

# **Aspiration and reality in participatory management of marine protected areas: A case study in Negros Occidental, Philippines**

Philipp Gorris

Leibniz Center for Tropical Marine Ecology (ZMT), Fahrenheitstrasse 6, D - 28359 Bremen, Germany  
Tel.: (00)49-(0)421-23800-115; Mail: philipp.gorris@zmt-bremen.de

## *Abstract*

*In the face of increasing depletion of fisheries resources and degrading marine ecosystems, marine protected areas (MPAs) are becoming more and more important around the globe as they are perceived to provide an institutional solution for sustainable marine resource management and conservation objectives. Since the 1990s, the concept of co-management for natural resource management has spread all over the world. For MPAs, it is commonly believed that participatory management in terms of co-management enhances the success of MPAs since it improves the effectiveness of conservation efforts for the benefit of nature and local populations. The co-management concept strives for creating a permanent forum in which a common strategy is initiated, negotiated and exercised in a collaborative way. It explicitly emphasizes the inclusion of wide ranging stakeholder interests and the attempt to balance those. The ideal state of co-management can be seen in a management situation where government institutions and non-government stakeholders are equal partners. This case study examines how a co-management arrangement for MPA is implemented in order to shed light on the operation of a particular co-management arrangement for an MPA. The analysis includes 2 aspects: the formally granted rights of local fishermen in MPA management; and their actual influence on decision-making in the management body. It is found that despite the legal stipulation of an equitable co-management arrangement including government and non-government stakeholders, actual decision-making is dominated by a local leader. This discrepancy between legally stipulated and actual influence of non-government stakeholders can be attributed to structural flaws within the management body in conjunction with local hierarchies and shortfalls regarding non-government stakeholder organization.*

## **1. INTRODUCTION**

Marine ecosystems in many regions of the world show alarming signs of degradation (The World Bank 2006) and 85 per cent of all fish stock is classified as overexploited (United Nations Secretary-General's High-level Panel on Global Sustainability 2012). Various factors such as intense exploitation and modern harvesting techniques exert increasing stress on marine species which renders many species unable to reproduce at a rate that will replenish a stable abundance (Astorkiza et al., 2006; Berkes, 2007). In the 2008 report 'The Sunken Billions' by the World Bank and the Food and Agriculture Organization (FAO), the total economic loss caused by the global decline in fish stocks is estimated to be approximately two trillion dollars for the last three decades (The World Bank and Food and Agriculture Organization 2008). However, the oceans are still an important source of food protein to more than 1 billion people worldwide (UNEP 2012) and the fisheries sector provides income for about 300 - 500 million people living in developing countries (Scholz and Schirm 2004). In consequence, the loss of functions, goods and services marine ecosystems provide is a significant barrier to the achievement of the first Millennium Development Goal to eradicate extreme poverty and hunger (United Nations Secretary-General's High-level Panel on Global Sustainability 2012).

### **1.1. Marine Protected Areas (MPAs)**

Marine Protected Areas (MPAs) have become more and more important around the world (Christie and White 2007; Kelleher 1999) since they are perceived to provide an institutional solution for sustainable management of marine resources and conservation objectives. The term 'Marine Protected Area' covers a collection of various interventions for marine management (IUCN World Commission on Protected Areas 2008). A MPA is defined as *"A clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values"* (IUCN World Commission on Protected Areas 2008: 3). The different MPAs applied worldwide serve a wide array of objectives and are implemented on different scales ranging from small-scale to multi-million hectare national parks (IUCN World Commission on Protected Areas 2008). The protection level within MPAs varies and includes no-take areas, designated to protect a single species or habitat type, as well as multiple-use, or limited take areas where human use is restricted (Christie and White 2007).

The basis for a successful MPA is a functioning system of incentives, regulations, sanctions and enforcement mechanisms to control the behavior of resource users (Pomeroy 1994). The benefits deriving from effective implementation of MPAs are diverse but generally include ecological (Adan, 2004; Alcala, 1998; Gell and Roberts, 2002; IUCN World Commission on Protected Areas, 2008; Roberts et al., 2001; White et al., 2006) as well as social assets (Govan et al. 2009; IUCN World Commission on Protected Areas 2008; Roberts et al. 2001; White et al. 2006). For implementing regulations and sanctions, MPAs must be based on a formally and/ or informally binding framework (Christie and White 2007). '*Formal rules*' refer to laws and ordinances adopted by the government or state-authorized institutions with administrative functions (Hidayat 2005). For enforcing formal rules, cooperation with the police or a government authority is needed in order to prosecute violations according to law. '*Informal rules*' are agreements which unfold binding authority on a local level through social pressure, threats of social sanctions as well as other sanctioning mechanisms of non-state bodies whose decisions are socially binding (Borrini-Feyerabend et al. 2004).

### **1.2. Potential from participatory MPA management**

Worldwide, however, a number of MPAs are indeed officially protected, but provide only very little contribution to the protection and recovery of marine resources (Christie and White 2007). The reasons for ineffective MPAs are frequently rooted in management flaws (Agardy et al., 2011; Christie 2004). For centralized natural resource management, it has been found that they are often not embedded in local structures and their impact on the local level remains low (Olsen and Christie 2000; The World Bank 2006; Borrini-Feyerabend 2011). In addition, many local communities have only limited control over public decision-making regarding natural resources on which they often critically depend (Ribot 2002). For MPAs, thus, participatory approaches are promoted by numerous scholars and a series of studies have shown that functioning participatory structures for integrating local stakeholders in planning and management enhance the support of local communities and contribute to the socio-economic and ecological success of MPAs (Alcala 1998; Christie 2004; Ferse et al. 2010; Fox et al. 2011; Glaser et al. 2010; Govan et al. 2009; Kelleher 1999; Pollnac and Crawford 2000; Pomeroy et al., 2007; Wells and White 1995; White et al., 2006; The World Bank 2006).

Management decisions for MPAs take place under unique social, economic, cultural, geographical and ecological conditions in conjunction with a high degree of uncertainty. Participatory management has great potential to reduce uncertainties regarding the effects of human-nature interaction in its particular context (Aswani and Hamilton 2004; Borrini-Feyerabend et al. 2007; IUCN World Commission on Protected Areas 2008; Pomeroy and Berkes 1997; Pomeroy et al., 2007). The central idea of participation in MPA management is that stakeholder feed their knowledge, needs and interests into the

process of knowledge accumulation and take part in negotiation for decision-making in order to actively contribute to shaping their present and future situation (van Vliet and Dubbink 1999). For tailoring management to needs and be prepared for change, it is obligatory to understand management as a process-oriented learning process and literature advocates an adaptive approach to management (Ban et al. 2012; Berkes 2007; Borrini-Feyerabend 2011; Olsen and Christie 2000; Pinto da Silva 2004; Siry 2011; Thompson 2008). This approach is based on the assumption that it is not possible to give simple answers to complex problems and universally applicable blue prints for effective management do not exist (Berkes 2007; Ostrom 2007). Accordingly, adaptive management conveys a systematic testing of measures being controlled by permanent monitoring and periodic evaluations in order to control the effects of the implemented management strategy and adapt the strategy if needed (Pomeroy et al., 2004). Hereby, management becomes capable of not only tailoring management to needs but also of reacting to uncertainties and changing circumstances. This results in an optimization of existing knowledge with regards to the given context and an increased effectiveness of management interventions (Pomeroy et al., 2004).

