Kuroshio Science **7**-1, 69-74, 2013

Outlook for SMI and Implementation of MPA's

Plutomeo M. Nieves*
Bicol University Tabaco Campus, Tabaco City, Albay, Philippines

Abstract

The paper describes the realities in San Miguel Island (SMI) and the implementation of the Marine Protected Area (MPA) in Sagurong based on the research activities undertaken by Bicol University Tabaco Campus and Kochi University, Japan, and the development initiatives of the City Government of Tabaco. Our review of research undertaken under the present collaboration points to extensive research efforts carried out focusing on the fisheries, seaweed, biodiversity, socio-economics, and governance. These are highlighted in the studies of Nieves and Bradecina (2011); Nieves *et al*. (2009); Bradecina *et al*. (2011a, b, c) and many others, the subject of which is SMI and MPA. The Tabaco City Government's development efforts measured in terms of its achievement of the Millennium Development Goals (MDG) institutionalized through the Community-based monitoring system (CBMS) also point to a brighter future for the island barangays of SMI. Milestone achievements have been reported by the City Government in the following: Goal 1- Eradicate Extreme Poverty and Hunger; Goal 2- Achieve Universal Primary Education and Goal 7- Ensure Environmental Sustainability. To address poverty eradication, the assistance of the Department of Agriculture and BFAR was tapped to provide alternative livelihood, introduction of new farming techniques, animal dispersal, free seeds, fertilizer and fingerlings, fishing nets;, and skills development through barangay sponsorship. To address health and nutrition, the City Health Office was mobilized to educate parents on nutrition and sanitation practices, the conduct of medical examinations, and to provide permanent health doctors and nurses and adequate medical supplies. In the aspect of environmental sustainability, interventions include the following: disaster preparedness; reforestation; coastal resource management; construction of sanitary toilets for targeted beneficiaries. With CRM mentioned as an intervention, the continued support for the protection and management of Sagurong Marine Fish Sanctuary and Reserve (S-MFSR) is ensured. Putting these efforts together will make positive changes directed towards a better future and a brighter outlook for SMI a reality.

Key words: MPA, San Miguel Island, Outlook

Introduction

The subject of international cooperation between the University Tabaco Campus (BUTC), Albay, the Philippines Graduate School of Kuroshio Science (GSKS) Kochi University, Japan and the National Sun-yet Sen University, Kaohsiung, Taiwan Bicol is the resources, environment and the people in the eastern Pacific Seaboard affected by the Kuroshio Current. This in essence formed a triangle of cooperation and joint studies conducted by the participating universities and agencies in Japan, Taiwan and Philippines which provided a venue for a better understanding of Kuroshio through the exchange of information and discussion of issues and challenges encountered contributing to the increase of public awareness of the Kuroshio.

In the Philippines, San Miguel Island (SMI) and the coastal waters of Lagonoy Gulf have been the subject Kuroshio-related studies being the most vulnerable areas exposed to the Kuroshio current's sphere of influence. This has impacted the island's ecosystem including the socio-economic conditions in a dynamic manner. These changes have molded the lifestyle and adaptive capacities of many living organisms over time.

This paper descriptively describes the SMI's outlook and the implementation of the Marine Protected Area (MPA) located in Sagurong, SMI in the context of international cooperation among the Kuroshio members and the City Government of Tabaco development efforts. Learning experiences from the collaboration provided opportunities for increased understanding of the related concepts and issues affecting SMI and MPA implemen-

*Corresponding author: e-mail plutz1122@yahoo.com

tation.

Methodology

A review and documentary analysis of research outputs carried out under the Kuroshio International Cooperation was the main source of datasets. This was augmented by the secondary data provided by the City Government's Community-based Monitoring System (CBMS). Analysis of data was done descriptively to elicit relevant information that answers the inquiry for the outlook of SMI and MPA's implementation.

