Understanding Community Support Towards Three Marine Protected Areas in the Visayas Region of the Philippines

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Abstract

Community support towards Natural Resource Management (NRM) strategies is thought to be crucial for their success and sustainability. This study considers the case of community based Marine Protected Areas (MPAs) in the Philippines where, despite their proliferation many are failing to achieve their objectives. The lack of acceptance and support from the adjacent community is thought to lead to these "failures" of MPAs. Very little work however has been carried out to understand support towards MPAs and what influences it.

I define support as the combination of attitudes and relevant environmental action undertaken with regards to the already implemented MPA. This thesis seeks to understand "community support" by determining:

1. What factors influence attitudes towards MPAs?

2. What factors influence actions towards MPAs?

3. What is the relationship between attitudes towards the MPA and MPA related actions?

I combine both quantitative and qualitative research methods to help determine which factors are associated with community support but also to help explain how these factors influence support. Fisher questionnaires, Semi Structured Interviews, In depth interviews and Focus Groups were carried out at three different villages with adjacent MPAs within the Visayas region of the Philippines.

A number of MPA design and MPA management factors as well as individual feelings, emotions and socio-economic characteristics were found to influence support through a multitude of ways. The plurality of factors identified, their interconnectedness and the way their impacts on support varies through time and between individuals within a community makes it clear there is no simple solution as to which set of factors are necessary for prolonged support. Nevertheless we now have a clearer idea as to how best to design, manage and implement an MPA in a way that is supported by the adjacent community.

Table of Contents

Tables and Figures

List of Tables

List of Figures

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Chapter 1: Introduction

Towards the end of 2006, I found myself reflecting on the two years I had spent studying Biology at undergraduate level. I often felt I should have studied an Ecology and Environmental degree instead. I was also pretty sure that I did not want to pursue an academic career…

One specific module in my final year changed my mind. It was based on fisheries and marine conservation. Although my notes are most likely scattered in an attic somewhere, I remember one quote in particular quite vividly. The discussion was on the use of Marine Protected Areas (MPAs) and how a number of small, connected MPAs could scale up to form a network. The message was clear, MPAs are:

"a win-win scenario"

They protect fish stocks and conserve biodiversity but also can provide more fish for fishermen in the near future and hence provide socio-economic benefits.

At this point, the situation for me was very simple. The future of oceans, their fisheries and their biodiversity are in peril yet we have only one apparently clear solution; MPAs. We were taught however that only a tiny proportion of the oceans were protected and more MPAs were needed. I wanted to understand why there were so few MPAs and found out rather quickly that one main reason was a lack of "community support".

The rationale for this thesis follows on from this, its predominant motivation is to try and understand why there are so few working MPAs through exploring in more depth what determines community support. I explain in this chapter, why coastal resource management (and in particular MPAs) is of special importance in the Philippines. Yet despite their increase in popularity in the region, many are thought of as failing to achieve the objectives placed on them. I then reveal how the lack of acceptance and support of the adjacent community is often thought to lead to the "failures" of MPAs.

This then leads me to describe what I mean by "community support" and to lay out the aims and structure of the thesis.

1. A need of Marine Protected Areas (MPAs) in the Philippines

This study considers the case of MPAs in the Philippines. Their reef fisheries provide livelihoods for more than a million small scale fishers (White et al. 2000). The coastline is fringed with 25,000 km² (Burke, 2011) of coral reefs containing over 2,500 fish species (Froese and Pauly, 2007) and nearly 500 different hard coral species (Licuanan and Capili, 2003). These reefs provide crucial ecological services such as the maintenance of biodiversity and shoreline protection (Shay O'Farrell et al., 2006). Despite being some of the most biologically diverse reefs in the world, 97% of these reefs are at risk from sedimentation, pollution and fishing pressure (Spalding 2001). Furthermore, Roberts et al (2002) have ranked the Philippines as having the highest threats to reefs in a centre of endemism (where species are particular to the region) of huge conservation importance.

At the same time that this environmental degradation is taking place in the Philippines, a large percentage of the population lacks the resources to meet its basic needs (Gjertsen 2005). In 2006 almost 33% of the population lived below the Philippines' poverty threshold (NSCB 2006). Most live in rural, coastal areas and depend on subsistence farming or fishing for a livelihood (IFAD 2010). However, it is thought that agriculture alone cannot make a substantial difference in levels of unemployment and poverty (IFAD 2010). Whilst the Filipino population continues to increase annually and pressures mount to export commodities to service external debt, natural resources are extracted at an ever increasing rate (Central Intelligence Agency 2005). Furthermore, overfishing in the Philippines has already reduced fish stocks in many areas to well below their maximum sustainable yields (Green, 2003; Tomascik and Mah, 1997) and the Filipino population is expected to double by 2040 (NSCB, 2013). Given that coral reefs provide livelihoods for coastal communities (Wells et al. 2006) and that reef fish are the primary sources of protein for most Filipinos (White & Cruz-Trinidad 1998) it is imperative to maximise fishery production to sustain nutritional wellbeing but also to ensure that fisheries do not collapse.

Conventional approaches however, have focused largely on single species management with a geographical focus in the developed world and have not served well the fishery management needs of the developing world (McConney and Mahon, 1998). One major reason why conventional fisheries management is unlikely to be implemented in developing countries where the impact of decreasing fish stocks and collapse of fisheries are greatest, is that biophysical data in these regions is sparse (Ban et al. 2009; Bell et al. 2006) which, in turn, may be due to a fisheries management focus in the developed world. It is important therefore to develop an efficient and achievable way to manage fish stocks targeted in these critical areas. One such technique often advocated is the use of MPAs.

There is potential for MPAs to provide a wide range of benefits (the evidence for this is highlighted in chapter 2) however it seems that many are failing to achieve all or part of the expectations that are placed on them.

2. Why are these MPAs "failing"?

The intellectual puzzle that drives this thesis is to determine why conservation or natural resource management techniques such as MPAs are frequently failing to achieve the objectives and aims that are placed on them by furthering an understanding of community support towards them. Indeed, before starting my PhD, I was intent on trying to understand how best to improve MPAs as fisheries resource management techniques.

In recent years, much work has been undertaken to determine which factors or variables are linked to MPA, coastal resource management success and common-pool natural resource management in general. Ostrom (2007a) argues that many variables have been identified by researchers as affecting patterns of interactions and outcomes observed in empirical studies of Socio-ecological Systems (SESs). These factors are not tied solely to one discipline and may involve issues to do with: (1) a resource system (e.g., fishery), (2) the resource units generated by that system (e.g., fish), (3) the users of that system, and (4) the governance/institutional system (Ostrom et al., 2007a).

Some studies argue that there are some specific factors which contribute to the success or failure of an MPA. For example, MPA age (Pajaro et al., 2010) or financial and technical support from municipal government (Milne and Christie, 2005) were both identified as being important contributors to the success or failure of MPAs in the Philippines. Other work has been more inclusive and suggested a number of factors or variables which can contribute to the success of MPAs. Pollnac et al (2001) for example determined the six best predictors for MPA success as being: small population size; perceived crisis in fish populations before MPA; successful alternative income projects; high level of community participation in decision making; continuing advice from implementing organisation and adequate impacts from municipal government. Christie et al (2009) also suggest certain MPA guidelines after identifying the key variables that are correlated with and predictive of MPA success. There are also a growing number of other studies which attempt to determine what influences the success or sustainability of an MPA. A number of different resource systems, resource units, user and institutional factors influencing MPAs have therefore been deduced (see Appendix 1). However, despite these efforts, MPAs in the Philippines and elsewhere, although increasing in number, are not meeting their objectives in the majority of cases.

3. The importance of Community Support

Irrelevant of whether one is concerned with economic, biological, socio-cultural or management indicators, an overwhelming number of studies have identified that the support of the community towards MPAs or other conservation strategies is linked towards their success (Aldon et al., 2010; Allegretti et al., 2012; Beger et al., 2004; Christie, 2005b; Christie and White, 1997; Courtney and White, 2000; Infield and Namara, 2001; Russ and Alcala, 1999; Stoffle and Minnis, 2007; Tissot et al., 2009; Yasué et al., 2010). Others are more specific and argue that it is the perception of the affected community towards MPAs and their impacts (Dimech et al., 2009; Gelcich et al., 2008; Pomeroy et al., 1997; Stoffle and Minnis, 2007) or the attitudes of individuals towards the MPA(Allendorf, 2007; Gelcich et al., 2005; Lan, 2009; Pita et al., 2011) that are of importance. White et al (2006) conclude that in the Filipino context, the success of most small MPAs is thought to lie in the amount of support within the community.

There has been some recent empirical work seeking to identify what influences support towards MPAs (Hoelting et al., 2012). However, overall, very little empirical evidence as to what drivers underpin the support of the communities towards adjacent MPAs and how it can be boosted has been collected (Fig.1.1). This is surprising given the importance of community support for the effective implementation and maintenance of MPAs. This thesis therefore seeks to understand community support and determine what factors influence it.
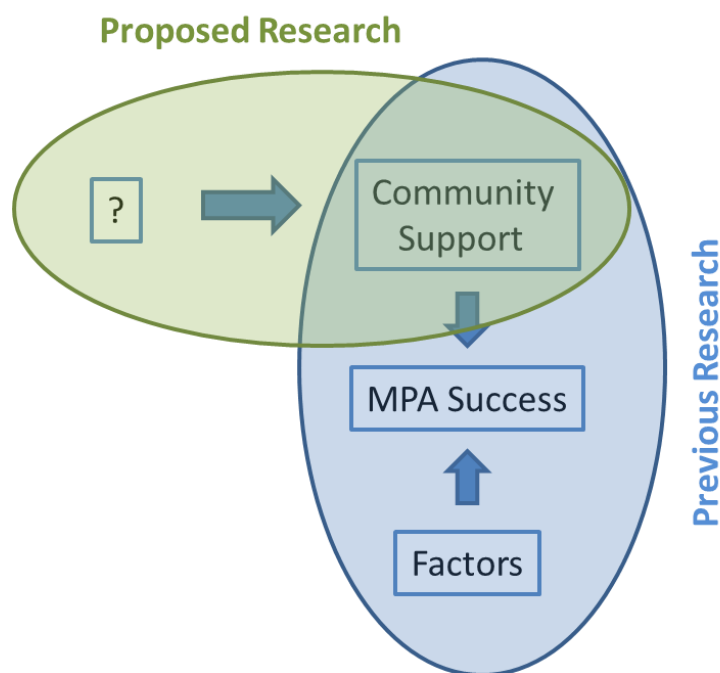
Fig.1.1. Rationale for investigating community support towards MPAs

Defining community support

Whilst the importance of community support towards MPAs is acknowledged, it has not yet been clearly defined. It is implied in most of the research highlighting the importance of community support above, that support involves acceptance and positive or negative perceptions of MPAs. However, for the purpose of this research, community support is defined as the combination of "attitude" towards the MPA and relevant "environmental action" undertaken with regards to the already implemented MPA. In turn I use Petty and Cacioppo's (1996) definition of attitude as "a general and enduring positive or negative feeling about some person, object or issue"

(Heimlich and Ardoin 2008) and Stern's (2000) definition of pro-environmental action as "behaviour intentionally undertaken to benefit the environment". In this context, I focus on actions undertaken that benefit the MPA which entails enforcement, compliance and/or monitoring of the MPA. To help explain this definition, it is useful to draw from environmental psychology literature and the various theories which attempt to explain pro-environmental behaviour. Attitude is used as a precursor or determinant for most models that attempt to explain pro environmental behaviour or action (Kollmuss and Agyeman 2002, Bamber and Moser 2007). However it is now widely believed that there is a large gap between attitude and behaviour and that attitude does not directly determine behaviour (Bamberg and Möser, 2007; Tanner, 1999). I built on this insight in my research design by individually exploring community support in terms of both environmental action and attitudes towards the MPA

Although it may initially be counter intuitive, community support cannot just entail pro-environmental behaviour towards an MPA, as those acting pro-environmentally (such as complying, monitoring and enforcing) may be doing so despite a negative attitude towards the MPA or for other reasons. For example, some individuals may be complying with MPA rules solely because they are scared of being caught and made to pay a fine and not because of a positive attitude towards it. Furthermore, someone might have a positive attitude towards the MPA but not have any plausible action to undertake (i.e. a non-fisher), or there may be barriers operating, preventing the individual acting to benefit the MPA. I therefore undertake a more thorough and complex exploration of community support that seeks to investigate these potential tensions and ambiguities.

This definition of community support would not be complete without an explanation as to what I view as constituting a "community". For the context of this research I view communities as small spatial units. *Barangays* are the smallest administrative division in the Philippines and I argue that each *barangay* could be viewed as a community. They compromise members of a small group, sharing the same geographical space who are more likely to interact with each other more often (Agrawal and Gibson, 1999). Frequently it is these barangays that are involved in using, managing and sometimes protecting their coastal resources (White et al.,

2005b). Indeed, the MPAs studied as I shall explain later (chapter 3), are situated opposite individual barangays and hence will have a direct impact on the residents of the barangay. I argue it is therefore important to understand the support of this community viewed as the residents of the directly affected *barangay*.

Such representations of community however, ignore the critical interests and processes within communities, between communities and of social actors. As can be seen from my disaggregation of support as both individual attitudes and actions, it is clear that I also focus on intra community issues and processes. A growing number of studies found that irrespective of how one defines community, they rarely comprise just one group of individuals who possess similar endowments or goals (Agrawal and Gibson, 1999). I therefore consider that there are multiple actors with multiple interests within these *barangays* that make up communities, that these actors interact with each other via a number of different processes and that institutional arrangements structure these interactions. These aspects of communities will prove essential when trying to understand support towards MPAs and why and how this may vary within a community.

Whilst many advocate for increased support and argue that MPAs will not attain objectives placed on them without the support of the adjacent community, the notion of community support itself is a very complex concept. Despite the importance attributed to it, very little work has undergone to understand what influences it. I argue that a lack of understanding of community support is an important knowledge gap which is a key limiting factor on the further spread and success of MPAs.

4. Aims and Structure of Thesis

The aim of this thesis is to rigorously probe this notion of community support in order to develop greater conceptual clarity and depth of understanding about what constitutes community support, how it arises and whether or not it translates into action. My overarching aim therefore is to "Understand community support towards MPAs in the Philippines".

To help answer the overarching aim, I use the definition of community support outlined above, and formulate a number of sub-questions.

1. What factors influence attitudes towards MPAs?
2. What factors influence actions towards MPAs?
3. What is the relationship between attitudes towards the MPA and MPA related actions?

The following chapter introduces and summarises some of the main streams of literature that were important in formulating my research questions and that help explain some of the findings of the empirical chapters. Chapter 3 outlines the research methods and techniques employed. It describes my research journey and explains the site selection process as well as providing contextual information for each village. Chapters 4-8 are empirical chapters which describe each factor found to influence attitudes and MPA related actions and the mechanisms at play. Chapter 4 takes a solely quantitative perspective and uses multiple regression analyses to determine what influences community support towards the MPA and looks at the relationship between attitudes and actions. Chapters 5-8 are conversely, mostly qualitative with some incorporation of descriptive statistics. They go deeper by providing an understanding of what influences attitudes, what influences their actions and by determining the sorts of mechanisms at play. The factors found to influence community support are broadly characterised as those involved with MPA design and MPA benefits, with MPA management, with socio-economic characteristics and those involved with feelings and emotions of individuals. These more qualitative chapters look at the influential factors case by case and analyse them independently of others. Whilst chapters 4 and 5 focus primarily on factors already identified in the literature and hypothesised to influence support, chapters 6-8 include a mixture of factors identified a priori and factors that emerged from inductive exploration of my data. The final chapter synthesizes these findings and reflects on the use of "community support" as a concept and the difficulties associated with understanding community support. It also summarizes the findings and how they relate to the overarching question of the thesis, and looks at the contributions it has made to the relevant literature.

Chapter 2: The Theoretical Underpinnings of Community Support

I outline in the previous chapter the rationale for this thesis, to further our understanding of community support, which I disaggregate as attitudes and actions. This chapter seeks to describe some of the streams of literature that served as the starting point of my research journey and helped in formulating my methodological approach.

Firstly, I explain how the limitations of conventional fisheries management has led to a growing interest in the use of MPAs and describe the ecological and socio-economic benefits expected of MPAs and whether these are achievable. I then outline the importance attributed to interdisciplinary approaches to fisheries management and how this is thought to improve MPAs. This allows me to introduce specifically the Socio-ecological system (SES) literature, Common Pool Resource (CPR) literature and Pro-Environmental Behaviour (PEB) literature and show how together, they can help provide an understanding of community support towards MPAs. This chapter serves to introduce some of the literature and the main concepts that are used throughout the thesis, many of which will be revisited in more depth in light of my research journey in the concluding chapter.

1. Conventional fisheries management and the turn towards MPAs

Current state of fisheries

Humans have fished since prehistoric times and the status and future of fisheries has been a contentious issue in the scientific and management community for over a century (Hilborn, 2007b). However, since the 1950's, fisheries have expanded faster than ever before. This huge increase in global fishing efforts led to rapid increases in catches (Pauly et al., 2002). Few areas of the ocean now remain unexploited, and it is the economic cost rather than technology that limits fishing power (Hilborn et al., 2003; Jennings, 2001). However, although most of the world's fisheries continue to produce substantial yields, it is now thought that the total world catch from marine stocks has peaked and may now be in decline (FAO, 2007, 2012; Sumaila, 2012).

Many fisheries are overfished and many more stocks appear to be heading toward depletion (Hilborn et al., 2003). There is now little doubt that we are suffering a "fishery crisis", global limits to exploitation have been reached and that recovery of depleted stocks must become a cornerstone of fisheries management (Worm and Branch, 2012). It seems clear therefore that the future of the world's fish stocks is in peril. This failure to manage fish stocks sustainably and the collapse of a number of fisheries worldwide have led many to question the efficiency of current fisheries management.

