

Highlights of the 2009 Behavioral Monitoring Surveys Danajon Bank and Verde Island Passage, Philippines

The Coral Triangle is a vast expanse of ocean bordered by the Philippines, Indonesia, Malaysia, Papua New Guinea, Timor-Leste and the Solomon Islands. It is the most diverse marine territory on earth and one of the planet's major food sources. Two globally significant ecosystems within the Coral Triangle (CT) are located in the Philippines' Central Visayas region, namely the Verde Island Passage (global epicenter of marine biodiversity) and the Danajon Bank (one of two double barrier reefs in the CT).

About 2.7 million Filipinos reside in coastal areas bordering the Verde Island Passage (VIP¹) and the Danajon Bank² and depend on the goods and services that flow from these bionetworks for food and livelihood. In recent years, however, the biodiversity and productivity of these life-sustaining ecosystems have deteriorated due to anthropogenic stresses driven, in part, by demographic factors (high population density and growth) and policy gaps and institutional weaknesses. As a result, food insecurity and conflicts among resource users are escalating - with severe consequences for human well-being and social stability in the region. While government and private groups are addressing these concerns, the gains of their sectoral management programs have proven difficult to sustain in the face of increasing population growth and demand for aquatic resources.

The same anthropogenic stresses that pose threats to the sustainability of fish and other aquatic resources are also aggravating the impacts of climate change in coastal Philippines. This was borne out by recent tropical storm Ketsana whose devastating impacts on the coastal city of Manila were exacerbated by its overcrowded condition, poor urban planning (inadequate drainage and garbage disposal) and deforestation in the nearby Cordillera Mountains, which compounded the flash floods triggered by the storm's record level of rainfall. And unless steps are taken to build resilience to climate change, it can be expected that an increased number of people in Philippines will be "at risk of hunger," according to a current assessment by the Asian Development Bank³.

Recognizing the need for a more holistic response to the multi-faceted challenges confronting coastal communities, PATH Foundation Philippines Inc. (PFPI) developed a model that links population, health and environment (PHE) factors and supports cross-sectoral coordination and collaboration. Using a quasi-experimental evaluation design, PFPI tested its "integrated population and coastal resource management"

¹ 33 coastal municipalities whose population total about 1.7 million people lie within the borders of the VIP

² 19 municipalities with populations totaling about 1.0 million border the Danajon Double Barrier Reef

³ Pongphon Sarnsamak. "Climate Change to Have Severe Impact on Food in Region: ADB." Friday, October 2, 2009. The Nation, Vol. 34, No 52373. October 2, 2009.

(IPOPCORM) approach in several coastal areas during 2001-2007. Results of this six-year research demonstrate that PHE approaches are cost-effective and can generate higher impacts on human *and* ecosystem health outcomes compared to sectoral management programs⁴. The model also demonstrated potential for strengthening community and ecosystem resilience to climate change⁵. IPOPCORM has since been replicated in 1,070 coastal *sitios* (hamlets) of 33 municipalities spanning 8 marine conservation priority areas in southern Philippines. This was achieved through unique partnership arrangements involving local governments units (LGU), non-governmental organizations (NGO), fisherfolk and other coastal resource users, and their Peoples Organizations (PO).

The current challenge is to test the scalability of PHE at the level of the ecosystem, which has yet to be demonstrated anywhere in the world. In 2008 PATH Foundation initiated work to bring IPOPCORM to scale in the Danajon and VIP ecosystems under a project entitled Poverty, Population and Environment (PPE) funded by the Packard Foundation and local collaborators⁶. The USAID-funded BALANCED⁷ project is also supporting activities designed to monitor the scale up process and documents its lessons and best practices.

