

Socio-Economic Indicators of Coastal Resource Management Participation: The Bataan Case

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Abstract

Recognizing the human dimension on participation to environmental conservation initiatives, this study determined the socio-economic characteristics of stakeholders in Bataan Coastal Resource Management (CRM) and how these variables influence their participation in the process. Data were collected through a survey. Four variables revealed to be independent indicators of high or poor CRM participation: the stakeholders' locality income class, age, level of education, and household size. These indicators are important matters to cogitate for they are indirect drivers of the success or failure of CRM activities. It is concluded that Bataan CRM in the Philippines needs to be reviewed to tackle socio-economic barriers to engagement. Assessment of the process of selecting Bataan CRM participants; strengthened information, education, and communication component through an enriched content and rationalized delivery; institution of a unified CRM database system; and establishment of a provincial CRM research center are all recommended to counteract stakeholder estrangement and unresponsiveness to CRM efforts.

Keywords: coastal resource management, coastal zone management, integrated coastal resource management, environmental management, Bataan

1.0 Introduction

The continuous degradation of the Philippines' coastal environment and resources has been under its national government's watch for more than three decades now (Courtney & White, 2000; Christie et al., 2002; PEMSEA, 2007), and since the 1980s, Philippine environmental agencies have been promoting Coastal Resource Management (CRM) practices to improve the situation in a national scale. CRM, in a nutshell, consist of programs, projects, and practices about the sustainable use and management of the coastal

environment and resources (White et al., 1998). It constitutes planning, implementation, monitoring, and evaluation of sustainable coastal resource conservation, protection, and utilization projects through sound decision-making and collective action (DENR & DA-BFAR, 2001). Its success rests highly on substantial information from coastal zone baseline information obtained from all stakeholder sectors (DA-BFAR, 2010). It is also referred to in various quarters as coastal management, coastal zone management, coastal area management, and integrated coastal management.

Several large- and small- scale CRM projects have been already rolled out in many of the Philippines' coastal provinces such as Bataan (PEMSEA, 2007), a peninsula south-west of the country's Central Luzon plain. Its provincial government in partnership with private groups and environmental organizations have been conducting CRM activities under the umbrella of the Bataan Integrated Coastal Management Program (BICMP) since early 2000. The CRM works under the BICMP mainly include information campaigns on coastal environment protection, clean-up drives on polluted shores, conservation works on threatened coastal and marine species, mangrove reforestation, and artificial reef planting activities. All have been implemented in an integrated framework using provincial and private sector resources (Cervania et al., 2018).

But even with its own CRM plan in place, Bataan remains to be hampered by rapid coastal zone deterioration due to anthropogenic reasons (Cervania et al., 2018). Wastes incessantly accumulate along its shores, polluting coastal waters and harming many economically-important aquatic species. Corollary to this is the declining fish catch, which is exacerbated by enhanced shore siltation due to deforestations and earth-moving activities, destruction of mangrove areas and other habitat systems, unclear delineation of municipal waters, rampant practice of destructive fishing techniques, and laxity in enforcement of environmental policies (Van Mulekom & Tria, 1999; BPMO, 2006; BCCF, 2007; Munchal, 2016; Cervania et al., 2018). All these problems continue despite of an existing CRM charter and on-going CRM activities, and the situation is expected to become worse sans appropriate actions.

There is a wide-consensus in the environmental

management realm on the nexus of the success or failure of any resource management initiative with the corresponding state of participation from stakeholders (Brody, 2003; Reed, 2008; Niyaz & Storey, 2011). Accordingly, for Bataan's integrated CRM works, well-coordinated projects with strong participation from all sectors involved are imperative. Inputs of all stakeholders including the government units, private sector, non-government organizations, and the coastal community must be warranted so that success can be attained through high engagement. Complementary to this, the extent of stakeholders' participation during the course of CRM process must be well-understood. Specifically, it must be evaluated throughout the CRM process by underscoring who are actually participating, at what stages in the process are people participating, at what degree people are participating, and what are the significant obstacles to successful participation under a socio-economic perspective (Ablong et al., 1998; Pollnac et al., 2002; Cankurt et al., 2008; White et al., 2006).