For many years, the objective of fishery management was to maximize the yield taken from a fishery without compromising future catches (Jennings, 2001). However there is still no agreement on the exact levels to which fishing mortality must be reduced and how to reduce by-catch to ensure the sustainability of catches (Browman and Stergiou, 2004). Furthermore, these conventional approaches to fisheries management often require detailed, accurate and high contrast data to predict the current and future state of fish stocks (Costello et al., 2012; Kelly and Codling, 2006). They are therefore of limited use when data is unreliable or unavailable, which is often the case given the complex nature of marine ecosystems. Furthermore, most stock assessment data required for these scientific approaches are from developed countries (Worm et al., 2009) and the required information is often not available from developing countries. Johannes (1998) argues that the costs of scientifically assessing each stock would vastly outweigh the total value of each fishery. Fisheries may even develop and become critically in need of management before any conventional scientific data can be collected (Berkes et al., 2006).

The management of fisheries in developing countries is far from achieving any kind of optimality (Johannes, 1998). The inability of conventional management tools to protect fish stocks could have a devastating impact on these countries where many are dependent on fisheries. For example, it is thought that out of the 120 million people involved in fish production and capture, 95% are from developing countries (Allison and Ellis, 2001). In many poor coastal communities such as the Philippines, people depend directly on reef species for most of their protein needs (Gjertsen, 2005). A large decline in fisheries would hence threaten their livelihoods.

Are MPAs the solution?

A large number of management tools are aimed at preventing overexploitation. However Marine Protected Areas (MPAs) have become increasingly popular (McClanahan and Mangi, 2001) due, in part, to their potential benefits and the failures and infeasibility of "data intensive" conventional forms of management. Many MPAs are thought to be failing to reach their objectives, often attributed to a lack of support (see chapter 1). Nevertheless, they are becoming a mainstream management tool in virtually all the world's oceans, and Parties to the Convention on Biological Diversity (CBD) have recently re-committed to set aside at least 10% of the world's oceans to MPAs by 2020 (Fox et al., 2012).

This interest in MPAs reflects dissatisfaction with conventional approaches to the conservation of marine ecosystems and fishery management (National Research Council, 2001). MPAs are often viewed as being a simple and cost effective way to increase stocks in diverse and complicated tropical fisheries (Roberts and Polunin, 1991; Roberts and Polunin, 1993). They have been found to increase abundance of important organisms, restore food webs, protect key habitats and sustain ecosystem services (Halpern et al., 2010) but are also argued to be socially viable and are considered easier to enforce than other fisheries management techniques (Christie and White, 2007). Indeed, MPAs have been promoted as a "win-win" approach, in that they can confer both biodiversity benefits and fish stock conservation benefits (Gell and Roberts, 2003b). The belief therefore, is that these strategies would be accepted and supported by communities, especially if these benefits are directly perceived. Although this may occur sometimes (Gjertsen, 2005) I demonstrate throughout the chapter, this is not necessarily the case. Many scientists still remain sceptical of the use of MPAs as a fisheries or conservation management tool. I present some of the evidence for and against MPAs later in this section.

For this study, MPAs are defined as "any area of the intertidal or sub-tidal terrain, together with its overlying water and associated flora, fauna, historical, and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment" (Kelleher and Kenchington, 1992). There are however, a huge range of different MPA tools and many different associated definitions.

Agardy et al (2003) argue that the diverse array of MPA objectives, goals and definitions varies enormously from place to place, "so much so that one could almost say that every MPA is unique, having been tailored to meet the specific circumstances of the place where it is established". Kelleher and Kenchington's (1992) definition is used as it is a broad-term definition of MPAs and hence describes the full configuration of protected areas in coastal areas and oceans (Agardy et al., 2003). "Marine Protected Area" is therefore used as a single, general umbrella term which can apply to a wide range of different marine habitat protection or resource management tools. A distinction can however be made between MPAs as "no take" marine reserves in which all forms of extraction and disturbance by humans are permanently banned and multiple use MPAs with mixed harvest, restricted harvest, and/or complete harvest prohibition areas.

Different types of MPA can accomplish a broad range of different objectives and there are currently two broad expectations placed on them (Pomeroy et al., 2005b):

1. Ecological expectations: to maintain or restore marine biodiversity, ecosystem function and to protect critical habitat.
2. Socio-economic expectations: to improve socioeconomic conditions mainly by increasing revenues from fisheries production in fished areas, either through transport of larvae from spawning stocks within the MPA (Gerber et al., 2005a) or by a net emigration of adult fish to adjacent fished areas, termed "spill-over" (Abesamis et al., 2006; Russ et al., 2005).

The next two sections provide evidence as to whether these expectations are met in practice. This has potentially severe repercussions for support, as if these expectations are not met, it may lead to negative attitudes and behaviours regarding MPAs.

Ecological and Social Expectations

Evidence for ecological benefits of MPAs has accumulated over the last few decades and McClanahan and Mangi (2000) review numerous field studies that have shown that MPAs have a higher abundance of fish than adjacent fished reefs. One influential study, which analysed 80 different MPAs concluded that higher average values of density, biomass, average organism size, and diversity were found inside reserves and

that these biological responses inside marine reserves "appear to develop quickly and last through time" (Halpern and Warner, 2002). Many studies have indeed demonstrated the positive ecological effects of MPAs both in terms of biomass within MPAs (Alcala et al., 2005; Babcock et al., 2010; Hargreaves-Allen et al., 2011; Mora et al., 2006; Russ and Alcala, 1996b) and in terms of larval export outside of MPAs (Pelc et al., 2010). The large body of work demonstrating the ecological benefits of MPAs has led Gell and Roberts (2003a) to argue that, by integrating large scale networks of marine reserves into fishery management, a reversal of global fishery declines could occur and provide urgently needed protection for marine species and their habitats.

There are however, certain limitations. Some argue that protected areas can have varied effects on particular taxa and that observed benefits of MPAs do not apply to all species at all times (Claudet et al., 2006; Mora et al., 2006). Hilborn et al (2004) reiterate this point by arguing that MPAs are poorer than conventional techniques at protecting highly mobile species. Others suggest that the conservation effect of a marine reserve is critically dependent on the size of the MPA and little would be gained by solely establishing small MPAs (Hannesson, 1998). Furthermore, studies also disagree on the amount of time required for exploited fish species to recover (McClanahan, 2011; Stobart et al., 2009). One view is that recovery could be relatively rapid and occur within 1 to 3 years (Halpern and Warner, 2002) whilst others have argued that the duration of protection inside "no-take" reserves to ensure full recovery of certain exploited fish stocks may take 3 to 4 decades (McClanahan, 2000; Russ and Alcala, 2004).

Another issue that also needs to be addressed is that of displaced fishing effort as MPAs can be thought of as a manipulation of fishers' spatial behaviour. The implementation of an MPA means that those fishers who used to fish in that area have to fish in other areas of the fishery (Sen, 2010; Valcic, 2009). Ecosystems outside the MPA may become degraded as this effort is reallocated and fishermen are forced to fish in a smaller space. The potential ecological benefits of MPAs may therefore be undermined (Botsford et al., 2009; Kellner et al., 2007) which may in turn have repercussions in terms of their attitudes and behaviours regarding the MPA.

Socio-economic expectations are also placed on MPAs and evidence both for and against socio-economic benefits arising from MPA implementation is growing. Gell and Roberts (2003a) however, argue that there is good evidence that fisheries have benefited through spill over of juveniles and adults, and export of eggs or larvae. They review a number of studies on fish movement tagging which show significant movement of fish between protected and fished areas. They also looked at catch per unit effort (CPUE) which had also increased significantly at varying distances away from MPAs. Some other early work demonstrating fishery spill-over was done at Apo and Sumilon Island in the Philippines. Alcala and Russ (2006) found that the spill-over effects from MPAs in these areas were small but significant. Furthermore the benefits from these MPAs served as models and inspiration for the expansion of MPAs nationally in the Philippines. One recent paper assessed the development of the exploited fish community inside and around an MPA 8 to16 years after fishing had ceased inside the reserve. They found clear evidence of fish spill-over as commercial yields at the MPA border increased continually and fish size and diversity was larger, closest to the MPA (Stobart et al., 2009). Irrespective of potential increases in number or of size of fish available for fishers to catch, Januchowski-Hartley et al (2013) found that MPAs may reduce "flight distances" (distance at which an organism begins to feel an approaching threat) of fish and hence improve their ease of catch.

There is a large body of evidence in favour of fishery benefits which could in turn lead to support towards MPAs. However it is important to note that the potential scale of spill-over vary across species and ecosystems (Gell and Roberts, 2003a). Indeed, fishery spill-over is argued to be strongly species specific and depends on species size and mobility (Tupper, 2007). Shipp (2003) further argues that MPAs will only improve sedentary stocks. Consequently their low mobility will minimise fishery spill-over. Furthermore, recovery rates of species in the adjacent fisheries differ between species, locations and the size of the established MPAs and can take decades (McClanahan and KaundaArara, 1996; Russ and Alcala, 1996a; Stobart et al., 2009). McClanahan and Mangi (2001) for example found that total CPUE in Kenya declined at all landing sites over 5 years regardless of whether an MPA was present or not. This also suggests that MPAs may improve CPUE in certain static systems but no benefits may be perceived to arise out of the MPA if the total fishing effort in the fishery is increasing. Furthermore, even if fishery spill-over is occurring, there is also

considerable debate as to whether it can compensate for lost fishing grounds and therefore may not lead to net increases in catches (Halpern and Warner, 2003; McClanahan and Mangi, 2000) These findings lead some to conclude that fishery spill-over evidence is still lacking (Kareiva, 2006).

There are also other important economic benefits arising from the establishment of an MPA such as increas in tourism, and more specifically dive tourism which could lead to support towards MPAs. This is particularly highlighted in Apo and Sumilon Island in the Philippines where the reserves have played a critical role in enhancing tourism activities (Alcala and Russ, 2006). Oracion et al (2005) also suggest that people can choose to become active in the MPA movement because the process itself (as opposed to the intended regulatory outcome) has a solidarity value in bringing people together and motivating people to take action. There is hence another benefit arising from the use of MPAs which is an increase in social capital of the adjacent communities involved in MPA implementation.

On the other hand, MPAs have also been found to have different negative impacts on adjacent communities. These potential costs of MPAs are rarely mentioned (Hilborn et al., 2004). Christie (2004) and Oracion et al (2005) demonstrate that the implementation of MPAs can lead to intense interpersonal conflicts within the community. These conflicts may be due to a number of different factors but are often grounded in class distinctions, differences in perceptions towards environmental management and inequitable sharing of economic benefits (Christie, 2004).

Although there are a number of broad socio-economic benefits argued to occur as the result of MPA implementation there is also a growing body of literature demonstrating the limitations of "fishery spill-over" and the negative socio-economic impacts that MPAs may have on adjacent communities. It is difficult to determine its' impact on the affected communities. After reviewing the scientific literature Mascia et al (2010) concluded that MPAs can demonstrate both positive and negative impacts on fishing communities and describe MPAs as "neither uniformly good nor uniformly bad for coastal communities". The implementation of MPAs can reduce the size of fishing grounds. Furthermore, they are often implemented in areas of commercial fishing interest. If fishery benefits are negligible or are not occurring, together with a

decline in fish stocks in surrounding areas, these losses of traditional fishing grounds may impact adjacent communities, especially if there are no alternative livelihoods available.

There is therefore a "mixed bag" of evidence as to whether MPAs are meeting the socio-economic or ecological expectations placed on them. As mentioned in the previous chapter, many studies are attempting to improve MPAs by determining what influences their success. However this notion of success has also been criticised.

The problem with "success"

One issue that arises when considering MPA success is that each MPA is thought to have a unique set of objectives and goals and hence there will be different criteria of "success" in each specific site (Agardy et al., 2003). MPA success will mean different things to different people and in different contexts. However, even within a specific context, or when considering a specific MPA there may also be problems when assessing the MPA success. Christie (2004) argues that although there is a strong linkage between the social and biological success of MPAs, MPA research is generally lacking detailed accounts of the social implications of MPAs and the activities associated with them. Hence, MPAs that meet narrow defined biological goals are generally presented as "successes" despite the fact that they are in fact social "failures" which can heighten interpersonal conflict within the community.

There can therefore be different types of success within a site. Success can be related to the social dimension of the system (economic, attitudinal and behavioural aspects) or to the condition of the resource itself and aspects of the wider ecology. By reviewing the literature on coral reef co-management, Wamukota et al (2011) find that most cases had diverse visions of success. Efforts have been made to try to incorporate these different visions of success to get a more holistic and accurate picture. Hilborn (2007a) argues that there are four major categories of fisheries objectives: Biological, economic, social and political. This thought is echoed by Himes (2009) (Table.2.1). These various objectives may sometimes be compatible but may also be in conflict. What is beneficial for one group may be disadvantageous to the other and hence the variety of stakeholder interests and needs may call into

question the notion of MPA success (Fishbein and Ajzen, 2009; Pajaro et al., 2010). This may have important repercussions for community support towards MPAs. Whilst biological or ecological success may lead some to view the MPA as beneficial and hence support it, others may view it as a social failure which has divided and led to conflict within the community. It seems therefore that this notion of "success" is riddled with problems and such an approach to understanding community support may be a limitation to furthering our understanding of how to improve MPAs.

I take a slightly different approach to understanding MPAs. I explain in chapter 1 how many attribute a huge importance to community support for MPAs to achieve the various goals and expectations placed on them. However it seems that there is a problematic circularity in which community support can be seen as both a product of MPA success but also a necessary pre requisite of success. Although community support is rarely defined in the MPA literature, often it is implied that it relates to attitudes and perceptions of the community towards the MPA (see chapter 1). Support is then often considered or assumed to be a predictor of compliance, in that a supported MPA leads to higher levels of compliance (Beger et al., 2004; Pomeroy and Carlos, 1997; White and Vogt, 2000). In turn, empirical work has elucidated a link between levels of compliance or enforcement and various measures of MPA success (Kritzer, 2004; McClanahan et al., 2009; McClanahan et al., 2006). As discussed above, a successful MPA can then provide the adjacent community with ecological or socio-economic benefits. As I illustrate in figure 2.1, this can then feedback and influence the support of the community towards the MPA.

Table 2.1. Economic, biological, socio-cultural and managerial perspectives on performance and success of MPAs. From Himes (2007)

Component	Indicators of performance
Economic	• Fishing sector: Increase in CPUE Increase in profits Increase in the economic efficiency of fishing sector Presence of spillover effect • Tourism sector: Increase in locally retained income derived from tourism Increase in the numbers of tourists • Cost:benefit ratio is maximised (including both market and non-market aspects) and an actual Pareto improvement is achieved
Biological	• Presence of reserve effect (increase in fish biomass and size and species richness, and minimised fluctuations) • Presence of refuge effect (increase in number and size of target species, increase in habitat complexity, spawners and juveniles protected) • Presence of spillover effect (increase in fish biomass outside of MPA) • Increase in overall well being of coastal resources
Socio-cultural	• Community is able to participate in management and play a role in decision-making • Costs and benefits are equally distributed across society • Community embodies a sense of ownership of the MPA • Stakeholder groups are educated and understand the importance of the MPA • Community supports MPA and doesn't feel penalised by its presence • Compliance with MPA regulations is maximised • Community benefits from the presence of the MPA (e.g. new sources of income) • Conflict is reduced between stakeholder groups • Stakeholders want the MPA to be a success and value its existence
Management	• A comprehensive and functional management plan and the presence of trained and experienced staff • Presence of adequate institutional structures and support • Operational and effective enforcement of MPA regulations • Input by all stakeholder groups in management decisions • Achievement of objectives specified in the management plan • Use of information and education regarding regulations and the importance of the MPA • High level of compliance with the regulations (i.e. low level of illegal activity)

Despite the growing number of studies which illustrate this important community support and MPA success cycle, most are still focusing on factors that are linked to MPA success and very little empirical work has sought to explore what influences community support or the link between MPA related attitudes and actions. Community support thus remains a "fuzzy" concept which is both a predictor and an outcome of MPA success. Instead, given the importance attributed to community

30

support for MPA success, I seek to further understand community support and explore what influences it. A focus on community support examines attitudes and behaviours with regards to MPAs and hence it is not necessary to determine which measures of "success" are being examined.
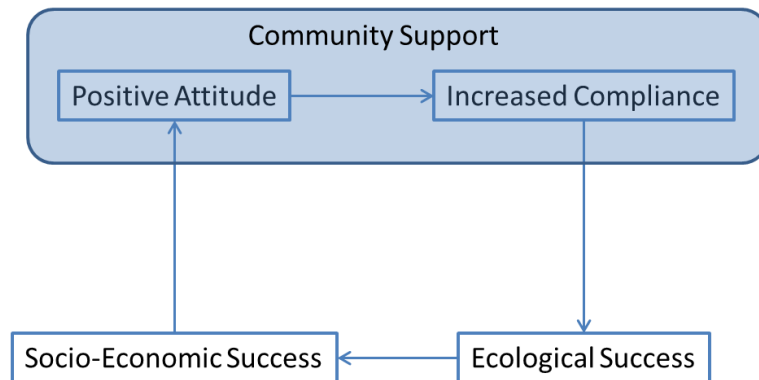
Fig.2.1. The community support and MPA success cycle

2. A new look at researching how MPAs work

This appreciation of the various expectations and objectives placed on MPAs in the Philippines and elsewhere has led to a plethora of more holistic and interdisciplinary approaches to fisheries management. Pita et al (2011) argue that research on MPAs tends to focus on ecological and conservation aspects of this fisheries management strategy and not on its human dimensions. It is argued that humans cannot be considered as separate from nature and there is a need to incorporate the dynamic interactions between societies and natural systems (Berkes, 2004).

