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Perceptions of Fishers towards Marine Reserves in Iloilo Coastal Communities, Central Philippines

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Abstract

A marine reserve, or marine protected area (MPA), enhances the health of the marine ecosystem, secures livelihoods, and improves community well-being. Despite successful implementation of reserves all over the world, little attention has been given to participation and cooperation between stakeholders in less known and small MPAs. This paper investigates fishers' perceptions of marine reserves in their communities, with an emphasis on the similarities and differences in their perceptions: (1) when their municipal governance is strong; (2) when their incomes are different; and (3) when they are members of non-government organisations (NGOs), or people's organisations (POs). Using survey data from 175 fishers in 5 coastal communities, north of the Province of Iloilo, fishers' perceptions were analysed regarding conflict between various stakeholders in reserves management, as well as their opinions regarding the level of participation in POs and in the overall improvement of coral reefs. Results of the study showed that improvement in the quantity and quality of coral reefs from establishment of marine reserves could be enhanced if fishers have higher incomes, are members of a people's organisation, or have less conflict with other fishers and their local government. Thus, attempts to improve local marine conditions through MPAs should address local participation and membership to NGOs/POs.

Introduction

Marine protected areas (MPAs) are important tools for fishery management and marine ecosystem conservation (Pita et al. 2013; Bennett and Dearden 2014). The primary goals of MPAs are to protect critical habitat and biodiversity and to enhance fisheries stocks by spillover effects (Roberts et al. 2001) in order to ensure sustainable income for coastal communities. The establishment of MPAs in the Philippines began as early as the 1970s (Balgos 2005) with more than 525 MPA sites legally established (Garces et al. 2013).

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However, only about 20% of these MPAs are achieving their management objectives (Lowry et al. 2009). Increasing coastal populations and unregulated tourism activities may cause declines in fish catches (Fabinyi 2010). In addition, mismanagement, conflict over property rights and economic development may lead to unsuccessful marine protected areas (West et al. 2006). For instance, participation of MPA stakeholders has been problematic (Chang et al. 2012) because of conflict between them. Involvement of local people in the management of MPAs is essential because they have the traditional knowledge and they are direct users of marine resources. However, they are often excluded in the management process (Liu et al. 2010) and subsequently develop conflict with other stakeholders.

In the Philippines, several studies have addressed the issues of MPA management practices (e.g. conflict), success indicators and governance (Balgos 2005; White et al. 2006; Boeh et al. 2013; Garces et al. 2013). However, what is not clear is the perception of resource users of natural resources that can influence the management of protected areas, especially in less known or small MPAs. Stakeholders' perceptions towards an ecosystem and towards management of conservation programmes are important components of local participation and empowerment.

Behaviour and attitudinal studies have been popularised in the field of psychology (Fishbein and Ajzen 1975), but have also been applied to ecosystem economics (Pouta 2003). Previous studies show that attitudes towards marine reserves are predictors of behaviour (i.e. compliance with MPA regulations; Table 1). For instance, several studies have looked at perceptions to local government and management practices/regimes (Fabinyi 2010; Abecasis et al. 2013; Bennett and Dearden 2014). In the analysis of socio-demographic charateristics of fishers and their perceptions to benefits of MPAs, Launio et al. (2010) found that locals have positive perceptions about the MPA benefits (including non-use values) in *'fully functional'* reserves.

Similarly, Johansson's (2011) epistemology of the democratic process may be adapted in the case of MPAs, which argued that individual and/or community aspirations are important elements of the democratic process (Fig. 1). In the management of protected areas, stakeholders should have a say about *'how it ought to be'* and parts of these opinions are observations around them (e.g. presence of conflict and changes in the quality of corals reefs). Understanding the perceptions and attitudes of resource users in socio-ecological systems could help predict possible behaviours that lead to the success or failure of management systems. This involves knowing the influences that act upon users and their likely responses, so that both the costs and benefits of such management strategies can be evaluated (Silva and Lopes 2015). Thus, knowing the perception of fishers towards marine reserves are crucial components for policy making.

This paper builds on the analysis of Fernandez and Pham Do (2010), where they explored the relationship of these perceptions towards conflict, MPA management and factors that were found to have important bearings to success of reserves; namely, local governance, fishers income level, and membership to people's organisations or other related institutions.

Using the same survey data, the paper focused on the perceptions of fishers and their perceived benefits from marine reserves in their communities, as well as their observations regarding conflict between different stakeholders. The findings could provide important contributions in aligning community development programmes with biophysical objectives of MPAs. Also, the study could provide insights in the significance of non-government organisations (NGOs) or people's organisations (POs) relating to the management of marine protected areas.

Table 1. Summary of previous studies on perceptions and marine reserves.

