Valuation of Gender Role Participation in Coastal Resource Management in Masinloc, Zambales, Philippines

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Abstract

Recognizing the importance of incorporating gender dimension into any development and conservation programs, gender analysis has become an important input in decision making that gives particular attention to sustainability of the programs. Using the case of Masinloc, Zambales, this study identifies the roles of men and women in the coastal resource management (CRM) and estimates the value of time spent by men and women in CRM activities. Gender-segregated data were gathered from 50 households where husband and wife from each household were separately and simultaneously interviewed using the same set of questionnaire, thus making a total of 100 respondents. Results of the analysis show that incorporating gender dimension into CRM research study affects the outcomes. Logit analysis shows that gender, awareness of the CRM activities and membership in organization significantly affect the decision to participate in CRM activities. On the other hand, the Tobit regression analysis shows that gender, household income, awareness about the CRM and membership in an organization affect the time devoted to and value of time spent in CRM activities. From the results, recommendations on how to incorporate gender dimension in CRM activities are forwarded.

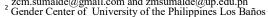**Keywords:** *gender analysis, conservation program, valuation, value of time*

Introduction

Background and Statement of the Problem

Coastal Resource Management Program (CRMP) is widely recognized as a basic service by local government to manage marine and coastal ecosystems. It is envisioned that the program could be an instrument to ensure optimal and sustainable use of coastal water under the jurisdiction of the local government with the end goal of equitable distribution of benefits for the marginal fishers (Provincial Environment and Natural Resources Office, PENRO, Zambales 2010).

The coastal resources of the province of Zambales are ecologically, scientifically and economically rich as declared under Proclamation No. 231 in August 18, 1993 as a Protected Seascape. Mangrove forest is one of the most critical ecosystems linking terrestrial and marine ecosystems. However, similar to what is happening in other parts of the Philippines, the mangrove forests in Zambales are being threatened. Rapid mangrove deforestation happened in the past due to human interference such as conversion to fishponds and indiscriminate logging (PENRO, Zambales 2010).

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One of the identified actions that address the coastal degradation is the implementation of Coastal Resources Management Program (CRMP). The municipality of Masinloc in Zambales Province is one of the municipalities that started to implement the CRMP in 1998. One of the key features of the program is the participation of women in the activities. It has been recognized that in the implementation of CRMP, the different roles, participation, knowledge and awareness of men and women in natural resource use and management are directly connected with the sustainability of the program as well as improvement of their environment and economic well-being. Thus, this study looks at the gender role participation in coastal resource management in the two selected villages of the Municipality of Masinloc, Province of Zambales.

Specifically, the study aimed to provide answers to the following research questions:
1. What is/are the activities performed by males and females in the different components of CRMP?
2. How much time is devoted by males and females in performing CRM activities?
3. How much is the value of their contributions in the different CRMP activities?

Objectives of the Study

This study aimed to assess and value the contributions of males and females in the CRMP activities in two coastal villages in Masinloc, Zambales.

Specifically, the study aimed to: a) estimate and assess the amount of time spent and value of time spent by men and women in CRM activities; b) identify the factors affecting participation, amount of time and value of time spent by men and women in CRM activities; and c) recommend ways by which gender dimension can be incorporated in CRM research activities.

Methodology

Framework of the Study

The study focused on the participation of women and men in CRMP. It attempted to characterize gender roles in terms of their participation in CRM activities. To achieve the objectives of the study, important steps were considered in data gathering. The first step was the understanding of the CRMP and the stakeholders which involved consultations, focus group discussions (FGDs) and key informant interviews (KIIs) with the CRMP officers and staff of the Municipal Agricultural Office (MAO), Bureau of Fisheries and Aquatic Resources (BFAR) and visits to selected barangays. The second step involved the preparation, review and pre-testing of questionnaire and orientation of the enumerators. The third step involved face-to-face survey with consideration on the availability of the respondents for interview at the time of visit.

In general, the study is structured to incorporate gender in CRMP. At the minimum, it disaggregated data by gender whenever possible in CRMP objectives, and took into account the time spent for those activities.