In order to achieve adaptive management, it is necessary aggregate as much information and knowledge as possible. In this regard, participatory management provides major advantages. Stakeholders represent their own interests with respect to their specific needs in the management process which provides for reduction of conflicts. Moreover, stakeholders have sector-specific expertise which is difficult and costly to obtain otherwise (Astorkiza et al. 2006). Local fishermen have knowledge of their surrounding ecosystem which they have accumulated over years (local knowledge) and which is frequently supplemented by traditional knowledge (Aswani and Hamilton 2004). Fikret Berkes defines the term "traditional knowledge" as: "*A cumulative body of knowledge, practice and belief, evolving by adaptive processes and handed down through generations by cultural transmission.*" (Berkes, 2004: 627). This specialized knowledge of the local ecosystem and its resources is mostly very detailed (Pomeroy and Berkes 1997). In particular, the older among the local fishermen have often valuable information since they have witnessed the development of catches and changes in natural environment over a longer period of time (Aswani and Hamilton 2004). Therefore, participation of fishermen in management creates the opportunity to include their expertise and expand the knowledge base for management (Jentoft and McCay 1995). In consequence, participatory MPA management can integrate local and traditional as well as modern science-based knowledge (IUCN World Commission on Protected Areas 2008). It provides for optimization of the information and data base, and creates the opportunity to adapt the management system to the specific needs and to quickly respond to changes as required by the adaptive approach (Borrini-Feyerabend et al. 2004). In addition, it was also found that stakeholders consider MPAs illegitimate if they are not actively involved in the management process (Pomeroy et al., 2007). Thus, participatory management encourages stakeholders to support MPAs and enhances its legitimacy (Wells and White 1995) and in conjunction awareness rising campaigns, it reduces the costs of enforcement measures (i.e. for extensive surveillance practices) (Silvestre and Pauly 2004).

### **1.3. The co-management approach**

Based on the potential of participatory management and in response to the weaknesses of centralized management effort, the idea of co-management was developed (Pomeroy and Berkes 1997). It builds on the basic premise that societies worldwide are inhomogeneous and specifically focuses on participation of local populations (Pomeroy and Berkes 1997). Grazia Borrini-Feyerabend et al. describe co-management in their book "shared power" as "*(...) a partnership by which two or more relevant social actors collectively negotiate, agree upon, guarantee and implement a fair share of management functions, benefits and responsibilities for a particular territory, area or set of natural resources*" (Borrini-Feyerabend et al. 2004: 69). The quintessence of co-management is

dialogue and consensus orientation. It intends to create a permanent forum in which a common strategy is initiated, negotiated and exercised in a collaborative way (Pomeroy and Rivera-Guib 2006) or as Olsson, Folke and Berkes express it: “(...) *adaptive co-management is about creating platforms or arenas, involving user groups and interest groups for knowledge sharing and collaborative learning about ecosystem management*” (Olsson et al. 2004: 86). The particular strength of the co-management approach lies in its explicit emphasis of the inclusion of the wide ranging stakeholder interests and the attempt to balance those (Borrini-Feyerabend 2011). The relevant social actors can be governments on different administrative levels, ministries and universities, indigenous councils, NGOs, organized interest groups, private actors and others (Borrini-Feyerabend et al. 2004). In fact, co-management arrangements cover various management partnerships showing different degrees of power sharing and integration of local management systems (Kuperan et al. 2008). The ideal state of co-management can be seen in a management situation where government institutions and non-government stakeholders are equal partners and jointly negotiate a formal agreement on their respective roles, responsibilities and rights in the management of a given set of natural resources and collectively implement it (Sen and Nielsen 1996).

#### **1.4. Objectives and structure of analysis**

For natural resources management in general and MPAs in particular, participation has become a major buzz-word and carries a normative demand for public policy making. However, empirical studies concerned with the examination of participatory management processes remain rare and the implementation of theoretical concepts, particularly in context of developing countries, is only poorly documented. But in order to achieve successful participatory MPA management, it is necessary to document both positive and negative experiences, and case study analysis' are needed to generate lessons learnt and document best practices (Ban et al. 2012). This article analyses participatory management of a MPA in Sipalay City (Negros Occidental, Philippines). The study is particularly dedicated to the questions: What is the formally granted level of participation of local fishermen and what is their actual influence on management decisions? Is there a discrepancy and if so, why? Hereby, this empirical study seeks to identify particular challenges arising for implementation of participatory management. It is meant to contribute to the improvement of the implementation of participative management and to reduce shortfalls in MPAs management.

For the analysis of participatory management of MPAs, a differentiated approach is needed. Therefore, it is distinguished between *de jure* and *de facto* integration of stakeholders. This implies that it may be possible that legally (*de jure*) defined participatory structures do not automatically lead to the actual (*de facto*) opportunity for stakeholders to actively engage in management since they may lack the power to effectively integrate their knowledge, interests and needs into the management process. After the introduction to the methodology, including the conceptual framework and the introduction to the study area, analysis of participatory MPA management is subdivided into two parts in order to provide for a comparison between legally assured and actual influence of fishermen. One course of analysis deals with the legally stipulated degree of stakeholder participation based on the legal framework for management. The second course examines the actual influence fishermen have on management related matters based on qualitative and quantitative data. Subsequently, the *de jure* and *de facto* degree of participation is discussed and compared.

## 2. METHODOLOGY

### 2.1. Data collection

A multiple data collection method was applied to acquire the necessary information. In addition to observation and collection of relevant documents, a survey with fishermen and interviews with stakeholders directly involved in MPA management (Key Informant Interviews) were conducted.

Key Informant Interviews (KIIS) were used for qualitative data collection. The KIIS were conducted in order to understand the perceptions of the various persons who are directly involved in the management of the MPA. The KIIS were conducted by semi-structured interviews. The interviews were recorded and transcribed. A total of 17 persons were interviewed for the case study. The names of the persons interviewed are omitted upon request of the interviewees. The results of the KIIS are used in the discussion section to examine the actual influence of the fishermen on the MPA management.

The survey was used to gather quantitative information from fishermen most affected by the MPA in the two barangays Maricalum and Barangay 4. For the survey, interviews were conducted with a structured questionnaire. In order to determine the number of participants the Slovin formula (margin of error 10%) was used. Accordingly, from a total of 262 fishermen in the two communities Maricalum and Barangay 4, 72 were to be interviewed. The survey was conducted by barangay and the number of respondents was allocated proportionally. The participants were randomly selected from a list of registered fishermen. The response rate was 100% since all selected fishermen, sometimes after a long search, could be found and participated in the survey. For data analysis, descriptive statistical analysis, i.e. percentage and mean, was used. The results of the survey were used to illustrate and validate the results of the qualitative data obtained.