Outlook for SMI and implementation of MPA's

Current Realities

Current realities from the perspective of cooperation and collaboration among partners showed much has been done about SMI. Review of studies done reveals important datasets critical for the development of SMI. For instance, Nieves *et al*. (2009) described the socio-economic conditions, status of fisheries and agriculture and the adaptive capacities of households and communities in SMI. Similarly, the effects of natural and socio-economic changes on coastal and upland ecosystem were characterized by Nieves and Bradecina (2011). These studies revealed that agricultural crops and the farming system in SMI have changed over time. For example, to avoid crop damages due to typhoon, planting sweet potato (*Ipomoea batatas*) and cassava (*Manihot esculenta*) became dominant instead of corn (*Zea maize*). In coastal areas, sea grass and coral reefs have been reported experiencing changes from human perturbation and from climate change. Changes in shoreline morphology are noticeable at varying degrees. Ecosystem change is evident in sea grass beds and coral reefs areas because of shoreline erosion and sedimentation.

Unsustainable fishing still continues to put pressure on natural resources. The fishery around SMI including Lagonoy Gulf has been reported as overfished (Soliman and Dioneda, 1999; Soliman *et al*., 1995, 1997). The use of illegal fishing gears and excess fishing efforts result in negative returns from the fishery with a corresponding impact on economic and ecological sustainability (Bradecina, *et al*., 2011c). Thus, the need for LGU to invest in manpower, resources and facilities for climate change adaptation, natural resource management and disaster risk reduction and management in their policy development.

Bradecina, *et al*. (2011a) explored local coastal recreational tourism as a potential strategy to help support changes in the agricultural farming system on the island and to generate potential revenue for LGU. It should be noted that financing natural resources management (NRM) efforts is always deemed critical in most LGU's. The wilingness to pay (WTP) among city residents for protecting SMI-MPA was also examined by Bradecina, *et al*. (2011b) indicating that residents with higher household income, are more aware of MPA, and are more willing to contribute PhP 110.2 per month.

On the other hand, it is interesting to note that the city government is now implementing renewed fisheries management policies against illegal fishing as is evident in coordinated patrols by (Fishery Law Enforcement Team) FLET and Maritime authorities (2011 Annual Report of Tabaco City). This can be construed as a green signal towards improvement in governance and sustainability of small-scale fisheries management including the Sagurong Marine Sanctuary.

City Government Development Initiatives

Government development initiatives in the context of this paper refer to the City Government's efforts and interventions designed to address problems and issues specified in the Millennium Development Goals (MDG's). MDG is achieved through a Community-based Monitoring System (CBMS) which includes an effective governance system geared towards the sustainability of small-scale fisheries management in SMI. It is well articulated that poverty combined with inappropriate development policies, a lack of employment and educational opportunities combined with an increasing population drives people to exhaust the very resources on which their livelihood depends, and thereby leads to environmental degradation. For this reason, CBMS strategies are designed to address these problems.

For San Miguel Island, MDG goals include the following: Goal 1- Eradicate Extreme Poverty and Hunger; Goal 2- Achieve Universal Primary Education and Goal 7- Ensure Environmental Sustainability. The CBMS indicators are presented in Tables 1, 2 and 3. It could be gleaned from the interventions that the city government is seriously working in addressing the CBMS indicators towards a positive outcome.

With a population growth rate of 1.98% and a population density of 10.92% (CBMS, 2008), potential impacts on and implications for natural resources and sustainable development must be taken into account. Their dynamic interactions over time are expected to result in changes and subsequent impacts on the environment, ecosystem and the people. Finally, these changes are manifested in the socio-economic condition of the

people and the status of the environment and ecology in the area.

To address the issue of extreme hunger and poverty in SMI, Box 1 provides specific interventions that are deemed necessary and practically doable under local conditions. Under circumstances of extreme hunger and poverty, people and the community struggle to make a living under the constraints of resource scarcity and limited employment opportunities. When immense pressure is placed on natural resources to the extent of extracting the resources beyond the limits imposed by nature, the people either get out of poverty or sink into it. On the other hand, addressing these problems will have a positive implication on the utilization of natural resources and on the life support system of the inhabitants and therefore can create better opportunities for the people on the island.