The husband and wife were interviewed separately to have some privacy during the interview and to avoid any one of them giving unsolicited or solicited opinions or answers to some of the questions. Participation and time used for household and CRM activities were considered in the analysis in as much as these are important in determining the access to and control of resources and how these resources can be translated in economic terms as value of time. The values of time involvement of men and women were estimated by getting the market value and/or opportunity cost of the time spent by men and women participating in CRM activities. Contributions of male and female respondents to the total value of activities were estimated by getting the ratio of their contributions to the total value.

The study was guided by the following hypotheses:

Hypothesis 1: There are no significant differences in the time spent and value of time spent in CRM activities between men and women in the study areas;

Hypothesis 2. Gender does not affect the decision to participate in the project and household concerns; and

Hypothesis 3. Gender has no effect on the time spent and value of time spent on CRM activities.

Place and Scope of the Study

The study was conducted in the municipality of Masinloc. Masinloc is located in the northern part of Zambales and lies on a coastal plain between the Zambales mountains to the east and the West Philippine Sea (also called as South China Sea) to the west. Masinloc is bounded on the north by the municipality of Candelaria, on the east by Mount Masinloc, on the south by the Municipalities of Palauig and Iba and on the west by Oyon Bay and Masinloc Bay (Figure 1). Masinloc lies between 119'52" to 119"58E longitude and 15"28"32" to 15"34"47"N latitude. It has a total land area of 30,600 hectares and a total coastal length of 42.2 kilometers.

Figure 1. Map of the Province of Zambales

Source: Ph locator map, pam.wikipedia.org

Specifically, the case study was conducted in two barangays (villages), namely: San Lorenzo (Panglit Island) and Bani. These two barangays were chosen due to the extent of CRM activities in the areas and upon the recommendation of the MAO and the CRM coordinator of Masinloc.

Data Collection

Primary and secondary data were used in the study. Secondary data related to CRM implementation were gathered from the provincial environment and natural resources office (PENRO) of Zambales and CRM office in Masinloc. Gender-disaggregated primary data were gathered through FGDs and KIIs with the personnel of government agencies involved such as the MAO, CRM–LGU and face-to-face interview among 50 households using pre-tested questionnaire. To generate gender-disaggregated data, husband and wife from each household were separately and simultaneously interviewed, making a total of 100 respondents.

Data Analysis

Participation in CRM Activities and Value of Time

The value of time spent in CRM was estimated using the opportunity cost of their time as represented by the income that the respondents forego when they attend CRM activities. If the respondents, especially the women, do not have reported income, the average of the income of the female respondents was used as proxy value. Thus, the value of time spent in CRM activities was estimated by multiplying the time (in hours per month) by the opportunity cost of their time. In cases where the respondents were given token remuneration, the value of time included the amount of the token.

Except for the decision to participate in CRM activities, time spent in CRM activities by gender and value of time, data disaggregated by gender were analyzed descriptively using frequency counts, averages and percentages.

Factors Affecting the Decision to Participate in CRM Activities

Decision to participate in CRM activities was analyzed using logit regression method.

Following Madalla (2001), the logit regression is as follows:

$$\text{LnZi} = \log \frac{P_i}{1-P_i} = \beta_o + \beta_i X_i + \mu_i \qquad (1)$$

where:

β_i = coefficients of the logit; X_i = vector of the explanatory variables that included barangay dummy, age, sex, educational attainment, household size, household income, awareness about CRM and membership in organization; P_i = probability of participating in the CRM activities, a yes answer to participate in the CRM project and μ_i = random error term.