The main goal of this study is to examine the present state of stakeholder participation to Bataan CRM to contribute to scientific formulations of schemes aimed at enhancing CRM engagement in the province. Specifically, the study addresses the following objectives:

- 1) Describe the socio-economic characteristics of stakeholders in Bataan CRM.
- 2) Describe the extent of stakeholder participation to Bataan CRM at the stages of planning, implementation, monitoring, and evaluation.
- 3) Identify socio-economic indicators of stakeholder participation to Bataan CRM activities at the same four stages.

2.0 Methodology

Study Area. The study's subject is Bataan, a peninsular province south-west of the Philippines' Central Luzon region. It is composed of 11 municipalities and a component city, covering a land area of 1,373 km². Total population is 687,482 as of May 2010. With the exemption of Dinalupihan (entry point from the north), all localities are coastal areas.

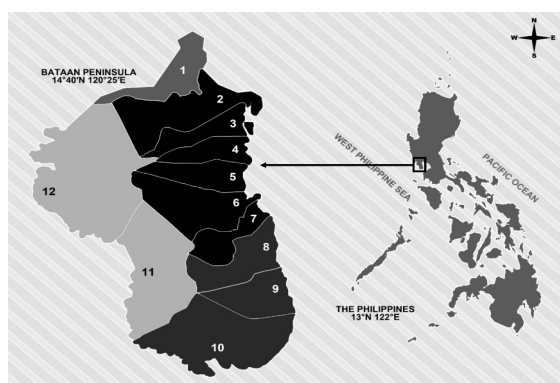


Figure 1. Study Area

Hermosa, Orani, Samal, Abucay, Balanga, Pilar, Orion, and Limay are located along the eastern coastline facing the Manila Bay, while the municipality of Mariveles is in the southern tip. Bagac and Morong lies along the western coastline fronting the West Philippine Sea (BPMO, 2006). Only the 11 coastal localities were included in the present investigation (Figure 1).

Sampling. The statistical population consisted of all the people (based from the latest available census when the study was conducted) from 11 coastal villages (N = 43,495), each representing a subject coastal locality (Table 1). The selection of the representative villages was based primarily on similarities of coastal villages within their locality in terms of physical features, distance from the coast line, and coastal resources utilization, except for Almacen which is the lone coastal village in Hermosa town.

Table 1. Distribution of Respondents per Coastal Locality

Coastal Locality	Map Code	Income Classification	Representative Coastal Village	Representative Coastal Village Population	Number of Respondents
Hermosa	2	First Class	Almacen	1,936	18
Orani	3	First Class	Pantalan Luma	5,026	45
Samal	4	Fourth Class	East Daang-Bago	1,195	11
Abucay	5	Third Class	Wawa	4,492	41
Balanga	6	Component City	Puerto Rivas Ibaba	4,146	38
Pilar	7	Third Class	Balut II	1,311	12
Orion	8	Second Class	Kapunitan	5,036	46
Limay	9	First Class	San Francisco De Asis	5,398	49
Mariveles	10	First Class	Cabcaben	6,269	56
Bagac	11	Third Class	Pag-asa	3,456	31
Morong	12	Third Class	Nagbalayong	5,680	51
TOTAL				43,495	398

Classification is based from the (Philippine) Presidential Decree No. 465 (Classification of Provinces, Cities, and Municipalities)

The total sample size is 398, which was obtained through Slovin's equation under 5% error margin. The 398 respondents were identified in the field through purposive sampling where the selection criteria are: long-time coastal area residency, direct or in-direct coastal resource use for livelihood, and willingness to participate in the investigation.

Data Gathering. A survey-questionnaire was utilized to gather the needed data. The tool consists of 2 parts. Part I deals with the profile of the respondents in terms of locality income class, age, level of educational, main income source, monthly household income, and household size; while Part II comprised of indicators to determine the extent of stakeholder participation to CRM cycle at the stages of planning, implementation, monitoring, and evaluation. The following scale was used to obtain responses from Part II: 5—Excellent, 4—Very Satisfactory, 3—Satisfactory, 2—Fair, and 1—Poor. A rating of "Excellent" extensive participation/performance, while "Very Satisfactory" means above average participation/performance. A "Satisfactory" rating means average participation/performance, while a "Fair" rating means a below average participation/performance. A "Poor" rating means a very poor participation/performance.

