Socio-Economic Conditions, Attitudes and Perceptions on Marine Protected Areas in San Miguel Island, Albay, Philippines

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Abstract

Socio-economic conditions and the local perceptions of marine protected areas were analyzed to determine the relationship between the two in San Miguel Island. Various quantifiable indicators as well as perceived status ratings on the 1, 035 respondents to a household survey of the five coastal villages of San Miguel Island, Albay, Philippines were used as primary data in the study. The results of the participatory resource appraisal, key informant interviews employing a historical timeline, resource mapping and perceptual transect tools were used to verify the results of the survey.

The results indicate that the socio-economic status of the households on the island was found to be lower than the regional and national average across all the socio-economic indicators. The high proportion of the population (28.26%) with only elementary education indicates limited option for high earning options. And income from farming and fishing on islands like San Miguel is not sufficient to meet the basic needs of the family thus requiring supplemental source of livelihood.

The results of the study indicate poor socio-economic conditions in comparison to the regional and national average. Respondents self assessed their economic condition as "diminishing" in the past five years and five years in the future and this was justified by the vulnerability of the island to weather conditions such as typhoons, altered rains and other problems reflecting the fluctuating economic status of the island.

Although, their income remains low, they were happy that the MPA has greatly helped them to sustain their daily food needs. Their attitudes and perceptions of the MPA's traced positive and they confirmed the positive pattern of changes in the status of resources such as coral cover, seagrass and mangroves especially after the establishment of the marine fishery reserve. However the results further showed a high percentage of households which do not have knowledge of the MPA's project and this indicates a needs for stronger forms of innovative information dissemination such as films, comic strips, plays and other media to enhance understanding and internalization among stakeholders and the community.

Key words: MPA, San Miguel Island, socio-economic status

Introduction

The island of San Miguel Tabaco City, Albay Philippines (Fig. 1) is geographically located off the east coast of Tabaco Bay and lies south of Lagonoy Gulf. The island has a total land area of 44.08 km2, characterized by hilly to mountainous and slightly rolling areas. As well as plain and elevated areas at about 35m above sea level. The island consists of three upland villages (Hacienda, Agñas and Visita) and two coastal villages locally referred to as "barangays" (Rawis and Sagurong).

The island can be reached by motorized boat in about 30 minutes from the Maritime Port of Tabaco City (Nieves, et al., 2009). The island's economy is basically capture fisheries-based, in particular, it is a reef resource dependent as shown by the dominance of reef fishes and invertebrates in the composition of catch from the island. (Soliman *et.al.*, 1997).

The San Miguel Island marine fishery reserve (SMI-MFR) has a total area of 2.25 km^2 (sanctuary = 1.0 km^2 and reserve = 1.25 km^2) was established through a Barangay Sagurong Council Resolution and a Municipal

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Council Ordinance, which formed the legal bases of the declaration in 1998. As evidence of its successful establishment, in 2002 the SMI-MFR was chosen as the 2nd Best Managed Coral Reefs of the Philippines by PhilReefs, a consortium of agencies working for the conservation and management of the country's coral reefs. And this project encouraged the nearby municipal councils (e.g. Tiwi, Albay) to implement an MFR project along their coast. An assessment conducted by Soliman and Mendoza in 1998 showed that at 62.58% SMI-MFR has the highest coral cover among the 14 functional marine fishery reserves and sanctuaries in the Bicol Region of which 6 are functional.

The SMI-MFR project was initially funded by Bicol University from 1995 to 1997 through its research and development funds, however, beginning in 1998 cost have been shared by the Tabaco City Government and Sagurong Barangay Council. From 1999 onwards, the maintenance and management of the marine reserves and sanctuaries has been funded by the City Council of Tabaco. The City Council provides regular financial support of between P 100, 000 and P 400,000 for its management. This allocation was used for sustaining the project.

1. Objectives of the Study

This study aims to analyze fisherfolks respondents, attitudes and perceptions of the marine protected area established ten years ago and to assess the socio-economic status of San Miguel. Measurable indicators of the island socio-economic status and fishers perception of marine protected area will be analyzed to determine the relationship between the two.

