on fishing for their livelihood (La Viña, 1997). Fisheries are one among the so-called common resources which economists describe as renewable resources that may increase or decrease over time depending on the degree of human exploitation (Elazequi, et al., 1998). The sources of fisheries production include the municipal and sustenance fisheries, commercial fisheries, brackish water aquaculture, and mariculture or sea farming. One of the groups of people who depend on fishing as their main source of livelihood is the Kalagan tribe.

The Kalagan are the indigenous people in Eastern Mindanao, particularly in Davao Oriental and Surigao. Based on history, the Kalagan tribe was divided into three, namely Mandaya, Mansaka, and Mangguangan, based on where they lived. Since they were all Kalagans, they spoke basically one dialect, although with different accents (Lizada, undated). On the other hand, the Muslims in the Gulf of Davao Oriental call themselves Kalagans. They are the descendants of the Kalagans who left East Coast. The word Kalagan was derived from the word Caraga, the place where the first Kalagan tribe lived before the advent of the Spaniards. Kalagan was also derived from the word “kaag” which means to inform, and “an” which means tribe or people (Vicente, Pers comm 2003). Today, Kalagans are considered the second largest group of indigenous people in Davao Oriental (PPDO, 1996).

Meanwhile, almost all Kalagans who live near the coastal areas of barangays Dahican, Mamali, and Tagabakid depend on fishing as the main source of their livelihood. Thus, it would be interesting to study the fishing practices of Kalagan fisherfolks in Mati, Davao Oriental, their problems and needs in fishing, management strategies, as well as the impact on coastal resource management.

This study generally sought to answer the following research questions: (1) What is the profile of the Kalagan fisherfolks in Barangays Dahican, Mamali, and Tagabakid? (2) What are the fishing practices of the Kalagan fisherfolk in Barangays Dahican, Mamali, and Tagabakid? (3) What are the problems and needs encountered by the respondents in fishing? (4) What management strategies are adopted by the fisherfolks to protect the coastal resources? and (5) What are the implications of the fishing practices of the Kalagan fisherfolks on the coastal resource management of Mayo Bay and Pujada Bay in Mati, Davao Oriental?

The general objective of this study was to investigate the fishing practices employed by the Kalagan fisherfolks and their implications for coastal resource management in Mati, Davao Oriental. Specifically, the study sought to describe the profile of the Kalagan fisherfolks in Barangays Dahican, Mamali, and Tagabakid; determine the fishing practices employed by the Kalagan fisherfolks in these barangays; identify the problems and needs encountered by the respondents in fishing; determine the management strategies adopted by the fisherfolks to protect coastal resources; and examine the implications of the fishing practices of the Kalagan fisherfolks for the coastal resource management of Mayo Bay and Pujada Bay in Mati, Davao Oriental.

This study was conducted in order to investigate the fishing practices employed by the Kalagan fisherfolks in Mati City, Davao Oriental and its implications to coastal resource management. The results of this study will serve as an information to the people who engage in fishing activities on that particular area so that they will be aware of the resources they depend on and help them acquire a better understanding of the importance of the fishery resources as a major source of their daily needs. This will also serve as baseline data for agencies, which

implement the Coastal Resource Management Program (CRMP).

This study only focused on the investigation of fishing practices employed by the Kalagan fisherfolks in Mati, Davao Oriental and its implications to coastal resource management. It also determined the fishing methods used by the Kalagan fisherfolks, the problems and needs in fishing, and the management strategies. Thus, the results and findings of the study will only apply to the Kalagan fisherfolks of barangay Dahican, barangay Mamali, and barangay Tagabakid in Mati, Davao Oriental.

Methodology

The study area

The study was conducted in three coastal barangays of Mati, Davao Oriental, particularly in Barangays Dahican, Mamali, and Tagabakid. Barangay Dahican is 5.16 kilometers from Mati Poblacion and can be reached within 30 min. This barangay is situated between Mayo and Pujada Bays. Barangay Mamali has a total distance of about 21 km from Mati Poblacion, and this barangay is found in the Pujada Bay area. Barangay Tagabakid has a travel distance from Mati Poblacion of 16 km. This barangay faces the Pacific Ocean and belongs to Mayo Bay. Both of these Barangays are accessible to any type of vehicle. These barangays were located in the southern part of Mindanao Island, lying between 6° 55" North latitude and 126° 14" East longitude (Figure 1).