Review of related literature and unstructured interviews were conducted prior to the construction of the instrument. Its initial draft underwent validation by CRM and research methodology experts from Bataan Peninsula State University (BPSU)-Research and Development Office, BPSU-Graduate School, and the Department of Environment and Natural Resources (all in the Philippines). Before field use, permissions were secured from municipal administrators

of concerned localities. Likewise, approval and cooperation were sought from representative village leaders to explain project objectives to target respondents.

Data Analysis. The data gathered were organized and processed using the Statistical Programs for Social Sciences (SPSS) version 20.0 software. Frequency and percentage distribution were used to describe the stakeholders' profiles, while mean score and standard deviation were used to describe the extent of their participation to CRM works. The following ranges were used to interpret the obtained results for the latter: Excellent—4.21 to 5.00, Very Satisfactory—3.41 to 4.20, Satisfactory—3.61 to 3.40, Poor—1.81 to 2.60, and Very Poor—1.00 to 1.80. Multivariate Analysis of Variance (MANOVA) and One-Way ANOVA were used (at $\alpha = 0.05$) to describe any significant effect by socio-economic indicators (Part I of the instrument) on the extent of CRM participation wholly and at specific cycle stages. Fisher's Least Significant Difference (LSD) was utilized for necessary post-hoc analyses.

3.0 Results and Discussion

Socio-Economic Profile of the Participants. The results of the study mirror the socio-economic difficulties facing the stakeholders. Data (Table 2) showed that the respondents were predominantly middle-aged adults (56.0%) and mostly based from first class municipalities (42.2%) where economic opportunities and basic government services are expected to be above par within the province. However, data indicated a generally poor socio-economic condition as average monthly income pegged meagerly at 5,000 Philippine pesos (98.60 US dollars) and below

Table 2. Profile of Participants

Variable	Group / Level	f	%
Locality Income Class	Component City	38	9.5
	First Class Municipality	168	42.2
	Second Class Municipality	46	11.6
	Third Class Municipality	135	33.9
	Fourth Class Municipality	11	2.8
	TOTAL	398	100
Age	Older Adult (56 Years Old and Above)	58	14.6
	Middle-Aged Adult (36 to 55 Years Old)	223	56
	Young Adult (18 to 35 Years Old)	117	29.4
	TOTAL	398	100
Level of Education	Has College Degree	2	0.5
	Has Tech-Voc Diploma	4	1
	Has Tech-Voc Units	3	0.8
	High School Graduate	122	30.7
	Reached High School	77	19.3
	Elementary School Graduate	122	30.7
	Reached Elementary School	60	15.1
	No Formal Schooling	8	2
TOTAL	398	100	
Main Income Source	Capture Fishery	334	83.9
	Fish Vending	39	9.8
	Fish Trading	6	1.5
	Fish Processing	13	3.3
	Boat Building	6	6
	TOTAL	398	100
Monthly Household Income	Below PHP5,000	365	91.7
	PHP5,000 to PHP9,999	24	6
	PHP10,000 to PHP14,999	2	0.5
	PHP15,000 to PHP19,999	5	1.3
	PHP20,000 and Above	2	0.5
	TOTAL	398	100
Household Size	Small Size (With 1 to 2 Children)	18	4.5
	Average Size (with 3 to 5 Children)	188	47.2
	Large Size (With More Than 5 Children)	192	48.2
	TOTAL	398	100

(91.7%) coupled with large family size of 3 or more children (95.5%). Almost all respondents were not able to acquire post-secondary education (97.8%) most likely due to the said situations. Another key finding is the respondents' apparent over-dependence on capture fishery for livelihood (83.9%) despite of reported continuing decline in fish catch and deterioration of the province's coastal waters during the past three decades (BPMO, 2006; PEMSEA, 2007). A plausible reason to this phenomenon is the limited occupational options brought upon by under-education, and / or the reported lack of livelihood opportunities promotion and provision by their respective LGUs. Moreover, it can be presumed from the results that the province's coastal zones are under tremendous stress due to the underlined anthropogenic pressures (Cruz-Trinidad et al., 2002.; Della Grace et al., 2004; D'Agnes et al., 2010; Cervania et al., 2018).