Moving towards interdisciplinarity

There are numerous interrelated factors which contribute to a decline in fish stocks which are not easily isolated for management purposes. For example, Bell et al (2006) argue that conserving biodiversity and reducing poverty need to be addressed together. Aswani and Hamilton (2004) go further to say that fishery biologists will "rarely achieve ecological sustainability and the protection of marine biodiversity unless they seriously consider the social, economic, and political behaviours of the actors whose ecosystems they seek to conserve". Indeed, it is argued that short term biological gains from MPAs will likely disappear unless the social issues are addressed (Christie

et al., 2003). Jentoft (2000b) uses Durkheim's concept of anomie, that overfishing may be a consequence of normative confusion which occurs when social ties are weak and moral standards unclear. It follows that if communities disintegrate socially, it can lead to a threat to fish stocks as there are no more social norms in place to prevent overfishing. Yet despite the strong linkage existing between social and biological successes, MPA research and the resultant literature is argued to be lacking detailed accounts of the social implications of MPAs (Christie, 2004). Rosendo et al (2010) argue that the lack of attention given to social factors and dynamics is one of the main reasons for disappointing outcomes of MPAs. This is a an argument that applies to any form of sustainable development plans (Vella et al., 2009). An understanding of attitudes and actions towards these Natural Resource Management (NRM) strategies may help provide a solution to this problem.

The need for more interdisciplinary forms of fisheries management research is increasingly being recognized. Jentoft (2006) argues that ''natural sciences alone cannot meet the current challenges posed by the coasts'' and a more comprehensive and systemic approach is required that encompasses all the links that fisheries have with other sectors of the society. Stakeholders' views are of increasing concern as fisheries management involves social values, interests and power. Jentoft (2006) therefore suggests that fisheries management should be expanding and incorporating information from different disciplines.

Moving away from conventional specialist biophysical approaches to more interdisciplinary ones is necessary if we want to implement successful fisheries management strategies. It has become increasingly clear that purely biological objectives will not be met whilst social and economic considerations are not met (Beddington et al., 2007). But equally, social and economic objectives will not be met while a stock is in such a depleted state that the fishery is threatened (Beddington et al., 2007). Nevertheless, the prevailing biophysical perspective tends to regard the primary stakeholders as part of the problem instead of seeing them as the key to the solution (Bell et al., 2006). It is imperative that these approaches take the social, economic and political interests of stakeholders into consideration. Bell et al (2006) argue that both coral reefs and livelihoods will continue to be lost unless interests and involvement of coastal communities in fisheries management is acknowledged. An

understanding of community support is a way to see stakeholders as the solution by determining what leads to positive attitudes and actions which can benefit the MPA.

Socio-ecological systems (SES) thinking embraces this interdisciplinarity and attempts to tackle environmental and natural resource management issues with a more holistic approach. It provides a useful theoretical context within which I will situate more specific approaches to community support.

Socio-ecological systems (SES's)

Work on SES's clearly appreciates the interdisciplinary approach to framing and solving problems and is not only an area of study but can also be considered as a way to see the world itself. Berkes et al (2003) recognise that there is an emerging consensus regarding the need to look for broader approaches and solutions to resource and environmental issues. Distinctions that are often made between society and ecology are increasingly thought of as being arbitrary and unhelpful because of the many feedbacks which lead social and ecological systems to co-evolve over time (Colding et al., 2000). SES theory provides a useful perspective for linking these two domains (Hicks et al., 2009).

The study of social-ecological systems (SES) which include "societal and biophysical subsystems in mutual interaction" (Gallopin, 1991) has become influential in natural resource management in recent years. The SES approach is strongly interdisciplinary and argues that SESs cannot be captured using a single perspective but are best understood by the use of a multiplicity of perspectives (Berkes et al., 2003). SES research is closely associated with a number of subfields which combine social sciences with environmental issues. Together, they may help shed some light on the failures and successes of fisheries management and provide us with ideas as to how to improve current fisheries management practices by exploring this notion of community support.

Ideas of "resilience" of systems are closely linked to SES research (Folke, 2006). This resilience concept has three defining characteristics: the amount of change a system can undergo while maintaining its function and structure; its self-organisation capabilities; and its ability to build and increase the capacity for learning and

adaptation (Berkes et al., 2003). Unlike the old dominant "equilibrium" perspectives which have implicitly assumed a stable and resilient environment where resource flows could be controlled and nature would self-repair into equilibrium when human stressors were removed (Holling, 1973), the resilience perspective focuses on change and aims to manage the capacity of social–ecological systems to cope with, adapt to, and shape change (Folke, 2006). Indeed Berkes et al (2003) argue that "management processes can be improved by making them adaptable, flexible and able to deal with uncertainty and surprise by building capacity to adapt to change". SESs can therefore be considered as both complex and adaptive which require continuous testing, learning about and understanding in order to cope with change and uncertainty (Carpenter and Gunderson, 2001).

However, although "adaptable and flexible" management sounds like a good approach, similar to interdisciplinary approaches in general, it may be hard accomplish in practice. Adaptive management is often thought to lead to certain stakeholders furthering their own interests at the expense of resilience (Fabinyi, 2008). Indeed, Fabinyi (2008) describes how a contradiction can be observed between the resilience of a social-ecological system, and the interests of fishers in the Philippines. In this particular case, fishers with the support of the local government manipulated the MPA to improve their immediate socio-economic benefits at the expense of the ecological resilience of the socio-ecological system. It seems therefore that the wishes of stakeholders may be to increase the short term social or economic benefits and little to do with long term ecological function of the system in the future.

Nevertheless, it is important when considering resilience of systems (such as natural resource management strategies) to pay attention to the various needs and interests of those affected. Armitage and Johnson (2006) argue it is difficult to promote socio-ecological resilience when any SES comprises an array of diverse and contested interests. Indeed, this is another reason why understanding support of individuals (and more specifically their attitudes) towards NRM strategies such as MPAs is crucial for their success and may help contribute to improve the resilience of the SES in which it is embedded.

Linking the social and ecological aspects of a system is hence crucial for long term sustainability of conservation and natural resource management strategies. However it is difficult to do so in practice. An understanding of what influences support towards these strategies may be a way to incorporate varied interests and desires of individuals in the community to help improve their management.

Theoretical influences of community support

I now introduce two lines of theorising that strongly influenced my initial approach to understanding community support; the Common Pool Resource (CPR) and the Pro-Environmental Behaviour (PEB) literature. These play a central role in shaping my methodology and form the starting point for my research journey.

a. *Common Pool Resource (CPR) Literature*

CPRs include resources in which (i) exclusion of beneficiaries through physical and institutional means is especially costly, and (ii) exploitation by one user reduces resource availability for others (Ostrom, 1990). These issues pertaining to difficulty of exclusion and subtractability can create CPR dilemmas where people follow their own short term interests and consequently produce outcomes that are not in anyone's long term interest (Ostrom et al., 1999). Debate around CPR however takes issue with the idea that users are seen as the problem rather than the solution for CPR management. The CPR Literature is core to the community based natural resource management movement in general, including that of MPAs.

Hardin's (1968) influential article "The Tragedy of the Commons" serves as a good starting point to introduce CPR thinking as it provides another good example of resource users traditionally being seen as the problem hindering successful fisheries management. Hardin (1968) argues that under such CPR scenarios, individuals acting in their own rational self-interest will ultimately deplete a shared limited resource even when it is clear that it is not in anyone's long-term interest for this to happen. Hardin's proposed solution to the problem was either for strong government intervention or for privatization of rights to the resource. It is argued therefore that solutions must be imposed on users by external authorities. Ostrom et al (1999) however, describe how both government ownership and privatisation are themselves

subject to failure in a number of instances and suggests that other solutions for stable resource management exist. It is even thought that top-down-government and private property rights regimes can fail to sustainably manage natural resources as readily as communal ownership (Acheson, 2006).

Furthermore, not all players are thought to enter a collective action situation as pure forward looking rational egoists who make decisions based solely on individual outcomes. Some bring with them a set of norms that can support cooperation (Ostrom, 2000). The tragedy of the commons could be averted by mechanisms that cause individuals to act in the interests of the collective good rather than with narrow self-interest (Ostrom, 2002). This is an issue that can be explored further by understanding what influences behaviours towards MPAs.

This suggests that communities or resource users of a CPR may organise themselves and manage local resources more sustainably than when rules are externally imposed on them. It is now the belief that people closest to the natural resource are best placed to know how to manage the resource and have the incentives to manage in a sustainable way (Nunan, 2006). Compared to previous work on development which considered communities as a hindrance, current writings champion the role of community in conserving their natural resources (Agrawal and Gibson, 1999). Some subsequent research is looking at resource users being the key to the solution of successful, sustainable fisheries management. Ostrom and colleagues go on to suggest conditions which facilitate sustainable CPR management and identify a number of principles which are prerequisites for stable CPR arrangement (Ostrom, 2000). It is thought that "when the users of a resource design their own rules (design principle 3) that are enforced by local users or accountable to them (design principle 4) using graduated sanctions (design principle 5) that define who has rights to withdraw from the resource (design principle 1) and that effectively assign costs proportionate to benefits (design principle 2), collective action and monitoring problems are solved in a reinforcing manner" (Agrawal, 1999). This summarises some of the main design principles thought to lead to stable local CPR management. It implies that sustainable natural resource management is more likely to be achieved as some of these principles are adhered to and hence that there is a type of "recipe" to follow for the sustainable use of CPRs.

Although I believe that the CPR literature can offer insights into providing an understanding of community support towards management strategies such as MPAs, this body of literature offers very little discussion on the support of the community towards various NRM strategies. This is surprising as these design principles are sometimes mentioned as influencing attitudes of individuals. For example, when users of a resource designed their own rules (design principle three), it is thought to lead to positive attitudes towards these rules (Ostrom, 2000) . More frequently however, there is mention of how these design principles can influence environmental behaviours such as compliance with rules and cooperation between individuals in terms of monitoring the resource (Ostrom, 2000).

Indeed community support seems to form an integral part of collective action and sustainable management of CPRs yet despite its increasing recognition in the MPA literature; it is rarely explicitly discussed in CPR thinking. Although attitudes and behaviours are sometimes mentioned, the link between these is rarely made. It seems that the focus at the community level may overlook the importance of individual behaviours and attitudes within the community. In contrast, the next section focuses at the individual level and the links between attitudes and actions.

b. *Pro-Environmental Behaviour (PEB) Literature*

In contrast to CPR literature, the PEB literature takes a more individualist approach and seeks to understand why some individuals refrain from acting pro environmentally and attempts to predict behaviours.

Despite growing concern and awareness over environmental issues Pelletier et al (1999) find that a large proportion of people remain inactive with respect to environmental protective behaviours (Young, 2008). Clearly we cannot design effective interventions to address social problems without a thorough understanding of the factors that determine human behaviour (Fishbein and Ajzen, 2009). Many of these environmental issues are rooted in human behaviours and therefore can be

managed by changing relevant behaviours to reduce the negative impacts (Steg and Vlek, 2009).

It has been assumed that educating people and changing their attitudes and beliefs would be sufficient to change their behaviour. However, most studies have shown that attitudes do not necessarily translate into actions (Tanner, 1999). Indeed, much of the PEB and environmental psychology literature seeks to explain this gap between knowledge and awareness and environmental behaviours (Young, 2008).

One of the main aims of the PEB literature is to better understand why people act pro environmentally and to determine what the barriers to pro-environmental behaviours are. These, according to Kollmuss and Agyeman (2002) are behaviours that "consciously seeks to minimize the negative impact of one's actions on the natural and built world".

The question as to what shapes pro-environmental behaviour is a complex one and a plethora of models attempt to explain this phenomenon. Kollmuss and Agyeman (2002) identify three common theoretical frameworks under which many of the more popular and widely cited theoretical models of behaviour change fit:

 a. Linear models; the oldest and earliest models of PEB whereby knowledge precedes attitude formation which in turn influences behaviour. These models however have been found to be too simplistic and have since given rise to models such as the theory of reasoned action or theory of planned behaviour (Fishbein and Ajzen, 2009) which are broader in scope and posit that attitudes do not directly determine behaviour but do so indirectly by influencing intentions. Furthermore, these intentions are not solely influenced by attitudes but are also thought to be influences by normative pressures and perceived control (akin to self-efficacy) (Young, 2008).

 b. Altruism, empathy and pro-social behaviour models; in contrast to linear models, these include moral considerations into the framework and include one's self interest and the interests of others. Morals and altruistic considerations are hence thought to be key to understanding conservation behaviours (Kollmuss and Agyeman, 2002).

c. Sociological models; these models integrate the psychological with the sociological. It therefore follows that behaviour is a function of the individual and its environment. In particular the ABC model of behaviour (Stern 2000) posits that actions or behaviours are derivative of attitudes (as the linear model) but also derivative of the external conditions or context within which the individual operates.

These models are well summarised and more detail is provided in Young's (2008) literature review on the diverse theories of behaviour change. In summary, Young argues that what shapes behaviour cannot be visualized in one single framework or model. However, a range of factors have been established as having influence on models of pro environmental behaviour in different situations. These range from demographic factors, external factors (e.g. institutional, economic, and cultural) and internal factors (e.g. values, attitudes, motivation, awareness, etc…).

It is clear that PEB is closely linked to my definition of support. It is concerned with predicting behaviours of individuals and attitude is considered to be an important predictor. The solutions of fisheries' problems are indeed thought to depend on changing the behaviour of individuals on a local scale (Berkes et al., 2006). However PEB work rarely involves NRM strategies such as MPAs. Gifford (2007) argues that this is a gap in the literature that should be addressed as environmental psychologists' work on PEB could be a contributor to achieving sustainable resource use and conservation objectives. PEB work could serve as the key link between individuals and policy makers. It could help evaluate the acceptability of the proposed structural changes as well as assess the impact of these changes on their behaviour (Gifford, 2007). This suggests that work on PEB could help NRM strategies such as MPAs by understanding support of individuals via their attitudes and behaviours towards them.

Despite the potential contributions that PEB work can have for providing an understanding of support towards MPAs, it's predominant focus is on what influences *individual's* attitudes and behaviour and there is very little discussion as to what this means for support at the community level. It is implied therefore that community support would be the sum of individual support towards MPAs. However, we know that a community (or in this case community support) is more than the sum of its'

parts yet behaviour change strategies tend to focus on the choices individuals make in isolation.

In the final section of this chapter, I will offer a critical analysis of CPR and PEB thinking about community support and I will draw out some of thew key insights that fed into my methodology. In keeping with my research journey I will revisit this literature in my conclusion from the standpoint of my findings.

3. Implications for theorising and researching community support

CPR and PEB literature is attempting to understand what factors are linked with successful collective action, sustainable use of common pool resources and pro environmental behaviours. Although community support towards NRM strategies, policy or interventions are seen as important for their success, very little work has been carried out to elucidate what community support is, and how it can be influenced. I argue here that bringing the CPR and PEB literature together offers a starting point for pushing and furthering an understanding of community support towards MPAs.

These strands of literature highlight possible ways in which community support in terms of both attitudes and actions, can be determined and therefore can contribute to its understanding. There are some specific differences between these types of literature and critiques of them that need to be addressed however I first describe how they contribute to my theoretical framework and methodological approach.

Rational vs. Irrational Actors

Much of the fisheries management and MPA literature sees individuals as rational actors whose attitudes and behaviour are a consequence of how they view and weigh the benefits and costs of their actions or of a natural resource management strategy. For example, the "win-win" scenario of MPAs (Gell and Roberts, 2003b) that I described earlier focuses solely on the conservation and economic benefits that MPAs provide. This suggests that individuals will support this strategy as it furthers their individual economic interests. Indeed many behaviour change strategies identified in the PEB literature often seek to appeal solely to financial self-interest (Horton and

Doron, 2011). CPR thinking looks more into a "collective rationality" but often it also assumes that economic calculations can drive individual behaviour and neglects differences between individuals (Chuenpagdee and Song, 2012). Some argue however that it would be advantageous for future conservation efforts to acknowledge not solely the costs and gains that can arise through these efforts but also to build on the local aesthetic values and traditional beliefs (Gadd, 2005). Furthermore, Chuenpagdee and Song (2012), argue that it should take a more sociological view and manage MPAs in such a way that considers trust and reciprocity. The PEB literature has also illustrated how farmers' conservation relation behaviours do not appear to have wholly personal or selfish reasons (Beedell and Rehman, 2000). Recent developments in social psychological theory and research suggests that people are not just motivated by narrow economic self-interest, they also consider the broader implications of their decisions for others and for the environment (Van Vugt, 2009). The assumption that individuals are rational actors, pursuing their own selfish interests assumes away the fact that human behaviour is embedded in social relationships which are shaped by cultural and structural forces (Jentoft et al., 1998). For example, the behaviours of others in the community and perceived fairness and equity is of huge importance when understanding how people will act (Horton and Doron, 2011).

The SES and much of the PEB literature take a slightly different stance and do not necessarily assume individuals to be narrow minded, selfish actors wanting to pursue their own interests but consider the social relations between individuals, cultural and historical context of the systems studied, as well as the personal characteristics, feelings and emotions of individuals.

Individual vs. Community level

Focus at the individual or community level is another issue that serves to distinguish between the different bodies of literature identified. Society cannot exist without individuals, their ideas, emotions and moral points of view (Andersen and Kaspersen, 2000). Following on from my definition of community support, it is clear that I am looking at attitudes and behaviours which occur at the individual level. However, some social scientists such as Durkheim, would argue that acts, ideas and motives of

individuals could not solely explain the levels of support in a community and that it is only through the study of collective social facts that we could understand community support towards MPAs (Andersen and Kaspersen, 2000). Work on collective action and CPRs follows from this line of thinking and focuses at the community level. It aims to identify for example what guidelines or factors could make a community more likely to manage their natural resources sustainably (Ostrom et al., 1999). It also seeks to identify which communities may be more likely to manage their resources sustainably. Work on fisheries management and MPA success also tends to use a broader lens and focuses at regional or community level. These strands of literature rarely focus on the individual attitudes or behaviours and on the heterogeneity within a community. However, the interests of a community are not the same as the actions and beliefs of that community and it is important to distinguish between communities and individuals (Agrawal, 2005). This is where the PEB literature can provide important insights for understanding community support as it focuses on individual attitudes and behaviours. What promotes the interest of one group may impact positively for some but may impact negatively for others (Fabinyi, 2008) and hence NRM strategies such as MPAs can impact individuals differently.