In order to complement the obtained information, an analysis of the legal framework was conducted i.e. compiling, evaluating and reviewing the related documents available. The data was collected from official documents from government offices in Sipalay City and the two barangays. Observations were limited to visits to the MPA area, characteristics of the study barangays and the interviewees' households. This information was mainly used to validate the otherwise collected information.

### 2.2. Analytical Framework

Based on the Common Property Theory (CPT), Ostrom and Schlager classify participation according to the rights of stakeholders in the management process (Schlager and Ostrom 1992). They distinguish between rights and rules. Whereas rules are defined as „*generally agreed-upon and enforced prescriptions that require, forbid, or permit specific actions for more than a single individual*“, rights are to be seen as actions that are allowed based on rules (Schlager and Ostrom 1992: 250). Thus, rights derive from rules. Subsequently, they divide rights into *operational rights* (OR) and *collective choice rights* (CCR). OR are use rights and CCR are concerned with the right to set rules (Ostrom and Schlager 1992: 251). OR include the rights of *access*, described as; „*The right to enter a defined physical property*“, and *withdrawal*, which is seen to be: „*The right to obtain the 'products' of a resource*“ (Schlager and Ostrom 1992: 250). CCRs are subdivided into 3 rights: (1) *Management*, as: „*The right to regulate internal use patterns and transform the resource by making improvements.*“ (Schlager and Ostrom 1992: 251); (2) *Exclusion* as: „*The right to determine who will have an access right, and how that right may be transferred.*“ (Schlager and Ostrom 1992: 251); and (3) *Alienation* as: „*The right to sell or lease either or both of the above collective choice rights.*“ (Schlager and Ostrom 1992: 251). Accordingly, five different rights are obtained (two OR + three CCR) which can be granted independent from each other or together. Based on this subdivision, its possessors can be distinguished according to the rights

	Authorized User	Claimant	Proprietor	Owner
Operational Rights	X			
Management	X	X		
Exclusion	X	X	X	
Alienation	X	X	X	X

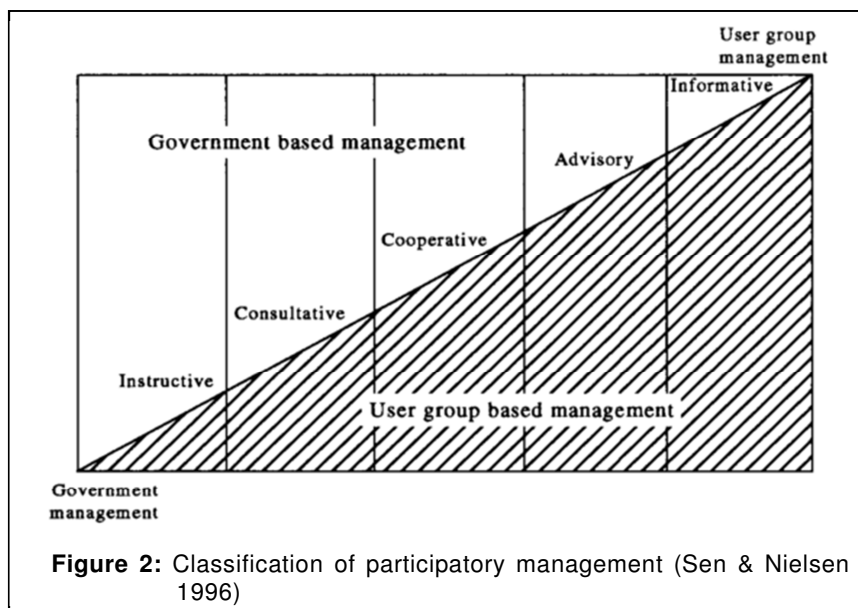
**Figure 1:** Framework for analyzing participation (Schlager & Ostrom 1992)

they have and four categories are obtained. Stakeholder with only OR are called "Authorized User"; Stakeholder who have OR and the right to management are named "Claimant", Stakeholder having OR, the right to

management and the right of exclusion are called "Proprietor"; and the stakeholder holding all rights are "Owner" (see figure 1). Using these categories, it is possible to determine and analyze the influence the different stakeholders have in MPA management.

Sen and Nielsen provide another categorization based on the manner of interaction between non-government and government stakeholders (Sen and Nielsen 1996). As shown in figure 2, they subdivide five categories: "Instructive", "Consultative", "Cooperative", "Advisory" and "Informative". "Instructive" refers to management of the government with only minimal exchange of information between government and stakeholders. Thus, although there is an interaction between government and stakeholders, this interaction is seen primarily as provision of information by the government (communication runs only "down-stream"). "Consultative" is characterized by consultative exchange. The relevant management decisions, however, after a consultation (communication is "up-stream" and "down-stream"), are taken solely by the government. In a "cooperative" management arrangement, non-government and government stakeholder cooperate together as equal partners in decision-making and the implementation of decisions. In a management situation which is referred to as "advisory", all decisions are taken independent from the state apparatus in a specially designed body with no government involvement. This management body takes the decisions and advises the government to implement the decisions. In this situation, government acts as the executive authority for decisions taken by the external management body. "Informative", the fifth category, means that the entire authority for management is

delegated to non-government stakeholders and the external management body is only responsible for informing government of these decisions (Sen and Nielsen, 1996: 406f). In this classification, non-government stakeholders in categories one and two have no CCR, but have merely an advisory role. In category three, both the government



and the stakeholders hold CCR. In category four and five, all CCR rest with non-government stakeholders.

These two classifications provide for detailed analysis of participatory management. By separately classifying the *de jure* assured degree of participation and the *de facto*

influence of fishermen, a possible divergence will be visible. Moreover, the specific problems and obstacles arising for integration of fishermen in context of participatory management can be identified in the course of analysis.

### **3. INTRODUCTION TO STUDY AREA**

#### **3.1. National Context**

The Philippines is located in the so-called "Coral Triangle", the global epicenter of marine biodiversity (The World Bank 2006). Its residents are highly dependent on marine resources and the per capita consumption of marine resources is one of the highest in whole Southeast Asia with an average of 33.8 kilos per year (UP-MSI et al. 2002). Fishing is of immense importance for both the poor rural population and the Philippine economy as a whole (Barut et al., 2004). In 2004, the Philippines was the world's ninth largest fish-production country with an annual fish production of 3.93 million metric tons (including aquaculture, seaweed and shellfish) (BFAR 2007). On average, about 50% of the population's daily protein intake requirement is covered by marine resources (White and Courtney 2000).

However, the Philippines have experienced an alarming rate of marine ecosystem degradation (Santos 2004) and studies estimate that fish abundance sharply declined in recent decades (Ingles 2004; Zaragoza et al. 2004a; Zaragoza et al. 2004b). It is assumed that the current biomass in some Philippine bays is only less than 10% in comparison to the 1950s (The World Bank 2006). Nevertheless, fisheries production has still been on the rise due to advanced production technology, increased fishing intensification and aquaculture. Whereas 2,793,556 metric tons of fish was produced in 1997, overall harvest increased to 4,408,472 metric tons in 2006 (BFAR 2007). While overall landings of fishery products continue to rise, catch-per-unit-effort with traditional fishing methods of small-scale fishers is in steady decline (The World Bank 2006). This development leads to increased marginalization and vulnerability of the already poor marine resource dependent population, particularly in rural areas. Thus, effective marine resource management measures are urgently needed in order to secure food security and create income opportunities for the Philippine population.