Source	Region	Examples of Perceptions Examined
Fabinyi (2010)	Calamianes Islands, Philippines	Favouritism of local government to tourism entrepreneurs
Launio et al. (2010)	Claveria, Misamis Oriental, Philippines	Perceptions about conservation and the environment
Svensson et al. (2010)	Van Phong Bay, Vietnam	Perceptions about changes after MPA establishment
Abecasis et al. (2013)	Corvo, Azores, Portugal	Pride in this community initiatives and perceptions about MPA managed by the government
Garces et al. (2013)	Calamianes Islands, Palawan, Philippines	Perceptions of fish catch and resource conflict
Bennett and Dearden (2014)	Thailand	Perceptions impacts on adjacent communities as well as perceptions of governance and management processes

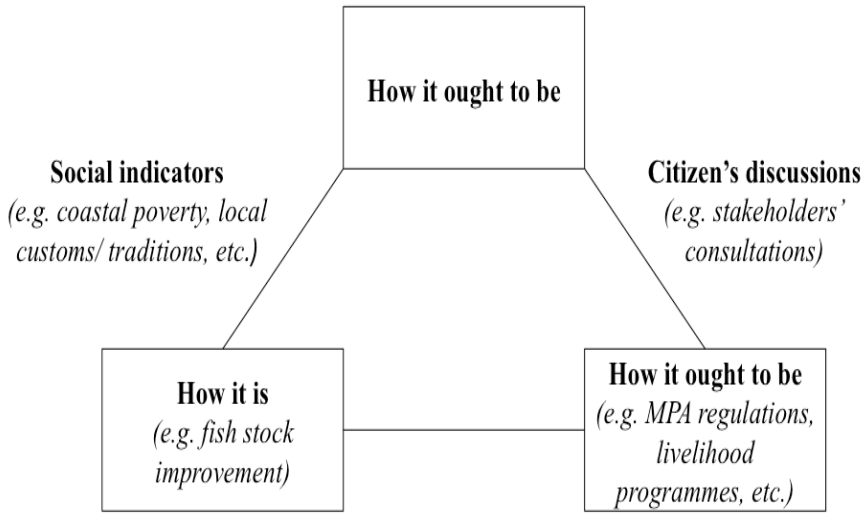

Fig. 1. General relationship between science, social research and people's perceptions in case of marine reserves management; modified from Johansson 2011.

Materials and Methods

Northern Iloilo in the Philippines (Fig. 2 and Table 2) was selected as a case study area for two reasons. First, the economy of the area is highly dependent on fisheries, wherein most barangays (or villages/communities) are in coastal areas. Second, there is a wide variation in the length of time for the establishment of protected areas. For instance, some municipalities established MPAs recently, while some were set up more than a decade ago. The information allows comparison of experiences between these areas. Data collection was conducted in six municipalities (Ajuy, Balasan, Concepcion, Carles, Batad and Estancia) of Northern Iloilo.

A quantitative approach was employed in order to allow an empirical investigation of preferences towards marine protected areas. The analysis focused on the perceptions of fishers towards MPAs and their relationship to quality of municipality governance, their membership to the fisher folk associations or other related organisations, and their weekly income. Two data sources were used: social surveys of fishers' perception and secondary data from the Department of Interior and Local Government (DILG). A questionnaire was developed to acquire information about MPAs and respondents' perceptions towards MPAs. The questionnaire was translated into the local dialect, but respondents were also given a choice to answer in English if they preferred. For this paper, the following data were used: several statements indicating perceptions of fishers towards MPAs; their income level; and their membership to people's organisations or other related institutions. The fishers were asked to rate the following statements through a Likert scale:

(1) There is an improvement in the quantity and quality of corals. (2) There is a conflict between the municipal and the commercial fishers. (3) There is a conflict between the government and the municipal fishers. (4) There is a conflict between the government and the commercial fishers. (5) There is a conflict between the NGOs/POs and fishers. (6) There is an active participation of NGOs/POs (e.g. fisherfolk association).

Social desirability bias often occurs in social survey because individuals tend to exaggerate or undermine responses, especially for sensitive questions (e.g. perceptions about conflict) (Krumpal 2013). Therefore, precautions were made to minimise misreported or inaccurate responses. Some statements were negated, as shown above (e.g. statements #2 to #5), in order to avoid similar and repetitive responses.

Two enumerators were hired to help with data collection. An enumerators' training was conducted to provide them with skills on how to use the questionnaire and how to handle possible problems in the field. The translated questionnaire was discussed during the training and improvements were made in terms of readability, understandability and clarity of questions. Based on purposive sampling of fishers in all six municipalities, face-to-face interviews were conducted from June to July 2008.