Specifically, the explanatory variables were expressed as: brgy = barangay dummy (1 if barangay is San Lorenzo, 0 if barangay is Bani); age = age of respondent (years); gender dummy (1 if female, 0 if male); education = educational attainment of respondents (years of schooling); hhsize = household size (number of household members); hhy = household income (PhP/year); awareness = awareness about CRM dummy (if a respondent is aware, 0 otherwise); and organization = membership in organization dummy (1 if respondent is a member of an organization, 0 otherwise)

The probability of participation in the CRM was computed as follows:

$$P_i = \frac{1}{1 + e^{-z}} \qquad (2)$$

The higher the value of logit, the higher the odds in favor of a yes answer to participate in the CRM project. The marginal effects ($\frac{\partial P_i}{\partial X_j}$), which explain the change in probability to participate for every unit change in the explanatory variable, were computed as follows:

$$\frac{\partial P_i}{\partial X_{ij}} = \beta_j P_i (1 - P_i) \qquad (3)$$

Factors Affecting Time and Value of Time Spent Participating in   CRM Activities.

To include the latent variable which is not observed such as zero value, the Tobit regression was used to determine the effects of the different factors on the time and value of time devoted to CRM activities by the respondents. The Tobit regression for time devoted to CRM activities is as follows (Madalla 2001):

$$Y^* = \beta_i X_i + \mu_i \qquad (4)$$

Where: Y^* = time devoted for CRM activities (hours per month); Y_i = latent variable which is not observed = Y^* if $Y^* > 0$, = 0 if $Y^* \leq 0$; β = coefficient of the Tobit; X_i = vector of explanatory variables; μ_i = random error term, μ_i ~ IN (0, σ2) . The explanatory variables are as defined in Equation 1.

The probability of time (Y) equals zero is mathematically expressed as:

$$Pi = \frac{1}{\sqrt{2\pi}} \int_{\infty}^{\frac{z}{\sigma}} e^{\frac{(\frac{z}{\sigma})^2}{-2}} \qquad (5)$$

The marginal effects given as $\frac{\partial Y_i}{\partial X_i}$ explain the change in time spent on CRM activities with the changes in the explanatory variables. These were computed using the following equation:

$$\frac{\sigma Y_i}{\sigma X_j} = \beta_i F\left(\frac{\Sigma \beta_i X_i}{\sigma}\right) \tag{6}$$

The effects of the factors affecting the value of time spent (PhP per month) by the respondents on CRM activities were estimated with the same explanatory variables and procedure using Equations (4) to (6) except that the dependent variable was changed from time devoted to CRM activities to value of time which was expressed in pesos per month.

Results and Discussion

The CRMP of Masinloc LGU

The CRMP of Masinloc started in 1998 under the office of the Mayor but was made official only on June 4, 2008 when the Office of the Sangguniang Bayan[3] (SB) enacted Municipal Ordinance No. 92-08, known as the Coastal Resources Management (CRM) code of the Municipality of Masinloc. As stated in the Code, the objectives of the CRMP are to: 1) institutionalize good coastal governance practices through the establishment of a functional multi-sectoral coastal resources management body with institutionalized budget allocation; 2) enhance the participation of community and other stakeholders with regular status reporting and feedback; 3) reduce environmental degradation by completely stopping all illegal and destructive activities in all municipal waters; and 4) sustain 10% of the good reefs and enhance the management of critical coastal habitats (i.e., mangroves, seagrass) (SB Report 2010).

When the Municipal Environment and Natural Resources Office (MENRO) was established in 2011, the CRMP was transferred to this Office and a CRM coordinator was appointed. Stakeholders are identified and Peoples' Organizations (POs) were mobilized as users and managers of coastal resources. Women are also involved in the activities identified in the CRMP.

Profile of Respondents

The summary of the socio-economic characteristics of the respondents is shown in Table 1. On average, the female respondents were younger (38 years) than the males whose average age is 43 years. By barangay, both the male and female respondents from Barangay Bani are relatively older than those from San Lorenzo. In terms of educational attainment, 44% and 42% of total male and female respondents, respectively, were able to finish high school. There was a higher percentage (52%) of male respondents from San Lorenzo who finished high school compared to Bani with 36%. On the other hand, the reverse was recorded for female, where Bani had higher percentage (48%) female respondents with secondary schooling than those from San Lorenzo with 36%. This may be explained by the availability of the free high school facility in Bani which is not available in San Lorenzo.

