Proceedings of the 12th International Coral Reef Symposium, Cairns, Australia, 9-13 July 2012
22A Cultural, political & historical dimensions of coral reef management

Whose sustainability? Top-down participation in MPA management in Indonesia

Marion Glaser[1], Wasistini Baitoningsih[2]. Sebastian CA Ferse[1], M. Neil[3], Rio Deswandi[1]

[1]Leibniz-Center for Tropical Marine Ecology (ZMT), Fahrenheitstr 6, 28359 Bremen, Germany
[2]The Nature Conservancy Berau Office, Jl. Cempaka II No.7, Berau 77311, East Kalimantan, Indonesia
[3]Anthropology Department, Hasanuddin University, Makassar, South Sulawesi, Indonesia
Corresponding author: marion.glaser@zmt-bremen.de

Abstract. A review of a major community-based marine protected area program (CB-MPA) in an Indonesia island archipelago is the point of departure for this article. Despite a well-designed institutional structure to facilitate local participation, local knowledge about the CB-MPA is found to be low and resource access and influence on decision-making in the program negligible among the majority of islanders. At the same time, most of those who know about the program consider it as pertaining to the public authority only. These findings stand in contrast to evidence on non-formal ways of protecting and managing marine areas in the same geographical area but outside the formal MPA institutional framework. In particular, a number of emergent rules-in-use in marine management operate parallel to legally established MPAs. It is argued that emergent forms of marine area protection such as non-formal self-organizing island exclusion zones (IEZ) offer as yet mostly unused potentials for formal MPA development, particularly in those coastal and marine areas without traditional forms of marine and coastal management.

Key words: Community-based marine protected areas, Emergent rules, Formal and non-formal modes of marine protection, Island exclusion zones, Indonesia.

Introduction

Indonesia's coral reefs are among those with the highest biodiversity on earth. With some 51,020 km^2, the country has about one-fifth of the coral reefs on the earth [1]. These ecosystems can benefit from effectively protected areas and, as a consequence of better marine protected area management, ecosystem-dependent human populations can reap benefits including increased catch per unit effort and food security [2]. In Indonesia the total marine area covered by National Parks in Indonesia is about 62,600 km^2, or about 1.08% of the Indonesian marine area [5–7] but marine area protection is implemented in various legal forms[3,4]^2.

Many of these formally gazetted MPA areas are not effectively managed for fisheries or habitat protection [8]. The aims of the Indonesian government for future marine area protection are ambitious: 10 million hectare of marine area was to be under MPA frameworks by 2010, a goal which was reached with the declaration of an extra 3.5 million hectare of protected area in the Savu National Park in May 2009. For 2020, 20 million hectare of Indonesian sea territory is to be under formal protection [9].

The definition of protected area by the IUCN, explicitly incorporates forms of protected area management outside the formal legal frameworks established by the nation state. The integration of traditional ecological knowledge into protected area management and intercultural approaches to the linking of knowledge systems has thus become possible [13,14].

However, in many parts of the globe, and especially in marine and coastal territories, local customary management is either absent or inadequate while challenges such as demographic growth, coastal urbanisation, sea level rise and other facets of global change require effective institutional responses. An apparent gap in local institutional capacity exists in coastal and marine areas where traditional customary forms of management are weak or lacking. Despite varying adequacy of local traditions for formal MPA design under contemporary conditions, there is a fairly strong consensus that formal MPAs without any local inputs to institutional development tend to be too inflexible to incorporate the rationales and priorities of local ecosystem stakeholders [16].

Ferse et al. [15] suggest that a combination of formal MPAs as the more rigid formal frame and community-based natural resource management as the adaptive core will provide more effective protected area management. In order to thus combine stability and adaptability, the local elements that make up the

adaptive core of a management system need to be identified and evaluated in each specific case.

This article evaluates the participatory element of a major Indonesian marine conservation programme (COREMAP) that supports community-based no-take areas, and identifies other approaches to ecosystem protection and management in the same region.