#### **3.2. The study area**

Sipalay City is located in the southern part of the province Negros Occidental. It is bounded by the municipalities of Cauayan in the north, Hinobaan in the south (the southernmost municipality of Negros Occidental), Candoni in the east, and by Sulu Sea in the west. It is approximately 178 km away from Bacolod City, the province capital of Negros Occidental. Sipalay consists of 17 barangays, of which five barangays form the city's urban core. The total length of the coast Sipalays covers 45 km on the mainland and an additional 12.79 km coastline on the 24 islands within its territorial waters. According to 2007 census, its total population consists of 67,211 inhabitants.

Unlike most cities and towns in Negros Occidental, Sipalay City is not dependent on the sugar industry. Its early economy was fueled by logging and mining. Until about 10 years ago, Sipalay City hosted the Maricalum Mining Corporation (1957 to 2001), the biggest copper, silver and gold producer in the country, as well as the Philex Gold Philippines Inc. (1995-2001). The closure of these industries resulted in massive economic problems. In 2003, about 53% of the labor force in Sipalay was engaged in farming. Agricultural products of Sipalay include rice, corn, banana, coconut, mango, pineapple, guava and citrus. Fishing absorbs 21% of the total labor force and is also a major source of income for the local population. In recent years, tourism has become another important source of income and coastal zone development is geared towards tourism.

The focus of the study is the Sipalay City MPA covering certain portions of the waters of the barangays Maricalum and Barangay 4. Therefore, these barangays are particularly affected by the implementation of the MPA and were the focus of this study.

Barangay 4 is part of Sipalay City's urban core. It has a total land area of 628.28 ha. Accessibility of the barangay is difficult. Even though it is part of the urban core, the distance from the city center is 6 km. The main transport vehicles are tricycle or motorbikes. The dominant income sources are farming and fishing. Only 30% of the households in the barangay have access to electricity. Four day care centers, one elementary school, and a health center can be found in the barangay.

Maricalum is classified as a coastal/agricultural barangay and has a land area of 3,661.99 ha. It is 8 km away from the city center. Access to the barangay, particularly the coastal part, is also difficult. As of 2007, there were 864 households with a population of 4,535 persons. The major sources of income include farming, livestock, and fisheries. 70% of the households of the barangay have access to electricity. The barangay has four day care centers, two barangay health centers, two pre-schools, one primary school, three elementary schools and a high school.

## 4. RESULTS

### 4.1. Legal framework

For marine and coastal management, including MPAs as a fisheries management tool, the Philippine Fisheries Code (FC) requires the implementation of an institutionalized mechanism for stakeholder integration. Particularly in order to strengthen the rights of local fishermen in the process of planning and implementation of MPAs, a City Fisheries and Aquatic Resources Management Council (CFARMC) has to be created on the city level (Republic of the Philippines 1998).<sup>1</sup> The composition of these CFARMCs, as determined in the FC, has to include one representative of each the Development Council, an accredited NGO, the Department of Agriculture, the private sector and eleven representatives of the fisheries sector (Republic of the Philippines 1998). Hence, the CFARMC is mainly an organization representing the interests and needs of fishermen. Its specific functions is, apart from assisting the local government units (LGU)<sup>2</sup> in the creation of fisheries management plans and to recommend fisheries related ordinances to the local parliaments, to support and advise the LGUs in the establishment and management of MPAs (Republic of the Philippines 1998).

On 12 August 2004, the "Marine Sanctuary Campomanes Bay" in Sipalay City, hereinafter called the MPA, was formally created by the "City Ordinance 2004-2006" (S.O. 2004) and the associated regulations for the particular marine portion entered into force. In its preparation process, a CFARMC was created. Prior to the implementation of the MPA, the S.O. 2004 was discussed by the CFARMC. In its "Resolution No. 02-2003", the CFARMC advocates the endorsement of the S.O. 2004 by the parliament of Sipalay City. The objective of the MPA is defined as: *"(...) to protect, conserve, regenerate and rehabilitate the fishery and aquatic resources within the Barangay 4 and Barangay Maricalum marine reserve and sanctuary."* In its first section, the S.O. 2004 defines all relevant terms used in the document and specifies the geographic area for the implementation of the MPA. The protected area is divided into two zones. An inner or core zone (30 ha) is declared where all extractive and destructive activities are prohibited. An outer zone (36 ha) is designated as "Reserved Area" or buffer zone where fishing by traditional methods is allowed. For every zone, regulations are provided and measures to be taken in case of violations specified. In the buffer zone, only registered

---

<sup>1</sup> The barangay and the national level are also requested to create FARMCs for similar purposes (BFARMC and NFARMC respectively).

<sup>2</sup> In the Philippines, the term local government unit (LGU) refers to governments on a city/ municipality level including their various agencies.



fishermen from the adjacent barangays Maricalum and Barangay 4 are allowed to fish, provided they follow the specified regulations.

Decision-making is delegated to a management body called "Sanctuary Management Board" (SMB). Consequently, the authority for taking decisions related to the protected area is formally given to the SMB. Decision-making is to be carried out by incorporating the local administrative structures as well as local fishermen from Barangay 4 and Maricalum. The SMB comprises 18 members as defined by the S.O. 2004: the Mayor (LGU)<sup>3</sup>, the "Punong" of Barangay 4 and Maricalum (Barangay Captain, elected officials), the "Committee Chairman on Agriculture and Fisheries" from Barangay 4 and Maricalum (elected representatives of the respective barangay municipal council), the Bantay Dagat Chairman (Chairman of the enforcement unit, employee of the LGU), an officer from the "Community Environment and Natural Resources Office" (CENRO) (employee of the LGU), the "CFARMC Chairman" (Fishermen representative), the "City Agriculturalist" (Chairman of the City Agriculture Office, employee of the LGU), a representative of an accredited NGO from one of the two barangays (environmental advocate but not further specified), a school teacher (employee of the LGU), one representative for each of the two barangays' fishermen (BFARMC, elected fishermen representative of the barangay level), the chief of the "City Philippine National Police" (national level), one representative of private, commercial sector from the two barangays, the chairman of the "City Tourism Council" (elected representative) and a "Tourism Officer" (employee of the LGU). According to S.O. 2004, the position of the SMB chairman ought to be held by the mayor. The two Barangay Captains are the vice-chairmen. Apart from the positions determined by the ordinance, the SMB has to determine further official positions (e.g. accountant) and internal procedural rules. No procedure for taking decisions can be found in the S.O. 2004.

In 2005, the S.O. 2004 was confirmed and further specified by the SMB in "Resolution no. 2005-001". Various additional activities were regulated and entrance fees for e.g. recreational and scientific activities introduced. Attached to this resolution is a management plan, the "Sipalay MPA Action Plan". This plan conveys detailed information about the implementation of regulations, the budget, schedule for one year and responsibilities for the specified activities. However, the SMB Resolution 2005 does not contain specifications regarding internal procedures for decision-making and how to fill in internal positions.