Data sources and collection

Both primary and secondary data were obtained to meet the objectives of the study. Primary data were taken from the respondents, who consist of Kalagan fisherfolk engaged in fishing. This was done through the use of the descriptive method of research utilizing the questionnaires and supplemented with personal interviews in gathering data. Secondary data was collected from various sources such as books and journals. A site observation was also conducted. The number of respondents was obtained using Slovin's formula, thus

$$n = \frac{N}{1+N(e)^2}$$

Where: n = sample size
 N = number of Kalagan fisherfolk
 E = allowable error (5%)
 1 = constant

Data analysis

Data were analyzed using descriptive statistics such as frequency counts and percentages.

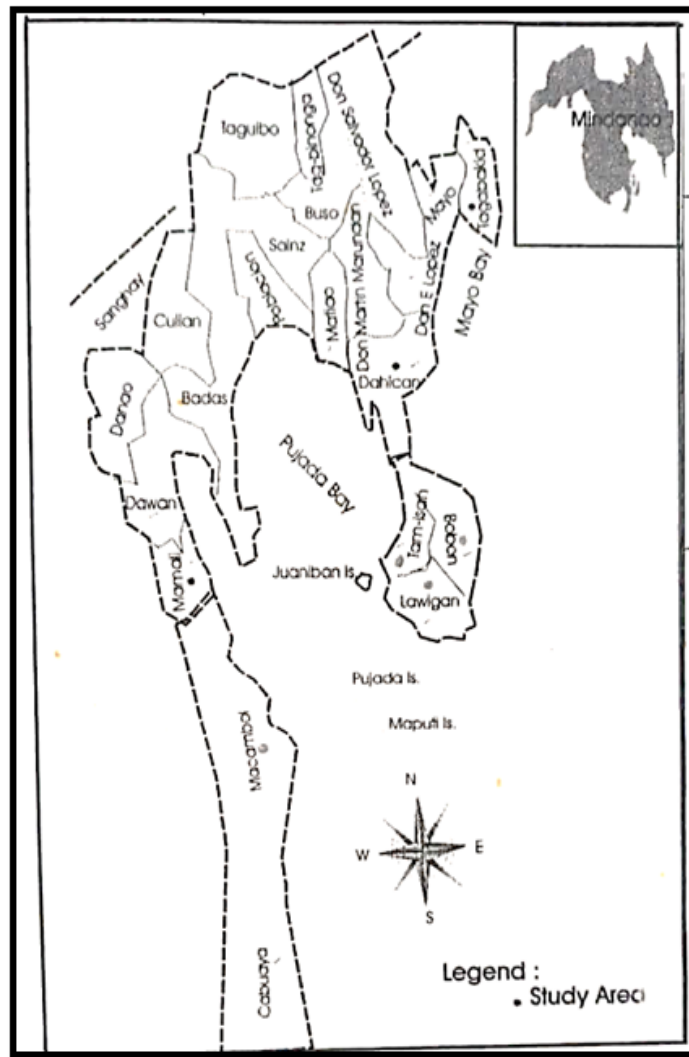


Figure 1. Study area.

Results And Discussion

Social profile of the Kalagan fisherfolks

Based on the results of the study conducted, about 125 Kalagan fisherfolks were identified from three coastal barangays in Mati, Davao Oriental that were included in this study. It was found out that Barangay Dahican has the highest number of Kalagan respondents who engage in fishing (49.6%) because this barangay has a greater number of the Kalagan population. This was followed by Barangay Tagabakid (40%) while Barangay Mamali listed the lowest number of Kalagan fisherfolks (10.4%) since it has the lowest number of Kalagan respondents (Table 1).