2. Methodology

The quantifiable indicators of attitudes, perceptions and socio-economic status of the households were gathered through a household survey with the aid of a semi-structured questionnaire in the five coastal barangays of San Miguel Island, Albay, Philippines. The 1,035 respondents were selected by stratified sampling design. Trained enumerators administered the questionnaires to the respondents.

Descriptive and analytical tools such as mean averages, frequencies and percentages were used. The quantifiable indicators of socio-economic status covered the following demographic characteristics of respondents and household members: socio-economic status indicators such as income and source of income, and perceived economic status. For the assessment of attitudes and perceptions fisherfolk evaluated their perceptions of a given statements on the established MPA in the area.

The findings of the survey were verified agaisnt the results of the participatory resource appraisal (PRA) methods using the historical timeline, transect mapping, 24 hour activity and resource mapping.

3. Results and Discussion

1) Attitudes towards and Perceptions of the Marine Protected Area in San Miguel Island

The results of the study, shown in Table 1 indicate
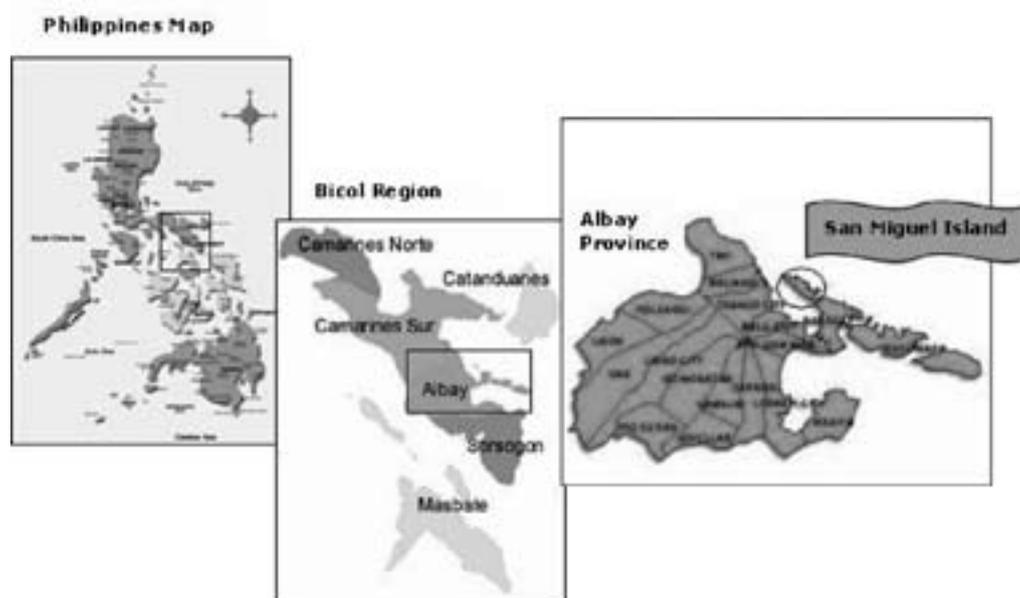
Fig. 1 Location of the Study

Table 1. Distribution of responses to the statements regarding the Marine Protected Area

Statement	No knowledge (0)	Strongly disagree (1)	Disagree (2)	Slightly disagree (3)	Slightly agree (4)	Agree (5)	Strongly agree (6)	Weighted mean
				Frequency				
a. It is necessary to preserve the natural environment so that my grand-children may benefit from it.	99	1	6	3	98	414	414	5
b. I have a duty to protect the coral reefs, seagrass beds and mangroves.	99	1	6	12	139	454	324	5
c. I want to protect the coral reefs, seagrass beds and mangroves because marine life depends on them.	99	0	3	9	171	473	280	5
d. I am willing to spend money to protect coral reefs and seagrass beds because they help protect the community from floods.	99	2	27	76	323	395	113	4
e. I am not using the coral reefs and mangroves now, but I am willing to spend money to protect them in case I want to use them in the future.	103	4	18	53	294	350	213	4
f. Establishing an MPA is necessary for preserving the natural environment.	136	4	9	18	181	433	254	4
g. Establishing an MPA increases a fisher's income from fishing.	155	3	34	45	241	391	166	4
h. Establishing an MPA only decreases a fisher's income from fishing	153	110	289	193	148	105	37	3