Community Participation in Bataan CRM Programs. Stakeholder participation in Bataan CRM at all program stages is lackluster (Table 3). The respondents gave an overall "Poor" ratings at the planning ($\bar{x} = 1.96$, $\sigma = 0.96$), implementation ($\bar{x} = 1.98$, $\sigma = 1.13$), monitoring ($\bar{x} = 2.08$, $\sigma = 0.76$),

and evaluation ($\bar{x} = 2.02$, $\sigma = 1.02$). All indicators at each stage obtained "Poor" descriptive ratings as well. Four socio-economic variables revealed to be independent indicators of high or poor participation namely, the stakeholders' locality income class ($\lambda = 0.919$, $F = 2.088$, $p = 0.007$), age ($\lambda = 0.933$, $F = 3.468$, $p = 0.001$), level of education ($\lambda = 0.875$, $F = 1.875$, $p = 0.004$), and household size ($\lambda = 0.922$, $F = 4.069$, $p = 0.000$) based from MANOVA results (Table 4).

Given the multivariate analysis findings, univariate main effects were examined. One-Way ANOVA results (Table 5) confirmed that the type of locality has a bearing on participation at the planning ($F = 3.431$, $p = 0.009$) and implementation ($F = 2.569$, $p = 0.038$) stages. Further analysis using Fisher's LSD revealed that the extent of participation at the planning phase is significantly lower in the component city of Balanga ($\bar{x} = 1.58$, $\sigma = 0.95$) than in Bataan's first class municipalities ($\bar{x} = 2.10$, $\sigma = 1.08$). Moreover, it was found that the participation at the implementation stage is significantly higher in fourth class municipalities than in the province's second class municipalities ($\bar{x} = 1.70$, $\sigma = 0.62$) and capital city ($\bar{x} = 1.78$, $\sigma = 1.05$).

Table 3. Stakeholder Participation in Bataan CRM Programs at Different Stages

CRM Stage	Indicator	\bar{x}	Σ	Description
Planning	Attendance to CRM program briefing / orientation sessions and discussions together with CRM program planners.	1.99	1.13	Poor
	Participation to CRM plan drafting together with CRM program planners.	1.88	1.09	Poor
	Information sharing on the state of and threats to coastal resources and environment to CRM program planners	2.04	1.28	Poor
	Information sharing on CRM program needs and concerns to program planners.	1.98	1.1	Poor
	Involvement in the setting of vision, mission, principles, and objectives of CRM programs.	1.89	1.07	Poor
	OVER-ALL	1.96	0.96	Poor
Implementation	Understanding of the end-goals of the CRM program implementation.	1.99	1.13	Poor
	Performance of assigned roles in the CRM program implementation.	1.95	1.08	Poor
	Maintenance of healthy interaction with the community in the course of CRM program implementation.	1.96	1.12	Poor
	Cooperation with co-implementers in the course of CRM program.	2.06	1.13	Poor
	Attendance to on- going CRM education and training activities.	1.93	1.16	Poor
	OVER- ALL	1.98	1.13	Poor
Monitoring	Participation in the tracking of changes in fish catch in the respective municipal waters by CRM implementers and researchers.	2.06	0.93	Poor
	Participation in the monitoring of increase or decrease of household income in the respective coastal community by CRM implementers and researchers.	2.05	1.02	Poor
	Cooperation in the monitoring of incidence of destructive and illegal fishing practices in the respective coastal area by authorities, CRM authorities, and researchers.	2.08	0.86	Poor
	Cooperation in the monitoring of conditions of coastal and marine habitat systems (coral reefs, mangrove forest, and sea grass beds) in the coastal zone by the CRM implementers and researchers.	2.09	0.87	Poor
	Cooperation in the monitoring of water quality in the respective municipal coastal waters and waterways by CRM implementers and researchers.	2.11	0.91	Poor
	OVER- ALL	2.08	0.76	Poor
Evaluation	Participation to the periodic evaluation of CRM activities by implementers based from monitoring results.	2.07	1.04	Poor
	Participation to the periodic diagnosis of strong points, issues, and problems in CRM activities by implementers.	2.06	1.1	Poor
	Provision of feedback on where the CRM program has been successful at.	2	1.15	Poor
	Provision of feedback on where the CRM program has been unsuccessful at.	1.92	1.13	Poor
	Participation to periodic CRM program fine-tuning activities by implementers.	2.07	1.19	Poor
	OVER- ALL	2.02	1.02	Poor