Table 1. Frequency distribution of the Kalagan fisherfolks from the three coastal barangays.

Coastal Barangay	Frequency	%	Total Population of Kalagan Fisherfolks
Dahican	62	50	90
Mamali	13	10	19
Tagabakid	50	40	74
Total	125	100	183

Table 2 shows the general socio-demographic profile of the Kalagan fisherfolks. The fisherfolks were between 19 and 74 years old. Most respondents in barangay Dahican were between 30-34 years old (18%); barangay Mamali were between 30-44 years old (15%), and barangay Tagabakid were between 25 to 29 years old (26%). At this age range, they are capable of fishing compared with older fisherfolk.

It was also found out that respondents interviewed were all male. Each was represented mostly by the father, who engaged in fishing to support the family. However, there were also other members of the family who did the same job just to help their parents. Most of the respondents were married. In barangay Dahican, 63% of them were married; in barangay Mamali, 85% were married, and in barangay Tagabakid, 76%. The majority of the respondents reached only the elementary level: barangay Dahican (73%), barangay Mamali (62%), and barangay Tagabakid (66%). However, there were also some (26%) respondents who reached the secondary level and only a few (16%) acquired a college education. According to some fisherfolk (67%), they were not able to acquire a higher level of education because of financial problems and early marriage.

The household size of the respondents consisted of 5 to 15 members. In Barangay Dahican, the household sizes of the fisherfolks were between 6-10 members (50%), while in Barangay Mamali and Tagabakid, the household sizes were less than 5 (46.15% and 60%, respectively). The majority (87.17%) of the respondents have lived in this area for more than 36 years.

Economic profile

The majority (61.6%) of them earned a daily income of Php 50 to 150 where in Barangay Mamali has the highest (8%) daily income, followed by Barangay Dahican (6%) while Barangay Tagabakid has the lowest (52%) daily income range, from which all the expenses for their needs were to be taken, especially their daily food (Table 2). According to del Rosario as cited by Moreno (2002, unpublished), these groups of people with low education find it difficult to work in government offices as well as in private firms because of their low educational attainment. They are considered the poorest among the other economically disadvantaged groups.

Table 2. General socio-demographic profile of the Kalagan fisherfolks.

Age	BARANGAY					
	Dahican		Mamali		Tagabakid	
	F	%	F	%	F	%
19-24	7	11	1	8	6	12
25-29	10	16	1	8	13	26
30-34	11	18	2	15	9	18
35-39	5	8	2	15	8	16
40-44	10	16	2	15	5	10
45-49	3	5	0	0	3	6
50-54	8	13	1	8	2	4
55-59	4		2	15	0	0
60-64	4	7	1	8	1	2
65-69	0	0	1	8	2	4
70-74	0	0	0		1	2
Total	62	100	13	100	50	100

Total	62	100	13	100	50	100
Sex						
Male	62	100	13	100	50	100
Female	0	0	0	0	0	0
Total	62	100	13	100	50	100
Civil Status						
Single	23	37	2	15	10	20
Married	39	63	11	85	38	76
Widowed	0	0	0	0	2	4
Total	62	100	13	100	50	100
Educational Attainment						
Elementary	45	73	8	62	33	66
High School	13	21	4	31	16	32
College	4		1	8	1	2
Total	62	100	13	100	50	100
Household size						
5 Below	29	47	6	47	30	60
6-10	31	50	5	38	17	34
11-15	2	3	2	15	3	6
Total	62	100	13	100	50	100
Length of residency						
5 Below	19	30	1	8	8	16
6-15	14	23	3	23	15	30
16-25	4	7	1	8	3	6
26-35	3	5	7	54	2	4
36 above	22	35	1	7	22	44
Total	62	100	13	100	50	100
Income per day						
50-150	40	5	11	85	26	52
151-200	10	16	2	15	9	18
201-above	12	19	0	0	15	30
Total	62	100	13	100	50	100