Table 1. CBMS Core Indicators of MDG 1.

Problem and Issues	AGN %	HAC %	RAW %	SAG %	VSA %
Proportion of malnourished children aged 0-5 years old	4.10	7.9	14.5	15.3	1.8
Proportion of household with income below the poverty threshold	69.8	80.8	84.9	71.6	78.3
Proportion of households with income below the food threshold	50.0	66.9	7.0	46.7	67.7
Proportion of households who experienced food shortage	8.6	2.8	29.4	38.3	3.8

Source: Paper presented by Hon. Mayor Krisel Lagman-Luistro during the 7th Poverty and Economic Policy (PEP) Research Network Conference, December 11, 2008, Dusit, Thani Hotel, Makati City, Philippines.

Box 1. Intervention to address Goal 1- Eradicate Extreme Poverty and Hunger	
Health and Nutrition	Poverty
1. Rehabilitate the below normal and below normal very low children and sustain the feeding program; 2. Educate parents on nutrition and sanitation practices; 3. Malnourished children must undergo medical examination in the City Health Unit; 4. Backyard gardening for food supplement, and 5. Provision of permanent health doctors and nurses and adequate medical supplies.	1. Alternative Livelihood programs; 2. Introduce new farming techniques, animal dispersal, free seeds, fertilizers and fingerlings with the assistance of the Department of Agriculture and BFAR; 3. Provide fishing nets to target beneficiaries; 4. Barangays will sponsor at least 2 or 3 persons with willingness to develop their skills, and 5. Trainings on organic farming.

On the aspect of literacy and education, Table 2 presents a detailed account of the proportions of school age children deprived of elementary and secondary education in SMI. Comparatively, *Sagurong* (38.70%) and *Visita* (42.20%) had a relatively higher percentage of children 6 to 12 years old not in elementary school. Meanwhile, Hacienda (63.70%) and Sagurong (53.60%) had the highest percentage of children 13-16 not in secondary school, implying higher dependency ratios that in turn mean additional pressure on the resources with implications for food security. Reducing poverty and increasing resilience of the people is urgently needed.

Box 2 presents the interventions identified to achieve universal primary education, in SMI. Access facilities (i.e. Day Care Center and footbridge), specialized educational modalities (i.e. Non-formal education and Alternative Learning System (ALS)) including provision of school supplies is now given due attention to achieve the goal of universal primary education.

Problems and issues addressed in regard to environmental sustainability are shown in Table 3. These are in terms of the proportion of households living in makeshift housing, classified as squatters/informal settlers, without access to safe water supply and without access to sanitary toilet facilities. Of particular value to coastal resources management is the proportion of households without access to sanitary toilet facilities as this will directly and indirectly affect the health and integrity of the aquatic environment.

In ensuring environmental sustainability, Box 3 pro-

Table 2. CBMS Core Indicator of MDG 2.

Problem and Issues	AGN %	HAC %	RAW %	SAG %	VIS %
Proportion of children 6 to 12 years old not in elementary school	29.60	24.30	21.60	38.70	42.20
Proportion of children 13-16 not in secondary school	40.50	63.70	46.60	53.60	43.80

Source: Paper presented by Hon. Mayor Krisel Lagman-Luistro during the 7th Poverty and Economic Policy (PEP) Research Network Conference, December 11, 2008, Dusit, Thani Hotel, Makati City, Philippines.

Box 2. Intervention to address Goal 2 – Achieve Universal Primary Education
1. Additional construction of day care centers in Purok 1 and 3 in Hacienda and one in Agnas including teachers; 2. Rehabilitation of foot bridge connecting school and Hacienda; 3. Conduct non formal education classes and Alternative Learning System; 4. Education advocacy to parents, and 5. Libreng Gamit sa Eskwela Program

vides the interventions that will followed up on. With CRM mentioned as an intervention, this can be construed as a positive signal for the continued support of the protection and management of Sagurong Marine Fish Sanctuary and Reserve (S-MFSR)

Outlook for SMI

Since 2005 when the Kuroshio international cooperation emerged into what is known as "Kuroshio Triangle" until the recent expanded S-shape cooperation better termed as "Kuroshio-Related S-Shape Zone" which includes the participation of Malaysia and Indonesia, San Miguel Island has been the focus of interest in the Philippine joint studies.