## **4.2. Survey results**

In order to integrate fishermen in management, they must be convinced that marine management measures are needed. Accordingly, the fishermen were first asked if they generally see a need to protect the local marine resources. The question was answered with "yes" by 100% of the respondents. Asked about their awareness of existence of the MPA, 100% responded that they know about the MPA. In a next step, fishermen were asked if they agree with the establishment in its present form. This question was answered with "no" by 75% of the respondents. Thus, all respondents felt the need to protect marine resources but three fourth did not agree with the MPA in its present form. When asked whether they should be consulted in decisions concerning the management of the MPA or not, 97.22% of the fishermen responded with "yes" and only 2.78% with "no". Subsequently, the fishermen were asked who developed the rules related to the MPA. 83.33% held the opinion that they were developed by the local government on the city level. Thus, the vast majority considered it important to be consulted in management decisions for the MPA, but the most of the fishermen perceived that the regulations were developed by the local government.

Stakeholder organization and interaction is an important prerequisite for participatory management of MPAs. To assess the degree of fishermen organization, the fishermen

---

<sup>3</sup> Notions in brackets indicate the member's affiliation in the administrative structure.

were asked if they are a member of a registered fishermen organization. 19.44% of the respondents answered this question with "yes" and 80.55% answered "no". This result suggests a very low level of officially recognized organization. But perhaps cooperation of fishermen is not limited to formally recognized and registered organizations but is carried out informally. For this reason, the study participants were asked to assess the general cooperation of fishermen using a scale of 1-10 (1 is low and 10 high). The yielded mean was 5.85. Accordingly, the overall level of cooperation of the fishermen indicates a higher degree of cooperation as expected from membership in a fishing organization. The interaction between stakeholder groups plays an equally important role for participatory management. When asked about the collaboration between fishermen and local government on a scale from 1-10, the obtained mean was 4.82. Hence, cooperation between fishermen and local government is only moderate and a little lower than cooperation between fishermen.

Influence on MPA management can be seen as reflected in the influence on the design of the MPA regulations. Hence, the fishermen were asked to indicate whether they generally felt "very involved", "moderately involved", "a little bit involved" or "not involved" in the creation of the MPA regulations. 4.17% felt that they were "very involved," 15.28% "moderately involved," 31.94% "a little bit involved" and 47.22% "not involved". Overall, the vast majority of respondents (79.16%) felt that they are only a little bit or not involved which verifies that about 80% perceive that the regulations related to the MPA were developed by the local government. In order to assess the satisfaction of the fishermen with their current degree of participation in MPA management, fishermen were asked if they are "very satisfied", "moderately satisfied", "little satisfied", "not satisfied" or "not satisfied" with their current influence on MPA management. 2.78% of the respondents felt "very satisfied", 15.28% "moderately satisfied", 20.83% "little satisfied", 37% "not satisfied" and 16.67% answered "not at all satisfied". Accordingly, only about one fifth of the respondents felt involved or very involved in creation of MPA regulations and were satisfied or very satisfied with their current influence on MPA management.

## **5. DISCUSSION**

### **5.1. Legal framework**

The establishment of the Sipalay's MPA is based on a legal document issued by the local government. Using the classification of Schlager and Ostrom (1992), we can determine the extent of participation of fishermen in the management of Sipalay City's MPA. Therefore, we may take a look at the rights granted to the fishermen. S.O. 2004 states that in the core zone of the MPA all extractive usage is prohibited and for the buffer zone, only registered fishermen from the barangays Maricalum and Barangay 4 are allowed to enter the area and to extract marine resources, provided they obey the rules of this zone. Hence, only fishermen from these two barangays are provided with OR. Concerning CCR, the ordinance transfers full management responsibility to an external body, the SMB, which has the necessary legal authority to manage the MPA. Its composition is determined by the ordinance and comprises representatives of various stakeholder groups. The fishermen, represented by CFARMC as well as by two BFARMCs, are an equal member of the SMB. Regarding the right "exclusion", the SMB holds the right to exclude individuals and particular groups from entering a particular portion of the marine environment. This right was exercised when closing off a particular portion of the sea from any kind of marine resource extraction and restricting access to the buffer zone to registered fishermen from Barangay 4 and Maricalum. Hence, the SMB can regulate access. In order to possess the right of "management", the SMB is required to have the authority to pose regulations concerning the MPA. The SMB is authorized and issued rules regulating the usage of this sea portion. It has determined that fishing is only allowed by using traditional fishing techniques which are further

specified in the SMB Resolution 2005. In addition, it has implemented rules for diving and introduced fees for specific activities carried out in the specified zones. Thus, the SMB holds the right of “management”. Regarding the right of “alienation”, no specifications can be found in the legal framework. However, it can be assumed that since the local parliament provided the SMB with the given rights, the parliament is in the position to withdraw and redistribute them. Therefore, the right of “alienation” still rests with the local parliament. Since the fishermen representatives are formally equal partners in the SMB, the fishermen of Barangay 4 and Maricalum are on the level of “proprietor”. All other stakeholders lack the ORs. Nevertheless, regarding the CCR, all stakeholders represented in the SMB are equipped with equal rights.

The authors Sen and Nielsen (1996) provide a classification by which the degree of influence on MPA management is determined using the way of interaction between government and non-governmental stakeholders for management. For the Sipalay City MPA, the management is carried out by an equally stranded cooperative management arrangement involving government and non-government actors. Accordingly, the influence of fishermen in MPA management is to be classified “cooperative”, the third of five levels.

Based on the formal framework, the level of participation in MPA management is to be rated high. The degree of stakeholder integration in MPA management of Sipalay City is a perfect example for equitable co-management by government and non-government stakeholders, and necessary prerequisites for participatory MPA management are provided by the legal framework.

## **5.2. Aspiration and reality: *de facto* influence of stakeholders on decision-making process**

For participatory MPA management, dedication and will of stakeholders are indispensable. During the study, all surveyed fishermen and key informants held the opinion that marine resources need protection. Moreover, almost all fishermen wanted to be involved in the management of the MPA. Thus, dedication and will of fishermen for marine resource management in general and participatory MPA management in particular are given.

Before discussing participatory management in the SMB, it is necessary to shed light on the political reality in local context. Within the local government, the mayor has an enormously powerful position. Within the LGU, the Mayor's Office is responsible for all decisions on employment. This results in a situation in which the mayor can arbitrarily install and dismiss employees since employment contracts which contain assertion about duration of employment do not exist for the study area. Moreover, the mayor only appoints employees who are allegiant and if they turn against him in significant questions, they might lose their job. Given the context of poverty, the loss of a job within the government is severe. Analyzing the structure of the SMB against the background of socio-political realities in a local context illustrates factors which impact the ability of the majority of stakeholders to influence MPA management.