It may be important therefore to understand community support through both an individual and a collective approach. Bourdieux suggests it is important to abolish this "well established and mutually exclusive" opposition between individualistic and collectivist stance(Bourdieu and Wacquant, 1992). Latour (1996) agrees and argues it is not a good idea to have such a gulf between individuals and society and that indeed the two are intertwined. I take this latter stance and combine both individualist and collectivist positions from these different bodies of literature to understand community support towards MPAs. This is a point that I will further embellish and highlight in Chapter 3 when I discuss the methodological approach to understanding community support.

Governance vs. Management

Like any other management tool, MPAs come with restrictions on user behaviour and can influence peoples' ability to sustain themselves and hence I believe can influence their support towards it. However, whilst the MPA literature frequently refers to how

the MPA is managed, other strands of literature such as CPR literature, focus on governance.

I use both concepts of management and of governance. Governance is a term that is often considered broader than management whilst management is defined and perceived as a technical exercise of employing means to achieve given goals. Governance on the other hand, includes deliberation and determination of basic relevant values and principles and hence, normative theory, values, principles and goals are part of governance (Chuenpagdee and Jentoft, 2009).

I frequently use the term "management" as I am primarily concerned with the specific ways in which the MPA is managed and how this reflects on support towards the MPA. However, when trying to understand how some of these management factors may influence support it is important to draw on governance theory and look at the broader picture and hence the term governance is also used.

Research on MPA management tends to focus on the ecological and conservation aspects and not on its human dimensions. However MPAs are not just technical management measures but socio-political enterprises (Chuenpagdee et al., 2013). Changes in the way the MPA is managed will impact those in the community and more importantly will impact individuals differently. Jentoft et al (2007) see marine governance as a relationship between two systems; a governing system (social) and a system to be governed (social and natural). This theme of looking at social and natural systems is one which is is closely linked to the SES literature. This is important as it implies that support of the community will not simply be affected by the MPA rules and regulations. The presence of "good" rules does not ensure they will be followed (even if they are designed by members of the community), due to temptation to encroach for example by some individuals (Ostrom, 1990). Furthermore MPAs and their management is not politically neutral but can interfere with livelihoods and social relationship (Jentoft et al., 2012). For example, after the relatively successful establishment of an efficient monitoring system on Negros Island, Philippines, this quickly eroded when rival political candidates used the guards in charge of monitoring as a tool to win votes in the election by threatening their positions if they were elected in the upcoming election (Knudsen, 2009). MPA management therefore

also involves power struggles and politics and can also contribute to social inequity by creating opportunities for local elites to control resources (Cinner et al., 2012). This can have serious consequences for support as perceived corruptibility of the enforcing authority can corrode the willingness to comply with regulations (Sundström, 2012).

It is important therefore to consider how MPA management can influence the support of individuals, and how it can affect different individuals in different ways. However, it is also essential to acknowledge that policies or specific rules are not the central driver behind actual practices. Although they can influence behaviours and support of individuals towards MPAs, it may prove important to consider the broader concept of governance which sees the management of MPAs not simply as a set of rules and regulations (Fabinyi and Dalabajan, 2011). What is seen as legitimate governance may not therefore depend solely on issues pertaining to the MPA but may also depend on the wider culture of governance in that context.

A factorial approach to understanding community support

Much of the literature described in this chapter identifies factors associated with MPA success, design principles required for collective action and the sustainable management of CPRs and factors which are thought to influence pro environmental behaviour. Each of these strands of literature has insights and limitations and I seek to capture the former and ameliorate the latter by combining these strands of literature using a factorial approach. This entails exploring which factors can influence attitudes or actions towards MPAs positively or negatively.

Whilst certain factors identified may prove to be tangible and easily measured, others may be less evident and difficult to discern. After having discussed the importance of interdisciplinarity in understanding community support, I believe it is essential to combine both qualitative and quantitative techniques to gather information and ensure that I consider both tangible and less tangible factors, an issue which will be discussed further in chapter 3. Furthermore, whilst the factorial approach was useful in seeking to understand how attitudes and actions towards MPAs are influenced, the nature of this research still remains exploratory. I aim to get a holistic and encompassing view of community support and hence rely not solely on a deductive factorial approach but

also on the qualitative research. The latter can provide a more nuanced and contextualised understanding of both factors identified a priori or inductively through the data and identify not only which factors influence support but also *how* they influence support.

In hindsight, identifying the literature helped me in my approach to researching and understanding community support and was just one step of a long research journey (see chapter 3). These strands of literature however proved to be essential starting points for the development my methodological framework and helped explain some of the findings that occur throughout the thesis.

Chapter 3: Methodology

This chapter outlines the methodology I adopted to address the research themes and questions outlined in chapter 1 and 2. The term "methodology" refers to the rationale and the philosophical assumptions that underlie a particular study relative to the scientific method (Bryman, 2008). Broadly speaking, it is a way of turning a research problem into a workable design.

I explained in chapter 1 how the initial motivation for this thesis was to try and improve community based MPAs in the Philippines. I was fascinated that despite thepotential social, economic and ecological benefits that could be accrued at a village level over a potentially short amount of time, very few MPAs have been implemented over the worlds' oceans. Furthermore, few affected communities were supportive of such a management strategy. My aim therefore was to determine what influences support towards MPAs and by doing so to try and improve MPAs and promote their proliferation.

There is no doubt that my background in biology has shaped this study. I realised however that an interdisciplinary approach would be required to help answer such a question. My interest in moving from pure natural science into the social sciences was driven by the belief that natural science was only capable of making limited further contributions to improving MPAs and other similar NRM strategies. I explain throughout this chapter my progression from natural to social sciences and my undertaking of a mixed methods approach.

The first section of this chapter draws from Bryman (2008) and Mason (2002) and outlines my methodological and philosophical assumptions towards the research and relates these to my research strategy. I then will explain the research design of the study, the research methods used and how the data was analysed. I then describe the villages where the research took place. It is important to understand the community in which the research takes place in order to put some context to the quotes and themes that emerge throughout the following empirical chapters. Finally I mention the ethical procedure and potential sources of error that occur throughout this research.

The multidisciplinary and complex nature of this research led me to adopt a mixed methodological approach. Social, economic, cultural and political conditions are closely linked to MPAs (Bruner et al., 2001; Pollnac et al., 2010). Furthermore, ecologically, MPAs are embedded within larger areas of extensive and often intensive resource extraction and habitat modification (Pollnac et al., 2010). The complexity of these social-ecological interactions is such that a large number of potential factors can influence community support towards MPAs and highlights the interdisciplinary nature of this research.

There are a number of arguments against mixed methods research (Bryman, 2008) which often are based on the epistemological commitments different research methods carry and the idea that quantitative and qualitative research are separate paradigms. However there are also a number of specific benefits to this research strategy. Greene et al (1989) for example, highlight five reasons for combining methods in a single study which also applied to my research:

- Triangulation in the classic sense of seeking convergence of results: *In my case where qualitative and quantitative data agree it improved the validity of my findings. A large number of different methods were used to elucidate information on specific factors in order to increase reliability of findings. Where results disagreed, I paid close attention to the possible reasons as to why this was, which opened up different aspects of a specific issue and helped explain why certain factors influence support differently.*

- Complimentary, in that overlapping and different facets of a phenomenon may emerge: *This was important as I wanted to get a holistic view of what influences community support. Different factors may influence support in different ways and via different mechanisms. Qualitative and quantitative research methods allowed me to be able to elucidate different aspects of support and what influences it. Whilst the quantitative methods were useful for exploring what influences support and looking for evidence for and against*

causal influences through correlation, the qualitative methods were good at exploring processes and at opening how and why certain factors influence support.

- Developmentally, wherein the first method is used sequentially to help inform the second method: *As I illustrate later, I used quantitative methods to inform my qualitative work and ensure that the appropriate techniques and probes were used to uncover more information on specific issues that I previously highlighted as important.*

- Initiation, wherein contradictions and fresh perspectives emerge: *contradictions between my qualitative and quantitative approaches occurred rarely, but where they did it led to the development of some interesting insights.*

- Expansion, wherein the mixed methods add scope and breadth to a study: *this is an important aspect as I wanted to make sure that I could determine many factors which influence support and not solely a few factors relevant to only few individuals or groups of individuals. I explain later how quantitative methods were only able to provide feasible information on factors that are more tangible, whilst qualitative approaches can tackle issues that are more complex and less amenable to quantification*

All these benefits from mixed methodological research applied in my case. However the "expansion" benefit is of particular importance. My research involved looking at various factors thought to influence support. They could be categorised as:

i. those that operate at an individual level and can change from person to person
ii. those that operate at a community level and change from site to site.

However, only three villages were studied which made it difficult to carry out quantitative analysis of community level factors. This made it impossible to quantitatively analyse the effect of these community variable levels on community support as there were only 3 cases. Although comparisons could be made between the three sites, statistical analyses require a larger sample size. Qualitative analyses on the

other hand allowed me to explore the issues and factors that operate at a community level and may influence support.

The developmental aspect of mixed method research identified by Greene et al (1989) was also important for this research. My fieldwork was split into two main instances: August to December 2010 involved the quantitative data collection and April-June 2011 involved the qualitative data collection. Due to unforeseen circumstances, I had to leave the qualitative fieldwork trip earlier than planned and hence returned in December 2011 to complete data collection. In between, I had enough time to carry out quantitative analyses of the data (chapter 4) which could then inform what aspects to explore further using qualitative research methods.

Identifying factors which influence support

An important aspect of this research was to identify which factors may influence support towards MPAs. One fundamental difference between qualitative and quantitative work depends on one's orientation towards the role of theory in relation to research. Whilst quantitative work often emphasizes a deductive approach whereby theory is tested, qualitative work often undertakes an inductive approach which relies on the generation of theory (Bryman, 2008). I therefore presented theory at the beginning as "tentative model or conceptualization to be developed and refined during data collection"(Miles and Huberman, 1984). For this thesis this meant carrying out a review of the NRM, MPA, CPR and PEB literature and hypothesizing which factors could influence attitudes, compliance or enforcement of individuals towards the MPA.

As I describe in chapter 2, much of the MPA, SES, CPR and PEB literature is attempting to understand what factors are linked with MPA success, collective action, sustainable use of common pool resources and pro environmental behaviours. In turn, I explain in chapters 1 and 2 how in each case, community support towards NRM strategies, policy or interventions are seen as important for their success, yet very little work has been carried out to elucidate what community support is, and how it can be influenced.

Prior to my fieldwork therefore, I carried out an extensive review of the literature comprising over 150 different studies. Due to my predominantly ecological and environmental background, many of the studies arose from the MPA literature, however, throughout the research journey these also entailed studies from the CPR and PEB literature. I was initially planning to carry out questionnaires and hence started to identify a list of factors that may influence support and that I could gather data on via a questionnaire whilst in the field. Given the exploratory nature of this thesis, my aim was to be as inclusive as possible at this early stage and then to refine and develop my focus in the light of my empirical findings about which factors were relevant and meaningful in these contexts. Some factors were found to directly affect MPAs and some affected collective action or environmental behaviours such as recycling. I however hypothesised that collective action or PEB may influence support towards MPAs and was testing to see if any of these factors do indeed influence MPA related attitudes or actions. The more comprehensive list of factors identified and their references are presented in Appendix 1. Many of these factors were very similar to each other, for example different bodies of literature may look at slightly different aspects of a similar factor (for example, experience of fishermen or age of individuals). Furthermore some factors did not apply to the context of this study (for example, factors involved with tourism as there is little to no prominent tourism in the sites studied, see chapter 3). These factors were therefore combined or removed at the outset to provide a consolidated list of factors that were both useable and theoretically applicable to my field sites (Table 3.1).

This is very much a deductive approach to research in understanding community support towards MPAs. I aimed to collect data on these factors via questionnaires and hence they needed to be amenable to such a research method. Many factors identified (especially from the CPR literature) proved very difficult to measure quantitatively at an individual level using questionnaires. Social capital, temptation to free ride (Ostrom, 2000) for example are believed to be important for common property regimes and the sustainable management of common pool resources, yet these may not be explored easily via questionnaires. Other very general factors such as feelings, emotions or cultural factors (Kollmuss and Agyeman, 2002) are also thought to be predictors of environmental behaviour, yet these are too broad for data to be obtained via questionnaires. I wanted to be inclusive of all potential factors influencing support

Table 3.1. Consolidated deductive list of factors and their references hypothesised to influence MPA related attitudes or behaviours towards the MPA.

	Deductive Factors	References
MPA Design	*Fishery Benefits*	(Alcala and Russ, 2006; Christie, 2005a; Christie et al., 2009; Gelcich et al., 2007; Pollnac and Pomeroy, 2005; Pomeroy and Carlos, 1997; Pomeroy et al., 2005a; Russ and Alcala, 1999)
	MPA Size	(Agardy et al., 2003)
	MPA Location	(Christie et al., 2002)
	MPA Network	(Christie et al., 2002)
	MPA Boundaries	(Armada et al., 2009; Christie and White, 2007; Lowry et al., 2009)
Socio-Economic Characteristics	*Wealth*	(Cinner et al., 2009a; Kollmuss and Agyeman, 2002; Leiserowitz et al., 2006; Maliao et al., 2009; Pollnac and Pomeroy, 2005; Pomeroy et al., 1997)
	Asset Holding	(Nunan, 2006)
	Fishing Experience	(Dimech et al., 2009)
	Income from Fishing	(Dimech et al., 2009; Pollnac and Pomeroy, 2005)
	Job Diversity	(Allison and Ellis, 2001; Armada et al., 2009; Christie, 2005a; Cinner et al., 2009a; Gelcich et al., 2009; Pollnac et al., 2001; Pollnac and Pomeroy, 2005; Pomeroy et al., 2005a)
	Time Spent Fishing	(Dimech et al., 2009)
	Gears Used	(Blyth et al., 2002)
	Mobility	(Aswani and Hamilton, 2004; Gelcich et al., 2007; Hannesson, 1998)
	Participation/Influence	(Agrawal and Chhatre, 2006; Christie, 2005a; Jentoft, 2000b; Maliao et al., 2009; Nunan, 2006; Olsen and Christie, 2000; Pollnac et al., 2001; Pollnac and Pomeroy, 2005; Pomeroy and Berkes, 1997; Pomeroy and Carlos, 1997; Pomeroy et al., 2005a; Pomeroy et al., 1997; White et al., 2005a)
	Unfair/Corrupt Management	(Lowe, 2000)
	Knowledge of Objectives	(White et al., 2005b)
	Expectations of MPA	(Christie, 2005b; Leiserowitz et al., 2006)
	Knowledge of Rules	(Christie, 2005a)
MPA Management	*MPA Leadership*	(Christie et al., 2009; Ostrom et al., 1999; Pietri et al., 2009)
	Institutional Cooperation	(Christie, 2005a; Christie et al., 2009; Hilborn et al., 2004; Maliao et al., 2009; Milne and Christie, 2005; Olsen and Christie, 2000; Pollnac et al., 2001; Pomeroy and Carlos, 1997; White et al., 2005a)
	Sanctions	(Christie et al., 2009; Hilborn et al., 2004; Nunan, 2006; Ostrom, 2000)
	Guards	(Christie and White, 2007)
	Unfair Wealth Distribution	(Christie, 2004; Christie et al., 2005; Pollnac et al., 2001; Pomeroy and Carlos, 1997; Pomeroy et al., 2005a)
Feelings/ Emotions	*Solidarity*	(Christie et al., 2002; Hicks et al., 2009; Maliao et al., 2009; Oracion et al., 2005; Ostrom, 2000; Ostrom et al., 1999)
	Locus of Control	(Kollmuss and Agyeman, 2002; Young, 2008)

towards MPAs. Therefore, I also undertook an open-ended qualitative approach to explore certain factors which were also identified a priori to the fieldwork to gather more information on factors which proved difficult to assess quantitatively.

An inductive process also occurred which is highlighted in chapters 6 to 8. It allowed for the inclusion of other context specific factors that may not have been highlighted in the literature. These arose mostly as "themes" as they were areas of discussion occurring throughout various focus groups. They emerged as "patterns" throughout the different focus groups and respondent interviews across sites. An inductive process also led to an understanding of why certain factors or themes influenced support, sometimes in surprising ways.

The use of a mixed methodological approach has allowed me to explore a wide variety of factors spanning different disciplines which I hypothesize can influence support towards MPAs. It can also help elucidate the mechanisms via which they influence support. I argue therefore that a number of methodologies are needed to understand the interactions between social and ecological systems and more specifically in this case, to understand community support towards these resource management strategies.

2. Research Design

Whilst the above section focused on my *research strategy* which explained my orientation to the proposed research, this section focuses on research design which attempts to explain the type of framework I used for the collection and analysis of data.

In this case, the predominant research design is comparative which entails studying contrasting cases using more or less identical methods (Bryman, 2008). The quantitative approach involved data collected from a number of individuals in a cross sectional design format. Therefore, quantifiable data was collected for a large number of individuals within each of the three communities studied. The comparative design was also applied in relation to a qualitative approach and hence took the form of a multiple case- study. The three communities varied significantly and due to the small

number of communities studied they were not quantitatively comparable. Therefore this qualitative approach proved to be essential to investigate community level factors that may influence community support towards MPAs

It is argued that "in-depth knowledge is sometimes achieved through the study of a single case. Often, however, it is best achieved by studying several instances of the same thing because different aspects may be more visible in different cases" (Ragin, 1994). By searching for commonalities and differences between these three contrasting communities I argue it placed me in a better position to establish the circumstances in which a theory will or will not hold, and could suggest what factors influence community support across a number of cases.

One limitation that must be considered when using such a research design, is that internal validity is often weak (Bryman, 2008). This form of validity reflects the extent to which a causal conclusion based on a study is warranted. Cross sectional research for example, produces associations rather than findings from which causal inferences can be made. Indeed, as I aim to determine "what *influences* community support towards MPAs" it is clear that causality (or the inference of causality) forms a large component of the study and that this could pose a problem. It is important however to distinguish between the divergent views on how to address causality which depend on one's epistemic position.