The enumerators ensured that the interviews were carried out individually and in a comfortable setting. This is because other fishers may influence the interviewee's response if both fishers were interviewed at the same time, or in close proximity. A total of 200 fishers were interviewed and only 175 completed the survey instrument used in this paper. Originally, stakeholders from public and private institutions were also interviewed, but were not included because the study focused on fishers. There were only six and seven respondents to represent the municipality and NGOs/POs, respectively.

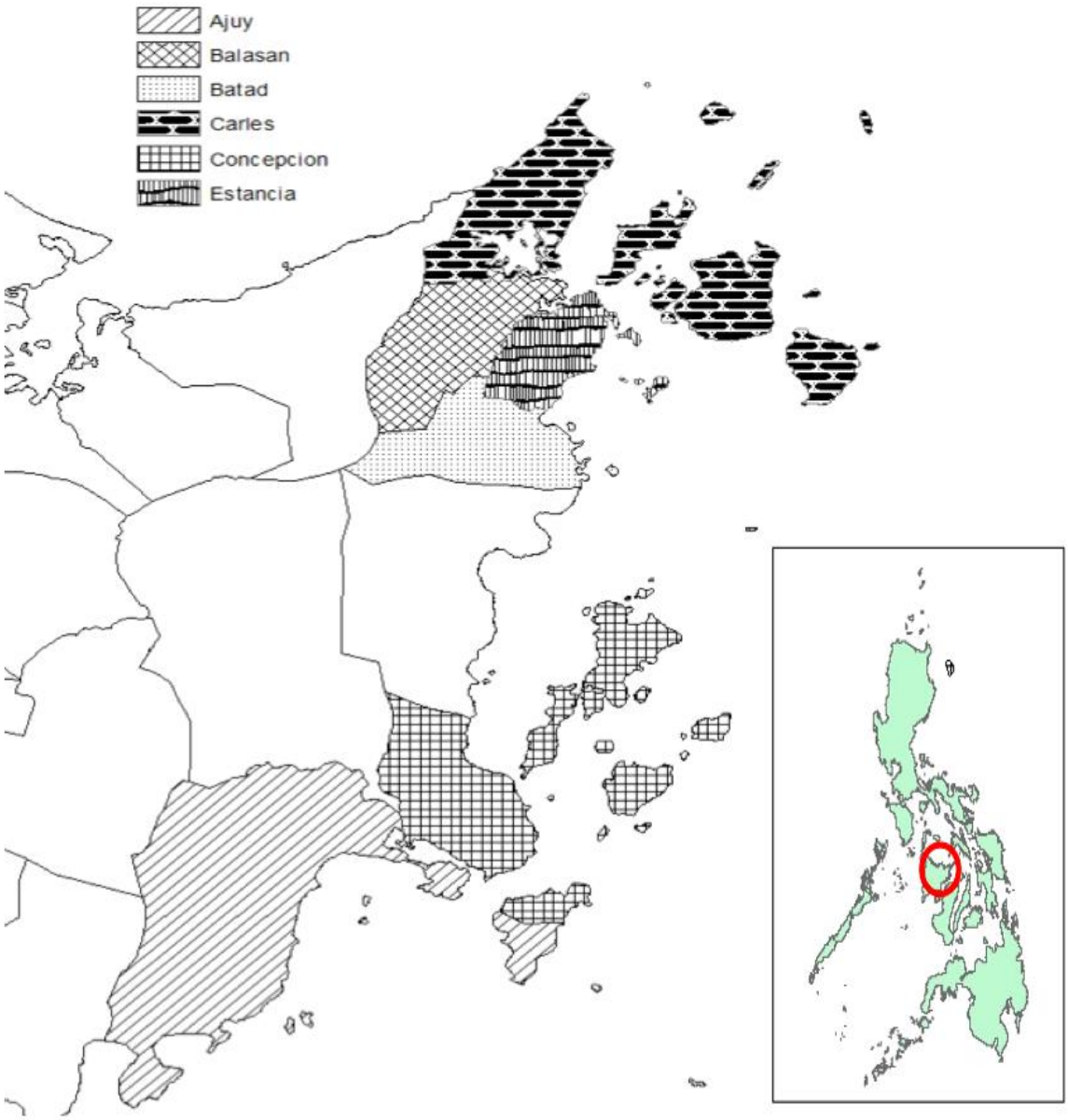

Fig. 2. Sampled areas for case study on perception of fishers towards marine reserves in six municipalities in Northern Iloilo, Central Philippines.