For the SMB, no procedure of arriving at decisions in the SMB is prescribed by the legal documents. In addition, during the KIIs, nobody wanted to talk about how decisions are made in the SMB and how the Resolution 2005 entered into force. In accordance, the following illuminates the power balance within the SMB. The mayor chairs the SMB. However, the mayor is very busy and only attends the meeting for particular occasions. Therefore, a “Management Supervisor” was appointed by the mayor in order to carry out the supervision of the SMB on behalf of the mayor. At the beginning of the MPA management, the Management Supervisor was the CENRO-chairman. After some time, he was dismissed without replacement and no regular meetings of the SMB were held any more. In 2008, after a general restructuring of many LGU agencies, the mayor ceded authority for management supervision to the chairman the City Agricultural Office

(CAO). In effect, the mayor appointed him to represent him in the meeting and fill in the role of the Management Supervisor. This procedure particularly reflects his overall influence on the decisions taken by the SMB. Moreover, budget is needed to carry out implementation of management measures. For the MPA in Sipalay City, this budget is provided by the local government and decisions on budget also rest in the hands of the mayor. Hence, the mayor is responsible for allocating the necessary budget for MPA implementation which can be distributed by the SMB. The authority to appoint and dismiss officials within the SMB and to provide the necessary funds for MPA implementation is of fundamental importance for carrying out MPA management. Since both remain under the authority of the mayor, his ability to influence decision for MPA management, formally carried out by the SMB, becomes obvious.

According to the S.O. 2004, three representatives of fishermen organization ought to be in the SMB (i.e. BFARMC representatives from each of the barangays and a CFARMC representative). In addition, one NGO with headquarters in one of the barangays is to be included. In fact, however, apart from the CFARMC none of these other organizations exist. Hence, the CFARMC is the only officially recognized organization that could represent the interests of local fishermen. The current representative holds his position since the foundation of the CFARMC. During the KIIs, however, it was highlighted that the majority of fishermen do not feel adequately represented by the CFARMC. This is reflected by the fact that more than 80% of the fishermen are not a member of any officially recognized fishermen organization and the CFARMC, as being the only officially recognized organization, only represents 20% of the fishermen at maximum. Hence, it is not possible to represent "the fishermen" as homogeneous group in Sipalay City. Instead, it has to be assumed that the CFARMC opinion, which is fed into the management process, is not common sense among the fishermen. The reason might be that the representation of stakeholder groups is usually dominated by the influence of their representatives as believed by David Mosse's (Mosse 2007). However, in order to not perceive the fishermen as a homogeneous stakeholder but to cover a greater variety of interests and opinions within this stakeholder group, more fisher organizations are need. Only then, an adequate representation would be guaranteed.

In addition, the function of the CFARMC is described in the S.O. 2004 as follows: „*City Fisheries and Aquatic Resource Council*’, hereinafter referred to as *CFARMC*, created by virtue of Republic Act No. 8550, functions of which include, but not limited to, assistance in the enforcement of fishery laws, rules and regulations within the municipal waters.” This description explicitly emphasizes the involvement in the implementation of the regulations established by the S.O. 2004 and the Resolution 2005, and does not refer to the involvement of the CFARMC in the definition of rules. This explicit understanding suggests that the CFAMRC in Sipalay City is not meant to enable the fishermen to influence the definition of rules but rather serves the purpose to enforce them as effective as possible. Similarly, literature on MPAs suggests that by formally integrating stakeholders, the legitimacy of the measures is increased and communicating the regulations through fishermen organizations, obedience of regulations by fishermen is increased (Pomeroy et al. 2007; Sen and Nielsen, 1996; White et al. 2006).

The assumption that fishermen have little impact on the MPA management is supported by the results of the survey. All survey participants new of the existence of the MPA but only 25% agreed with its present form. Four fifth of the respondents believed that the rules of the MPA were developed by the LGU and, equivalently, merely one fifth of them felt involved in the creation of the MPA rules. This might be the 20% of fishermen who are a member of the CFARMC. Apart from membership in a formally recognized organization, informal cooperation among fishermen is better than expected from the number of fishermen being member of an official organization but remains only moderate. For cooperation between government and fishermen, the obtained values are also only moderate. Thus, cooperation within a stakeholder group and between stakeholder groups is in need of improvement. Overall, the current level of influence on

MPA management is rated dissatisfactory or very dissatisfactory by 80% of the respondents. This level of dissatisfaction in conjunction with the perceived lack of involvement in the creation of rules leads to the conclusion that if the fishermen had had a high degree of influence on decision-making in the MPA management process, the MPA related regulations would have not been implemented in its present form or would have been adapted according to the needs and interests of the fishermen in later stages of management.

In conclusion, it can be assumed that the legally granted level of participation for MPA management is meant to make use of its potential for implementation by increasing fishermen's obedience of the imposed regulations through enhancing legitimation and information transmission. At the same time, an actual influence of the local fishermen on a CCR level is being neglected. For this case study, it appears obvious that the vast majority of the fishermen have little or no influence on decision-making. Regarding the categorization of Schlager and Ostrom we must assume that the influence of the large majority of fishermen is very low on the CCR level and can be seen at the level "Authorized User". The actual degree of participation becomes even clearer in the classification of Sen and Nielsen. Because despite the small impact on the management process itself, a "down-stream" communication to inform the fishermen about decisions taken is given. But for most of the fishermen, an up-stream communication process and definitely no equitable cooperative management can be assumed. Consequently, the actual influence of the overwhelming majority of the local fishermen is to be categorized "Informative". This analysis clearly shows that for the MPA in Sipalay City the level of *de facto* influence on the management is below the *de jure* level guaranteed by the legal framework due to local socio-political realities.

## 6. CONCLUSION

Co-management arrangements bear great potential for the success of natural resource management in general and MPAs in particular (Armitage 2005; Sen and Nielsen 1996; Gracia Borrini-Feyerabend et al. 2004). For MPA management in Sipalay City, the formal (*de jure*) implementation corresponds to the concept of co-management. Local fishermen were legally integrated as equal stakeholders in the management process and a participatory management body is implemented which constitutes a perfect example of equitable co-management. In practice (*de facto*), however, the actual influence of fishermen on decision-making is considerably lower than legally stipulated. This discrepancy can be attributed to structural weaknesses within the management body in conjunction with local hierarchies and shortfalls regarding non-government stakeholder organization. For integrating local stakeholder in MPA management, as suggested by the co-management concept, local level socio-political realities, especially in hierarchical societies as found in the Philippines, become particularly relevant and need to be addressed in order to empower local non-government stakeholder for equitable MPA management. In this case, the mayor accumulates tremendous power. He holds the authority to allocate the necessary budget for management and can arbitrarily exchange personnel. This results in an asymmetric power relationship within the management body and keeps the level of stakeholder influence low since the internal structure of the management body remains unclear. In addition, the fishermen are represented as a homogeneous stakeholder neglecting the diversity of opinions and interests within the group of fishermen in conjunction with an only moderate level of internal and external stakeholder cooperation. Consequently, this case study shows a "top-down" management on a local level despite a legally stipulated equitable co-management structure. In order to achieve equitable MPA co-management, it is necessary to not only design participatory MPA management structures but put further emphasis on its actual implementation and reduce power asymmetries in the management body.