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[3] Also known as Municipal Council

Table 1. Socio-economic characteristics of respondents by barangay, Masinloc, Zambales, 2011

Characteristic	San Lorenzo (n = 50)		Bani (n = 50)		Total (n = 100)	
	Male (n = 25)	Female (n=25)	Male (n= 25)	Female (n=25)	Male (n= 50)	Female (n=50)
Average Age (years) (minimum – maximum)	39 (22-59)	34 (21-59)	47 (24-78)	41 (20-77)	43 (22-78)	38 (20-77)
Family Size (Average)	4.5		5.1		4.8	
Educational Attainment (% of respondents)						
Elementary level	8	12	24	4	16	8
Elementary graduate	28	16	8	28	18	22
High School level	4	20	20	16	12	18
High School graduate	52	36	36	48	44	42
Vocational	8	4	4	0	6	2
College	0	12	8	4	4	8
Primary Occupation (% of respondents)						
Fishing	96	24	92	4	94	14
Business operator	0	16	0	36	0	26
Others[a]	4	4	8	8	6	6
None/Plain housewife	0	56	0	52	0	54
Secondary Occupation (% of respondents)						
With secondary source of income[b]	48	16	64	4	56	10
None	52	84	36	96	44	90
Annual Household Income (PhP/ year)	94,836		112,263		103,550	
(minimum-maximum)	(18,000 – 314,400)		(24,000 – 438,000)		(18,000 – 438,000)	
Percent of Income from Fishing	45		43		44	
Per Capita Income (PhP year)	26,644		24,994		25,819	
(minimum – maximum)	(2,571 – 141,0000		(3,900 – 111,000)		(2,571 – 41,000)	
Percent Contribution of Male and Female to Total Household Income	71.50	20.75	62.42	20.25	66.58	20.48

[a] Off-farm labor and public service such as barangay official

[b] Include farming/livestock raising, fishing, off-farm labor, business and public service such as barangay official

It appears that there is a defined occupational role for male and female in the study areas. More male respondents (94 %) have fishing as primary occupation while, generally, more female declared no occupation or as plain housewives and those that are employed are engaged in small business operation (e.g., *sari sari* store and buy and sell).

The average household income is PhP 103,550 per year, 44% of which came from fishing that was identified as the primary occupation of most male respondents. The households in Bani had average income of PhP 112,263 per year which is 18% higher than the earnings of those from San Lorenzo. However, due to smaller family size, San Lorenzo households had relatively higher average per capita income of PhP 26,640 per year than households from Bani with PhP 24,999 per year. The husbands in both barangays have significantly higher share of total household income than their wives. This implies that in these areas men are expected to be the bread winner performing the productive role in the family while women are left with the reproductive role.

Participation in CRM Program

Although the respondents reported that they are aware of the CRMP, participation in CRM activities appeared to be wanting. Only one-third of the total female respondents and 66% of the males admitted that they are participating in CRM activities (Table 2). Same pattern of participation among males and females was recorded for both barangays.

Among the activities participated in by the respondents were mangrove reforestation, coastal cleanup, guarding the marine protected area (MPA), environmental protection campaign and *bantay dagat* (sea warden). In general, there were more male respondents who participated in mangrove reforestation and coastal cleanup than female respondents. By barangay, those from San Lorenzo participated more in mangrove reforestation than those from Bani. For coastal cleanup, females from Bani outnumbered the males and the other respondents from San Lorenzo in terms of participation. In the case of sea warden, there was almost equal percentage of male and female respondents from San Lorenzo but it could be noted that more females than males from Bani were involved in the activity.