The relatively higher participation in the first class municipalities (Mariveles, Limay, and Orani) might be a reflection of the increasing cognizance of stakeholders in these areas on the jeopardies of coastal zone destruction and the socio-economic importance of coastal resources. Apparently, Mariveles and Limay towns are Bataan's main industrial hubs and hosts to a power plant and oil refinery. Deteriorating coastal water quality, destructive fishing, and over-fishing are their perennial problems (BPMO, 2006; PEMSEA, 2007). The town of Orani meanwhile is known to be the province's aquaculture center being a major tiger prawn, milkfish, tilapia, and mud crab

producer through brackish water fishery. The town also suffers from coastal water pollution brought upon by proliferation of fishponds both legally and illegally (BPMO, 2006). Fisherfolks in the three localities definitely have so much to gain from successful CRM works. On the other hand, the relatively lower CRM participation in Balanga can be explained by the increasing opportunities for alternative livelihood in the area. The rising standard of living in the capital city might be driving occupational mobility causing reduced interest on coastal conservation efforts among the fisherfolks (Villareal, 2004).

Table 4. Multivariate Test Results

Socio-Economic Indicator	λ	F-Value	p-Value	Interpretation
Locality Income Class	0.919	2.088	0.007	Significant
Age	0.933	3.468	0.001	Significant
Level of Education	0.875	1.875	0.004	Significant
Monthly Household Income	0.949	1.287	0.197	Not Significant
Household Size	0.922	4.069	0	Significant
Main Income Source	0.95	1.268	0.21	Not Significant

Computed using a level = 0.05

The One-Way ANOVA results confirmed that age has a significant influence on stakeholder participation at the CRM stages of planning ($F = 3.930$, $p = 0.020$), implementation ($F = 8.722$, $p = 0.000$), and monitoring ($F = 8.637$, $p = 0.000$). Post-hoc testing indicated that at the planning stage, older adults ($\bar{x} = 2.28$, $\sigma = 1.30$) tend to have significantly higher participation than their middle-aged ($\bar{x} = 1.92$, $\sigma = 0.93$) and younger ($\bar{x} = 1.87$, $\sigma = 0.81$) counterparts. Likewise, at the implementation stage, it was found that older adults ($\bar{x} = 2.44$, $\sigma = 1.34$) tend to have significantly better involvement than middle-aged ($\bar{x} = 1.95$, $\sigma = 0.95$) and young

adults ($\bar{x} = 1.80$, $\sigma = 0.78$) adults. Lastly, at the monitoring stage, older participants ($\bar{x} = 2.41$, $\sigma = 1.00$) figured to have higher participation than middle-aged ($\bar{x} = 2.08$, $\sigma = 0.72$) and young ($\bar{x} = 1.91$, $\sigma = 0.64$) ones.

Evidently, older stakeholders tend to be more participative in Bataan CRM activities, and this phenomenon according to literature might be due to two inherent older people qualities—health consciousness and generativity. The elderlies' awareness of their own susceptibility to hazards caused by deteriorating coastal environmental quality (Geller & Zenick, 2005), and their urgent

desire to leave a legacy of a sustainable coastal environment to younger generations (Warburton & Gooch, 2007; Davies & James, 2011) might be driving a sense of environmental stewardship among them, which are both advantageous from the CRM standpoint, and hence can be maximized

by CRM front liners. Senior stakeholders and all other groups with high enthusiasm and motivation levels must be identified early in the CRM cycle, and must be given meaningful roles in the whole course of the CRM activities.

Table 5. *Univariate Test Results*

Socio-Economic Indicator	CRM Cycle Stage	F-Value	p-Value	Interpretation
Locality Income Class	Planning	3.431	0.009	Significant
	Implementation	2.569	0.038	Significant
	Monitoring	1.322	0.261	Not Significant
	Evaluation	1.586	0.177	Not Significant
Age	Planning	3.93	0.02	Significant
	Implementation	8.722	0	Significant
	Monitoring	8.637	0	Significant
	Evaluation	2.908	0.056	Not Significant
Level of Education	Planning	3.093	0.003	Significant
	Implementation	2.66	0.011	Significant
	Monitoring	3.584	0.001	Significant
	Evaluation	1.463	0.179	Not Significant
Monthly Household Income	Planning	0.864	0.486	Not Significant
	Implementation	1.443	0.219	Not Significant
	Monitoring	1.722	0.144	Not Significant
	Evaluation	1.084	0.364	Not Significant
Household Size	Planning	7.138	0.001	Significant
	Implementation	12.302	0	Significant
	Monitoring	9.952	0	Significant
	Evaluation	8.718	0	Significant
Main Income Source	Planning	1.241	0.293	Not Significant
	Implementation	0.87	0.482	Not Significant
	Monitoring	1.028	0.392	Not Significant
	Evaluation	0.829	0.508	Not Significant