Reckoning on the idea of knowing what has been done and what needs to be done about SMI and the implementation of MPA, it appears that the most logical answer to the question of the outlook is on the affirmative for several reasons. Firstly, the institutional arrangement as legal basis for its existence and operation is in place from the barangay level (Resolution No. 04 series of 1997 by Sangguniang Barangay of Sagurong) up to the provincial level. The structure that supports its operation and management is also in place though it requires strengthening and revitalization.

Table 3. CBMS Core Indicators of MDG 7.

Problem and Issues	AGN %	HAC %	RAW %	SAG %	VIS %
Proportion of households living in makeshift housing	2.90	1.08	9.32	12	1.90
Proportion of households classified as squatters/informal settlers	6.2	0.00	0.72	0.60	1.60
Proportion of households without access to safe water supply	92.10	81.70	98.21	37.60	63.30
Proportion of households without access to sanitary toilet facilities	20.70	45.10	47.70	29.70	34.50

Source: Paper presented by Hon. Mayor Krisel Lagman-Luistro during the 7th Poverty and Economic Policy (PEP) Research Network Conference, December 11, 2008, Dusit, Thani Hotel, Makati City, Philippines.

Box 3. Intervention to address goal 7- Goal 7- Ensure Environmental sustainability
1. Massive campaign on disaster preparedness; 2. Tree planting program (reforestation); 3. Coastal resource management; 4. Support the PODER program; 5. Solicit assistance from NGOs and private sector for construction materials; 6. Garbage composting, and 7. Construction of sanitary toilets among toilets from the city government with counterpart from the targeted beneficiaries.

Second, managing S-MFSR is difficult and challenging in many aspects. First, a sustainable source of funds for managing MPA's has been recognized as vital to the long-term operation, hence, the initiative of Bracedina *et al*. (2011c) to explore sources of financing. It should be noted that in the Philiippines, LGU's are dependent on the 20% internal revenue allotment (IRA) for development projects. The study of Bradecina, *et al*. (2011b) points out the willingness of city residents to pay (WTP) in order to protect the MPA in Sagurong, San Miguel island, Tabaco City, Philippines. Another study by Bradecina, *et al*. (2011a) on local recreational tourism as a potential strategy to support changing fisheries and agriculture is an excellent option that provides balance between income generation and resource conservation and protection. Moreover, the level of awareness among key players relative to MPA's has to be established and needs must be addressed to avoid conflict and misunderstanding. Nieves *et al*. (2009) reported that fishers and community members are fully aware of the status of the coastal resources and recognize that unsustainable activities affect the resource base on which their economic activities and livelihoods depend. Interestingly, most of the respondents still hope that with effective policies, governance and management, the present condition will be reversed and current activities will be made sustainable on a long-term basis. Gleaning on the prospects for the sustained implementation of MPA's in SMI, indicators point out to a positive outlook. Thirdly, the City Government is doing its share of making thing better for the people so that unsustainable anthropogenic activities (i.e. illegal fishing, poaching, aquatic pollution, etc.) can be minimized by achieving the goals of MDG. Addressing poverty, hunger, literacy and environmental sustainability in the island requires the cooperation of all stakeholders and the political will of government leaders. Translating research findings into action that delivers tangible results is what makes the outlook better.

Putting all these efforts together will create a positive change directed towards a better future.

Conclusion and Recommendation

Development indicators points out to a brighter outlook of SMI and MPA's implementation. This can be gleaned from present effort both of the academe (i.e. Bicol University Tabaco Campus and Kochi University, Japan), the City government leadership and the people of SMI.

Research and development has certainly generated datasets as input for planning, management and decision-making. The City Government of Tabaco for its part is also seriously implementing Millennium Development Goals (MDG), the success of which are measured through CBMS indicators. On this note, a brighter outlook for SMI is not far from reality.