BEHAVIORAL MONITORING SYSTEM (BMS)

The Behavioral Monitoring System (BMS) is one of the information systems developed by PFPI for program monitoring purposes. It uses population-based surveys to collect quantitative information in order to describe target groups in the community, monitor progress toward desired behavior change, and calibrate program implementation strategies. PFPI has refined the system over a period of 14 years and applied BMS methodologies in both urban and rural areas to monitor HIV/AIDS prevention, family planning practice and PHE activities. For the IPOPCORM initiative, the BMS was designed to gather information on attitudes and behavior related to indicators for reproductive health, coastal resource management and their integration. For the PPE project, additional indicators were added to monitor levels of poverty, food security and climate change awareness that may influence PHE practices in the coverage areas.

⁴ Castro, J. & D'Agnes, L. (2008) "Fishing for families: reproductive health and integrated coastal management in the Philippines." *FOCUS on Population, Environment and Security* 15:1-11. The Woodrow Wilson International Center for Scholars. Online at: http://www.wilsoncenter.org/topics/pubs/ECSP_Focus_Apr08Castro.pdf

⁵ D'Agnes, L. & Castro, J. (2009) Impact of integrated population and coastal resource management on ecosystem health and human wellbeing in Culion Island, Philippines. Case study selected by the Smithsonian Institute as a "Success Stories in Ocean Conservation." Online at: http://www.mnh.si.edu/exhibits/ocean_hall/success_stories.html

⁶ Local NGOs and local government units

⁷ Building Actors and Leaders for Advancement of Excellent in Community Development (BALANCED) is a global program of USAID's Office of Population and Reproductive Health which seeks to advance use of effective PHE programs worldwide.

1. Methodology

A. Study Design

This study considered a cross-sectional design using quantitative methods and face-to-face interview of sample respondents. Data from BMS surveys are then triangulation with qualitative information from other sources (local government, field supervision reports) to draw inferences for program refinement and policy reforms.

B. Survey Instrument

The (BMS) instrument (questionnaire) was translated and pre-tested in April 2009 by individuals with prior BMS implementation experience. The instrument was finalized, based on pre-test findings, and contains socio-demographic, health, coastal conservation and climate change-related questions as well as opinion questions on population-environment and poverty linkages. Manuals of procedures and coding instructions were prepared to guide the interviewers in the sampling method and in the conduct of the survey.

C. Survey Areas

The 2009 BMS surveys were conducted in three areas where IPOPCORM is being scaled-up under the PPE project. The study sites include Ubay (Bohol) and Bato (Leyte) as part of the Danajon Bank and Isla Verde (Batangas) as part of the Verde Island Passage (VIP). Within each site, six coastal *barangays* (villages) were selected based on the level of cooperation of the local government and their accessibility and proximity to a marine protected areas (MPA).

Target areas for the BMS share a set of common characteristics that render them ideal candidates for PHE policy and program development. All are rural and have relatively high rates of population density and growth compared to national figures. Their populations also have high momentum with more than 35% of people under the age of 15 years - which also is an indication of future anthropogenic stress. Incidence of poverty is high and increasing in these areas. All are located in ecosystems that are ranked by the government as “extremely high priority” for conservation of marine biodiversity.

D. Data Collection Methods

The target respondents for the 2009 BMS comprise individuals in the reproductive age group (15-49 years). A sample of 300 respondents per study site was targeted (total 900 respondents). The interviewers who conducted the survey are community outreach workers who received prior training from PFPI on BMS survey processes and interview methods. The enumerators were given a 2-day training to discuss the nature, purpose, survey procedures, fieldwork techniques and specific aspects of the study to be carried out by the team. Social preparation (e.g. courtesy calls to local officials) was also conducted by the enumerators and project coordinator to secure permission and support from the local authorities in conducting the survey.

1. Selection of Subjects

The interviewers conducted an initial preparation in the field before the actual survey. They secured master lists of households from the selected *barangays* and used them to systematically select the sample households. A sample of 1,080 households was drawn from all the study *barangays* (20% adjustment was included). From these sample households, only one eligible household member was interviewed.