a high positive response to questions regarding MPA where 80% or 828 out of 1035 respondents agreed with the need to preserve the natural environment for future generation. Seventy four percent (74%) or 778 respondents had a positive response to accepting responsibility for protecting the coral reefs, seagrass beds and mangroves. Likewise 73% accepted support for the protection of marine resources; further 48% were willing to contribute monetary assistance for the protection of marine resources. However, 31% slightly agreed but could not contribute monetarily but instead would render labor-service to protect the resources. Relative to the utilization of mangroves, seagrass beds and coral reefs as a source of livelihood, 54% of the respondents were not directly benefiting from the marine resources, however they were very much willing to contribute monetarily to safeguarding and managing of the marine fishery reserve

sustainably. Eight three percent (83%) agreed that MPAs are necessary for preserving the natural environment, and 77% confirmed that establishment of MPA increases fishers' income while 28% stated that an MPA decreases income of fishers.

2) Opinions on the status of marine resources before and after the establishment of the MPA

The results of the survey on the perceived status of coral cover, seagrass bed area, and fish catch before and after the establishmentof the MPA are presented in Table 2 below. Forty five percent (45%), or 470 out of 1035 respondents viewed that the coral cover are better, forty-three percent observed that the seagrass beds were better too and forty-two percent found that the fish catch had increased during the ten year existence of the MPA. However a higher percentage of respondents 45% did

Table 2. Distribution of responses to the questions regarding the SMI-MPA status

Opinion on SMI - MPA	No Idea (1)	Worse (2)	No change (3)	Better (4)
		Frequency		
1. How is the coral cover before and after the establishment of the MPA?	468	16	81	470
2. How is the area of seagrass beds before and after the MPA's establishment?	468	16	97	454
3. How is the fish catch before and after the establishment?	470	23	103	439

not know or had no knowledge of the status marine resources after the establishment of MPA or even the marine fishery reserve project on the island, this indicates the need for a stronger information, education campaign (IEC) to greatly increase involvement and participation.

4. Socio-economic Status

1) Demographic Characteristics

San Miguel Island consist of 2,423 households with a total populations of 13, 484 (NSO, 2006). The average household size of the island is 6 and ranges from one to fifteen. These values are not significantly different from the national average of 5.0 and the regional average of 5.24, and are similar to Lagonoy Gulf's (the location of San Miguel Island) statistics (Pelea et al, 2004). The most frequent household size is five as shown by the mode.

Sex distribution on the island is almost equal, with 51.7% men and 48.3% woman (See Table 2). The average age is 24, ranges from one year old to ninety four years old as shown in Table 2. The modal age of the population is 15. The age percentage distribution in Figure 3 reflects a young population, with most of the household members in the 9-16 age range. However, it also reflects the facts that the percentage of the population that is dependent (aged below 15) is almost equal to the proportion of earning members of the household (aged 15 and above).

Table 2. Descriptive statistics of household size and age of household members

Descriptive statistics	Household size	Age of household members
Mean	6	24
Median	6	18
Mode	5	15
Standard deviation	2.5	18.7
Range	14	94
Minimum	1	1
Maximum	15	94

Table 3. Sex distribution of the household members

	Frequency	%
Women	2863	48.26
Men	3069	51.74
Total	5932	100.00

Table 4. Dependency level in San Miguel Island

	Frequency	%
Age below 15	2379	40.10
Age above 15	3553	59.90
Total	5932	100.00

Table 5 gives details of the productive members of the household. More than half (51.3%) are men and a majority (54.3%) are married. Interestingly, the highest proportion of the population (28.26%) is elementary graduate. Only 13.10% finished high school, while 2.28% were able to obtain a college education. Generally, the low education attainment of the working-age population their limited option for achieving higher earnings.