Table 2.   Participation of the respondents in CRM activities (percent of respondents) by barangay, Masinloc, Zambales, 2011

Activity	San Lorenzo (n = 50)		Bani (n = 50)		Total (n = 100)	
	Male (n = 25)	Female (n =25)	Male (n = 25)	Female (n =25)	Male (n =25)	Female (n =25)
Participation in CRM activities						
Yes	68	36	64	36	66	36
No	32	64	36	64	34	64
CRM activities participated in by respondents[a]						
Mangrove reforestation	94	78	63	67	79	72
Guarding the MPA	18	33	19	11	18	22
Coastal cleanup	65	22	75	89	70	56
Bantay Dagat	47	44	13	22	30	3
Environmental protection campaign	12	11	13	11	12	11

[a]Multiple responses of respondents who participated in CRM activities

Time Spent Participating in CRM Activities

Involvement in CRM activities was evaluated in terms of time devoted in these activities. For all activities, individual male respondents spent an average of 145 hours per month, which accounted for 56% of the total time for all the activities (Table 3). This implies that, on the average, the gap between the time devoted by males and females to the CRM activities was not significant at all. Activities for coastal cleanup accounted for the highest contribution of 40% to total time spent on CRM activities by an individual. This was followed by time spent on guarding the MPA that contributed around 39% of an individual male and 29% of the total time of an individual female's total time. On the other hand, environmental protection-campaign, which was rated the highest in terms of participation had the least time spent which ate up only 7 to 16 hours per month of the male's and female's time, respectively. This may be explained by the fact that this was a one-shot community-wide scale activity and not as a daily activity. The socialization during the activity provided the impetus for the high self-rating by the respondents.

Table 3. Time spent (hours per month) of the respondents in CRM activities by barangay, Masinloc, Zambales, 2011

Activity	San Lorenzo (n = 50)		Bani (n = 50)		Total (n = 100)	
	Male (n = 25)	Female (n =25)	Male (n = 25)	Female (n =25)	Male (n = 50)	Female (n =50)
Mangrove reforestation	16	22	19	5	17	14
Guarding the MPA	52	24	64	60	56	34
Coastal cleanup	61	54	53	24	58	44
Bantay Dagat	9	4	6	6	8	5
Environmental protection campaign	10	7	4	24	7	16
Total	148	112	146	119	145	114

Value of Time Spent by the Respondents in CRM Participation

In most cases, respondents were not paid for participating in CRM activities. It was only in Barangay San Lorenzo where majority, 81% of the males and 78% of the females, were given minimal amount or allowances by the LGU as member of the *Bantay Dagat* (Table 4). Some of those who were not given cash were provided with simple snacks or T-shirts as token for joining the activities. This was particularly true for the coastal cleanup and environmental protection campaign activities. Those who did not receive anything are doing the activities on a voluntary basis for community service.

Table 4. Payment for participating in CRM activities (percent of respondents) by barangay, Masinloc, Zambales, 2011

Activity	San Lorenzo (n = 50)		Bani (n = 50)		Total (n = 100)	
	Male (n = 25)	Female (n =25)	Male (n = 25)	Female (n =25)	Male (n = 25)	Female (n =25)
Were you paid to do the activity						
Yes	81	78	6	11	44	44
No	19	22	94	89	56	56
If no, what type of remuneration is/are given						
Free snacks	33	50	40	38	39	40
T-shirt	0	0	7	13	6	10
None	67	50	53	50	56	50

Since time is an important resource, it has corresponding value regardless of how small it is. As shown in Table 5, the value of time spent on CRM activities was relatively higher (54% of the total) among the female respondents than among the male respondents, although the latter devoted relatively more time on the activities. This may be attributed to the fact that the opportunity cost of time of the females who participated in the CRM activities are higher than the males. These females were those who reportedly operate a business or are engaged in buy and sell activities. Comparing the two barangays, the contribution of women from San Lorenzo to the total value of time spent was 52% while those from Bani contributed only 42% to their barangay total. The higher share of women from San Lorenzo was due to the higher opportunity cost of their time which was used in the valuation.