The interviewers selected the respondents from each sampled household using the Kish method/grid⁸. This method provides a mechanism for selecting a member of each household in a systematically varying fashion so that, across the entire sample, all possible household member-types are represented in the same proportions as in the population (McBurney 1988⁹).

After the interviewer identified the respondent in the household, the interview proper was performed using the pretested BMS questionnaire. All the respondents were interviewed in their local dialect and their answers were recorded on the questionnaire during the interview.

E. Data Processing

The questionnaires were edited by the interviewers while they were still in the field. They also coded the responses using the coding instruction as their guide. Responses in local dialects were also translated to English. After the editing and coding process, the questionnaires were then submitted to PFPI office for further checking for accuracy and completeness. The data were encoded in the data entry program constructed using CPro 3.4 software. After encoding, a series of range and consistency checks were done. Inconsistencies were traced back to the specific questionnaires and subsequently corrected. To ensure quality of data, 20% of the encoded data were manually validated against the responses on the questionnaires. STATA software version 10.0 was used for data management and analysis.

F. Data Analyses

Descriptive statistics were generated for the responses. For categorical variables, frequency and percent distributions, and bar graphs were presented. For continuous variables (e.g. age), summary statistics such as means or medians and range were generated. Chi-square (χ^2) test was used to determine if presence of a disease in the family within the last 12 months is associated with: i) perceived change in the environment; ii) waste management; iii) water source; and, iv) sanitary toilet. All the analyses were two-tailed, and *p-values* of 0.05 or less were considered significant.

⁸ Online information about the Kish Method is available from the World Health Organization at: https://www.who.int/chp/steps/Part2_Section2.pdf

⁹ "On Transferring Statistical Techniques Across Cultures: The Kish Grid" Peter McBurney Current Anthropology, Vol. 29, No. 2 (Apr., 1988), pp. 323-325 <http://www.jstor.org/stable/2743408>

OVERVIEW OF 2009 BMS RESULTS IN VERDE and DANAJON

Demographic and Socio-economic Profile

A total of 897 respondents from 18 coastal *barangays* were surveyed in May for the 2009 BMS. The age of the respondents averages 31.6 years. Young (age 15-24 years) adults comprise 29 percent of the BMS sample while females represent six out of 10 respondents. Majority of those interviewed are married or living in union and have completed high school. Most are natives of their respective *barangay* and reside in households with 5.1 members, on average, which is similar to the national figure (5.0). Despite having high education level, 34 percent of respondents are unemployed (“no source of income”) while those with jobs mainly engage in trading, handicraft/cottage industry work (non-formal sector), farming and fishing – all of which rely on natural resources. 60 percent of working respondents report no secondary source of income.

The high rate of unemployment among BMS respondents is consistent with the low levels of household income reported by the same interviewees. Overall, 62 percent of respondent households earn less than P5000 (US\$110) per month from all sources, which is below the official poverty threshold for a family of five¹⁰. Incidence of poverty in the BMS sites is considerably higher than the national average rate (40%) and the estimated rate for coastal municipalities in the Philippines (54%)¹¹.

The average monthly income figure for BMS respondents, however, masks wide disparities in poverty incidence across the survey sites. On Isla Verde, poverty lurks at 79 percent, whereas in the Danajon it ranges from 62 percent of households on Ubay to 45 percent on Bato¹². Even more striking is the proportion of households living in “abject” poverty on Isla Verde (38%) and in Ubay (18%) with combined monthly income from all sources ≤ P1500 (\$30) per month which translates into a daily income share of P10 (US\$0.20) per household members.

Despite the impoverished state of the BMS communities, 59 percent of respondents with monthly income below P5000 claim it is “sufficient to meet daily needs” with yet another 6 percent saying they are able to “save money after meeting daily needs”. Other BMS data showing majority of respondents own a cell phone (70%), radio (61%) or television set (50%) support these claims and the implication that even “poor” households have some disposable income. This augurs well for the social marketing strategy used in IPOPCORM to promote contraceptive self reliance in coastal areas.