According to a positivist/crude realist perspective, only experimental inquiries will allow one to determine whether a treatment *causes* an outcome to change (Maxwell, 2004b). This view is derived from Hume's analysis of causality in which he argues that we can have no knowledge of causality beyond the observed regularities in associations of events (Maxwell, 2004b). Comparisons of situations are thus required in which the causal factor is present or absent and controls are implemented on other possible explanatory factors. This approach to addressing causality however is riddled with problems. Firstly it is based solely at the level of co-joined events and does little to constitute an explanation (Patomaki and Wight, 2000). To say that wealth influences support because all wealthy across the three sites were positive towards the MPA for example, is hardly explanatory. It is also important to note, that in most cases these experimental approaches to causality most often occur in *closed*

systems. The absurdity of searching for such simple causality is clear when looking at the SES's which are more open and complex systems. Dwairy (2006) argues that in such complex systems, the interactions between the variables become all the more central and examination of the influence of single factors become secondary. They further posit that "we should not be deluded into thinking that discovery of all solitary connections between the variables enable us to understand the complete system of interactions". Outcomes may therefore be the result of many different causes in such open systems and the same cause may lead to different outcomes (Patomaki and Wight, 2000). These limitations of a positive/crude realist position have serious implications towards my research. It may be possible to determine what factors are associated with attitudes, compliance and enforcement but it would prove very difficult to determine whether they *influence* support and hence to be able to say if a change in factor X will lead to an increase or decrease in support towards the MPA.

A number of researchers deny that causality is a valid concept in the social sciences. This coincides with a more naturalistic/constructivist position which sees causality as not merely empirical or contingent but heavily dependent on meaning (Guba and Lincoln, 1982, 1996). Guba and Lincoln (1989) argue that "there exists multiple, socially constructed realities ungoverned by natural laws, causal or otherwise". They further mention that an inquirer can at best establish plausible inferences about the patterns and webs of interacting factors, events and processes that shape actions (Guba and Lincoln, 1982). The constructivist therefore sees no way of determining a cause-effect relationship.

Maxwell (2004a) argues that a critical realist position can provide a way out of this polarized confrontation between positivist and constructivist approaches on the issue of causal investigation. Whilst it recognizes the reality and importance of meaning critical realism also recognises physical and behavioural phenomenon as having explanatory significance. Furthermore, it also recognises the importance of context of the phenomena studied and does not reduce this context to a set of extraneous variables (Maxwell, 2004a). An understanding of the cultural and historical context of each site may also elucidate the processes by which an outcome occurs. This is in sharp contrast to a simple comparison of situations involving the presence and absence of an independent variable presumed to be the cause. Unlike a constructivist

epistemology however, it still recognizes the importance of causal explanation and also emphasizes the importance of validity (Maxwell, 2004b).

Quantitative analyses therefore allowed me to test for significant associations between specific factors and MPA related attitudes, compliance and enforcement. These findings could then be triangulated with qualitative data. The qualitative approach importantly enabled me to investigate a wider range of factors such as those that operate at a community level that I could not explore quantitatively due to the small number of communities studied. Furthermore it allowed for an inductive component of the research whereby certain findings and specific factors found to influence support emerge from the field. The combination of quantitative and qualitative methods helped determine which factors are associated with community support. Importantly the qualitative research helped in determining associations but also helped explain how these factors influenced support. An understanding of the mechanisms by which these factors operated helped enable me to infer causality and draw more reliable and valid statements from the research.

3. *Research methods and Analysis*

Following on from my mixed methods research strategy; I used both qualitative and quantitative research techniques and a number of different methods (Fig. 3.1). This allowed me to add breadth and scope to the study, uncover different facets of the issue discovered by different research methods and to search for commonalities and differences between the different approaches. I argue it can therefore provide a deeper and more holistic understanding of community support.

Methodological Approach	Date of Fieldwork	Sample	Mode of Enquiry	Scale of Analysis
Quantitative Approach →	08/10-12/10 →	166 Questionnaires →	Deductive Factors →	Analysis at Individual Level
		24 Focus Groups		Triangulation ↕
Qualitative Approach →	04/11-06/11 12/11-01/12 →	54 Semi Structured Interviews →	Deductive Factors Inductive Themes →	Individual and Community Level Analysis
		18 In Depth Interviews		

Fig.3.1. Methodological approach to this research

Every factor or theme that I hypothesize could influence support towards MPAs, whether these arose inductively or deductively, and the data sources or methods that were used are provided in Table 3.2. For many factors deductive and inductive approaches helped elucidate different aspects of that particular factor and how or why it influences support. For other factors, these arose solely inductively as I had not considered them a priori, and vice versa certain factors determined a priori did not arise inductively through the data. Due to the mixed methods approach undertaken, a number of different methods could be used to elucidate different themes or factors and could provide different sorts of understanding for each factor. Different methods were best suited for different factors, however in many cases different methods could provide different sorts of understanding of the issue and hence many methods were used to provide a fuller understanding of the factors at hand. If certain methods were not used this is either because the themes arose inductively through the research or that information on those factors could not be gathered via those methods.

Quantitative Methods and Analysis

From August until December 2010, I carried out 166 questionnaires (see Appendix 2) with an interpreter to determine fisher folk's support towards the local MPA and gather information on each individual factor to be examined quantitatively. Questionnaires were translated in Cebuano and answers were transcribed in the field. Only fisher folk were asked to participate. This involved mostly male fishermen, but two female fishers that were interviewed in Bonbonon (as almost all fishing was done by men). These included any individuals that spend time fishing (with any gear, including gleaning) each week, be it recreational, part time or full time. Each specific question related to the deductive list of factors identified (Table. 3.1) that could potentially influence support. Janette Lauron Rubi was my main interpreter for the quantitative and qualitative data collection. She carried out the questionnaire and asked the questions at Candaping B and Suba. Lynne Manara was my interpreter for the questionnaires carried out in Bonbonon, however she did not enjoy the work and did not continue. I was present at all interviews and often conducted follow up questions and open ended questions to gather more information for the qualitative methods and approaches.

Table 3.2. Summary of factors and themes identified deductively or inductively to influence community support towards MPAs via questionnaires, focus groups (FG), Semi Structured Interviews (SSI), In-depth interviews or Key Informant interviews

Factors and Themes		Deductive	Inductive	Questionnaire	FG/SSI/IDI	Key Informant
MPA Design	Economic Benefits	✓	✓	✓	✓	
	Non-Economic Benefits	✓	✓	✓	✓	
	MPA Size	✓				✓
	MPA Location	✓	✓	✓	✓	
	MPA Network	✓	✓		✓	✓
	MPA Boundaries	✓	✓	✓	✓	
Socio-Economic Characteristics	Wealth	✓	✓	✓	✓	
	Asset Holding		✓	✓	✓	
	Fishing Experience	✓	✓	✓	✓	
	Income from Fishing	✓	✓	✓	✓	
	Job Diversity	✓	✓	✓	✓	
	Time Spent Fishing	✓	✓	✓	✓	
	Gears Used	✓	✓	✓	✓	
	Mobility	✓	✓	✓	✓	
	Participation/Influence	✓	✓	✓	✓	
	Power to Enforce	✓	✓		✓	
	Knowledge of Objectives	✓	✓	✓	✓	
	Expectations of MPA	✓	✓	✓	✓	
	Knowledge of Rules	✓	✓	✓	✓	
Management	Management in General		✓		✓	✓
	MPA Leadership	✓	✓	✓	✓	✓
	Fisherman's Association	✓	✓	✓	✓	✓
	Institutional Cooperation	✓	✓	✓	✓	✓
	Continuity of Governance	✓	✓		✓	✓
	Sanctions	✓	✓	✓	✓	✓
	Guards	✓	✓		✓	
	Unfair/Corrupt Enforcement	✓	✓	✓	✓	
	Angry Enforcement		✓		✓	
	Unfair Wealth Distribution		✓		✓	
Feelings/Emotions	Solidarity	✓	✓	✓	✓	
	Locus of Control	✓	✓		✓	
	Fear		✓		✓	
	Pity		✓		✓	
	Laziness		✓		✓	
	Environmental Concern		✓		✓	
	Jealousy		✓		✓	
	Freedom		✓		✓	

Initially, local government and key informants were contacted to source lists of fishers for the questionnaires. As these may have been inaccurate and out-dated, I also conducted opportunistic sampling at landing sites, or whilst individuals were repairing nets and constructing fish traps. Snowball sampling, where respondents were asked to let me know of other fishers in the area was cross checked with the questionnaires already carried out to ensure that the majority of fishers had been interviewed. Finally, each house in the village was approached to check if any fishers had not yet been interviewed. If the house was empty, neighbours were asked if any fisher's resided in the house. An estimated 70-90% of the total number of fishermen were interviewed in each village. Most fishers were happy to participate in the questionnaire however a number of individuals (approximately 5-10 at each site) who were timid, very busy at the time of study or those away for a long period time were not interviewed.

The majority of questions were treated as separate variables or factors. However some questions were also grouped together to construct two indices for use in quantitative analyses using factor analysis. I created indices for questions relating to individuals' perceptions of support towards MPAs and those relating to individuals' wealth. This was particularly important for enabling multiple regressions (as reported in chapter 4) where the number of variables included need to be kept at a minimum. The indices also helped allow simple descriptive analyses comparing support and wealth between individuals and between villages throughout the thesis. I describe how these indices were constructed in further detail in chapter 4.

As I explained earlier it is important not to look at each factor in isolation from others when trying to infer some form of causality. It is clear that carrying out a statistical test for each individual factor to see if it has a significant effect on attitudes or enforcement will not be a productive endeavour. As one increases the number of tests, so does the chance of getting a Type 1 error where a significant result is found due to chance. This would lead one to conclude that a relationship exists when it doesn't (Dytham, 2011). It was also important to consider which factors are *most* influential and hence the quantitative data is predominantly used for multiple regression models (chapter 4) where it is possible to see which factors are deemed most important predictors of attitudes or enforcement. However, the quantitative data was also used

for some simple descriptive analyses to help corroborate information obtained via qualitative means.

Qualitative Methods and Analysis

The bulk of the qualitative research was carried out a few months after quantitative data collection and analysis. This was for a variety of reasons:

1) This allowed time for me to build a rapport with the community. Especially for qualitative work, this meant they were more at ease and were more trusting as I had not used the information they had provided via the questionnaires to their detriment in any way.
2) I could develop my local Cebuano language knowledge so I would be more likely to identify the nature of the discussions and could ask the interpreter to probe for more information if required.
3) I could develop questions that are more easily understood by the interpreter or individuals within the community.

Focus groups were used as the predominant qualitative research method. In this case they were used to gain an understanding of community support and to see what is important for support by seeing the issue through the eyes and hearts of the target audience. The aim was to learn how the target audience sees, understands and values the MPA. How do they think about it? How do they feel about it? How do they talk about it? What do they like, dislike about it? What keeps them from reporting or encroaching? What are the barriers? What are the incentives etc…Focus groups allowed me to observe the interactions between individuals. I also found that participants were more comfortable than during individual questionnaires and other research methods and I feel they may have contributed more information. Despite the advantages of focus groups, it is important to consider some of the drawbacks. Firstly, it may prove difficult to ascertain what influences MPA related actions. Individuals are often unaware of what really drives their behaviour. For some individuals and in some situations behaviour is a result of a thoughtful, reflective, cognitive process. However, those who study behaviour argue that many decisions are non-rational and often emotional responses. Reiss (2004) identifies 16 motives that drive behaviour

and Feig (2006) argues that emotions are the key drivers of behaviour. Individuals may be unaware of the driving emotions that influence their behaviour and may be unable to articulate emotions. Projective questions, questions that ask about feelings as opposed to thoughts, as well as exercises in sorting, arranging, drawing and similar activities can give insights into these emotions. Attention was therefore placed on emotions within the focus groups in conjunction with the more rational and logical answers given by some respondents.

Secondly, another issue which must be considered is the fact that not all individuals in a focus group are necessarily expressing their own individual view and may have their responses influenced by each other so they may not reflect what people actually think or feel.

A final issue with focus groups is that individuals may not like to admit that they have no knowledge or views on certain specific topics. Under these circumstances, answers may be invented.

Despite these limitations, I argue that focus groups were useful at uncovering local narratives about what determines support of MPAs and provided insight as to what the local 'received wisdom' is about why some individuals support whilst others do not.

Before carrying out the focus groups a few essential steps needed to be taken. First I prepared a discussion guide (Appendix 3) with the basic questions that needed to be addressed. This followed the framework proposed by Krueger (1997) whereby opening questions and transition questions precede the key questions and closing questions attempt to summarize the findings from the session. The key questions were loosely based around my aims of this thesis and asked about attitudes and actions towards the MPA along with the links between them. As a summary question, respondents were asked which three factors or themes they believed played the biggest role in influencing support. Due to my limited knowledge of the local Cebuano dialect, Janette Lauron Rubi who was my interpreter for the questionnaires in Suba and Candaping B was trained as a moderator for the focus groups at all sites. This was an important task. The quality of the information gained is thought to be a

direct reflection of the moderators ability to manage the discussion and the participants (Kruger, 1998).

Fig.3.2. Janette carrying out a fisher's wife focus group at Candaping B

Chapter 9 from International Focus Group Research (Hennink, 2007) proved to be essential in helping me train Janette as a moderator. We focused on the ideal characteristics required of a good moderator (Table. 3.3) and paid particular attention to: encouraging and managing a discussion; careful listening; using non-verbal signals; probing; seeking diverse views; managing group dynamics and the common problems moderators face. Due to the previous quantitative research we carried out together, Janette was quick to learn and was very knowledgeable of the MPA at each site as well as being aware of the type of information required.

Janette's daughter, Sarin Fatima Lauron was also trained as a note taker for the focus group sessions. Her primary role was to record the key issues raised in as much detail as possible but she also recorded the names and certain socio-economic information of each participant (Hennink, 2007). My role was to set up the equipment, to make sure the respondents were at ease (by providing snacks and drinks) but predominantly to ensure that the moderator and note taker were carrying out the focus groups, probing effectively and taking notes of their comments and in some circumstances their facial expressions or body language. With limited knowledge of the local dialect,

I would sometimes be able to follow the thread of conversation and ask certain specific probing questions in Visayan, much to the amusement of many respondents.

At the end of each focus group session the participants were asked to go through the factors that had been identified as important for attitudes or actions of individuals with regards to the MPA (these were written on a flip chart). They then conferred and had to agree to the three factors they deemed most important in terms of influencing support towards the MPA.

Table 3.3 A list of the ideal characteristics of a good Focus Group moderator. Source: (Hennink, 2007)

Ideal Characteristics of a good moderator
Well-developed interpersonal skills
Effective communicatory
Empathetic and encouraging
Cultural sensitivity
Fluent in language of discussion
Confidence in controlling discussion
Non judgemental
Aware of own biases
Confidential
Flexible and spontaneous
Experience with group dynamics
Clearly express thoughts
Interested in others' opinions
Sense of humour
Active listener
Good memory

After the Focus Group, Janette, Sarin and I would discuss the key issues, any differences between other groups and any problems discovered. This would be a time where I would ask the moderator or note taker to elaborate certain specific moments during the focus group such as moments of laughter or where I thought an argument was occurring. We carried out two pilot studies to practice before carrying out the focus groups.

We carried out a multiple category design involving Focus Groups with several types of participants. This would increase the chances that a wide range of factors and

themes thought to influence support were identified, as a large range of different participants together with their varied needs and interests were considered. Different types of respondents may identify different factors or different themes may emerge and hence it may prove interesting to compare groups within one category or from one category to another to see if there are differences in factors identified. The aim was to carry out 8 focus groups at each site 4 with fishermen, 2 with women within the community (many of which are fishers' wives) 1 with local government and those involved with the MPA within the community (Table 3.4). Two pilot studies were carried out at Bonbonon to serve as practice runs . This formed a main part of focus group moderator training any any necessary changes to the focus group discussion guide could also be made. The data from these pilot studies were not included in the analysis. The 4 focus groups carried out amongst fishermen were to seek consistency of findings and cover new potential factors influencing support. I should note that not all fishers were full time fishermen but some were part time or recreational. Furthermore, contrasting these with government focus groups and women focus groups may provide new and contrasting insights into an understanding of support. The descriptions of the focus groups and their participants are described in Appendix 4.

The fisher questionnaires only included 2 women as these were the sole female fishers I came across. It was impossible therefore to quantitatively assess whether gender had an influence on support towards MPAs. However most women at the three sites were involved to some extent in the fishery. Many would be at the landing sites when their husbands or family members would return from fishing and help count, weigh and sell the fish. Others were dependent on their husbands to provide fish as protein and are very aware of the fluctuations in catch and the potential impacts the MPA may have had. Finally, many women at the three sites were part of fisher associations (FAs) or were barangay officials (village officials) or in the case of Bonbonon, a barangay captain (village captain, in charge of village level decisions). It was essential therefore that women were part of the qualitative process to get a more holistic understanding of community support. I should note however women are less likely to encroach the MPA (as they rarely engage in fishing activities) but may play a role in discouraging or encouraging their husbands or sons to do so. Therefore when trying to uncover what influences compliance, they are asked about how certain factors may affect the

compliance of others and not themselves. Attitudes and reporting on the other hand are activities that are undertaken by all and hence can be investigated in a similar way. Where female and male focus groups differed in what they believed influence support I highlight this as it is essential in providing an understanding of support. Following on from previous fieldwork I carried out on MPAs in the Philippines (Chaigneau, 2008), I would argue that whilst a gendered lens may help in explaining *why* certain factors influence support, similar factors may be identified by both groups and hence may not uncover what factors influence support towards MPAs. Gender issues are therefore more pertinent for my qualitative approach to understanding community support.

Throughout the empirical chapters I specify whether the focus groups are with fishers' wives or with those involved in MPA management, if not, this implies it is a fisher focus group. Furthermore, I code material as BFG for Bonbonon, CFG for Candaping B and SFG for Suba. All comments made by participants were labelled as P and all those comments made by Janette, the focus group moderator were labelled as M.

Unfortunately, it was not possible to carry out a focus group with local government and those directly involved with MPA management from Candaping B, although I spent time with them informally to gather information, due to time restrictions (and a few last minute changes) those from local government could not attend. Furthermore, an extra fisher focus group was carried out at Bonbonon for practice purposes.