Resulting from this case study, three particular challenges for equitable MPA co-management are to be highlighted:

1. Highly asymmetrical power structures in the management body counteract an equitable management of non-government and government stakeholders despite a legally ascertained equitable co-management structure.
2. Funding is a major challenge for participatory MPA management since the provision of funds is likely to be associated with significant influence on the management process by its source.
3. By merely one "voice" in the MPA management process, a stakeholder group such as "the fishermen" is represented as uniform actor. This does not reflect the diversity of opinions within a stakeholder group and leads to inadequate representation.

Consideration of the challenges identified in this study is crucial for implementing participatory MPA management since the given socio-political context, in which any local level management measure for natural resources including MPAs is necessarily embedded, heavily impacts the performance of participatory MPA management. Hence, for achieving equitable management, a clearly defined and reliable internal structure in the management body for reducing hierarchical asymmetries as well as adequate non-government stakeholder organization and representation are mandatory. To sum up, co-management arrangements for MPA management provide important potential for the implementation of adaptive management. But there is an urgent need to close the gap between aspiration and reality in MPA co-management processes for contributing to effective biodiversity conservation and unleashing the socio-economic potentials of MPAs worldwide.

*Acknowledgements:*

*This study was made possible thanks to the funds provided by the GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit; formerly: GTZ – German Technical Cooperation) and the ASA Programme. I also thank PD Dr. Marion Glaser for providing invaluable comments on this article.*

## **BIBLIOGRAPHY**

- Adan, W.R., 2004. A local Government Alliance Approach to Integrated Coastal Zone Management: The Gingoog Bay Development Council. In DA-BFAR, ed. *In turbulent seas: The status of Philippine marine fisheries*. Cebu City (Philippines): Coastal Resource Management Project, pp. 327-331.
- Agardy, T., di Sciara, G.N. & Christie, P., 2011. Mind the gap: Addressing the shortcomings of marine protected areas through large scale marine spatial planning. *Marine Policy*, 35(2), pp.226-232. Available at: <http://linkinghub.elsevier.com/retrieve/pii/S0308597X10001740> [Accessed July 6, 2011].
- Alcala, A.C., 1998. Community-based coastal resource management in the Philippines: A case study. *Ocean & Coastal Management*, 38, pp.179-186.
- Armitage, D., 2005. Adaptive Capacity and Community-Based Natural Resource Management. *Environmental Management*, 35(6), pp.703-715.
- Astorkiza, K. et al., 2006. Participation. In L. Motos & D. C. Wilson, eds. *The Knowledge Base for Fisheries Management, Vol. 36*. Amsterdam, pp. 239-265.

- Aswani, S. & Hamilton, R., 2004. The value of many small vs. few large marine protected areas in the Western Solomon Islands. *SPC Traditional Marine Resource Management and Knowledge Information Bulletin*, 16(March), pp.3-14.
- BFAR, 2007. *Fisheries Profile 2006*, Quezon City (Philippines).
- Ban, N.C. et al., 2012. Recasting shortfalls of marine protected areas as opportunities through adaptive management. *Aquatic Conservation: Marine and Freshwater Ecosystems*, 22, pp.262-271. Available at: <http://doi.wiley.com/10.1002/aqc.2224> [Accessed February 29, 2012].
- Barut, N.C., Santos, M.D. & Garces, L., 2004. Overview of Philippine Marine Fisheries. In DA-BFAR, ed. *In turbulent seas: The status of Philippine marine fisheries*. Cebu City (Philippines): Coastal Resource Management Project, pp. 22-13.
- Berkes, F., 2007. Community-based conservation in a globalized world. *Proceedings of the National Academy of Sciences of the United States of America*, 104(39), pp.15188-93.
- Berkes, F., 2004. Rethinking Community-Based Conservation. *Conservation Biology*, 18(3), pp.621-630.
- Borrini-Feyerabend, Gracia, 2011. Co-management and Shared Governance – the “Effective and Equitable Option” for Natural Resources and Protected Areas? (Keynote Paper). In D. G. Spelchan, I. A. Nicoll, & T. P. Hao Nguyen, eds. *Co-management/Shared Governance of Natural Resources and Protected Areas in Viet Nam*. Soc Trang (Vietnam): Gesellschaft für Internationale Zusammenarbeit (GIZ).
- Borrini-Feyerabend, Gracia et al., 2004. *Sharing Power. Learning by doing in co-management of natural resources throughout the world*, Cenesta/ Teheran: IIED and IUCN/ CMWG.
- Borrini-Feyerabend, Grazia et al., 2007. *Co-management of Natural Resources: Organising, Negotiating and Learning-by-Doing*, Heidelberg (Germany): GTZ and IUCN.
- Christie, P., 2004. Marine Protected Areas as Biological Successes and Social Failures in Southeast Asia. *American Fisheries Society Symposium*, 42, pp.155-164.
- Christie, P. & White, Alan T., 2007. Best practices for improved governance of coral reef marine protected areas. *Coral Reefs*, 26(4), pp.1047-1056. Available at: <http://www.springerlink.com/index/10.1007/s00338-007-0235-9> [Accessed July 10, 2011].
- Ferse, S.C.A. et al., 2010. Allies, not aliens: increasing the role of local communities in marine protected area implementation. *Environmental Conservation*, 37(1), pp.23-34.
- Fox, H.E. et al., 2011. Reexamining the science of marine protected areas: linking knowledge to action. *Conservation Letters*, 00, pp.1-10. Available at: <http://doi.wiley.com/10.1111/j.1755-263X.2011.00207.x> [Accessed December 18, 2011].
- Gell, F.R. & Roberts, Callum M, 2002. *The fishery effects of marine reserves and fishery closures*, Washington D.C.

- Glaser, M. et al., 2010. "Nested" participation in hierarchical societies? Lessons for social-ecological research and management. *Int. J. Society Systems Science*, 2(4), pp.390-414.
- Govan, H. et al., 2009. *Status and potential of locally-managed marine areas in the South Pacific: Meeting nature conservation and sustainable livelihood targets through widespread implementation of LMMAs*, Suva (Fiji).
- Hidayat, A., 2005. *Institutional Analysis of Coral Reef Management. A Case Study of Gili Indah Village, West Lombok, Indonesia*, Aachen.
- IUCN World Commission on Protected Areas, 2008. *Establishing Resilient Marine Protected Area Networks - Making It Happen* Establishing, Washington D.C.
- Ingles, J., 2004. Status of the blue crab fisheries in the Philippines. In DA-BFAR, ed. *In turbulent seas: The status of Philippine marine fisheries*. Cebu City (Philippines): Coastal Resource Management Project, pp. 47-52.
- Jentoft, S. & McCay, B., 1995. User participation in fisheries management, Lessons drawn from international experiences. *Marine Policy*, 19(3), pp.227-246.
- Kelleher, G., 1999. *Guidelines for Marine Protected Areas*, Gland (Switzerland)/ Cambridge (UK): World Commission on Protected Areas of IUCN - The World Conservation Union.
- Kuperan, K. et al., 2008. Measuring Transaction Costs of Fisheries Co-Management. *Coastal Management*, 36(3), pp.225-240. Available at: <http://www.tandfonline.com/doi/abs/10.1080/08920750701681991> [Accessed September 16, 2011].
- Mosse, D., 2007. "People's Knowledge", Participation and Patronage: Operations and Representations in Rural Development. In B. Cooke & U. Kothari, eds. *Participation, the new tyranny? 4th impressions*. New York/ London, pp. 16-35.
- Olsen, S. & Christie, P., 2000. What Are We Learning from Tropical Coastal Management Experiences? *Coastal Management*, 28(5), pp.5-18.
- Olsson, P., Folke, C. & Berkes, F., 2004. Adaptive comanagement for building resilience in social-ecological systems. *Environmental management*, 34(1), pp.75-90. Available at: <http://www.ncbi.nlm.nih.gov/pubmed/15383875> [Accessed July 18, 2011].
- Ostrom, E., 2007. A diagnostic approach for going beyond panaceas. *Proceedings of the National Academy of Sciences of the United States of America*, 104(39), pp.15181-7. Available at: <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=2000497&tool=pmcentrez&rendertype=abstract>.
- Pinto da Silva, P., 2004. From common property to co-management: lessons from Brazil's first maritime extractive reserve. *Marine Policy*, 28(5), pp.419-428. Available at: <http://linkinghub.elsevier.com/retrieve/pii/S0308597X03001337> [Accessed August 3, 2011].
- Pollnac, R.B. & Crawford, B., 2000. *Discovering Factors that influence the Success of Community-Based Marine Protected Areas in the Visayas, Philippines*. *Coastal Management Report # 2229. PCMARD Book Series No. 33.*, Los Banos (Philippines).