Reproductive Health Situation and Practices

More than 80 percent of BMS respondents are sexually active. The average age of sexual debut is 21 years and ranges from 6-38 years with the youngest age reported in Ubay¹³. Majority of BMS respondents (80%) have children with the average number

¹⁰ P6195 (US\$136) per month

¹¹ Philippines National Statistics Coordinating Board (NSCB), 2007.

¹² These rates mirror the government’s most recent statistics for poverty incidence among fisher households which averaged 66.7 percent in 2007.

¹³ Information from other sources supports the implication of child sex abuse in Ubay.

being 3.7, which is higher than the national total fertility rate (3.2 children per woman). The high fertility rate corresponds with the low levels of contraceptive use (modern methods) among BMS respondents which range from 13 percent in Verde to 23 percent in the Danajon areas (compared to 35% for rural Philippines). Among those currently using modern FP methods, oral pill is the method of choice in Verde and Ubay whereas IUD is population in Bato. Most users obtain their supplies from drugstores or the government's rural health units (RHU). Other information showing drugstores are few and far between in these study areas and RHUs often run out of FP supplies suggest lack of access may be a reason for low levels of contraceptive use and FP practice.

There is a disconnect between what respondents cite as their "preferred" number of children (3.2) and the actual number of their offspring (3.7) suggesting unmet need for family planning is prevalent in these areas. This inference is supported by the same BMS data showing high numbers of unintended pregnancies especially in Bato where 44 percent of those who reported a pregnancy in the 12 month period preceding the survey said it was "unplanned" compared to about 35 percent in the other study sites. These rates are higher than the national figure for unintended pregnancy among women of childbearing age (30%)¹⁴. However, 70 percent of the new mothers breastfed their infants which is encouraging given that only 16 percent of Filipino mothers nationwide initiate breast-feeding.

The majority of BMS respondents believe that youth should have access to contraceptives and information on sexuality suggesting these communities will be receptive to programs targeting teens with reproductive health services, which are clearly needed as 44 percent of young (15-24 yrs) people who participated in the BMS are already having sex and less than 8 percent said they used any method to prevent pregnancy during first sex.

Across the sites, there is a high level of awareness among BMS respondents of the dual-protection that condom use affords with 68 percent saying it can prevent pregnancy *and* sexually transmitted infections. Few (<4%), however, report recent use of condom for either pregnancy or disease prevention purposes which again could be due to access constraints.

Awareness of reproductive health rights is also high in the study areas as evidenced by 86 percent of respondents who agree with the opinion statement "Everyone should have the right to choose how many children they want and when to have them." This result implies people are more likely to follow their conscience rather than dictates of the Catholic Church that prohibit contraceptive use. Another BMS finding that supports this notion is the high level of concern among BMS respondents that "if couples do not practice FP they may not be able to send all of their children to school." The huge value that Filipinos place on education should be exploited by programs that aim to reduce unmet demand for family planning in these coastal communities.

Public Health and Environmental Health Situation and Practices

The respondents were asked if they or a member of their family had experienced one of the following diseases or symptoms in the last 12 months: severe diarrhea, pneumonia, skin disease, dengue, malaria, tuberculosis, sexually transmitted disease (ST) and

¹⁴ Guttmacher Institute (2009) *Meeting Women's Contraceptive Needs in the Philippines*. In Brief: 2009 Services Volume 1. http://www.guttmacher.org/pubs/2009/04/15/IB_MWCNP.pdf

jaundice. Nearly half reported a disease incidence with severe diarrhea, skin diseases and pneumonia being the most frequently cited. The rates differ significantly ($p\text{-value} < 0.001$) across the study areas with respondents on Bato reporting the highest incidence (57%) followed by Ubay (55%) and Verde (34%).