Other sources of income of the Kalagan fisherfolks

The majority (69%) of the fisherfolks were satisfied with their daily income, but some (31%) fisherfolks claimed that their needs exceed their income, considering that their daily income ranged from Php 50 to 150. In order to meet their daily needs, they rely on alternative sources of livelihood for additional income, as shown in Table 3. Some (11%) respondents owned a sari-sari store, engaged in farming (30%), fish vending (4%), worked as laborers (9.6%), and others were drivers and conductor (15%), carpenter (3%), barber (2%), Arabic teachers (2%), and owned a chainsaw (2%). However, almost all (43%) depend on fishery resources alone, especially in barangay Dahican (63%). However, in barangays Mamali, only a few (39%) and Tagabakid (20%) depend on fishery resources because they engage in farming. Compared to Dahican, the soil productivity in these areas was suitable for farming. Hilly mountains are found in these barangays, which support the survival of other wildlife animals.

Table 3. Other sources of income.

Other sources of income	BARANGAY					
	Dahican		Mamali		Tagabakid	
	F	%	F	%	F	%
Farming	6	10	7	54	24	48
Sari-sari store	3	5	0	0	3	6
Laborers	2	3	1	8	9	18
Driver and conductor	9	15	0	0	0	0
Carpenter	1	2	0	0	1	2
Barbershop	0	0	0	0	1	2
Chainsaw operator	1	2	0	0	0	0
Arabic teacher	1	2	0	0	0	0
No other source of income	39	63	5	39	10	20
Total	62	100	13	100	50	100

Fishing operation of the Kalagan fisherfolks

Table 4 shows the fishing operation by this group of fisherfolks. The highest number of years engaged in fishing was 24 years and above. In barangay Mamali (38%), in barangay Dahican (34%), and barangay Tagabakid (50%) were listed below five years because the majority of the fisherfolks in these barangays have just recently engaged in fishing because they had other sources of livelihood to meet the needs of their family. Other fisherfolks (54%) had been engaged in fishing for 6 to 23 years. Most of these fisherfolks go out to fish once a day, in 87% of the respondents in barangay Dahican, barangay Mamali (85%), and barangay Tagabakid (78%). While others (35%) go out twice a day, especially those fisherfolk with no other source of income. The duration per operation was between 1 to 15 hours daily. But mostly, they spend at least 1-4 hours; in Barangay Mamali 53.84% fisherfolks who spend at least 1-4 hours, followed by Barangay Tagabakid (52%), but in Barangay Dahican, only 30.64%. According to Maguindanao (2001, unpublished), local fishers derive their living by working hard daily at sea as a source of their livelihood. They also lead the most difficult life with the least opportunities as compared with farmers.

They usually go out to fish in the evening on a daily basis. The majority (51%) of them said that it is better to go fishing in the evening because they catch more fish, as there are fish that are nocturnal. They go into full-time fishing so that their families would not be hungry, especially those who only depend on fishing as their daily job. The implication of these to coastal resource management is that the increasing demand for fish by the fisherfolks may result in over-extraction of the marine resources.

Fishing practices employed by the Kalagan fisherfolks

The fishing methods they employed were the “sudsud”, “bubo”, “payaw”, “pana”, “bunsod”, “pukot”, “baling”, compressor, and the most common was the “pasol” (90.4%) (Table 5). They used “pasol” because it is the easiest and simplest way of catching fish, and it could also not damage other marine resources such as coral reefs and seagrass. But some said that they could not afford to buy other fishing gear because their income was just enough for their basic needs. This indicates that fisherfolks used limited fishing methods to catch more fish. The more fishing gears they have, the more fish caught and the higher the pressure on marine resources.

Table 4. Fishing operation of the Kalagan fisherfolks.