Table 2. Socio-demographic characteristics of the sampled coastal municipalities in Northern Iloilo surveyed for case study on perception of fishers towards marine reserves*

	Ajuy	Balasan	Batad	Carles	Concepcion	Estancia
Number of *barangays (brgy)*	34	23	24	33	25	25
Land area (km^2)	175.52	57.3	52.61	103.52	97.2	30.55
No. coastal brgy (percentage of total)	18 (53%)	2 (8.6%)	6 (25%)	32 (97%)	18 (72%)	16 (64%)
Main source of income	Fishing	Farming, Fishing	Fishing	Fishing	Fishing	Fishing
Surface area of municipal waters (km^2)	250	0.6	8	368	320	10
Length of shoreline (km^2)	74.83	3.5	8.2	94.7	120	28.51
No. of islands	0	0	2	30	17	3
Registered Municipal Fishers	3185	120	142	4500	3211	1296
Wardens, patrol boats	65, 2	0	60, 3	100, 3	160,6	45, 1
No. of MPAs	1	0	1	1	1	1

*Data were sourced from National Statistics Coordination Board 2009; cited in and adapted from Fernandez and Pham Do (2010, p. 102).

Secondary data from the Department of Interior and Local Government (DILG) were acquired in order to describe local governance. Specifically, DILG reports the performance of municipalities in the Philippines through the State of Local Governance Performance Electronic Report (e-SLGPR) (Department of Interior and Local Government 2014). The assessment included areas of governance in administration, social, economic, environmental and on the valuation of fundamentals of governance. These were based on responses from municipalities to different questions relating to the areas above using the rating: (5 = Excellent, 4 = High, 3 = Fair, 2 = Low, and 1 = Very Low). Environmental governance was used as proxies for strength of governance in each municipality; which included sub-areas on forest ecosystem management, freshwater ecosystem management, coastal marine ecosystem management, and urban ecosystem management. Table 3 summarises these governance ratings. Overall, the focus of the paper was to analyse and categorise statements indicating perceptions towards marine reserves and to understand their relationship to (1) quality of municipality governance, (2) to their membership to fisherfolk association or other related organisations, and (3) to their weekly income. Data were encoded and analysed in STATA. A Principal Component Analysis (PCA) was used to determine which six statements previously mentioned go well together.

This analysis is appropriate as the items about perceptions may be correlated to one another and may explain the same construct (SAS Institute Inc. 2014). The PCA is a data reduction technique that looks at the variation of variables and recommends possible factor categories. For instance, responses to the statement about conflict between the government and the municipal fishers (statement #3) may be associated with the statement on conflict between the government and the commercial fishers (statement #4). On the other hand, descriptive analyses, ANOVA, and correlation were used to draw the relationships between fishers' perceptions and: (1) quality of municipality governance, (2) their membership to the fisherfolk association or other related organisations, and (3) their weekly income. For example, mean responses to these statements were utilised and these responses were compared across categories of income.

Table 3. Summary of governance indices of six municipalities in Northern Iloilo surveyed for case study on perception of fishers towards marine reserves*,

Municipality	Forest ecosystem management	Freshwater ecosystem management	Coastal marine ecosystem management	Urban ecosystem management
Balasan	5.0	5.0	5.0	4.33
Batad	3.67	3.33	3.67	3.88
Ajuy	3.67	3.67	3.67	3.78
Estancia	n/a	2.33	3.67	3.85
Carles	3.67	3.67	3.67	3.83
Concepcion	3.33	3.67	3.67	3.28

*Sourced from the State of Local Governance Performance Electronic Report (e-SLGPR) of the Department of Interior and Local Government (DILG).

Results

This section is organised into four parts, the first part being summary groupings from seven statements about perceptions. The second, third, and fourth parts present the analysis of the relationships between fishers' perceptions and the quality of municipality governance; fishers' weekly income; and membership to fisherfolk associations or other related organisations, respectively.

Categorising perceptions towards marine reserves

The fishers were asked (using a Likert scale of 1 to 5) about: (1) whether they thought there was an improvement in the condition of marine resources, (2) if there is conflict between stakeholders (e.g. municipal fishers, commercial fishers, government, etc.), and (3) the level of participation of NGOs and POs, in relation to the presence of marine protected area in their communities (Table 4).

Table 4. Summary statistics of statements indicating perceptions towards marine protected areas.