Table 3.4 Study design highlighting the number and types of Focus Group, In Depth Interviews and Semi structured Interviews carried out at each site.

	Bonbonon			Candaping B			Suba		
Participant Types	FG	SSI	IDI	FG	SSI	IDI	FG	SSI	IDI
Fishermen	5	12	4	5	12	4	4	7	4
Fishermen's Wives	2	3	0	2	3	2	2	3	0
Village Officials (and those involved with MPA)	1	4	2	0	4	0	1	8	2

The ideal size of a focus group is between 8 and 12 people. It is thought with this number of participants, it makes it easier to recruit and host focus groups and make it more comfortable for the participants (Hennink, 2007). I therefore aimed for 8 participants at each focus group. However in practice this varied, and in most instances 6 individuals were present. Fishermen were chosen randomly from the questionnaires we carried out, and asked whether they would like to participate. Snacks were given as an incentive, but many were late or decided not to attend last minute. This involved a difficult decision between free and informed consent and a very slow research process with a potential of having too few focus groups at each site. I therefore chose a small payment as a compromise. Therefore a monetary incentive of 50 Pesos (1-2$) was given to those who attended. This is an important change that was meant to my ethical statement (Appendix 5) I wrote before departing for fieldwork, but was important to ensure that participants attended the focus groups and that I collected sufficient data (via focus groups) within my allocated fieldwork time. I argue that this monetary incentive was insufficient to make individuals want to attend focus groups (as some refused due to time or monetary constraints), I believe it ensured those willing to attend to arrive on time and not to change their minds. Fishermen's wives were chosen throughout the village via snowball sampling. Key individuals related to the MPA were already identified from the previous quantitative research.

Although focus groups were the main qualitative technique used I also carried out Semi Structured Interviews and In Depth Interviews. The Semi structured interviews were carried out alongside the quantitative research methods and served to elaborate some of the comments and answers that arose throughout the questionnaire (Appendix 6). These interviews consisted of a series of open ended questions aimed at understanding more on the deductive list of factors I identified in Table 3.1. I initially aimed to carry out 20 semi structured interviews at each site to ensure that I included differing views and thoughts on the various factors. However I reached theoretical saturation point (where no new conceptual insights are generated by continuing data collection) at each site after 10-15 so I carried out 18 semi structured Interviews with fishermen at each site. Similarly to the Focus groups, these are coded as BSSI from Bonbonon, CSSI from Candaping B and SSSI from Suba. Only fishermen were

interviewed, but if they were involved in MPA management of some form, I specify this in the empirical chapters.

Conversely, the in depth interviews were focused on providing information on certain inductive themes or factors that arose through focus groups or informal discussions with those in the community. Janette carried out 6 in depth interviews at each site following on from each Focus Group. That way those shy or timid in a group setting could be interviewed, or those with interesting insights could elaborate further. I was not present for these interviews as I thought it may make the respondent less able to speak freely and so Janette coviently carried these out and recorded the interviews. They are coded up as IDI, BIDI from Bonbonon, CIDI from Candaping B and SIDI from Suba. If the non fishermen or those involved in MPA implementation or management were interviewed, I specify this in the empirical chapters.

The data obtained from Semi Structured Interviews was translated in English during the interview. However data obtained from Focus Groups and In Depth Interviews was recorded, transcribed in Cebuano and then translated to English. Transcription happened within 1-2 days after the focus group. They were verbatim transcripts, however much was lost in the translation process. It is sometimes best not to think of the transcription as word for word but the basic meanings of each sentence was not lost. The extensive training carried out before and during data collection helped to ensure this.

The data was then coded into various factors or themes. This work was carried out in NVIVO. The factors or themes had for the most part, been pre-determined (deductively) through my literature search and quantitative analyses (Table 3.1). However, certain themes and subthemes were added as I progressed through the focus groups and new interesting factors emerged. These were predominantly themes pertaining to the feelings and emotions of individuals (Table 3.2).

Using NVIVO, I indexed the whole data set at each site for in depth interviews and focus groups using the factors as labels and marking segments of the transcript relating to each factor. Those themes that arose inductively were also labelled. This allowed me to create descriptive summaries of each theme and factor, with relevant

quotes and to determine whether findings were consistent across groups and across sites. When answering my research questions on what influences support, I could then go through each thematic report and see how these themes influence attitudes, MPA related actions or the link between them. Furthermore, this information helped to elucidate how and why these factors or themes influence support. I strived to illustrate how these themes influenced the different aspects of support by including them in summary diagrams at the end of each empirical chapter. A summary of the quantitative analysis is provided in table 3.5 which highlights the number of extracts coded up as a particular theme and the number of sources it arose from (i.e. how many interviews or focus groups mentioned the particular theme). It may be useful to refer back to this table throughout the thesis, however it should remain solely illustrative and not indicative of the importance of certain themes, as throughout semi structured interviews certain themes may have been probed and specific questions asked, eliciting specific responses.

Analysis of individual themes and factors provided a more detailed understanding of each issue and enabled comparison between discussion groups to see if there was consistency between sites. Given that the three villages differ in terms of community level factors such as MPA design and its management, different factors and themes emerged as important. I paid attention to both the content and the credibility/plausibility of the data, remembering that information is more credible when: examples given are vivid and detailed; participants describe their own experiences; specific issues are highlighted and explained; replies to open ended questions are spontaneous rather than probed; the speaker does not contradict themselves (Hennink, 2007). For the most part, this was up to the judgement of the moderator and note taker, however during the transcription and translation, it was possible for me to isolate those topics of discussion that were heavily discussed or where individuals contradicted each other and hence were of particular interest.

During analysis I focused principally on elucidation and understanding of the factors and aimed to identify similarities between sites. This therefore involved searching for commonalities between villages to pick up factors that were more significant in that context rather than ones that were highly idiosyncratic whilst remaining alert to and inquisitive about the differences that emerged.

Table 3.5 Broad themes coded throughout the analysis of qualitative data, the number of extracts coded for each particular theme and the number of different sources that these extracts were coded from. Darker colours represent higher frequencies of occurrence than lighter colours.

		Bonbonon		Candaping B		Suba	
		Number of Extracts	Number of Sources	Number of Extracts	Number of Sources	Number of Extracts	Number of Sources
MPA Benefits and Design	Benefits From MPA	110	15	141	19	70	18
	Size	19	5	39	17	38	25
	Location	34	17	18	15	21	13
	Part of Network	7	4	17	6	12	6
	Boundaries	55	16	43	14	15	10
Socio-economic Characteristics	Wealth	53	18	55	16	26	14
	Dependence on Fishing	23	11	16	11	15	10
	Gears	25	11	32	10	66	20
	Empowerment	73	24	86	20	55	18
	Knowledge of MPA objectives	102	28	51	16	36	19
Governance and MPA Management	Management in General	15	12	32	18	69	17
	MPA Leadership	20	12	29	16	44	22
	FA or SA	47	23	16	13	17	15
	Cooperation Between Institutions	28	12	46	20	42	17
	Continuity of Governance	21	14	7	6	27	13
	Sanctions	58	21	56	17	20	12
	Guards	15	10	43	16	50	18
	Unfair-Corrupt Law	24	17	38	15	62	24
	Angry Management	4	3	61	16	7	7
	Unfair Wealth Distribution	29	12	34	27	6	5
Feelings and Emotions	Solidarity	58	20	51	17	45	17
	Locus of Control	43	15	37	12	2	2
	Scared	51	22	35	18	27	11
	Pity	11	7	17	9	5	5
	Lazy	23	14	11	8	16	6
	Environmental Concern	20	13	7	4	9	6
	Jealousy	15	7	37	14	18	11
	Freedom	21	11	26	10	11	7

4. Site Selection

The rise of MPAs in the Philippines

Despite some mixed ecological and socio-economic evidence of MPA benefits, as described in chapters 1 and 2, their use is gaining popularity and the number of MPAs implemented across the globe is continually rising (Fox et al. 2012). The Philippines is no exception to the rule and has been at the forefront of establishing community based MPAs since the 1980s (Christie et al., 2002). The Philippine Marine Sanctuary Strategy (Areco et al. 2004), aims to protect 10% of Filipino coral reef area in no-take MPAs by 2020. Alino et al (2002) believe there are more than 700 MPAs already in place across the Philippines. Most of these have some no-take component and have been legally established since the 1970s (Alcala & Russ 2006).

Alcala and Russ (2006) argue that the rapid expansion of the use of MPAs in the Philippines was partly due to the success of the Apo and Sumilon MPAs established in the early and middle 1970s. " The success of these two small no-take reserves, and the programmes of marine-resource management with which they are associated, served as templates for a widespread application of marine conservation and reef fisheries–management programs across the entire Philippines" (Alcala & Russ 2006).

Courtney and White (2000), explain how two major forces have influenced the development of coastal management in the Philippines in recent years. The first is a series of donor assisted non-government organization (NGO) and government projects that have resulted in a number of coastal resources management (CRM) projects, all of which have established MPAs of various kinds. This is similar to the point made by Alcala and Russ (2006) as these have resulted in the implementation of the Apo and Sumilon MPAs which have in turn inspired other villages to follow suit. The second major influence affecting the evolution of coastal management in the Philippines is the devolution of authority from central to local governments (White et al. 2002). The decentralisation of the management of near-shore fisheries to municipalities and local fishing communities was mainly under the Local Government Code (LGC) initiative of 1991 (Pomeroy & Carlos 1997). This devolution of authority has encouraged more CRM and MPA projects through a variety of institutions, including government,

NGOs, people's organisations, research institutions, and multilateral and bilateral donor organisations, employing different strategies and approaches. National legislation now promotes the use of this management measure for coastal habitats and fisheries.

Although some of these MPAs have been implemented and managed effectively, as well as demonstrating benefits to the adjacent fisheries (Abesamis et al., 2006; Gell and Roberts, 2003a; Russ and Alcala, 1996a)almost 90% have been rated as ineffective (Beger et al. 2004). The "effectiveness" has been rated on the basis of the level of management and enforcement together with the impact on catch and level of illegal activity. Pajaro et al (1999) also found that out of 439 MPAs studied only 44 were fully enforced. Therefore, most MPAs are little more than official declarations and represent "paper parks" that are designated but in reality do not achieve their goals, often due to high levels of encroachment and relaxation of rules and regulations. Furthermore, (Pomeroy et al. 2005a) describe how MPAs in the Philippines have not been sustainable as they are not maintained after external support is withdrawn.

My initial motivation for the research was to improve the dire state of MPAs and their impacts on adjacent communities by understanding community support towards them. It was important therefore that this research demonstrates considerable external validity to ensure that the study's results are applicable to other groups. The comparative design described earlier helps achieve this by allowing me to see which factors are consistently influencing support across the three sites. Furthermore, different villages may have different characteristics and hence I can explore different community level factors which may be influencing support.

The site selection process was therefore fundamental for the external validity of this research. The research took place in the Visayas region of the Philippines, where the majority of Filipino MPAs are concentrated. Given the large amount of MPAs and therefore potential study sites, it proved difficult to determine which sites to choose for this study. Whilst choosing three similar sites (with similar community level factors such as MPA design and MPA management) would improve the internal validity of the findings, choosing thee different sites (with different MPA design and

MPA management factors) would improve the external validity of the findings (Mollinga and Gondhalekar, 2012).

I therefore selected three differing sites to allow for comparative analysis and search for commonalities between sites. These were within the Visayas and I ensured that they differed in a number of demographic, MPA management and MPA design factors. I aimed for difference in their geographical location, population size, MPA size and age of MPA (Table 3.6). In particular, I wanted to make sure that their MPAs varied in their perceived success and that their management differed. For this, I used an MPA rating system developed by The Coastal Conservation Education Foundation (CCEF) (White et al., 2006). It has become a popular management effectiveness tool nationwide and assesses the progress of an MPA over time in five different levels (Table 3.7, Maypa et al., 2012).

Table 3.6. Characteristics of the three villages studied in the Visayas region of the Philippines

Village	Municipality	Province	Population size (2007)	MPA size (ha)	MPA implementation	Perceived MPA success (CCEF MPA Database)
Bonbonon	Siaton	Negros Oriental	1629	8.6	1994	Fair
Candaping B	Maria	Siquijor	590	20.4	2003	Good
Suba	Anda	Bohol	1123	20	2004	Very Good

I also wanted to ensure that the three sites would be representative of the majority of MPAs in the Philippines. All sites studied therefore had MPAs within their barangay territorial waters and have very limited if any tourist amenities within the village. This is in contrast to a large number of studies considering MPAs in the Philippines, which often focus on MPAs frequented by divers and national or international tourists. However, it is clear that not all MPAs in the Philippines are so regularly frequented by tourists, indeed considering the accessibility of many villages harbouring MPAs I would argue those sites frequented by tourists are in the minority. Furthermore, to ensure that the MPA is old enough for some potential ecological or socio-economic benefits to occur, all had MPAs over 7 years of age. All MPAs were also considered

to be community based and are within the Central Visayas region of the Philippines (Fig.3.3).

Table. 3.7. MPA Rating Levels with the corresponding criterion and points used to establish rating levels from the complete rating guide. Sources : (Maypa et al., 2012; White et al., 2006)

Rating	Phase	Management performance	Description
Level 1	Initiated	Passing	MPA establishment activities are in progress (6 pts, 1 year since establishment)
Level 2	Established	Fair	MPA is legalized and management activities have started. (16 pts., 1–2 years since establishment)
Level 3	Enforced	Good	MPA regulations are implemented and management activities are maintained for 2 years or more. (24 pts., only applies for 2 years old and more)
Level 4	Sustained	Very good	MPA is well-enforced over the years; participation and support from the LGU and community is consistent. (30 pts., only applies for 3 years old and more)
Level 5	Institution-alized	Excellent	Management and enforcement is consistently maintained and is assured by additional legal support. (40 pts., applies for 4 years and more)
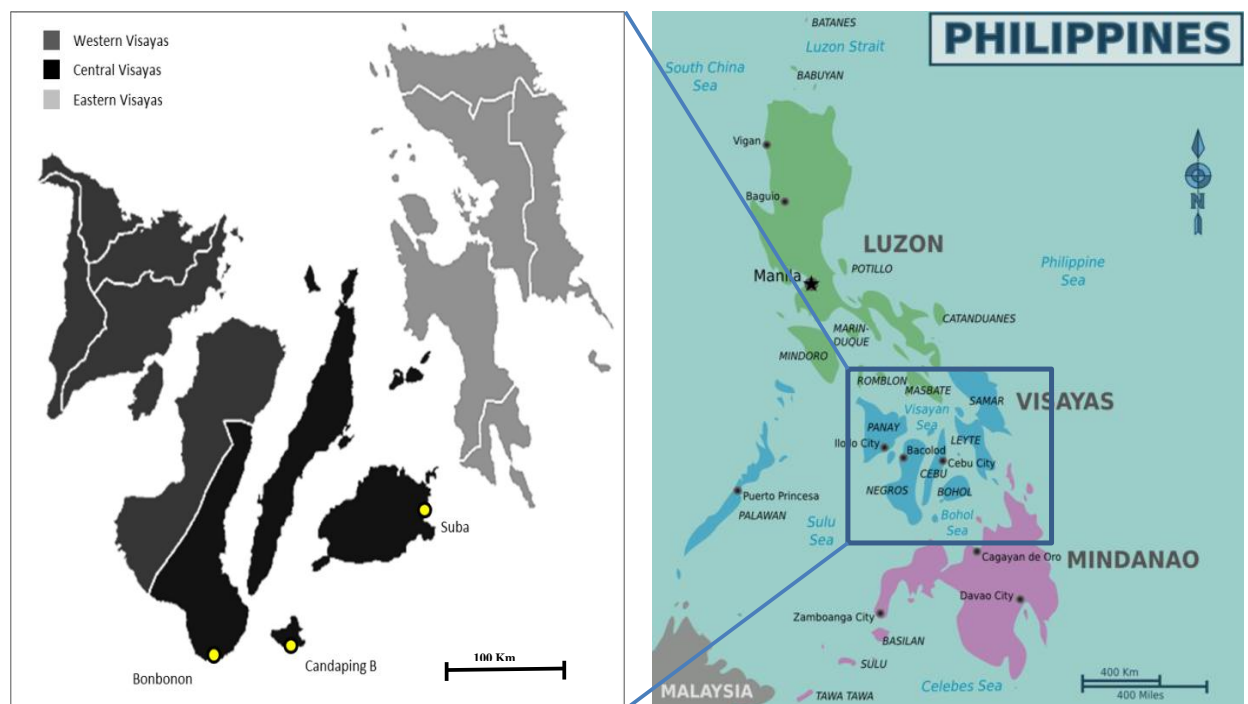
Fig. 3.3. Map of the Visayas region of the Philippines, including the three sites where I undertook my research with estimated scale bars, and a broader map of the Philippines (Source: Wikitavel; http://wikitravel.org/en/File:Map_of_Philippines.png)

Certain practical issues also played a part in the site selection process: ability to reside within the village itself; proximity to a town or city with internet (2-3 hours); and safety were all considerations also taken. The sites were also close together which allowed me to get to either site within a day or two and helped speed up the research process.

I initially wanted to get specific data and information on a variety of village level characteristics such as: MPA design; MPA rules and regulations; historical information; MPA leadership; what happens when someone encroaches; and other contextual and socio-economic characteristics of the village. However, although there was this type of contextual and historical data available for each site from organisations such as Coastal Conservation Education Foundation (CCEF), Bureau of Fisheries and Aquatic Resources (BFAR) and other NGOs or GOs, I quickly realised whilst in the field that these were out-dated or inaccurate. Instead of a top down approach into investigating these issues, the small number of sites explored together with the length of time I spent in the field, allowed for a more detailed bottom approach. This involved using observation, key informant interviews and in depth interviews within each site. The information gathered however is more complex and sometimes contrasting depending on the individuals interviewed. Different key informants for example would have different ideas as to what the aims of the MPA were. By focusing on secondary sources or interviews with GOs and NGOs, I highlighted that all sites had guards on a rota who are in charge of monitoring the MPAs, that all three sites had an FA or an MPA management committee and that there are supportive leaders in place. After only a few days spent at each site and carrying out interviews with a number of individuals it became clear that certain supportive leaders of the MPA were not re-elected (such as in Suba), that guards frequently do not monitor the MPA, especially at night and that certain FAs (in Suba and Candaping B) were no longer functioning.