Material and Methods

1.1. Two ship-based research excursions

About 20 Indonesian and German researchers and students undertook two ship-based research excursions to the islands of Barrang Caddi, Badi, Saugi, Karanrang, Bonetambung and Jangang-Jangangang in the Spermonde Archipelago (Fig.1). The first of these two 10-day excursions took place in March 2009. Researchers aimed to generate scientifically sound and societally relevant information and to inform and ''envoice'' more marginal islanders, such as fisherfolk in coastal conservation and management.Also explored were seasonal, spatial and social network dynamics in livelihood and resource use as well as coping strategies. past human-nature dynamics and local visions for the future. A range of participatory methods (seasonal calendar, future visioning and back-casting) were used in focus groups which differed by age, sex and socio-economic status. Individual interviews and larger open meetings were also conducted [22]. The second research excursion (May–June 2009) worked on demographic history, local economy including fisheries, local leadership, society, values, social-ecological and technical knowledge. The islands and marine governance and management systems; islanders' problems, ideas and knowledge systems; reef-related interests and strategies to cope with crises and benefit from opportunities were also investigated. In-depth interviews, participant observation in the classical anthropological tradition and daily team discussions were used.

1.2. Field work on participatory practice in MPA design and management

Initial field research was carried out for two weeks in August 2008 by S.F. Interviews were conducted with COREMAP personnel, community leaders, NGO, business representatives and scientists from Hasanuddin University on mariculture introduction and the role of COREMAP on Badi Island. This was followed by six-month field research period by W.B. (September 2008-February 2009) on the islands Salemo, Sabutung, Karanrang, Gondongbali and Kapoposang. 238 people were randomly selected and interviewed, indidually or in natural focus groups, on the implementation of CB-MPA at village level. A semi-structured questionnaire was used [26].

A six-month field research was also carried out by R.D. on Barrang Lompo, Barrang Caddi, Kodingareng Lompo, Bonetambung, Langkai and Lanyukang Islands on local fisheries institutions. In-depth interviews, participant observation and focus group discussions were used.

The following section examines the effectiveness of the different ways of managing and protecting marine territory we encountered in the Spermonde region.

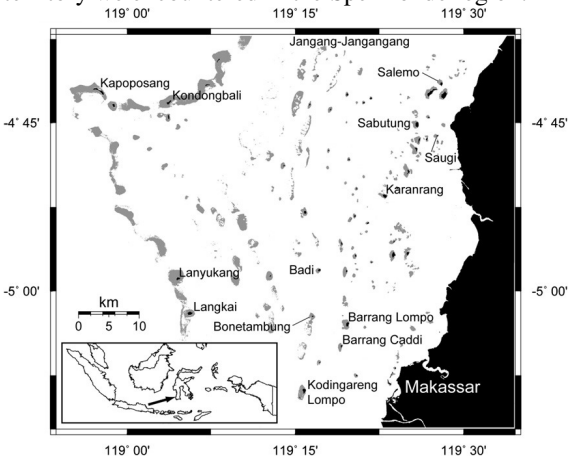

Figure 1: Map of study area with locations of research islands. Grey areas indicate coral reefs. Position within Indonesia shown on inset..

Results

We define *protected area management* as any action limiting the use of a marine area and its resources, and *protected areas* as areas affected by such actions, either permanently or temporarily.. In order to analyse the rationales and logic behind rules-in-use, we examine all institutions that regulate marine resource use. We aim for an improved understanding of the larger complex of marine resource use rules.

Five ways that regulate and at least partially protect marine areas were evident in Spermonde Archipelago:

1. Formally declared no-take areas intended by government as part of planned larger MPAs.
2. Incidental forms of protection.
3. Myths or taboos.
4. Influential interests in favor of conservation.
5. Newly emergent non-formal rules outside the formal institutional framework.

Discussion

2.1. COREMAP MPAs and no-take areas

In its Community-Based Marine Protected Area (CB-MPA) programme, COREMAP explicitly aims to facilitate an active community role in MPA management. With the concept of district-level marine area management, objectives such as the decentralization of political powers, the effective protection of marine areas and the abatement of

declining fish catches are to be addressed at the village level through the CB-MPAs. The small-scale village-level MPAs under the COREMAP programme prohibit all fishery activities: In general MPA terminology, they are 'core zones' or 'no-take areas'. In the Spermonde Archipelago, some of COREMAP's no-take areas (NTAs) are to be the core zones of a larger scale district-level MPA [23,24,27–29].with one NTA per village[6].