Table 5. Value of time (PhP/month) in participating in CRM activities by barangay, Masinloc, Zambales, 2011

Activity	San Lorenzo (n = 50)		Bani (n = 50)		Total (n = 100)	
	Male (n = 25)	Female (n =25)	Male (n = 25)	Female (n =25)	Male (n = 25)	Female (n =25)
Mangrove reforestation	850	600	548	105	734	371
Bantay Dagat	756	443	400	725	685	537
Guarding the MPA	1,101	1,257	1,021	450	1,069	1,055
Coastal cleanup	117	118	151	95	135	100
Environmental protection campaign	148	764	210	450	179	1,214
Total (PhP/month)	2,973	3,182	2,330	1,824	2,802	3,277

Factors Affecting Participation in CRM Activities

Three separate regression analyses were done to determine the factors that affect participation in CRM activities: one for all respondents combined where gender was introduced as a variable; one for female respondents where awareness to CRM program of the LGU was omitted due to limited data; and one for male respondents. For the male and female regressions, respondent's income was used instead of household income based on the hypothesis that individual's income will affect the decision to participate in CRM activities (Table 6).

In the full regression, three variables - gender, awareness of CRM activities and membership in an organization - appear to significantly affect the participation in CRM activities. The log likelihood is -33.3368 and is highly significant at 1% level which indicates the significance of the model in predicting the participation in CRM activities. The value of the coefficient of the gender dummy is -0.5637 which means that if the respondent is a female, the probability that she will participate in the CRM activities will decrease by 0.5637. These results may be an indication that a female will have the tendency not to participate in CRM activities because it may be an added burden due to her reproductive role.

On the other hand, the signs of the coefficients of awareness of CRM activities and membership in an organization are both positive, which means that with these variables, probability of participation will increase. Specifically, if the respondent is made aware of the CRM program, his/her participation will increase by 0.7509. Moreover, if the respondent is a member of an association, the probability that he/she will participate in the activity will increase by 0.60. Since awareness has positive relationship with the probability of participation, program implementors should make sure that the clients are fully informed about the program.

For the male respondents, awareness of the CRM program and membership in an organization were found to have significant positive effect on the decision to participate in the CRM activities. This indicates that the probability of participation will increase by 0.811 if the male respondent is more aware of CRM activities and 0.429 if a member of an association.

Table 6. Factors affecting participation of the respondents in CRM activities, Masinloc, Zambales, 2011

Variable	Female		Male		All Respondents	
	Logit Coefficient	Marginal Effects	Logit Coefficient	Marginal Effects	Logit Coefficient	Marginal Effects
Gender dummy	-	-	-	-	-0.256***	-0.5637***
Barangay dummy	1.728	0.391	1.564	0.292	0.483	0.120
Age	-0.267	-0.064*	0.062	0.012	0.001	0.0003
Education	-0.0525	-0.013	-0.025	-0.005	0.038	0.010
Household size	-1.034**	-0.247*	0.067	0.013	-0.250	-0.073
Household income	-	-	-	-	0.00004	0.00001
Respondent's income	0.0005*	0.0001*	-.0003	-.00004	-	-
CRM awareness dummy	omitted	omitted	4.668***	0.812***	4.384***	0.751***
Organization membership dummy	10.038**	0.969***	2.346**	0.429**	2.947***	0.605***
Constant	10.336		-5.183		-2.405	
Log likelihood	-11.4733	-11.4733	-13.4506	-13.4506	-33.3368	
Pseudo R^2	0.5738	0.5738	0.5883	0.5883	0.5191	

* significant at 10% level ** significant at 5% level *** highly significant at 1% level

On the other hand, there are more variables that are found to affect the decision of female respondents to participate in CRM activities. These variables include age, household size, respondent's income and membership in an association with the first three variables having no significant effect in the overall regression and male's decision to participate in CRM activities. The negative sign of the coefficient of age implies that probability of women's participation in CRM activities will decrease as they get older. In the same manner, an additional member of the household would mean a decrease in the probability of female's participation in CRM activities by 0.247. As shown in the socio-economic characteristics of the respondents, the average age of female respondents is 38 years old which reflect that the female respondents are in their reproductive age, thus the additional child would tie her to reproductive roles of child care and nurturance thus, diverting away the time for CRM activities. Respondent's income bears a positive sign which means that increasing income of women increases the probability that they will participate in CRM activities.