Table 5. Characteristics of household members aged 15 and above

A. Sex	Frequency	%
Female	1711	48.16
Male	1842	51.84
Total	3553	100.00
B. Civil Status	**Frequency**	**%**
Single	1497	42.13
Married	1929	54.29
Separated	11	0.13
Widowed	116	3.26
Total	3553	100.00
Educational Attainment	**Frequency**	**%**
No formal education	34	0.96
Elementary undergraduate	792	22.29
Elementary graduate	1004	28.26
High School undergraduate	963	27.10
High School graduate	464	13.10
Vocational graduate	158	4.45
College undergraduate	57	1.60
College graduate	81	2.28
Total	3553	100.00

2) Socio-economic Status

The mean household income, P 55,690.83, shows that San Miguel islanders earn 52.13% less than the national cohort and 36.71% less than the regional average (NSCB 2005). The distribution of annual household income in Figure 3, shows a convergence in the lower income bracket, 57% in the P 11, 000 to 50, 000, range 19% in the P 51, 000 to 100, 000 and range 10% in the below P 10, 000 bracket. The distribution corresponds to a mean per capita income of P 10, 427, which is notably lower than the regional poverty threshold of P 12, 661.
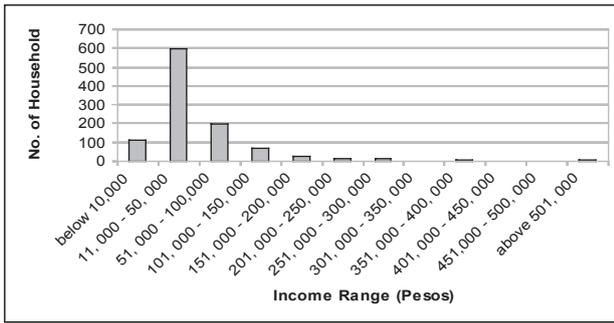
Fig. 4 Distribution of household Income

The sources of household income, listed in Table 5, shows that farming (28.91%) and service-related jobs (29.76%) account for significant proportions of occupations/livelihoods. Fishing represents almost one–fifth (18.26%) of household income, while mat making provides income for 11.44% of the households. Other sources of income include professions or government services (3.29%), and business (3.29%). The results also show that income from farming and fishing on islands like San Miguel Island is not enough to meet the basic needs of the family, and supplemental sources of livelihood are required.

The respondents self-assessment of their economic status is shown in Figure 5, past (2002), present (2007) and future (2012) years all reflect is decreasing economic condition from 2007 to 2012, a slight increase in mean rank with a greater portion of respondents giving lower ratings on their future status indicates a slow recovery from the typhoon damage. It was noted that in 2006 two super typhoons hit the Bicol area and the gains from years of struggle of were greatly damaged.

Conclusion

In general, the island features a young household population with a high dependency level, with a 79% incidence of poverty which is a much lower than the regional level. The high proportion of the population (28.26%) with only elementary education background

Table 6. Sources of household income on San Miguel Island

Income Source	No. HHM	%	Annual Income			
			Min	Max	Mean	SD
Farm	475	28.91	2,000.00	120,000.00	19,538.23	689.20
Farm +	29	1.77	1,000.00	64,800.00	27,972.41	2455.65
Fish	300	18.26	3,750.00	243,000.00	43,673.57	2273.47
Fish +	28	1.70	8,000.00	510,000.00	78,680.36	18360.80
Mat making	188	11.44	800.00	56,000.00	6,203.86	506.12
Mat Making+	4	0.24	2,000.00	20,000.00	8,250.00	4049.18
Services	489	29.76	2,000.00	504,000.00	41,528.94	2133.07
Professionals	54	3.29	11,400.00	600,000.00	116,958.80	13294.54
Businesses	54	3.29	1,500.00	288,000.00	51,324.81	7293.03
Supported/pension	22	1.34	6,000.00	48,000.00	22,113.64	2431.74
Total	1643	100.00				
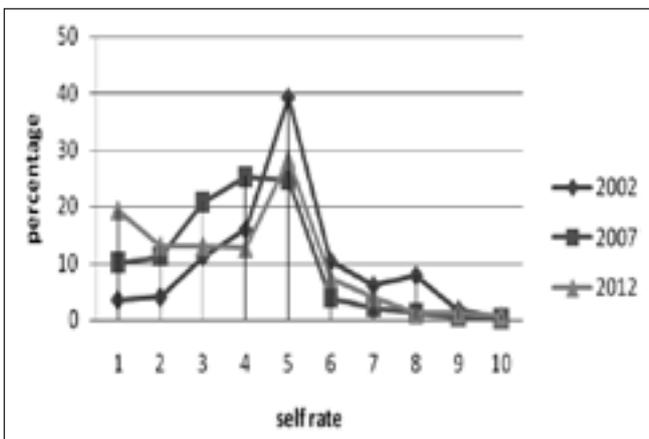
Fig. 5 Self assessment of the respondents on their Economic Status