To define a village-level NTA, the residential community was gathered for a one single session Focus Group Discussion (FGD). Villagers were asked to define their (i) fishing grounds; (ii) mariculture areas if any and (iii) marine transportation routes. These areas were recorded on a map. Those who attended the FGD meeting in their village were then asked to select areas with good coral cover as the local no-take area. Generally, an area with high coral coverage, which was also visible and easily accessed from the island, was selected [26].

The ''in-the-water'' demarcation of the selected NTAs was later undertaken by an external contractor reportedly without coordination with the local communities or the members of the FGD group who had selected the area[26].

COREMAP marine conservation rules were formally signed by local government representatives and are thus theoretically valid. However, on several of the researched islands, the existence of the rules was neither widely known nor were they applied on a regular basis- It was stated by interviewees that the rules were not crafted by the local people themselves but introduced by the COREMAP project in one-off village level meetings, attended people whose claim to speak for the whole village was not established. When asked about the document, several of the signatories stated that it was kept in the COREMAP district office and not available on the island. Interviews with responsible staff indicate that lack of time and resources for participatory rule development were a major constraint. The resulting CB-MPA rules may thus have missed important local economic, social and cultural aspects. This reduces the chances for a locally grounded participatory implementation.

COREMAP village activities under the CB-MPA programme include training, the provision of surveillance facilities and support to alternative livelihoods that decrease pressures on coral reefs and resources. Various trainings had been provided such as for teachers, preachers and gender training. For surveillance activities, patrol boats, digital cameras, binoculars, communication radios and snorkelling gear were provided. A computer, printer and support for the development of alternative livelihoods were provided to each village [24].

2.2. Status of COREMAP's CB-MPA/ NTAs

The level of local knowledge about CB-MPAs in the islands visited was low. Over half (53%) of interviewees were not involved with COREMAP and not even aware that there was a MPA nearby. Even the 47% interviewees who stated they knew something about the CB-MPA were unable to explain its function —they tended to ask the interviewer (W.B.) about it. It was difficult to obtain information on the MPA rules, even from local COREMAP participants. If one person in a discussion group had information through affiliation with COREMAP, others appeared to simply repeat that person's statements. Thus, although some people not involved with COREMAP stated that they knew about the MPA, this does not necessarily indicate independent knowledge of the CB-MPA [26].

Local acceptance of the no-take CB-MPA concept was mixed. About three-quarters of respondents stated their support for a non-extractive MPA. This included all members of COREMAP and the respondents who had not known anything about the local CB-MPA. The main stated reason for support was that a fish spawning and nursery ground is needed. Other reasons were local food security and fishermen's need for resource sustainability. However, those who were unaware of the CB-MPA did not support a non-extractive MPA seing neither its relevance to their own work nor any other reason for it.

We found that COREMAP funds to support local capacitation and livelihood mainly provided benefits to an influential minority while resource access and decision-making influence were outside the reach of the majority of villagers. Thus, the perception that the COREMAP patrol boat was provided for the local managers or other village officers' needs prevailed in the islands [26]. Seaweed farming, fishing and/or travel by the village officers were common uses of the patrol boats. Clear agreements on boat maintenance did not exist.

The Village Grant was not used according to the priorities voiced by the majority of residents. Much of it was privately appropriated rather than employed for more generally recognized community welfare [26]. Seed Fund loans were used for purposes that had no direct relation to coral reef use such as to add to existing grocery stalls. Access to Seed Fund money was obtained via private contacts with local managers–public local announcements about loan availability were reportedly not made.[7]

The CB-MPA and associated support structure was clearly a source of money and materials for some villagers. The use of programme resources (village grant, seed fund) did not occur in accordance with the preferences of the majority of residents or ecosystem users. Programme resources were privately

appropriated or used according to the preferences of local elites rather than for more generally agreed objectives [26]. Not surprisingly, villagers considered the rules of CB-MPA as only relevant for the beneficiaries of COREMAP support. The fact that this support was unevenly distributed and not in accordance with majority priorities undermined COREMAP conservation objectives. ''*As soon as the money was spent, people were not interested anymore [in the CB-MPA]*'' (village head).