I therefore focussed solely on the more tangible contextual information that I did not feel was contested or observed to differ in the field in this chapter. Based on informant interviews, observation and secondary sources, I summarise the key characteristics and differences between the three sites below. Nevertheless this contextual information may help in understanding why certain factors were found to

influence support towards MPAs in the following chapters. Other village level characteristics and issues that are more ambiguous are presented in the empirical chapters.

Bonbonon

The first site I visited was that of Bonbonon barangay situated on Negros Island. I was shocked initially as to how much the village was dispersed. Despite its' relatively large population size the population density was very low. I learnt that the village could be divided into a number of different neighbourhoods called "puroks" or "sitios". I was based by a bay almost opposite the MPA in a "purok" called Tambobo. However there were another 4 "puroks" which took almost an hour to reach by foot, sometimes through rather muddy forested paths (Fig.3.4). It was important to visit households even in the forest as many were fishers despite being a considerable distance away from the shore.

Negros Island was very much involved in the farming of sugar cane (Karnow, 1990), yet fishing still remains an important livelihood. Although many villagers are fishers themselves, large fishing boats from other parts of the Philippines (notably Mindanao but sometimes other countries) frequently spend a few days here to rest, offload their catch and repair their boats (Fig. 3.5). This is mostly because of the natural protection Tambobo bay offers during times of extreme weather. For similar reasons, the area is also frequented by "yachties" or sailors, many of which have remained, living on their boats within the bay permanently and could be considered as part of the Bonbonon community. The fact that some westerners have spent time living in Bonbonon meant that many fishers were not scared or even surprised at seeing me within the village. I took special care to make clear that I was not in any way related to any of the westerners in the area as their presence in the community seem to have led to a number of arguments and debates within the area.

Fig.3.4. Path leading to "Agbagacay" sitio in Bonbonon

Fig 3.5. Foreign fishermen repairing their nets in Bonbonon

The fact that foreign fishermen or "outsiders" are often present in Bonbonon has also led to conflict. They were thought to wreak havoc as they spend time in the local bars, can make noise and sometimes become violent.

I was lucky to be able to rent a bamboo hut opposite the MPA which meant I could unofficially monitor it from time to time. It proved very difficult however, as the MPA boundaries were not clearly delineated and most encroachment was thought to occur at night making it almost impossible without a strong flashlight to determine if anyone was violating the rules. Figure 3.6 shows the approximate location of the MPA, near the entrance to the bay.

The MPA was implemented following a coral and fish survey conducted by the Centre for the Establishment of Marine Reserves in Negros Oriental (CEMRINO, 1995). Since then most MPA management is up to the Barangay itself, according to the Municipal ordinance (2000) (local municipal law):

"All law enforcement officers of the municipal government, Philippine national police, bantay dagat, and barangay tanods are authorized to enforce this ordinance. Other competent local government officials and members of fisher's organizations or cooperatives who have undergone training in law enforcement may be designated in writing by the municipal government as deputy fish wardens in the enforcement of this ordinance" (Municipal Ordinance 2000).
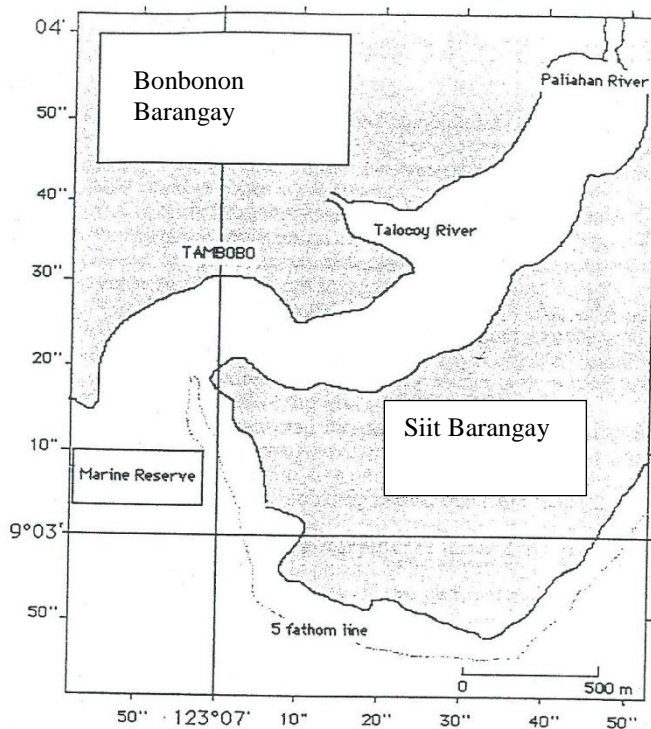
Fig.3.6. Approximate location of Tambobo MPA in Bonbonon Source: (CEMRINO, 1995)

A number of individuals can therefore be in charge of enforcing the MPA at Bonbonon. Throughout my time in Bonbonon however, most of the enforcement work stemmed from members of the Fisherman's Association (FA). These members are involved in any issue pertaining to fisheries and their management (discussed further in chapter 6). Indeed, given the proximity of the MPA to the entrance of the bay, it is an MPA that could quite easily be monitored by those that are fishing or are in boats. It would prove rather more difficult to monitor by individuals on the shore or in their houses without the use of binoculars and/or flashlights.

Candaping B

Candaping B barangay was in sharp contrast to Bonbonon in that it is relatively isolated and sees few outsiders from beyond the village or municipality. It's based on Siquijor Island in the Maria municipality which is one of the least accessible parts of the island. Together with the fact the village has a small population size (Table 3.6) and is over a small geographical area gives Candaping B a far more insular and community feel. I felt more comfortable in this village and on hindsight spent more time with the villagers.

Fig. 3.7. Fishing boats on the Candaping B shoreline

There is a resort in the village, yet despite its size it sees very few tourists throughout the year (pers.obs). Although a few villagers work as caretakers in the resort, most depend essentially on farming and fishing for a livelihood. Indeed fewer jobs are available to those in the village due to the long commute to the nearby municipal town where more schools and government positions are located. Despite the small population, similar numbers of fishermen were identified in Candaping B and in Bonbonon, highlighting the dependence on fishing within the village. I would also argue that many fishers here were fishing for subsistence rather than for money which was the case for some in Suba or Bonbonon.

I was again lucky enough to be staying in a hut at the back of the hotel, in full view of the MPA. Similarly to Bonbonon however, whilst I could monitor the MPA in my free time, it was hard to tell if someone was encroaching. In this case, the predominant reason was because the MPA supposedly had a core zone, buffer zone and a navigational pathway where boats were allowed to pass but not to fish (Fig. 3.8). Although I tried to understand the purpose of the buffer zone, neither the BFAR, DA or key informants within the village could provide me with a clear answer. For most, the rules and regulations that apply to the MPA core zone were identical to those of the buffer zone. It became clear through qualitative analyses however that many encroachers found in the buffer zone were excused and given the benefit of the doubt that their encroachment was a mistake (which may or may not have been the case). The navigational pathway however would allow fishing boats (*bangkas*) and motor boats to pass through, whilst these are restricted throughout the rest of the MPA. This therefore made distinguishing encroachers from passers-by quite difficult, especially at night time.
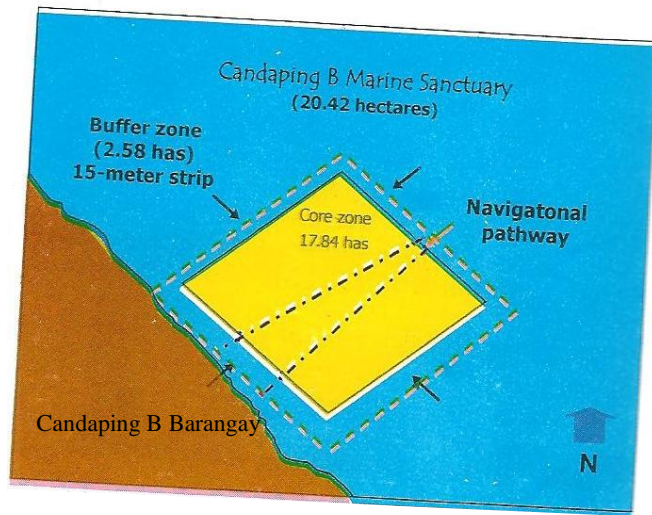
Fig.3.8 Candaping B MPA Design Source: (Bendijo, 2004)

Baseline assessments had been carried out in order to determine the location of the MPA (Bendijo, 2004). However since implementation, it seems that a large array of different individuals and organisations had been involved in its management. The Marine Management Committee (MMC) comprising various governmental and non governmental individuals within the community which should technically be in charge (Bendijo, 2004) was no longer active. However, the local resort had sponsored two *barangay tanod* (local police officers) to take on specific MPA watch duties This was only an honorary fee paid monthly and is not a salary (pers. Comm). Candaping B however, received comparatively more help in terms of advice and monitoring from the municipal and regional government than Bonbonon and frequent trips were made by the BFAR. I noticed however that although the barangay tanods were respected by the provincial government, there was no cooperation between these individuals and the local government. It therefore proved very difficult for them to carry out their work and it was hard to enforce rules and regulations if they did not receive backing from the barangay captain. Indeed the barangay captain had expressed a disinterest with issues regarding the MPA (pers.obs) and would not be interviewed on the matter.

Suba

Suba barangay was the most accessible village, being right next to the municipal town and along a main road. It was hard to delineate at times between Anda town (the municipality) and Suba barangay. So although the population size of Suba may be

smaller than Bonbonon, due to its proximity to the municipality it does not have a small community feel.

No tourist amenities were available in Suba, and indeed I rented out a house during my stays there. The beach at Anda however is relatively well known especially amongst Filipinos and some tourists would come from other resorts to picnic on the nearby beach. Due to the proximity to the municipal town, there are more possibilities for alternate livelihoods than in the other sites.

I felt the least comfortable whilst in Suba and the villagers were less responsive and less willing to participate in my data collection methods. This was a feeling that was also expressed by Janette and Sarin who felt more at ease in Candaping B and to a lesser extent in Bonbonon.

Unfortunately, the MPA was not clearly visible from my accommodation, yet it is visible to any individuals on the shoreline. The history of the Suba MPA is of particular interest as it was initially set up in 1994; it then closed and re-opened again in 2004. It was divided into two parcels; parcel 1 was 6.35 ha and parcel 2 was 13.6 ha. Parcel 1 was well maintained and guarded until the present whilst parcel 2 was abandoned in 2009 by the demand of the local people (Suba-Fig. 3.10). This shows the dynamic nature of MPAs, and highlights the fact they are not static entities but can change over time, a theme which will be re-visited throughout this research.

Fig. 3.9. Janette carrying out an in –depth interview with a fisher from Suba
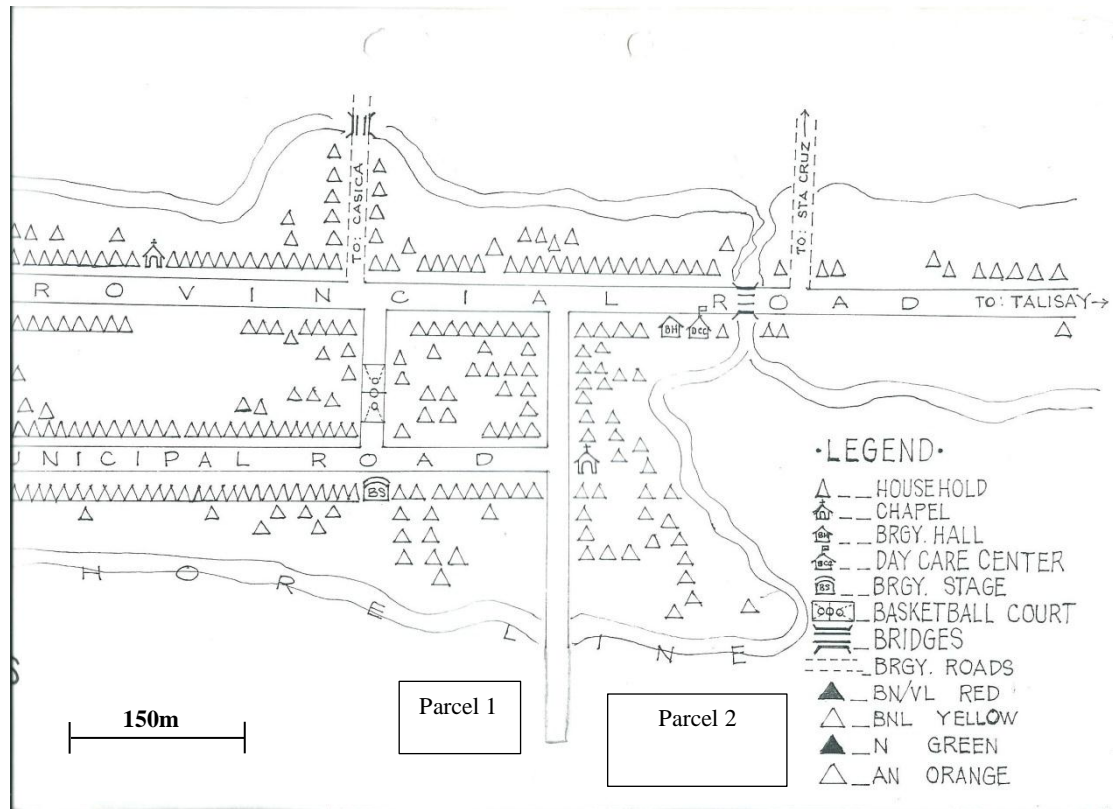
Fig. 3.10 Map of Suba and MPA locations of both parcels and estimated scale bar (Source; Department of Agriculture, Anda Municipality, Bohol)

Interestingly, despite its proximity to the municipality, Suba MPA receives far less support from municipal government than the other two sites. In a similar vein to Candaping B, there is supposed to be a Suba MPA council consisting of amongst others, the barangay captain, local tanods, bantay dagat and a member of the BFAR; however the council was no longer visibly active. Despite the fact that MPA enforcement is legally allowed to be carried out by municipal government, members of the barangay council, bantay dagat or certain people's organisations like Fishers Associations (FA's), it seemed to me that nobody was at the time of the research actively monitoring and enforcing the MPA.

Conclusion

The three sites studied therefore vary considerably in terms of the MPA design and the way it is managed. I hope to have conveyed that there was a different "feel" to each barangay. Whilst, Candaping B had a strong sense of community, the presence of foreign fishermen and "yachties" at Bonbonon appeared to have eroded this feeling,

and the proximity of Suba to a nearby town may have had a similar effect. It may also be due to the fact I spent comparatively more time in Candaping B both due to circumstance (extreme weather conditions and illness meant a longer stay in Candaping B) but on reflection may also be because I enjoyed my stay and fostered friendships with members of the community. The information provided in this section may help to provide some context to some of the arguments made in the following empirical chapters and to help in providing an understanding as to how and why certain factors influence support and why certain themes emerged as important.

5. Research Ethics

It is important to consider the repercussions of the research in relation to the people whose lives are being studied. Ethical issues such as the projects worthiness, the researcher's competence, the relationship with respondents, harm and risk, questions of privacy, confidentiality, anonymity, and data ownership amongst others are thought to arise at different times throughout the research process (Miles and Huberman, 1994). Dealing with these ethical issues effectively involves heightened awareness, negotiation, and making trade-offs among ethical dilemmas (Zingerli, 2003). To assure the safety and wellbeing of participants, I adhered to the following principles:

a. Confidentiality – I preserved the anonymity of all respondents by ensuring the data was kept confidential and that names were changed before any publications. I stored the data securely, keeping identifying markers of individual's data separate from the collected data. However, although names were changed some empowered and MPA involved individuals may still be able to be recognised. Comments made by empowered individuals were via key informant interviews or MPA involved focus groups and those participating were made aware that their comments would be recorded and published. Furthermore, the comments made and recorded for this thesis were not secret and were widely known throughout much of the community. It is those comments made by fishers which are damning to those in charge of managing the MPA or in government, that were of utmost importance to keep confidential. All comments made by fishers were kept confidential and anonymous.

b. Participation –All individuals were made aware of my research aims and objectives and had the opportunity to opt out of the interview at any point. In order to put participants at ease, an interview was offered wherever they felt most comfortable, such as in the family home or in a private or public space. A small monetary incentive as well as provision of snacks and drinks was also in place to encourage participation.

c. Permission – I contacted the regional, provincial and municipal governments before entry to the relevant villages to ensure that they were aware and happy for me to do my research within these sites. Furthermore, I negotiated entry to the barangays (villages) with the *barangay* captains and research was only carried out once their permission was granted. During the above negotiations, I explained my research, how I would carry it out and the objectives of my research. I provided a consent form (Appendix 7) and consent was obtained both via oral and written confirmation

d. Children – Where young fisherfolk under the age of 16 were being interviewed, their consent was sought as well as from their parents or from guardians. Furthermore, interviews were carried out within the parents' homes or in close proximity to their parents.

e. Feedback – I made clear that my findings would be made readily available to anyone that expressed an interest within the villages or regional, provincial or municipal government and relevant NGOs. I will return upon submission to hand out hard copies of the PhD to some who have already expressed an interest and briefly explain and summarise the key finding in an accessible language for local consumption.

This research was given ethical clearance by the University of East Anglia's Research Ethics Committee following the above guiding ethical principles (Appendix 7). However a few important issues arose throughout the research process. I became aware, especially in Suba that many believed that my presence and my research would result in a positive change to their MPA and the state of the adjacent fisheries. Despite

the fact I was stating my research aims and objectives (to understand what influences support), for some individuals I had to specify that my aims were to further contribute to knowledge in the area which could in turn potentially inform policy and management and that I myself had no immediate intention to change the status quo. At times I felt I was extracting information and taking certain individuals' time to answer questions, but providing them with no benefits. Eventually the data and analysis I perform may not help *their* MPA and the future of *their* fisheries. It was important for me therefore to minimise any potential disruption that my research may have on those studied as no benefits may be incurred from my presence there.