Computed using a level = 0.05

Moreover, the One-Way ANOVA tests confirmed that level of education has a significant effect on the respondents' CRM participation at the stages of planning ($F = 3.093$, $p = 0.003$), implementation ($F = 2.660$, $p = 0.011$), and monitoring ($F = 3.584$, $p = 0.001$). Specifically, post-hoc testing found that at the planning phase, stakeholders with college degree ($\bar{x} = 4.5$, $SD = 0.71$) tend to have significantly better involvement in CRM compared to those with technical-vocational education units ($\bar{x} = 2.07$, $\sigma = 0.95$), high school diploma ($\bar{x} = 2.01$, $\sigma = 0.92$), high school years ($\bar{x} = 2.07$, $\sigma = 0.99$), elementary school diploma ($\bar{x} = 1.82$, $\sigma = 0.93$), elementary school years ($\bar{x} = 1.84$, $\sigma = 0.98$), and those who did not attend school ($\bar{x} = 1.95$, $\sigma = 0.86$). In the same way, at the implementation phase, stakeholders with college diploma ($\bar{x} = 4.20$, $\sigma = 1.13$) tend to have significantly better participation than those with high school diploma ($\bar{x} = 2.02$, $\sigma = 1.01$), high school years ($\bar{x} = 2.14$, $\sigma = 0.99$), elementary school diploma ($\bar{x} = 1.82$, $\sigma = 0.88$), elementary school years ($\bar{x} = 1.89$, $\sigma = 1.10$), and those who lack any formal schooling ($\bar{x} = 1.90$, $\sigma = 0.71$). Likewise, at the monitoring phase, respondents with college degree ($\bar{x} = 4.30$, $\sigma = 0.99$) figured to have significantly better involvement compared to those with technical-vocational diploma ($\bar{x} = 2.5$, $\sigma = 0.84$), high school diploma ($\bar{x} = 2.12$, $\sigma = 0.75$), high school years ($\bar{x} = 2.11$, $\sigma = 0.79$), elementary school diploma ($\bar{x} = 1.97$, $\sigma = 0.71$), elementary school years ($\bar{x} = 2.01$, $\sigma = 0.75$), and those who did not attend school ($\bar{x} = 2.13$, $\sigma = 0.55$).

It can be inferred that under-education has made a negative difference on stakeholders' involvement at the planning, implementation, and monitoring stages of CRM cycle and the phenomenon might be attributed to the apparent

biases in the province's CRM participant selection processes where the undereducated individuals, oftentimes, are often less considered. There were clamors during the interviews that views and opinions on coastal zone situations from coastal dwellers with formal education deficiencies are often disregarded in the CRM process, even though they are long-time coastal residents. Such bias kills their motivation to engage deeply in the majority of the whole CRM cycle according to the respondents. The matter was aired several times during the interviews, with some respondents pointing out that they are not even aware that CRM-related activities are actually going on in their respective areas. Their apparent disconnection with CRM implementers defeats the very essence of ICM in which there must be substantial participation and cooperation from all entities involved.

Lastly, the One-Way ANOVA test results confirmed that household size has a significant influence on stakeholder participation at all CRM stages to wit, planning ($F = 3.093$, $p = 0.003$), implementation ($F = 12.302$, $p = 0.000$), monitoring ($F = 9.952$, $p = 0.000$), and evaluation ($F = 8.718$, $p = 0.000$). Specifically, multiple household size group comparisons revealed that at the planning stage, stakeholders in large household size ($\bar{x} = 1.78$, $\sigma = 0.86$) tend to have poorer participation compared to those in small ($\bar{x} = 2.38$, $\sigma = 1.22$) and average ($\bar{x} = 2.10$, $\sigma = 1.01$) household sizes. Similarly, at the implementation stage, respondents in large household size ($\bar{x} = 1.78$, $\sigma = 0.84$) tend to have lesser involvement compared to those in average ($\bar{x} = 2.11$, $\sigma = 1.04$) and small ($\bar{x} = 2.80$, $\sigma = 1.34$) household sizes. Likewise, at the monitoring stage, stakeholders in large family size ($\bar{x} = 1.92$, $\sigma = 0.66$) tend to have poorer involvement compared to those in average ($\bar{x} = 2.19$, $\sigma = 0.79$) and small ($\bar{x} =$