Thus despite its elaborate, multi-level organizational structure, carefully designed to support community capacitation and participation in marine protected area management, the success of the COREMAP CB-MPA programme has so far been limited in the studied islands.

2.3. Effective, non-formal ways of marine area protection

2.3.1. Incidental protection

In incidental forms of protection are circumstantial rather than intended. They are linked to the physical characteristics of a protected area or to the characteristics of the human communities associated with it. Thus, the proximity of a marine area to a larger town or a police station, the long distance of a protected site from markets or required inputs for production such as fuel reduce human use of marine areas.

2.3.2. Traditions, myths and taboos

Traditional management systems are not found in the Spermonde Archipelago. However, single taboos and myths that circumscribe or prevent the use of nature in particular locations do occur. The protection effect occurs within the so-called ''enchanted sphere'' [32], often without any intention of protecting nature or scientific understanding of human-nature dynamics [33–35].

Local perceptions of specific marine areas as home of dangerous spirits are also mentioned by Lowe [32]. Such prohibitions of nature use from the ''enchanted sphere'' need to be understood in order to optimize their potentials of contributing to an increased effectiveness of formal marine area protection [37].

2.3.3. Influential interests in favour of conservation

Companies and individuals with coinciding commercial interests strengthened local marine conservation. In one island, an ex-military resort owner successfully supported the local implementation of conservation laws.

2.3.4. Newly emergent rules

Rules and institutions emerge in response to demographic, technical or ecological change. Ecosystem users react to such changes with altered behavior and societies react by designing new rules, not only in the formal (legislative) realm but also at the non-formal, locally constructed level. Interactions between fishermen in diverse and dynamic environments are the setting for local rule construction [38]. Particularly in coastal areas with a large proportion of migrants from other ecological zones, long-standing local resource management traditions generally do not exist. In such regions without customary, traditional management structures, newly emergent local rules stand om contrast to top–down conservation frameworks [15].

Major institutional arrangements in Spermonde Archipelago that can be classified as locally constructed and newly emergent are:

1. locally agreed temporary full or partial closures of fishing grounds;
2. territorial subdivisions (with sticks or flags);
3. a number of innovative arrangements to share catches, for instance around bomb-fishing areas, and
4. self-defined ''Island Exclusion Zones'' or Island restriction Zones (Deswandi, 2012) where marine areas newly and informally claimed as island territories, are subject to locally constructed and implemented use rules and prohibitions.

All these non-formal coastal management rules have developed outside and parallel to formal legislative frameworks, in response to ecological, economic, technological or demographic change.

Conclusion

The first part of this article outlines a sophisticated and well-structured formal institutional framework, which was designed to involve communities in MPA conservation. This framework shows some serious shortcomings in implementation. The second part of the article identifies some non-formal marine conservation and management institutions. The article points to the relevance of locally constructed, non-formal rules for improving the effectiveness of marine conservation and management.

Further investigations into local marine protection and management rules that are emerging ''from the bottom up'' are needed. Even if they do not always lead to successful conservation, an improved understanding of locally constructed rules that are effectively implemented and locally sanctioned can contribute to the quality of formal MPA management and design.

Acknowledgement

This research was conducted under the Indonesian-German Scientific Cooperation Agreement and financed by the German Federal Ministry for Education, Science, Research and Technology (BMBF) as part of the programme Science for the Protection of

Indonesian Coastal Ecosystems (SPICE). We thank the Indonesian Ministry for Research and Technology (RISTEK) for research permits, the Land-Ocean Interaction in the Coastal Zone (LOICZ) program for financial support and the Centre for Coral Reef Research at Hasanuddin University, Indonesia for their cooperation.

Section 2.1. and 2.2. are part of the M.Sc. thesis of W.B., who thank the German Academic Exchange Service (DAAD) for the scholarship, which made her research possible. This article updates a more detailed elaboration of our arguments (Glaser, M., Baitoningsih, W., Neil, M. & Ferse, S. (2010) 'Whose sustainability? Top-down participation and emergent rules in protected area management - Local lessons for MPA design from Indonesia', *Marine Policy* (34): 1215-1225.

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