Respondents were also queried about their access to safe drinking water and sanitary latrines. Access to safe water varied significantly across the BMS study sites with less than 1 percent of households on Isla Verde having a protected water source compared to 6.6 percent on Ubay and 64 percent on Bato. Sanitary toilet facilities, on the other hand, are widely available with 72 percent or more of households in each area having toilets.

Chi-square tests were performed to determine if the percentage of respondents experiencing any of the abovementioned diseases differed according to their access to water and sanitation facilities. At 5% level of significance, the data (Table 1) indicate that the proportion of respondents who suffered any illness is greater for those for those who do not have sanitary toilets ($p\text{-value} < 0.002$).

Table 1. Percentage of BMS Respondents Who Suffered from Any of the Diseases According to Water Source and Sanitary Toilet, 2009

	Suffered from any of the disease	p- value
With protected water source?		
Yes	53.08	0.12
No	46.94	
With sanitary toilet?		
Yes	45.73	0.002*
No	58.79	
With protected water source and sanitary toilet?		
Yes	51.88	0.33
No	47.63	

* significant at $\alpha = 0.05$

Majority of the BMS respondents (65%) reportedly burn their garbage while one-fourth dumps waste in lowland areas or the ocean. Composting is practiced by about 20 percent of respondents. Bato is the only site where respondents reportedly have access to municipal garbage collection and 45 percent use it to dispose of waste.

The rate of illness suffered by the respondents (or any family member) was also analyzed in association with their waste management practice. Chi-square tests were performed to determine if the percentage of respondents experiencing any of the abovementioned diseases differed according to their waste management practices. The results (Table 2 below) indicate that the proportion of respondents who suffered any illness is greater for those who did not dump their garbage ($p\text{-value} < 0.04$).

Table 2 Percentage of BMS Respondents Who Suffered from Any of the Diseases According to their Waste Management Practices, 2009

Waste management practice	Suffered from any of the disease	p- value
Burning		
Yes	46.2	0.08
No	52.4	
Composting		
Yes	48.1	0.92
No	48.5	
Communal pit		
Yes	54.7	0.30
No	47.9	
Municipal garbage collection		
Yes	53.3	0.21
No	47.5	
Feeding to domestic animals		
Yes	57.8	0.10
No	47.6	
Dumping		
Yes	42.4	0.04*
No	50.5	

* significant at $\alpha = 0.05$

Climate Change Awareness and Impacts

The respondents were queried about changes in the climate or environment in their area over the past three years. Across the survey sites, “irregular rainfall” was the most frequently cited change followed by “increasing drought” (Ubay and Verde) and “ocean pollution” (Bato).

Chi-square tests were performed to determine if the percentage of respondents experiencing any of the diseases differed from those who perceived changes in the environment/climate and those who did not. The results (Table 3 below) indicate a higher rate of illness among those who observed environment/climate changes in their area compared and those who did not. All of the observed changes in climate correlated strongly with disease incidence suggesting that the impacts of climate change may be adversely affecting people’s health status in the study areas.

Table 3: Percentage of BMS Respondents Who Suffered from Any of the Diseases According to Whether They Observed Changes in the Environment, 2009

Perceived change in the environment	Suffered from any of the disease	p- value
More frequent flooding		<0.0001*
Yes	58.7	
No	44.3	
Increasing drought		<0.0001*
Yes	54.8	
No	39.6	
Water scarcity		0.02*
Yes	52.8	
No	45.1	
Irregular rainfall		0.04*
Yes	49.5	
No	37.3	
Changes in tidal patterns		0.01*
Yes	52.0	
No	43.3	
Erosion		0.001*
Yes	66.7	
No	46.6	
Salt intrusion		0.03*
Yes	57.1	
No	46.8	
Rising sea level		<0.0001*
Yes	55.5	
No	39.9	
Ocean pollution		<0.0001*
Yes	55.4	
No	39.8	
Floating dead fish		0.001*
Yes	60.1	
No	45.9	