Length of years in fishing	BARANGAY					
	Dahican		Mamali		Tagabakid	
	F	%	F	%	F	%
Below 5 years	21	34	2	15	25	50
6 years – 14 years	12	19	3	23	15	30
15 years – 23 years	15	24	3	23	6	12
24 years above	14	23	5	38	4	8
Total	62	100	13	100	50	100
Number of operations						
Once a day	54	87	11	85	39	78
Twice a day	7	11	1	8	8	16
Once a week	1	2	1	8	3	6
Total	62	100	13	100	50	100
Number of hours per operation						
1 hr. – 4 hrs.	19	31	7	54	26	52
5 hrs. – 8 hrs.	18	29	6	46	16	32
9 hrs. – 12 hrs.	19	31	0	0	4	8
13 hrs. – 16 hrs.	6	10			4	8
Total	62	100	13	100	50	100
Fishing time						
Morning	16	26	6	46	11	12
Afternoon	13	21	1	8	14	28
Evening	33	53	6	46	25	50
Total	62	100	13	100	50	100

Table 5. Fishing gear ownership.

Fishing gear	BARANGAY					
	Dahican	Mamali	Tagabakid	Total F	%	Rank
Pasol	55	12	46	113	90	1
Pukot	24	5	29	58	46	2
Payaw	13	1	20	34	27	3
Pana	12	4	14	30	24	4
Bubo	5	6	8	19	15	5
Baling	1	12	5	18	14	6
Bunsod	0	7	1	8	6	7
Sud-sud	0	2	1	3	2	8
Compressor	1	0	1	2	2	9
Total	62	100	13	100	50	100

Note: Fisherfolks give multiple answers.

Table 6 shows the fishing boat ownership of these fisherfolks. The majority of them owned a banca in barangay Mamali (69%), in barangay Tagabakid (56%), and in barangay Dahican (40.32%), and only a few (14%) owned a motorized pump boat. Most (76%) of the fisherfolks extend the area of operation along Pujada and Mayo bays in order to increase the volume of their catch to sufficiently support the needs of their family. This indicates that fisherfolks engage in fishing by using a fishing boat to extend their area.

This implies that the desire to catch more fish for economic reasons drives fisherfolks to extend their area of operation. Hence, more fish are extracted from the seas, although at different locations. Also, some areas have been overfished, so fisherfolks have to go farther to sustain their livelihood.

Table 6. Fishing boat ownership.

Fishing boat	BARANGAY					
	Dahican		Mamali		Tagabakid	
	F	%	F	%	F	%
Bangka	25	40	9	69	28	56
Pump boat	12	19	4	31	1	2
Both	21	34	0	0	21	42
None	4	7	0	0	0	0
Total	62	100	13	100	50	100

Fishery resources

Fish and shellfish are the most common marine products taken every day from the sea by the Kalagan fisherfolk in barangays Dahican, Mamali, as well as in Tagabakid and sold in the different parts of Mati. The majority (65%) of them catch different kinds of fish between 1-5 kgs per day (Table 7). Most of the fisherfolks in barangay Mamali (84.61%) catch fish between 1-5 kgs per day, in barangay Dahican (65%), and in barangay Tagabakid (60%). This shows that declining fish catch is insufficient to support the daily needs of the family. Although, they are assured of having fish for their consumption, some of their basic necessities cannot be satisfied. The implication of these to coastal resource management is that the demand to satisfy their basic needs will result to increased pressure on the fishery resources.

Table 7. Weight of fish catch per day.

Weight of fish catch (kilo)	BARANGAY					
	Dahican		Mamali		Tagabakid	
	F	%	F	%	F	%
Less than 1 kg	3	5	1	8	1	2
1 kg – 5 kgs	40	65	11	85	30	60
6 kgs – 10 kgs	10	16	1	8	11	22
11 kgs – 15 kgs	4	7	0	0	3	6
16 kgs – 20 kgs	5	8	0	0	5	10
Total	62	100	13	100	50	100

The most common fishes caught by this fisherfolks are listed in Table 8. These kinds of fish were taken from the sea everyday from these three coastal barangays in Mati, Davao Oriental.

Table 8. List of the most common fishes caught in the study area.