Scale item	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	N	Item mean (sd)
There is an improvement in the quantity and quality of corals.	4 (2%)	5 (3%)	49 (28%)	39 (22%)	78 (45%)	175	4.04 (1.02)
There is a conflict between the municipal and the commercial fishers.	7 (4%)	7 (4%)	11 (6%)	45 (26%)	105 (60%)	175	4.34 (1.03)
There is a conflict between the government and the municipal fishers.	19 (10%)	15 (9%)	19 (11%)	51 (29%)	71 (41%)	175	3.80 (1.34)
There is a conflict between the government and the commercial fishers.	10 (6%)	4 (2%)	30 (17%)	49 (28%)	82 (47%)	175	4.08 (1.11)
There is a conflict between the NGOs/POs and fishers	17 (10%)	25 (14%)	81 (46%)	33 (19%)	19 (11%)	175	3.07 (1.07)
There is an active participation of NGOs/POs (fisherfolk association).	6 (3%)	12 (7%)	84 (48%)	27 (15%)	46 (26%)	175	3.54 (1.06)

The Principal Component Analysis (PCA) shows statements that can be grouped together as they explained similar variations. Table 5 identifies three components (columns 2, 3 and 4) from six scale items (column 1). High values (0.60 and above) were selected as criteria for grouping perceptions. Three statements indicating conflict (between government and municipal fishers [0.852], government and commercial fishers [0.784], and between municipal and commercial fishers [0.608]) explained similar variation and should be grouped together. Subsequently, the statement regarding perceptions towards participation of organisations to marine reserve management (0.819) was the second component. The third component was the item reflecting fishers' assessment on the improvement of coral reefs after marine reserve establishment (0.935). Interestingly, the statements relating to opinion regarding conflict between non-government organisations (NGOs/POs) and fishers (-0.791) had a different correlation with the rest of the perceptions statements. This statement also had a different pattern of answers as shown in Table 1 earlier, so it was opted to assign it as our fourth component.

Perceptions towards marine reserves across municipalities

Successful MPAs depend on local governance (Jentoft et al. 2007). As shown previously, Tables 2 and 3 present different characteristics of sampled towns (including Balasan) and their corresponding ratings for environmental governance (forest, freshwater, coastal and urban ecosystems). Several observations were noted based on the perception scores. First, overall fishers noted less conflict between NGOs/POs and themselves.

In Concepcion, Ajuy and Carles, scores were 3 and below (3 was neither agree or disagree and 1 was least disagree) while scores were little above 3 in Estancia and Batad. Second, compared to perceptions of conflict between fishers and/or the government, perceptions of conflict between NGOs/POs and fishers were lower. Third, respondents also rated higher scores on improvement in the health of coral reefs, than the scores for participation of NGOs/POs. For instance, fishers noted high scores in improvement of the quality and quantity of coral reefs in Batad and Ajuy while respondents from Concepcion noticed high participation of NGOs/POs (Labiste n.d.).

Table 5. Results from the Principal Component Analysis (PCA) of six statements indicating perceptions towards marine reserves.

Scale Items	Components		
	1	2	3
There is a conflict between the government and the municipal fishers.	.852	-.037	.074
There is a conflict between the government and the commercial fishers.	.784	.096	-.208
There is a conflict between the municipal and the commercial fishers.	.608	-.222	.325
There is an active participation of NGOs/POs (such as fisherfolk associations).*	.224	.819	.226
There is a conflict between NGOs/POs and fishers.	.316	-.791	.219
There is an improvement in the quantity and quality of corals.*	-.013	.045	.935

Legend: *recoded for Principal Component Analysis (PCA)

Perceptions towards marine reserves and income levels of fishers

Socio-economic and cultural factors may affect fishers' perceptions (Pita et al. 2013; Blyth et al. 2002). During the interview, fishers were asked about sources of income and the corresponding monthly income from that source. Fishers indicated one or two sources of income and these were aggregated to indicate the total monthly income. Four main observations were noted. First, fishers in the highest income category (i.e. above ₱1,500 [US$34] per week, US$1 = ₱44 in June 2008) allocated higher scores to coral reef improvement and NGOs/POs participation. Second, fishers with higher incomes also noted high ratings (above 4) regarding conflicts between them and the government, and low ratings (close to 3) regarding conflicts to NGOs/POs.

Similar observations were seen in fishers under the lowest income category (i.e. ₱300 [US$6.8] per week). Third, the gap between ratings, in both highest and lowest income categories, is obvious in their perceptions about conflict between fishers and the government than the conflict with NGOs/POs. Fourth, there was not much of a difference between the ratings provided by the fishers in the two middle-income categories (i.e. ₱300 to 500 and ₱500 to 1,000 or US$6.8 to 11.4 and US$11.4 to 22.7). A pairwise correlation (using pwcorr command in STATA) was run for total monthly income and the mean conflict scores.

Results show a significant negative association between the two (p-value = 0.01 and coefficient = -0.17). This means that fishers with higher reported incomes reported low conflict with other stakeholders.