*significant at $\alpha = 5\%$

Marine Coastal Resource Use and Food Security

Less than 10 percent of respondents across the sites report fishing as a source of income. However, 50 percent of the surveyed households own fishing gear which suggests a higher level of fishing effort in these communities. Among those currently earning an income from fishing, the median catch during the last fishing activity ranges from 2.5 kg to 3.0 kg with Bato (Danajon site) reporting the lower level. The BMS overlooked the need to ask fishers about the average number of hours spend fishing during the last activity. Such data would have enabled our analysts to calculate the catch rate per unit of effort (CPUE) which, for small-scale fishers in the Philippines

averages 2.0 kg per fisher-hour¹⁵. Given that 72 percent of BMS respondents also report “there has been a decline in fish availability over the past few years”, we can infer that the fisher-respondents are having to travel further distances and spend longer hours fishing in order to meet their families’ daily needs, and that their hourly catch rate is less than the median catch rate reported during the last fishing expedition.

The respondents’ perception of declining fish availability is consistent with the levels of food insecurity revealed in the BMS data. In the Danajon sites, 64 percent of respondents agree with the opinion statement “sometimes there is not enough food to go around and the family goes hungry,” compared to 42 percent on Isla Verde. These levels of hunger are high compared to national estimates of the number of Filipino families that lack food (30%).

More respondents on Ubay (57%) are aware of the existence of a fish sanctuary or other type of marine protected area (MPA) in their area compared to Verde (36%) and Bato (17%). This trend emulates the actual numbers of MPAs in the study sites with Ubay having four MPAs compared to two in Isla Verde and only one in Bato. Among the respondents who are aware of a sanctuary in their area, majority value the sanctuary because it “increases the number of fish in the community.” Other frequently mentioned benefits include “conservation of coral reefs” and “gives additional income to the community.” Among those with awareness, 90 percent report no involvement whatsoever in the management of the fish sanctuary. This result together with other BMS data showing 16 percent of respondents lack knowledge of MPA benefits suggests a need for more intensive education and advocacy efforts to increase coastal inhabitants’ appreciation of, and participation in, marine protected area management particularly given the food insecurity concerns discussed earlier.

When asked about issues pertaining to community empowerment and responsibility for environmental protection, over half of the respondents in the Danajon sites claim “our community is helpless in protecting the environment” compared to fewer than 24 percent on Isla Verde. Similarly, more respondents in the Danajon think the government is solely responsible for conservation, compared to Verde. These trends reflect a need for interventions that can enhance community understanding of the links between coastal conservation and improved food security and increase their awareness of provisions under the law that delegate shared responsibility for environmental protection to local government units and civil society (e.g., Local Government Code). More inputs are also needed to encourage local governments to enter into co-management arrangements with local communities for protection of coral reefs, mangrove stands and other coastal habitats particularly in the Danajon ecosystem.

Awareness of Population-Health-Environment (PHE) Linkages

The respondents were presented with several opinion statements designed to gain insights into their level of awareness of PHE linkages. Majority of those surveyed across the sites (>72%) believe food insecurity is linked to “too many people and not enough fish to go around.” Similar proportions agree that “if couples do not practice family

¹⁵ Green, Stuart J., Alan T. White, Jimely O. Flores, Marciano F. Carreon III, & Asuncion E. Sia. (2003). *Philippine fisheries in crisis: A framework for management* (CRMP Document No. 03-CRM/20003). Cebu City, Philippines: CRMP of the DENR.

planning, there may not be enough natural resources to go around in the future.” Over half perceive linkages between the overcrowded conditions in their communities and spiraling garbage problems. Majorities also know that mangrove forests offer protection against the effects of a tsunami. A disturbing number of responders in Ubay, however, believe that it is acceptable to throw garbage on the beach “because the ocean takes it away and it causes no harm.” These perceptions could be due to the lower level of higher education (high school and college) among Ubay respondents compared to their peers in the other study sites, and indicate need for information, education and communication (IEC) campaigns tailored to their levels of schooling in order to reduce harmful practices and correct misunderstanding. The same campaigns can capitalize on other findings from Ubay showing “ocean pollution” and “floating dead fish” rank among the environmental changes frequently cited by BMS respondents from that area and their possible correlation with incidence of severe diarrhea (32%) and skin diseases (28%) which topped the list of communicable diseases that affected households in the last twelve months.