BARANGAY		
Dahican	Mamali	Tagabakid
Burot	Katambak	Burot
Katambak	Matambaka	Katambak
Matambaka	Pusit	Matambaka
Tanguigi	Iskuedo	Pusit

Tanguigi	Iskuedo	Pusit
Tulingan	Balo	Iskuedo
Pusit	Pirit	Bolinao
Iskuedo	Salay	Talasugi
Pirit		Barilis
Danggit		Danggit
Pandawan		
Salay		
Caraballas		
Bangsi		

Below are the lists of not commonly caught fishery resources in the study areas (Table 9). But in a survey conducted by the PCRA (2003), it has been found out that some of these kinds of fishes like balo, danggit, barilis, tulingan and burot were common in the study area. However, Kalagan fisherfolks revealed that they caught less of these kinds of fishes in their respective area.

The implication of these to coastal resource management is that because of the high pressure on the marine resources, fishery resources decrease.

Table 9. List of Not common fishes caught in the study area.

	BARANGAY	
Dahican	Mamali	Tagabakid
Talasugi	Burot	Tanguigi
Barilis	Talasugi	Tulingan
Bolinao	Danggit	Balo
Balo	Caraballas	Pandawan

Table 10 shows the common shellfish resources harvested by the Kalagan fisherfolks in the three coastal barangays in Mati, Davao Oriental (Appendix 7). They gathered shellfish for their foods.

Table 10. List of shellfish resources.

	BARANGAY	
Dahican	Mamali	Tagabakid
Lumban	Sigay	Lapas
Sigay	Sikad	Sigay
Boko-boko	Saang	Boko-boko
Tilangon	Aninikad	Tilangon
Lima-lima	Dilos	Tagaribon
Liswit	Tuyom	Takdagon
Tuway	Wasay-wasay	Basi
Sikad	Litub	Longa
Pasayan	Ustod	
	Sihi	
	taktakon	

Note: These are the terms according to their dialect.

Problems and needs in fishing by the kalagan fisherfolks

This group of fisherfolks had also encountered several problems and needs in fishing. Majority (83%) of the fisherfolks said that fishing was a difficult means of livelihood because they are not sure of their catch everyday but nevertheless, they continue to engage in such a kind of livelihood. However, some (67%) fishermen were contented because it provides their daily source of income.

Declining fish catch was their primary problem (Table 11). This has become difficult for them because their income was just enough to buy their basic daily needs. Some fisherfolks had also experienced windy weather during their fishing time especially in the months of October and March. They had difficulty in meeting the demands of their families considering that they just depend on their catch from the sea. According to the respondents they also had a problem on illegal method of fishing from the bigtime fishermen who used compressor, a kind of fishing gear that was prohibited by law although there were a few (2 %) of the fisherfolks who owned this kind of fishing gear.

Table 11 also shows the comparison of fish catch. Majority (72%) of them answered that their fish catch in the past years was better than the present; in addition, the sizes of the fish had become smaller. In barangay Mamali (92%) said that their fish catch is better than the past years as compared now, in barangay Tagabakid many claimed the same (78%) while in barangay Dahican (63%) also identified the same problem. Before, their fish catch can support the needs of their family unlike today, which implies that the fishery resources had declined due to the high pressure on marine resources. This indicates that the increasing fishing pressure on marine resources, resulted to a decreasing fishery resource as shown by the decrease in their fish catch. This observation is in agreement with the statement of Elazequi et al (1998). The marine environments that support the resources of these areas are now degraded because of this high fishing pressure and the use of some destructive fishing gears.

Coastal habitat destruction, over-fishing and illegal fishing are some of the factors that contributed to the decrease of marine resources and it causes biological extinction. The stock of a species becomes low that it is no longer profitable to hunt and gather (Miller, 1993 as cited by Maguindanao, 2001).

Table 11. Trend of fish catch as perceived of the respondent.