Perceptions towards marine reserves and membership to people's organisations

The mean scores of statements relating to perceptions of conflict were different, for instance, between NGOs/POs (4.26) and fishers (4.03) as well as the conflict with the government (3.0). However, there was not much difference for members and non-members in terms of reported intensities of conflict. In addition, regardless of their membership, fishers noted similar scores for coral health and cover. The ANOVA was used to test if there was a significant difference of perceptions of conflict between members and non-members. Results show that responses do not matter regardless of whether the respondent is a member or non-member of POs (p-value = 0.38).

Discussion

The involvement of fishers and their level of participation are crucial in the integrated and multi-sectoral planning process for MPA management (Courtney and White 2000). Gunton et al. agree with this view (2010), and they provided guidelines in planning marine ecosystem that highlights fishers' essential and multiple roles in MPA management. With clear understanding of what drives these fishers' perceptions, resource managers will likely predict fishers' behaviour towards MPAs. Therefore, results from these findings show some interesting insights as they provide platforms for management of marine reserves.

First, the groupings of perception statements from the PCA were as expected. The interactions between environment and fisheries (IBEFish) framework reflected various assessment criteria that could be applied to conflict management in MPAs (Chang et al. 2012). Specifically, it integrates social dynamics criteria that highlight empowerment of stakeholders through participation. Similarly, Davos et al. (2007) draws on the behaviour of stakeholders (e.g. attitudes of fishers towards participation), where they argued to be important for self and collective interests. In this paper, one anticipated finding was that fishers and governments have high level of conflict as municipal and commercial fishers are competing for fishing territories, while governments usually implement rules upon these waters. On the other hand, there is less conflict between organisations (e.g. NGOs/POs and fisherfolk (local) associations) because members are usually fishers themselves. To support this, fishers expressed a variety of perspectives, especially on whether MPA improves coral cover/health and towards conflict towards people's organisations. Second, fishers' previous experiences or dealings with NGOs/POs and other organisations may have influenced their responses regarding conflict in these organisations. Fishers and other local residents had participated in many (development) programmes initiated by various institutions.

For instance, in the municipality of Concepcion, the *'Zero Poverty 2020'* initiated in 2009 had exposed the residents to various NGOs and organisations, such as Save the Children USA, World Bank, Asian Development Bank, Ford Foundation USA. and the Philippines Canada Development Fund. The majority of the targeted beneficiaries of the programme consist of residents, such as small and artisanal fishers/women, marginalised farmers, and the unemployed (Committee on Social Inclusion, Participatory Democracy and Human Rights, 2010). Since the ratings of conflict between fishers and NGOs/POs were relatively similar in each municipality, therefore the difference may be associated to the ratings towards conflict between fishers and the government. Most notable were the results in Concepcion, Ajuy and Carles, where the mean scores were significant compared to those of Estancia and Batad. Community organising (e.g. developing new leaders in the locality) empowers people (Rockloff and Lockie 2006) and encourages them to participate in activities relating to marine reserves (e.g. consultation, mangrove reforestation, etc.). Local stakeholders, such as fishers, are major players in marine reserve management, because the activities affect their use of marine resources and livelihoods. In Silva and Lopes' (2015) investigation of fishers' perceptions in Brazil, they found that those from the local areas had more conservative attitudes than those who were not from the area.

Fishers do not participate in MPA activities/ regulations (e.g. education/training, tourism) because of many reasons. It seems possible that lack of participation is explained by stakeholders' lack of understanding about the (potential) benefits from MPAs (Uychiaoco et al. 2000; Daw et al. 2011) or marginalised stakeholders are struggling with power issues (Rockloff and Lockie 2006). On the other hand, differences of perceptions may be associated with fishers using different fishing gears (Blyth et al. 2002) and whether reserves with aims to manage fisheries or those with conservation aims (Pita et al. 2013).

The combination of findings provides some support that community education and capacity building should be made understandable to local communities (e.g. using local dialect or participation of local stakeholders) and those who have been trained in the past should encourage others to do so. Successful management is often correlated to the level of involvement of local stakeholders, especially in awareness and education programmes (Alder 1996). Non-selective fishers (i.e. use of non-selective gears) also tend to be more cooperative and involved with local organisations and other related activities (Silva and Lopes 2015). However, diversity of interests could be addressed through consultative processes and resolutions (Rockloff and Lockie 2004) where consensus decisions may be achieved.

Third, although, marine reserves seem to improve conservation efforts, consideration for management is still dependent on the sustainability of income of fishers. Based on our findings, perceptions vary with income levels. This may be related to the economic conditions of the area where the fishers live. For example, the local government of Concepcion generated ₱3.3 million (US$75,00) between 2004 and 2007 from apprehensions (arrests of violators) from marine reserve regulations and fishers reported an increase in fish catch of around 5 $kg \cdot day^{-1}$ (Alvez 2008).