2.56, $\sigma = 0.98$) family sizes. Lastly, in the same trend, stakeholders in large household size ($\bar{x} = 1.83$, $\sigma = 0.92$) tend to have lower participation than those in average ($\bar{x} = 2.16$, $\sigma = 1.08$) and small (2.64, $\sigma = 1.09$) household sizes at the evaluation stage.

Noticeably, there is a lower likelihood of Bataan CRM engagement among stakeholders in large families and such might be due to their financial impediments. The financial risks involved—most likely on food and transportation—with extensive CRM engagement might seem excessive for them at the margins of their situation. As what many of the respondents shared during the interviews, many of them would have wanted to contribute to the course of CRM process but they had to spend majority of their time in income-generating activities due to financial constraints. The phenomenon suggests that stakeholder participation in resource management works can indeed be driven by economic complications, meaning, the attitudes of participants towards CRM activities depend on the latter's financial impacts (Cervania et al., 2018).

4.0 Conclusion and Recommendation

This study provides some insights on the state of stakeholder participation to Bataan CRM and information on the socio-economic indicators in the process. It was found that the stakeholders' locality income class, age, level of education, and household size independently has a bearing on their CRM engagement. These socio-economic indicators of participation are important matters for policy makers to cogitate as they are indirect drivers of the success or failure of CRM works.

Bataan CRM programs need to be reviewed to address specific socio-economic barriers to stakeholder engagement such as under-education

and large family size. An assessment of the process of selecting CRM participants must be done with the aim of eliminating bias against less-educated local coastal dwellers. Regardless of formal education attainment, the long-time coastal dwellers' views on coastal environmental problems and on the CRM process must be welcomed in the course of CRM implementation for they are the direct coastal resource users and hence the most to be affected by the success or failure of the CRM works (Cervania et al., 2018). Their opinions must be put in maximum utility to best contextualize the province's CRM process. Their deficiencies when it comes to CRM technicalities (environmental terminologies and processes, as well as specific environmental protection legal bases) can be addressed by instituting capacity-building activities in the form of training provisions (both short- and long-term). While coastal dwellers with educational deficiencies might not readily have the experience and skills for methodical CRM aspects like actual project monitoring and evaluation, creating opportunities for them to soon be in a position where they will be able to support and contribute in these phases is nevertheless important. Training and eventually tapping them in data-gathering activities and other basic but important field functions for instance will not only heighten their level of engagement but will also increase the efficiencies of CRM fieldworks which often suffer from manpower insufficiencies.

Effective public education and outreach efforts can be valuable tools for encouraging constructive public participation and building strong constituencies. A strengthened information, education, and communication (IEC) component through an enriched content and rationalized delivery can help in counteracting specific groups'

estrangement to CRM efforts and to control the population growth in the coastal zones. The IEC materials must focus on wide-ranging information on coastal and marine ecology, environmental conservation and management, and population education and must be disseminated to a more diversified socio-economic spectrum. An efficient system of gathering, storage, and analysis of information for CRM will be critical in ensuring quality data for the IEC materials, therefore, a unified database system for CRM province-wide needs to be instituted too. More researches on the state of Bataan's coastal environment as well studies on the socio-economic aspects of the province's capture fishery and CRM must be commissioned for the same reason.

Academic institutions in the province can substantially help in the foregoing recommendations by establishing a research center focusing on CRM. Such research center must function not only as an institution for scientific data gathering, but as a vehicle for CRM stakeholder empowerment by providing training for CRM implementers and participants; advising to government and non-government agencies on ICM methods and practices; carrying out public information drives on CRM; conduct CRM conferences and workshops; and disseminate publications relating to Bataan CRM.

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