Has your fish catch decreased? Response	BARANGAY					
	Dahican		Mamali		Tagabakid	
	F	%	F	%	F	%
Yes	42	68	10	77	33	66
No	9	15	0		8	16
The same	4	7	0		2	4
Sometimes	7	11	3	23	7	14
Total	62	100	13	100	50	100
Comparison of fish catch						
Much better on the other year	39	63	12	92	39	78
Much better now	13	21	1	8	10	20
The same	10	16	0	0	1	2
Total	62	100	13	100	50	100

Management strategies adopted by the kalagan fisherfolks

The Kalagan fisherfolks were already aware of conserving and managing the coastal and marine resources so that the next generations can benefit from these resources. Avoidance of

illegal fishing activities was their management strategy for attaining sustainable fishery resources. This is because management and conservation techniques would come from the fisherfolks for they know their situation better. The majority (90.4%) of them said that using a simple fishing gear like the “pasol” as well as compliance with fishery laws could not destroy other marine resources. Table 12 shows the agencies implementing fishery laws and the year it was implemented. Majority (95.2%) of the fisherfolks answered that the fishery laws include, among others, the ban on illegal fishing.

Table 12. Agencies implementing fishing laws and year of implementation.

Agencies	BARANGAY					
	Dahican		Mamali		Tagabakid	
	F	%	F	%	F	%
DENR	5	8	4	31	0	0
DA-BFAR	54	87	9	69	50	100
Others	3	5	0	0	0	0
Total	62	100	13	100	50	100
Year implemented						
1970's	1	2	1	8	6	12
1980's	11	18	1	8	1	2
1990's	20	32	3	23	19	38
2000's	27	44	8	62	24	48
No specific years	3	4	0	0	0	0
Total	62	100	13	100	50	100

Implications of the Fishing Practices of the Kalagan Fisherfolks to Coastal Resource Management

Coastal marine habitats are continuously being exploited by such destructive fishing methods due to overfishing. Hence, protection of these habitats becomes a conservation technique to maintain a healthy population of fishery resources as well as for food security. It must be protected because it also serves as the breeding, feeding, and spawning ground of marine organisms (CRMP, 2001). Controlling factors, such as setting and enforcing quotas on fishing, the number of boats per fisherfolk, and other resource use, can promote the recovery of degraded coastal marine habitats. In addition, by providing alternative sources of income, it could serve as a means of reducing fishing pressure and, as a result, prevent habitat destruction. In such a way, maintaining high biodiversity levels and pristine coastal areas are vital to sustain fishery resources (CRMP, 2001).

The Kalagan fisherfolks were dependent on coastal resources, but their non-engagement in illegal fishing activities indicates the management of the coastal resources adopted by the fisherfolks to regenerate the capacity of the coastal marine habitats while meeting their basic needs. Furthermore, the growing demand for fishery resources also implies a growing demand to conserve and protect marine habitats and proper management of the said resources against the high fishing pressure of the fisherfolks because this will cause destruction and overfishing of marine resources. High pressure on marine resources causes biological extinction of the fishery resources in that particular area. Although the majority of this group of fisherfolks were not using illegal fishing as their way of catching fish, nevertheless, the pressure on fishing still increases. Giving them some alternative livelihood could lessen the dependence of these fisherfolks on marine resources.

Conclusion

The Kalagan fisherfolks who live in the coastal areas of barangays Dahican, Mamali and Tagabakid depend on fishing for their livelihood to meet the needs of their families. The fishing practices they employed were the pasol, pukot, payaw, bubo, baling, bunsod, sudsud, and compressor. The most common fishing gear they used was the pasol (90%) because it was the simplest way of catching fish and it could not damage coastal habitats. But some said that they could not afford to buy other fishing gears because their income was just enough for their basics needs. This indicates that fisherfolks need more fishing gears to catch more fish. This implies that the more fishing gear they have, the more fish caught and the higher the pressure on marine resources. They also used banca and motorized pump boat to extend the area of their operation due to continued open access of the area especially in the municipal waters in order to increase the volume of their catch to support the needs of their family. This implies that the desire to catch more fish, for economic reasons drives the fisherfolks to extend their area of operation. Although there were some areas have been continued increases in fishing pressure that fisherfolks have to go farther to sustain livelihood for their family. Majority (68%) of the Kalagan fisherfolks revealed that the volume of their catch has decreased compared to the previous years. They had also experienced windy weather during their fishing time especially in the months of October to March. During this month, fisherfolks cannot be financially stable because they have low fish catch. This shows that fisherfolks had difficulty in meeting their family's daily needs considering that they just on their catch from the seas daily. This implies that high pressure on marine resources causes biological extinction to the fishery resources on that particular area. But fisherfolks believe that the continued increases in fishing pressure on marine environment can be lessen by giving them alternative livelihood.