Similarly, non-member fishers might not be interested in participating because livelihood opportunities are only available to members (Bennett and Dearden 2014). In addition, some fishers, particularly those who use non-selective gear were found to be more flexible with work activities and more adaptive to MPA-related activities/regulations (Silva and Lopes 2015). Therefore, standardised information about the reserves should be encouraged at all levels (from community to national levels), while the process of management and outcomes should also be consolidated to and between other stakeholders (Uychiaoco et al. 2000). Most governments' lack the capacity to mobilise financial resources (Fidelman et al. 2014) and most efforts are externally funded (Courtney and White 2000); therefore, strong political will (Ibrahim 2013) and sustained funding (Courtney and White 2000) are also critical aspects in the management. Conservation and environmental issues should be identified and institutionalised into the management process. The abovementioned factors are crucial in improving marine reserve management and it serves as evidence to pursue collaboration between stakeholders.

Conclusion

Marine reserves are at high risk of being unsuccessful due to mismanagement and lack of support from local fishers. The impacts of local governance, fishers' income levels, and membership to people's organisations or other related institutions, are known to influence attainment of protected area objectives. This study sought to understand these factors and relate them to the perceptions of fishers, regarding conflict/participation and improvement of health of coral reefs. Results show that fishers' participation, income and membership to organisations influence their perceptions. The findings provide information for coastal managers. It is suggested that improvement in MPAs, through the quantity and quality of coral reefs, can be increased if fishers: (1) have higher income; (2) are members of a people's organisation; and (3) have less conflict with other fishers and local government. The demonstrated importance of income and participation (including membership) warrants attention. Secondary data were used as a proxy for local governance. This choice seems to be weak as unobserved heterogeneity may be a problem, when comparing individual level variables (e.g. perception ratings) and municipal level data (e.g. local governance rating from a secondary source). It is, therefore, suggested that in-depth analysis of the dynamics between governance and perceptions – probably looking at fishers' perception of governance and of MPAs – need to be further pursued. The challenge of successfully managing protected areas remains for local managers and governments to ensure that communities are well-informed and empowered.

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References

Abecasis, R., N. Longnecker, L. Schmidt and J. Clifton. 2013. Marine conservation in remote small island settings: Factors influencing marine protected area establishment in the Azores. Marine Policy 40:1-9.

Alder, J. 1996. Have tropical marine protected areas worked? An initial analysis of their success. Coastal Management 24:97-114.

Alvez, L. 2008. Concepcion, Iloilo: Best practice model of an integrated population, health and environmental program. Manila, Philippines: Philippine Centre for Population and Development. http://www.pcpd.ph/uploads/products/a0f665f46159a3b5f182b98cca300d97.pdf. Accessed 30 June 2015.

Balgos, M.C. 2005. Integrated coastal management and MPAs in the Philippines: concurrent developments. Ocean and Coastal Management 48:972–995.

Bennett, N. and P. Dearden. 2014. Why local people do not support conservation: Community perceptions of marine protected area livelihood impacts, governance and management in Thailand. Marine Policy 44:107-116.

Blyth, R., K. Michel, E. J. Gareth and P. Hart. 2002. Voluntary management in an inshore fishery has conservation benefits. Environmental Conservation 29:493-508.

Boeh, W., R.F. Subade, L.G. Geganzo and A.L.A. Subade. 2013. Zooming-in Co-management of Coastal Resources to Community Level: a Case in Southern Iloilo, Philippines. Asian Fisheries Science 26: 183-197.

Chang, K. C., H.H. Hwung and C. T. Chuang. 2012. An exploration of stakeholder conflict over the Taiwanese marine protected area. Ocean and Coastal Management 55:36-41.

Committee on Social Inclusion, Participatory Democracy and Human Rights. 2010. Zero Poverty 2020: The case of Concepcion, Philippines. United Cities and Local Governments UCLG.

http://www.uclgcisdp.org/sites/default/files/Concepcion_2010_en_final.pdf. Accessed 22 October 2014.

Courtney, C. and A. White. 2000. Integrated coastal management in the Philippines: Testing new paradigms. Coastal Management 28:39-53.

Davos, C., K. Siakavara, A. Santorineou, J. Side, M. Taylor and P. Barriga. 2007. Zoning of marine protected areas: Conflicts and cooperation options in the Galapagos and San Andres archipelagos. Ocean and Coastal Management 50:223–252.

Daw, T., J. Robinson and N. Graham. 2011. Perceptions of trends in Seychelles artisanal trap fisheries: comparing catch monitoring, underwater visual census and fishers' knowledge. Environmental Conservation 38:75-88.