References

Asian Development Bank. 2001. Rural Poverty Reduction in South Asia, www.adbi.org/executive summary/2001/11/12/109 (29October to 3 November 2001).

Asian Development Bank. 2007. Rural Poverty: Addressing the Issue More Effectively, www.adbi.org/poverty/rural_poverty.asp. (2007).

Bradecina, R.G., Shinbo, T. and Nieves, P.M. 2011a. Exploring Local Coastal Recreational Tourism as Potential Strategy to Support Changing Agriculture in a Typhoon-Prone Small Island of San Miguel, Tabaco City, Albay, Bicol Region.

Bradecina, R.G., Shinbo, T. and Morooka, Y. 2011b. Estimating the Willingness to Pay of City Residents for Protecting San Miguel Island MPA in Tabaco City, Philippines: Evidence from a Double Bounded Dichotomous Choice Contingent Valuation Method.

Bradecina, R.G., Soliman, V.S., Dioneda, R.R. and Pelea, N.R. 2011c. Profitability and Resource Rent of Multi-Gear Fisheries in Lagonoy Gulf, Philippines. ISSN 0031-7454, Philipp Agric Scientist, Vol. 94 No. 4 401-414, December 2011.

Gavino-Gumba, B.M. 2003. An Overview of Bicol Business and Economy. GIBON Journal, Ateneo de Naga University.

Joint Typhoon Warning Center. 2008. Appendix B: Characteristics of Tropical Cyclones Affecting the Philippine Islands (Shoemaker 1991).

Mallion, F.K., H.A. Francisco, C.S. Torres and Z.M. Sumalde. 1998. Occupancy and Cropping Patterns in the Mt. Makiling Forest Reserve. Published by the Makiling Center for Mountain Ecosystem, College of Forestry and Natural Resources, University of the Philippines Los Baños, college, Laguna, Philippines. in cooperation with Mt. Makiling Reserve Area and Laguna De Bay Commission, NFDO Building, DENR Compound, Visayas Avenue, Diliman Quezon City, Philippines. ISBN 013-5, p42-78.

National Statistical Coordination Board (NSCB). 2005. Poverty Statistics, www.nscb.gov.ph.

National Statistical Coordination Board (NSCB). 2005. Regional Social and Economic Trends (Bicol Region). www.nscb.gov.ph/ru5.

Nieves, P.M. and Bradecina, R.G. 2011. Effects of Natural and Socio-Economic Changes on Coastal and Upland Ecosystem in San Miguel Island, Albay, Philippines. Kusroshio Science, 5-1, 23-28, 2011.

Nieves, P.M., Pelea, N.R., Bradecina, R.G., Pereyra, M.A., Morooka, Y. Shinbo, T. and Rivero, M.C.P. 2009. Socio-Economic Conditions, the Status Fisheries and Agriculture and the Adaptive Capacities of Households and Communities in San Miguel Island, Albay, Philippines in the Kuroshio Sphere of Influence. Kusroshio Science, 3-1, 23-32, 2009.

Pelea, N.R., S.B. Borbe, J.M.D. Pelea. 2004. Socio-economic Conditions and Perceptions of the Status of Coastal Resources of Lagonoy Gulf, Lagonoy Post-RSA Project (Inception Report). Bicol Small Business Institute Foundation Inc. Bicol University Main Campus, Legaspi City.

Philippine Atmospheric Geophysical and Astronomical Services Administration (PAGASA). 2004. Information on Tropical Cyclone, Sangley Point, Cavite (1948-2003).

Pollnac, R.B. and Gorospe, M.L. 1998. Aspects of human ecology of Atulayan Bay, In: Pollnac R.B (ed) Rapid Appraisal of Management Parameters for Coral Reefs, Coastal Management Report, #2205,Coastal Resource Center, University of Rhode Island.

Soliman, V.S., de Jesus, S.C. Basmayor, L.O. Dioneda, N.W. 1997. Coastal Resource Management Issues in San Miguel Island, Tabaco Albay. R&D Journal Vo. X December 997, pp12-20.