- Pomeroy, R.S., 1994. Introduction. In R. S. Pomeroy, ed. *Community Management and Common Property of Coastal Fisheries in Asia and the Pacific: Concepts, Methods and Experiences*. Manila: International Center for Living Aquatic Resource Management (ICLARM), pp. 1-11.
- Pomeroy, R.S. & Berkes, F., 1997. Two to tango: the role of government in fisheries co-management. *Marine Policy*, 21(5), pp.465-480.
- Pomeroy, R.S. & Rivera-Guib, R., 2006. *Fishery Co-Management: A Practical Handbook*, Ottawa: International Development Research Centre.
- Pomeroy, R.S., Mascia, M.B. & Pollnac, R.B., 2007. Marine protected areas: the social dimension. In Food and Agriculture Organisation (FAO), ed. *Report and Documentation of the Expert Workshop on Marine Protected Areas and Fisheries Management: Review and Issues of Consideration*. Rome, pp. 149-182.
- Pomeroy, R.S., Parks, J.E. & Watson, L.M., 2004. *How is your MPA doing? A Guidebook of Natural and Social Indicators for Evaluating Marine Protected Area Management Effectiveness*, Gland (Switzerland)/ Cambridge (UK): IUCN.
- Republic of the Philippines, 1998. *Republic Act 8550, "The Philippines Fisheries Code of 1998,"* Quezon City (Philippines).
- Ribot, J.C., 2002. *Democratic Decentralization of Natural Resources. Institutionalizing Popular Participation*, Washington D.C.
- Roberts, C. M. et al., 2001. Effects of marine reserves on adjacent fisheries. *Science*, 294(5548), pp.1920-3. Available at: <http://www.ncbi.nlm.nih.gov/pubmed/11729316> [Accessed July 16, 2011].
- Santos, R., 2004. Poverty Profile in Philippine Fisheries. In DA-BFAR, ed. *In turbulent seas: The status of Philippine marine fisheries*. Cebu City (Philippines): Coastal Resource Management Project, pp. 138-143.
- Schlager, E. & Ostrom, E., 1992. Property-Rights Regimes and Natural Resources: A Conceptual Analysis. *Land Economics*, 68(3), pp.249-262.
- Scholz, U. & Schirm, B., 2004. Wie wichtig ist die Fischerei für die Entwicklungsländer? *entwicklung & ländlicher raum*, 4, pp.4-6.
- Sen, S. & Nielsen, J.R., 1996. Fisheries co-management: a comparative analysis. *Marine Policy*, 20(5), pp.405-418.
- Silvestre, G. & Pauly, D., 2004. Management of Tropical Coastal Fisheries in Asia. In DA-BFAR, ed. *In turbulent seas: The status of Philippine marine fisheries*. Cebu City (Philippines): Coastal Resource Management Project, pp. 153-167.
- Siry, H.Y., 2011. In search of appropriate approaches to coastal zone management in Indonesia. *Ocean & Coastal Management*, 54(6), pp.469-477. Available at: <http://linkinghub.elsevier.com/retrieve/pii/S0964569111000457> [Accessed March 16, 2012].
- The World Bank, 2006. *Scaling Up Marine Management, The Role of Marine Protected Areas. Report No. 36635 - CLB*, Washington D.C.

- The World Bank & Food and Agriculture Organization, 2008. *The Sunken Billions, The Economic Justification for Fisheries Reform*, Washington D.C.: The World Bank.
- Thompson, M., 2008. Fostering sustainable behaviours in community-based co-managed fisheries. *Marine Policy*, 32(3), pp.413-420. Available at: <http://linkinghub.elsevier.com/retrieve/pii/S0308597X07000991> [Accessed July 12, 2011].
- UNEP, 2012. *21 Issues for the 21st Century: Results of the UNEP Foresight Process on Emerging Environmental Issues*. J. Alcamo & S. A. Leonard, eds., Nairobi: United Nations Environment Programme (UNEP).
- UP-MSI et al., 2002. *Marine Protected Areas in Southeast Asia*, Los Banos (Philippines).
- United Nations Secretary-General's High-level Panel on Global Sustainability, 2012. *Resilient People, Resilient Planet: A future worth choosing*, New York: United Nations.
- van Vliet, M. & Dubbink, W., 1999. Evaluating Governance - State, Market and Participation compared. In J. Kooimann, M. van Vliet, & S. Jentoft, eds. *Creative Governance, Opportunities for fisheries in Europe*. Vermont (USA)/ Hants (England), pp. 11-30.
- Wells, S. & White, Alan T., 1995. Involving the Community. In S. Gubbay, ed. *Marine Protected Areas, Principles and techniques for management*. London, pp. 61-84.
- White, A.T. & Courtney, C., 2000. Integrated coastal management in the Philippines. *Coastal Management*, 28, pp.39-53.
- White, Alan T., Aliño, P.M. & Meneses, A.B.T., 2006. *Creating and Managing Marine Protected Areas in the Philippines*, Cebu City.
- White, Alan T, Gomez, E., et al., 2006. Evolution and Lessons from Fisheries and Coastal Management in the Philippines. , pp.88-111.
- Zaragoza, E.C., Pagdilao, C.R. & Moreno, E.P., 2004a. Fisheries for Tuna and other large pelagic fishes. In DA-BFAR, ed. *In turbulent seas: The status of Philippine marine fisheries*. Cebu City (Philippines): Coastal Resource Management Project, pp. 38-41.
- Zaragoza, E.C., Pagdilao, C.R. & Moreno, E.P., 2004b. Overview of small pelagic fisheries. In DA-BFAR, ed. *In turbulent seas: The status of Philippine marine fisheries*. Cebu City (Philippines): Coastal Resource Management Project, pp. 32-37.