Department of Interior and Local Government. 2014. Local governance performance management system. http://www.blgs.gov.ph/lgpmsv2/cmshome/index.php?pageID=23. Accessed 30 October 30 2014.

Fabinyi, M. 2010. The intensification of fishing and the rise of tourism: Competing coastal livelihoods in the Calamianes Islands, Philippines. Human Ecology 38:415-427.

Fernandez, C. and K. Pham Do. 2010. Logit and principal component analyses of the management of marine protected areas in North-eastern Iloilo, Philippines. Asia Pacific Development Journal 17:97-122.

Fidelman, P., L. Evans, S. Foale, C. Weible, F. von Heland and D. Elgin. 2014. Coalition cohesion for regional marine governance: A stakeholder analysis of the Coral Triangle Initiative. Ocean and Coastal Management 95:117-128.

Fishbein, M., and I. Ajzen. 1975. Belief, attitude, intention, and behaviour: An introduction to theory and research reading, MA: Addison-Wesley. 578 pp.

Garces, L., M. Pido, M. Tupper and G. Silvestre. 2013. Evaluating the management effectiveness of three marine protected areas in the Calamianes Islands, Palawan Province, Philippines: Process, selected results and their implications for planning and management. Ocean and Coastal Management 81:49–57.

Ibrahim, H. 2013. Towards an effective framework for coastal zone management: The Egyptian experience. Journal of Coastal Conservation 17:601–613.

Jentoft, S., T. van Son, and M. Bjørkan. 2007. Marine protected areas: A governance system analysis. Human Ecology 35:611–622.

Johansson, S. 2011. Conceptualizing and measuring quality of life for national policy. FIEF Working Paper. 171 pp.

Krumpal, I. 2013. Determinants of social desirability bias in sensitive surveys: a literature review. Quality and Quantity 47 :2025-2047.

Labiste, M. n.d. . Project monitoring and evaluation getting engaged, getting involved in Iloilo. http://www.angelfire.com/journal2/icode/pmec.html. Accessed 22 October 2014.

Launio, C., Y. Morooka, H. Aizaki and I. Yoshiaki. 2010. Perceptions of small-scale fishermen on the value of marine resources and protected areas: case of Claveria, Northern Philippines. International Journal of Sustainable Development and World Ecology 17 : 401-409.

Liu,J.,Z. Ouyang and H. Miao. 2010. Environmental attitudes of stakeholders and their perceptions regarding protected area-community conflicts: A case study in China. Journal of Environmental Management 1:2254-2262.

Lowry G.K., A.T. White and P. Christie. 2009. Scaling up to networks of MPAs in the Philippines: biophysical, legal, institutional, and social considerations. Coastal Management 32:274–290.

Pita, C., I. Theodossiou and G. Pierce. 2013. The perceptions of Scottish inshore fishers about marine protected areas Marine Policy 37:254-263.

Pouta, E. 2003. Attitude-behaviour framework in contingent valuation of forest conservation. Dissertation. Department of Forest Economics, University of Helsinki. 57 pp.

Roberts, C.M., J.A. Bohnsack, F. Gell, J.P. Hawkins and R. Goodridge. 2001. Effects of marine reserves on adjacent fisheries. Science 294:1920-1923.

Rockloff, S. and S. Lockie. 2006. Democratization of coastal zone decision making for indigenous Australians: Insights from stakeholder analysis. Coastal Management 34:251-266.

Rockloff, S. and S. Lockie. 2004. Participatory tools for coastal zone management: Use of stakeholder analysis and social mapping in Australia. Journal of Coastal Conservation 10:81-92.

SAS Institute Inc. 2014. SAS customer support: Principal component analysis. http://support.sas.com/publishing/pubcat/chaps/55129.pdf. Accessed 20 October 2014.

Silva, M. and P. Lopes. 2015. Each fisherman is different: Taking the environmental perception of small-scale fishermen into account to manage marine protected areas. Marine Policy 51:347–355.

Svensson, P., L. Rodwell and M. Attrilla, M. 2010. The perceptions of local fishermen towards a hotel managed marine reserve in Vietnam. Ocean and Coastal Management 53:114-122.

Uychiaoco, A., P. Aliño and A. Dantis. 2000. Initiatives in Philippine coastal management: An overview. Coastal Management 28:55-63.

West, P., J. Igoe and D. Brockington. 2006. Parks and peoples: The social impact of protected areas. Annual Review of Anthropology 35:251–77.

White A.T., P.M. Aliño and A.T. Meneses. 2006. Creating and managing marine protected areas in the Philippines. Cebu City (Philippines): Fisheries Improved for Sustainable Harvest Project, Coastal Conservation and Education Foundation, Inc. and University of the Philippines Marine Science Institute. 83 pp.

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