References

- Alcala, Angel C. (2001). Marine Reserves in the Philippines in the Philippines. Historical Development, Effects and influence on Marine Conservation Policy The Bookmark, Inc. Pp.4-5.
- Bayer, P., B. Feinberg, B. Lettacole, C. M. Peckaitis, M. D. Shaw Tantillo, H. G. Tench, and VF Towers. (1997). Encyclopedia Americana. International edition. Volume 11 Groler Incorporated. p. 290
- CCP Encyclopedia of Philippine Art. (1994). Volume 1 Peoples of the Philippines Aeta to Jama Mapun. Vera-Reyes Inc. Manila. Pp. 24 and 356. 1994. Volume 2. Peoples of the Philippines Kalinga to Yakan. Vera-Reyes Inc. Pp. 40-359
- CRMP. (2001). Coastal Management Orientation and Overview. Philippine Coastal Management Guidebook Series No. 1, Cebu City, Philippines, Pp. 10,15.
- Elazequi, D.D, MM. Paunlagui, C.M. Artiaga and J. V. De Luna. (1998). The Impact of the Local Government Code on Governance of Fishery Rights. Philippines Council of Aquatic and Marine Research and Development. DOST, Los Baños, Laguna.
- Environmental and Natural Resources ATLAS of the Philippines. (1998). Environmental Center of the Philippines Foundation. p.260.

- Espejo Hermes, J. (1998). Fish Processing Technology in the Topics. Rapid Lithographic and Publishing, Inc. Pp. 1-8.
- La Viña, A.G.M. (1999). Management of Fisheries, Coastal Resources and the Coastal Environment in the Philippines: Policy, Legal and Institutional Framework. International Center for Living Aquatic Resources Management, Makati City, Philippines. p. 7.
- Lizada, R. “Nonong”undated. Brochure: A brief History of Calagan (Caraga).
- Maguindanao, N.M. (2001). Status and Fishing Practices of the Fisherfolks in the Intertidal Zone of Guang-guang, Mati, Davao Oriental Davao Oriental State College of Science and Technology BSES Thesis. Unpublished
- Managing Coastal Habitats and Marine Protected Areas. (2001). Philippine Coastal Management Guidebook Series No. 5, Cebu City, Philippines, p. 62.
- Managing Impacts of Development in the Coastal Zone. (2001). Philippine Coastal Management Guidebook Series No. 7, Cebu City, Philippines, p. 1.
- Miller, GT Jr. (1989). Resource Conservation and Management. Wadsworth Publishing Company Belmont, California. A division of Wadsworth, Inc
- Moreno, A.P. (2002). Assessment of Fishing Livelihood in Mati, Davao Oriental. Davao Oriental State College of Science and Technology BSES Thesis. Unpublished
- Ramos, H. C. In Gregorio Mandaraog (Ed). (1998). Environmental and Natural Resources ATLAS of the Philippines. Environmental Center of the Philippines Foundation.p.251
- Socio-Economic Profile. (1996). Provincial Planning and Development Office. Capitol Hill, Mati, Davao Oriental.
- Vicente, S. Personal communication. (2003). Grand Daughter of the Famous Datu Tomaros. Former officer In charge of the Sultanate of Davao Oriental.
- White, A.T. and A. Cruz-Trinidad. (1998). The Values of Philippine Coastal Resources: Why Protection and Management are Critical. Coastal Resources Management Project, Cebu City, Philippines. Pp.2-4.
- <http://www.bar.gov.ph/capture-fisheries/gfx/agenda-lb.gif>. August 13,2003. @ 9:45.