Factors Affecting Time Devoted in CRM Activities

For the total respondents, the five factors that appeared to affect the time devoted to CRM activities significantly were barangay dummy, gender, household income, awareness about CRM program and membership in an organization. Except for gender dummy, all the variables showed positive effect on the time devoted to CRM activities (Table 7). The value of the log likelihood is -281.317 and is highly significant at 1% level which indicates that the variations in time spent in the activities related to CRM are explained by the model.

The coefficient of the gender dummy is -14.80558 and is highly significant at 1% level. This means that if the respondent is female, the time spent in CRM activities will decrease by 14.80 hours per month. On the other hand, the coefficient of the barangay dummy is equal to 8.1295 and is statistically significant at 10%. This indicates that if the respondent is from barangay San Lorenzo, the time spent in CRM activities will increase by 8.13 hours per month. This may be explained by the fact that the site of majority of the CRM projects, e.g., MPA and mangrove rehabilitation and reforestation is located close to the barangay. Moreover, there are several members of the *Bantay Dagat* from this barangay. The positive and statistically significant coefficients of awareness about CRM activities and membership in an organization indicate that time devoted to CRM activities will increase with the respondents' awareness of the program and membership in the association.

Comparing the results for male and female respondents, there are more variables that affect the time spent on CRM activities by females than those of males. While household size and respondent's income would have negative and positive effects, respectively, on the time spent by female respondents in CRM activities, these variables would have no effect on the time spent by male respondents (Table 7). The negative sign of the marginal effect of household size implies that an additional member of the household would decrease the time spent by women on CRM activities, probably due to the pressure of attending to the needs of additional member of the households.

Table 7.   Factors affecting time spent by the respondents in CRM activities, Masinloc, Zambales, 2011

Variable	Female		Male		All Respondents	
	Tobit Coefficients	Marginal Effects	Tobit Coefficients	Marginal Effects	Tobit Coefficients	Marginal Effects
Gender dummy	-	-	-	-	-40.320***	-14.806***
Barangay dummy	18.289	4.134	34.140	0.0243*	22.285*	8.130*
Age	-1.0221	-.229	0.679	0.001	-0.332	-0.121
Education	-0.270	-0.061	-1.75	-0.001	-1.728	-0.629
Household size	-10.710**	-2.404**	1.735	0.001	-5.330	-1.939
Household income	-	-	-	-	0.002***	0.001***
Respondent's income	0.0038*	0.0008*	-.0001	-.00001	-	-
CRM awareness dummy	-	-	97.662***	0.061***	88.125***	23.100***
Organization membership dummy	111.855***	51.937***	51.631***	0.036***	62.464***	26.913***
Constant	15.634		-126.082*		-62.062	
Sigma	45.139		55.038		49.854	
Log likelihood	-102.105		-179.350		-281.317	
Pseudo R^2	0.143		0.084		0.117	
Marginal effects after Tobit		5.849		.0513		12.397
Y = E(totaltime x |totaltime>0)	(predict, ystar(0,.))					

* significant at 10% level   ** significant at 5% level *** highly significant at 1% level

One interesting result was the positive effect of membership in organization on the time spent by both men and women in CRM activities although the effect will be higher for women. As indicated by the value of the marginal effects, membership in an organization would increase the time spent by women on CRM activities by 52 hours per month but only 0.03608 hours per month for men. This may be due to the fact that membership in an organization provides a sense of belongingness that encourages participation in the activities. This result indicates that membership in an organization is an important factor that should be considered in planning CRM activities and points to the need of forming associations among the participants in the activities.

Factors Affecting the Value of Participation in CRM Activities

The results of the Tobit analysis for the factors affecting the value of time by female, male and all respondents are summarized in Table 8. For all respondents, the variables that are found to have statistically significant effect on the value of time include gender dummy, household size, household income, awareness about CRM activities and membership in an association. Unlike in the regression on time spent in CRM activities, barangay dummy is no longer significant at 10%. This may be due to the possibility that the opportunity cost of time by the respondents in the two barangays did not vary too much. Household size which did not appear to have significant effect on time spent in CRM activities appeared to have significant effect on value of time at 10% level. The value of Log likelihood is -475.8537 which indicates the overall significance of the model in explaining the variations in the value of time for CRM activities.