	Year/Percentage of Respondents		
Rate	2002	2007	2012
1	4	10	19
2	4	11	13
3	11	21	13
4	16	25	13
5	39	25	28
6	10	4	7
7	6	2	4
8	8	1	1
9	2	1	1
10	0	0	1
Mean Rank	5	4	5

Note: 1 lowest & 10 highest rating

indicates limited options for higher earning options. And income from farming and fishing on island like San Miguel is not enough to meet the basic needs of the family, so that supplemental sources of livelihood are required.

The results of the study demonstrate the low socio-economic conditions in comparison to regional and national levels. This is exacerbated by the fact that the Bicol region is ranked second poorest region in the country. The diminishing self assessed levels of economic welfares of respondents were justified by the vulnerability of the island to weather conditions such as typhoons, altered rains and other conditions reflecting the fluctuating economic status of the islanders.

Although, their income remains low, ilanders were content since the MPA has greatly helped for them to sustain their daily food needs thus their attitudes and perceptions of the MPA were positive and they confirmed the positive pattern of change in the status of resources such as coral cover, seagrass and mangroves especially after the establishment of the marine fishery reserve. However the results further show a high percentage of households which do not have knowledge of the MPA project and this indicates a need for stronger and innovative information dissemination channels such as films, comic strips, plays and other media to enhance understanding and internalization among stakeholders and the community.

References

National Statistical Coordination Board (NSCB). 2005. Regional Social and Economic Trends (Bicol Region). www.nscb.gov.ph

Nieves, P. M., N.R. Pelea, R.G. Bradecina, M.A. Pereyra, Y. Morooka, T. Shinbo, and M.C.P. Rivero. 2009. Socio-Economic Conditions, the Status of Fisheries and Agriculture and the Adaptive Capacities of Households and Communities in San Miguel Island, Albay, Philppines in the Kuroshio Sphere of Influence. *Kuroshio Science* Vol. 3 No. 1, March 2009. Pp 15-32.

Pelea, N. R, S. G. Borbe, and M.J.D. Pelea. 2004. Socio-Economic Status of Fisherfolk in Lagonoy Gulf. In Soliman, V. S., R.R. Dioneda, Sr., and N.R. Pelea (eds.) 2004. Lagonoy Gulf Post-Resource and Socio-economic Assessment. *Final Report Submitted to the Fishery Resource Management Project*, Department of Agriculture-Bureau of Fisheries and Aquatic Resources, Quezon Avenue, Quezon City. Bicol Small Business Institute Foundation, Inc., Bicol University Main Campus, Legazpi City.

Soliman, V. S., de Jesus, S. C., Basmayor, L. O., Mendoza, A. B., Cante, A. A., and Buella, J. B. 1997. Assessment and Management of the Fishery and Coastal Habitats of San Miguel Island, Tabaco Albay. *R & D Journal*, Vol. X. Bicol University, Legazpi City, December 1997, pp 27-38.

Soliman, V. S. and Mendoza. A. B. 1998. Assessment of Management of Marine Fishery Reserves and Sanctuaries in Bicol Region, Philippines. *R & D Journal* Volume XI. Bicol University, Legazpi City, December 2000, pp 1-11.

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