A considerable number of respondents in the Danajon still perceive large numbers of children to be an economic advantage with the highest proportion found in Ubay (29%). And the disaggregated BMS data indicate Ubay respondents *indeed* have larger household size (5.3), higher rate of recent fertility (28%) and higher total fertility (4.0) compared to their peers in the other survey areas. Again, this could be due to their lower education attainment which other researchers note directly correlates with higher fertility. Their perception that larger families enjoy better economic status, however, does not hold true for households in their communities where poverty lurks at 62 percent and nearly one-in-five households lives in “abject” poverty with income from all sources averaging less than P1500 (US\$30) per month. This disconnect should be brought to the attention of Ubay’s leaders in a policy brief drawing on data from the BMS. PFPI staff should also feed back the BMS findings to communities that participated in the study and members of their barangay development councils.

Parallels can be drawn with the situation in Verde where larger numbers of households suffer from poverty and lack access to safe drinking water and electricity compared to Ubay but are better able to cope because of their smaller household size, fewer numbers of children, and lower rates of recent and total fertility. Verde respondents also enjoy better health status with fewer families lacking for food (42%) compared to Ubay (66%). Fishers from both sites report similar rate of fish catch (3.0 kg) with the difference being that the daily harvest is shared among 4.6 household members in Verde compared to 5.3 in Ubay. Verde residents also feel more empowered and responsible for protection of their environment and have greater appreciation of the benefits of MPA and conservation of coral reefs. Fewer residents on Verde (26%) compared to Ubay (63%) cite “ocean pollution” as an environmental change issue and the vast majority (90%) disapprove of throwing garbage on the beach whereas in Ubay over one-third consider it to be an acceptable practice. Overall, the PHE dynamics on Verde are more conducive to human and ecosystem health compared to Ubay - despite the less favorable economic situation of households in the former site.

Recommendations

- PFPI should feed-back the BMS results to LGUs and communities that participated in the study and use the findings to guide the development of site-

specific IEC and advocacy strategies drawing on the facts and implications documented in this report.

- Advocacy efforts should encourage local government to respond to the following factors which are contributing to resource depletion and environmental decline in the study areas: high unemployment, heavy reliance on natural resources, and absence of secondary sources of income.
- LGUs should encourage and facilitate greater community participation in the protection and management of coastal resources and work with and through barangay development councils to address the growing problem of ocean pollution linked to coastal resident's inappropriate waste disposal practices
- Involvement of peoples' organizations and other local institutions in the development and delivery of appropriate IEC messages and campaign materials is strongly urged to enhance effectiveness and assure that messages and media are appropriate to the education level and cultural context of the areas.
- Lack of access to condoms may not be the only reason use is low despite high awareness. There may be other reasons for awareness not being translated to actual use which could be identified using focus group discussion methods.
- The high awareness on reproductive health rights reflected in the BMS results can be used as an opportunity to convince local governments (concerned about the stand of the Catholic Church) to integrate RH into environment and climate change adaptation agendas.
- The high rate of women initiating breastfeeding is encouraging but exclusive breastfeeding (first 4 6-months of life) is needed to impact child survival and enhance birth-spacing. The BMS instrument should incorporate an additional question to determine the length of duration of exclusive breastfeeding and use the results to guide IEC strategies and messages.
- The BMS results shed important light on climate changes occurring in the study area. Additional questions are warranted to determine how individuals are coping with the change in their area.
- PFPI should repeat the BMS survey in 18-24 months so as to track changes in PHE and climate change awareness and prevention/coping practices over time.