The coefficient of the gender dummy is -1,370.287 and is highly significant at 1% level. This means that if the respondent is a female, the value of time spent on CRM activities will decrease by PhP 1,370.29 per month. For family size, the coefficient is equal to -284.8431 which implies that if family size increases by one unit, or if there is an additional family member in the household, the value of time spent on CRM activities will decrease by PhP 284.84 per month. This may be because an additional family member, especially young children, would require extra time for child care. Thus, the time spent particularly by women for CRM activities and its corresponding value would decrease. The coefficient of household income is 0.08179 and is significant at 1%, which indicates that if income increases by PhP 1,000 per year, the value of time devoted on CRM activities would increase by PhP 0.082 per month. Correspondingly, the awareness about CRM activities and membership in an association would increase the values of time by PhP 2,911 per month and PhP 1,840 per month, respectively.

Barangay dummy and household size appeared to have significant effect on the value of time of women but not of men. Accordingly, if the female respondent is from San Lorenzo, the value of time will increase by PhP 142.60 per month. This may be because women in San Lorenzo have higher opportunity cost of time than women respondents from Bani. On the other hand, the negative sign and value of the marginal effects of household size indicate that an additional member of the household would decrease the value of time spent on CRM activities of women by PhP 42.89 per month. This may be due to the decrease in time devoted by women on CRM activities when there is an additional member of the household. Regardless of gender, the value of time spent on the CRM activities increases with membership in an organization due to the latter's positive influence on the former.

Table 8. Factors affecting the value of time spent by the respondents on CRM activities, Masinloc, Zambales, 2011

Variable	Female		Male		All Respondents	
	Tobit Coefficients	Marginal Effects	Tobit Coefficients	Marginal Effects	Tobit Coefficients	Marginal Effects
Gender dummy	-	-	-	-	-1370.287***	-432.858***
Barangay dummy	661.265*	142.603*	717.348	0.014	575.314	179.548
Age	-29.027	-6.124	20.977	0.0004	-9.954	-3.098
Education	-16.942	-3.575	63.394	0.001	46.310	14.414
Household size	-203.288*	-42.893*	-42.055	-0.001	-240.843*	-74.964*
Household income	-	-	-	-	0.0818***	0.0255***
Respondent's income	0.105**	0.022*	0.213**	0.001**	-	-
CRM Awareness dummy	-	-	2975.656*	0.053***	2711.339***	615.528***
Organization membership dummy	2497.815***	1159.328***	1413.945**	.02785**	1839.715***	678.719***
Constant	344.8271		-5594.164		-2574.288	
Sigma	946.15		1974.314		1694.870	
Log likelihood	-156.7888		-294.2028		-475.8537	
Pseudo R^2	0.1030		0.0493		0.0769	
Marginal effects after Tobit: Y = E(value of time*|value of time>0, (predict, ystar(0,.))	113.1401		0.0462		534.6199	

* significant at 10% level ** significant at 5% level *** highly significant at 1% level

Conclusions and Recommendations

From the foregoing analysis, it is apparent that factors affecting the amount of time and value of time devoted in CRM activities differ by gender. The above results provided evidence that factors affecting decision to participate in CRM activities and outcomes differ by gender. This points to the importance of understanding and incorporating gender dimension in the design, planning and implementation of programs that would affect men and women.

To make sure that CRM research activities are gender sensitive, there should be a deliberate effort to incorporate gender in CRM research for program/project development. Gender dimension must be one of the important considerations in the conceptualization of the program and a norm in data analysis and discussion of results. The study demonstrates that gender plays a significant role in the discussions around environmental economics, which in the more recent discourse has provided evidence-based policy reforms for coastal resource management. Qualitative analysis can provide a good basis on what variables to be included in the quantitative analysis. In other words, analysis must combine qualitative and quantitative approaches. Results must be presented and interpreted in such a way that differences between men and women are taken into account.

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