Soliman, V.S. and Dioneda, R.R. 1999. Stock assessment of commercially important tunas, small pelagic and crustaceans in Lagonoy Gulf. Paper presented during the 5th National Symposium in Marine / science. October 17-19, 1999. UP MSI, Diliman, Q.C., 6p.

Soliman, V.S., de Jesus, S.C. Basmayor, L.O. Dioneda, N.W. 1997. Coastal Resource Management Issues in San Miguel Island, Tabaco Albay. R&D Journal Vo. X December 997, pp12-20.

Soliman, V.S., Nieves, P.M., Garces, L.R. and Sia, Q.P. 1995. Catch and Effort in the Lagonoy Gulf Fisheries. *In* G. Silvestre, C. Luna, V. Soliman and L. Garces (Eds). Resource and Ecological

Assessment of Lagonoy Gulf. ICLARM Technical Report No. 000p.

Tabaco City, 2011. Annual Accomplishment Report.

World Bank. 2001. Philippine Poverty Assessment Vol 1 and 2 (Poverty Reduction and Economic Management Unit, East Asia and Pacific Region, May 31, 2001).

World Fish Centre Annual Report 2006. www.worldfishcenter.org. World Fish Centre, PO Box 500 GPO, 10670, Penang, Malaysia.

World Fish Centre, Policy Brief 1865, 2008. Planning the use of Fish for Food Security in the Pacific, World Fish Centre, PO Box 500 GPO, 10670, Penang, Malaysia.

List of names and respective dissertation titles for the persons who have received the degree of Ph.D. conferred by the Graduate School of Kuroshio Science in Kochi University from March 2007 to March 2013

Year	Name	(Nationality)	"Title of dissertation"
2007	Ebrahim Abdulla Husain A. Jamali	(UAE)	"Study on larval migration of the amphidromous ayu in inlets and estuaries"
	Takeshi Hirayama	(Japan)	"The clarification of molecular basis relevant to virulence of yellowtail ascites virus (YTAV)"
	Masanori Murai	(Japan)	"Prime factors and moving picture for two contrasting types of flow-type landslide: a comparative study of the Paleogene Kobe Group, the Kurosegawa Belt and the Sanbagawa Belt, Southwest Japan"
	Kanak Saharia	(Bangladesh)	"Exploring the role of microfinance in building social capital among female microfinance members in rural Bangladesh"
2008	Hodaka Asama	(Japan)	"Study on the ecology and morphological variation of a parasitic crustacean species, *Pinnotheres sinensis*"
	Keshavmurthy Shashank Vishwanath	(India)	"Ecological studies on the influence of microorganisms on coral physiology"
	Bunji Yoshitomi	(Japan)	"Study on the multi-dimensional utilization of marine biomass resources: Antarctic krill (*Euphausia superba* Dana)"
	Bidyut Ranjan Mohapatra	(Canada)	"Ecophysiological studies on the grazing behavior of marine heterotrophic nanoflagellates"
	Ping-Yi Huang	(Taiwan)	"A direction towards sustainable feeding fish culture with least material loading in semi-enclosed seas"
	Jun-ichi Nunobe	(Japan)	"Study on early life history of the three-line Grunt, *Parapristipoma trilineatum*, in Tosa Bay"
2009	Takashi Kimiya	(Japan)	"Investigation of anti-allergic substances from marine algae cultured in deep sea water"
	Arisa Miyagawa	(Japan)	"Studies on development of high efficiency transformation of the marine diatoms"
	Mohd. Effendi bin Wasli	(Malaysia)	"Ecological study on soils and vegetation of fallow lands under shifting cultivation in Sarawak, Malaysia"
	Hajime Shinmoto	(Japan)	"Phenotypic diversification of infectious red seabream iridovirus and vaccine development"
2010	Chiharu Yamada	(Japan)	"Ecological characteristics of the non-native green mussel, *Perna viridis*, in Uranouchi Inlet, Kochi, Japan"

Continued on page 94