Although I made no major changes to the ethical procedures whilst collecting data in the field a few other issues did arise. Firstly, during focus groups, some individuals not invited to take part in the discussion would wish to attend. I quickly learnt that in these circumstances it was best to let them take part unless they were invited to participate in another session. The moderator and I however would do our best to focus the discussion on those invited participants. In the few cases where this happened, I made clear notes of the information provided by the guest participant and when he arrived and left the discussion. Secondly, I realised that many were not keen on attending one to two hour long focus group sessions as it meant time away from their jobs and potentially earning money or food. I therefore gave out 50 Pesos (1-2$) to encourage the invited participants to attend (as well as providing very large quantities of snacks).

6. Sources of Error

One of the main limitations to my methodological approach is that of the veracity of speech and whether what was said throughout focus groups or interviews reflected what respondents actually thought or believed. Some respondents may be providing answers that they think may be "correct" or may be the "right" answer whilst others may believe it is the answer that would make me happy and that I am searching for. I believe the former may be more current as I got the impression that some individuals were repeating what they were told by NGOs or government level officials when the MPA was implemented. It is important to note that this veracity issue is different for the different methods used. It may especially skew the quantitative data collected on

individuals' support towards the MPA as some may be more likely to say they are supportive as they feel this is what they should say. However, given the fact I use graphic scales for these questions, I am interested in looking at the variation of support between individuals which evades this issue somewhat. When exploring which factors may influence support, there is no correct answer and hence in many cases I believe that respondents were providing answers that reflected their thoughts.

Another issue that arose throughout the research was due to the language barrier present. Before fieldwork and whilst in the Philippines, I spent time learning the local Visayan dialect and hence could understand basic conversations, especially those involving coastal issues. However, it was important to have Janette as an interpreter throughout the different research methods used. I initially carried out some pilot studies with another interpreter who had spent time at Silliman University and was recommended. However, she had very little in common with the fishers and could not make them feel at ease. Janette was suggested by a member of CCEF who was living with her in Candaping B at the time. Although not a trained researcher or involved in coastal conservation, she had a great grasp of the English language and had the ability to put even the shyest fisherman at ease. I feel we understood each other very well and spent much time discussing the findings and our observations throughout the research process. However it is inevitable that during the translation of the focus groups or in depth interviews that some more nuanced information is lost in the process. In particular, it was hard for me to determine the interactions between different individuals within focus groups and I believe that it was hard to put some of this in words when translating the focus group transcripts. Nevertheless, there was an element of learning by doing and I feel that Janette, Sarin and I continued improving the ways we conducted our research as we progressed through the different research methods.

7. Conclusion

I found that my interests changed throughout the research process (Fig. 3.11). In particular, I began to question the use of the term "community support" that is so frequently mentioned in the NRM and MPA literature, as my research methods focused on *individual* attitudes and actions and that different individuals were affected

differently by the MPA and in turn supported the MPA to varying degrees. With hindsight, what started out as simply research design ended up being a journey that redefined in important ways what I was asking. I summarise this journey in Fig.3.11. In general my focus went from being mostly quantitative to becoming mostly qualitative, to such an extent that I nearly refrained from including chapter 4, which is solely based on the quantitative findings. Whilst the quantitative information was useful to be able to carry out multiple regressions and get an idea of the importance of certain factors, as well as triangulate information, I found that the qualitative data could elucidate *how* factors influence support. Furthermore, qualitative data allowed me to explore some of the inductive themes that influenced support which proved to be novel and less discussed in the MPA and NRM literature.

At the start of PhD		At the end of PhD
What factors influence community support?	Research Question →	How can we understand community support?
Quantitative Analysis	Research Strategy →	Qualitative Analysis
Factors	Unit of Analysis →	Themes
Deductive	Research Approach →	Inductive

Fig. 3.11 How my research focus changed throughout the study period

Having outlined my methodologies to understanding what influences community support towards MPAs in the Philippines, the following empirical chapters will elaborate on and respond to the sets of research questions outlined in chapter 1. The ordering of the chapters somewhat reflect my research journey as they begin with a more quantitative focus and become more qualitative towards the end of the thesis with more focus at factors that operate at the individual level. The organisation of the chapters and the development of my narrative across the thesis will illustrate this research journey more clearly and a fuller account of this journey will be highlighted in the conclusion chapter.

Chapter 4: Predicting Support towards MPAs

This chapter primarily seeks to identify those important predictors of community support towards MPAs. Following on from the literature review, I describe in chapter 3 how I identified a number of factors which could influence attitudes and actions of individuals towards MPAs and could hence help provide an understanding of community support towards these NRM strategies. I provide in this chapter a detailed account of where these factors arise in the literature and how they are hypothesised to influence support. After having carried out questionnaires at Bonbonon, Suba and Candaping B I obtained a substantial amount of information on a variety of deductive factors hypothesised and I carry out a multiple regression to determine which factors best predict community support towards MPAs.

In contrast to the following empirical chapters however, this focuses solely on the deductive list of factors identified in chapter 2 and on questionnaire data collected and is hence solely quantitative in its approach. Whilst I attempt to combine both qualitative and quantitative data in other chapters, a purely quantitative focus in this chapter asks 3 specific sub-questions which help in providing an understanding as to what determines community support, which could not be answered solely by qualitative and descriptive analyses provided in the following empirical chapters. These are:

    i.   Which individual-level factors predict attitude towards MPAs?

As outlined in chapter one, despite the importance of community support in ensuring the success of MPAs, little empirical work has been carried out to determine what influences community support. This question will seek to understand which factors are important predictors of support.

    ii.   Are attitudes of individuals related to actions that benefit the adjacent MPA?

Most studies suggest that community support relates to positive feelings or attitudes, which are supposed to lead to compliance and better enforcement (Ballantine, 1994; Pollnac and Pomeroy, 2005). Attitude is indeed used as a precursor or determinant for

most models that attempt to explain pro-environmental behavior or action (Kollmuss and Agyeman 2002, Bamber and Moser 2007). However, a large gap between attitude and behavior is now widely acknowledged such that attitude does not directly determine behavior (Bamber and Moser 2007). This question seeks to determine whether there is in fact a relationship between attitudes and actions when considering support towards MPAs in the Philippines.

  iii. Do differences between individuals or between villages have a bigger impact on support?

Many large-scale studies on the social, economic and/or ecological success of resource management strategies such as MPAs, examine factors either measured at the community level, or as individual or household variables aggregated to the community level (for example, Christie, 2005a; Hilborn, 2007b; Olsen and Christie, 2000; Ostrom, 2000; Pollnac et al., 2001). Communities however are not homogeneous social structures with similar groups of individuals possessing similar characteristics and shared common interests (Allison and Horemans, 2006; Coulthard et al., 2011a). Although some studies have examined how individual factors may influence the success of MPAs (Dimech et al., 2009; Gelcich et al., 2005; Pollnac et al., 2001), this question seeks to address the distinction between individual-level and community-level factors and their relative importance towards the success of MPAs which is rarely discussed.

The quantitative approach to this chapter will therefore help to determine which factors best predict attitudes and actions with regards to MPAs and will provide a measure of which factors are most important.

1. Data Preparation

I describe in chapter 3 how indices for support and wealth were created out of a number of variables. I highlight below how this was carried out, as these indices proved instrumental in carrying out the multiple regression analyses described in this chapter.

Individuals' perceptions of their support towards the MPA: To understand whether individuals harboured positive attitudes towards their MPA, questions were asked to determine whether they perceived any MPA benefits, their attitudes towards the management of the MPA and how these attitudes have changed over time. Specifically, respondents were asked: what effect they thought the MPA had on local fisheries; how effective the MPA was at preserving the reef; how well it was managed; whether they would like to keep or remove the MPA; whether their attitude had changed since implementation; and how they thought the MPA had affected the community. Answers were recorded as a position along a 10cm horizontal line representing the range from very positive to very negative (Bryman 2008). This graphic scale was also used for other questions pertaining to trust in the community later on in the questionnaire. Respondents were also asked whether they thought the MPA had resulted in any benefits. Each answer was given a score dependent on the number of benefits that were listed. An attitude index was then calculated for each individual by running a factor analysis with an oblimin rotation on the above six graphic scale questions in SPSS (Table. 4.1). Principal Component Analysis of the variables eliciting attitudes towards the MPA resulted in a single factor as determined by the scree test, which explained 53% of the variance. The data was then inverted and transformed to normalize the distribution and so that a high value would represent a positive attitude.

Table 4.1. Factor loadings obtained from a factor analysis on attitude variables used to calculate attitude indices of fisher folk towards MPAs.

Attitude variable	Factor loading
Keep or remove MPA	0.886
Change in attitude over time	0.859
Effect of MPA on community	0.851
Effect of MPA on fish	0.742
Views on Management	0.658
Benefits of MPA	0.593
Effect of MPA on reef	0.367

To understand the behaviours of individuals towards the MPA, respondents were also asked what they do or would do if they spotted an encroacher. Some for example report to the barangay captain or local chief of police whilst others warn the

encroachers or do nothing. No quantitative data was collected on the level of personal compliance with MPA rules and regulations as encroachment is illegal and thus questionnaire responses on personal compliance were not reliable.

Individuals' Wealth: Respondents were asked whether they owned a range of various household items, how they light their house, what the floor, walls and roof of their house is made of and whether they own a vehicle or not. All house structure indicators were ranked based on their cost determined by key informant interviews and personal observation. For for example, floor type was scored as 1 for soil, 2 for bamboo, 3 for wood, 4 for cement and 5 for finished. Finally they were asked to estimate the monthly expenditure of their household. A wealth index was then calculated for each individual by running a factor analysis with an oblimin rotation on the above questions in SPSS (Table. 4.2). The wealth of individuals resulted in a single factor as determined by the scree test. This factor explained 26.7% of the variance.

Table 4.2. Factor loadings obtained from a factor analysis on wealth variables used to calculate wealth indices of fisher folk towards MPAs

Wealth variable	Factor loading
TV	0.729
Fan	0.696
DVD player	0.668
Fridge	0.618
Iron	0.614
Rice cooker	0.575
Floor type	0.549
Expenditure per month	0.546
Light	0.544
Karaoke	0.531
Satellite TV	0.511
Wall type	0.465
Cooking	0.451
Computer	0.427
Roof type	0.411
Vehicle	0.334
Washing machine	0.32
Piped water	0.188

2. Multiple Regression Analyses

As previously mentioned in chapter 3, a large number of factors operating at an individual level, collated from a number of different research areas were hypothesized to influence community support (Table.3.1). However, not all factors were used. Only a subset of the deductive list of factors can be incorporated into the analysis. The principal reason is that a large sample size and a low number of independent variables (or factors) are required for regression analyses such as this. Due to the large number of factors identified and the comparatively small sample size (166 questionnaires), it is important to reduce the number of independent variables and hence remove some factors before analysis. Whilst this leads to a small number of factors being studied it improves the efficiency of the model (Maxwell, 2000). Therefore, only those factors that applied in the context of three studied MPAs in the Philippines were acknowledged. Secondly, certain factors identified in the literature were correlated with each other. In this case, only variables with the best range of data and clearest hypothesized link to the dependent variables were used. Finally, certain factors were found to vary very little across sites between individuals. These factors were removed from the analysis as they would not be able to explain the variance in the support of individuals towards the adjacent MPA. As a result, 12 individual level factors were considered for the analysis (Table.4.3.).

Before carrying out the multiple regressions I tested whether attitudes and enforcement differed significantly between the three villages using ANOVA and Chi-squared tests respectively. This may help in understanding the importance of community level factors in influencing support and the contribution of "village" as a predictor of support in the multiple regression analyses. Furthermore, to test the relationship between attitudes and enforcement, I carried out an Independent Samples T-Test to determine if there was a significant difference in attitudes between those that said they would act upon seeing encroachers and those that would not.

Table. 4.3. Factors considered to potentially influence support for MPAs in the Philippines, along with the variables used to indicate these factors.

Factor	Hypothesised relationship with attitude and action	References	Variable measured	Mean value and range
Mobility	Those with motor boats less affected and supportive of the MPA.	Hannesson (1998)	Boat Power (Paddle 1 or Pump boat)	1.3(1-2)
Education	Years of educational attainment is positively correlated with MPA success	Pomeroy et al (1997)	Years of Education	2.7 (1-5)
Fishing Experience	Those with less fishing experience have not seen the deterioration of the marine environment and are less supportive of MPA.	(Saenz-Arroyo et al., 2005)	Years spent fishing	25 (1-60)
Local level influence	Perceived level of influence is positively related to perceived success of MPAs.	(Pollnac & Pomeroy 2005; Pomeroy et al. 1997	Influence in MPA decisions (Likert scale of no influence-1, to influence in all decisions-5)	3.2(1-5)
Knowledge of MPA objectives	Knowledge of MPA improves the success of MPAs	White (2005b)	MPA Reason (No reason given-1-, or reason given-2)	1.9 (1-2)
Number of Gears	Those with many gears may be less affected by fluctuating resource availability and therefore may be less affected by the adjacent MPA	Blyth et al (2002)	Number of different Fishing Gears	1.3(0-3)
Local level participation	Local level participation in MPA decision making is linked to success of MPAs	Pomeroy and Carlos (1997) Christie et al. 2005; Pollnac et al. 2001	Participation in MPA decisions	3(1-5)
Time spent fishing	Unlike full time fisher folk, those that fish less regularly are more neutral on MPA issues	Dimech et al. 2009	Time Spent Fishing (Hours per week)	35.9(0.5-112)
Trust in agencies of	Those with trust in agencies of management are more likely to	Oracion et al (2005)	Trust for Bantay Dagat	8.1(1-11)

management	support the creation of MPAs			
Trust in agencies of management	Those with trust in agencies of management are more likely to support the creation of MPAs	Oracion et al (2005)	Trust for Local Government	7.3(1-11)
Trust between individuals	Trust between individuals is essential for effective management and low cost monitoring	Mascia (2004), Jentoft (2000), Ostrom et al (1999)	Trust for Other Fisher folk	7.7(1-10.9)
Satisfaction of personal needs	Individuals that have satisfied their personal needs may be more supportive towards the MPA	Kollmuss and Agyeman (2002)	Wealth Index	0(-1.3-4.8)

I used regression models and model selection methods to explore which individual variables predicted both dependent variables. For attitudes I fitted a multiple linear regression and applied a forward stepwise procedure in SPSS, which added and removed each of the 12 variables in turn to select a model with the optimal fit to the data on the basis of predetermined F-ratio values criteria ($p<0.05$ for inclusion and $p<0.1$ for exclusion). The selected remaining variables were therefore retained in a final model. However, as I was interested primarily on the impact of individual variables on attitude over and above the differences attributable to "site" such as differences in village characteristics, the village variable was also retained in the final model.

To explore the relative explanatory power of individual-level variables and village, I used F tests on nested models to check how much the addition of significant individual-level variables improved models which already included village, and conversely whether addition of village significantly improved models which already included significant individual level factors.

For the enforcement dependent variable, I fitted a binary logistic regression model to predict the probability of enforcement based on individual characteristics and village, and applied a forward model selection procedure to select the model with the optimal fit to the data. In the same way as for attitude, the village variable was retained

(together with factors selected through the stepwise process) for the final model and chi squared tests were used on nested models to assess the relative explanatory power of individual-level variables and village.

Village was therefore a priori included in all final models as I was interested in individual characteristics that affected the dependent variables over and above the differences attributable to differences in sites. I should also note that whilst I present the results from forward stepwise regression models, I also carried out backwards stepwise regressions. The latter are more inclusive yet I was concerned primarily with extracting the most important predictors of support out of a relatively large number of factors and hence opted for a forward selection process. Furthermore, models obtained from the forward selection procedures had lower AIC (Aikeke Information Criterion) values which are often used in model selection procedures (Burnham and Anderson, 2002). Whilst these stepwise regressions prove useful in determining predictors of support towards MPAs, I recognize that there is considerable debate surrounding the use of stepwise regressions in selecting models and can lead to spurious claims (Whittingham et al., 2006). Indeed, I did not correct p-values for multiple comparisons inherent in the model selection process. It is important therefore to consider these results alongside the qualitative analyses carried out in chapters 5-8.

3. Factors Influence Attitude

I identified 12 individual level factors from the literature as potentially influencing community support (Table 4.3). Five of these factors together with differences between villages were further identified as being significant predictors of community support (Table.4.4). Indeed, the final attitude regression model explained almost half (43.8%) of the variance of attitude in individuals (Table 4.4.).

Whether or not individuals could provide a reason as to why the MPA was put in place was an important predictor of attitudes. It seems therefore that an increased understanding as to the purpose of the MPA may lead to greater acceptance and support of the MPA. This may help explain why an understanding of MPA objectives and potential benefits arising from MPA or NRM strategies is suggested to influence the success and efficiency of management (Lowry et al., 2009; Ostrom, 2003).

Table. 4.4. Selected regression models and significant factors predicting attitude or action in support of MPAs

Dependent Variable	Attitude	Enforcement
Model type	Multiple linear reg	Binary logistic
"Village" (change in hierarchical model) [1]	3.405*	23.94***
"Individual Level Factors" (change in hierarchical model) [2]	14.317***	31.6***
"Knowledge of why MPA was implemented" [3]	0.194***	2.54***
"Trust towards the *Bantay Dagat*" [3]	0.184**	0.138*
"Trust towards other fisher folk"[3]	0.206**	Not Included
"Perceived influence in MPA decision making" [3]	0.377***	Not Included
"Wealth" [3]	Not Included	0.77*
"Time spent fishing" [3]	-0.155*	Not Included
Final Model	R^2=0.438, F=14.815, P<0.001, N=133	R^2=0.48-0.513 , X^2=16.54, P<0.05, N=156

Where * P<0.05 ** P<0.01 *** P<0.001
[1] Test statistic from F test (for multiple linear regressions) or Chi squared test (for binary logistic regressions) on nested models with individual factors
[2] Test statistic from F test (for multiple linear regressions) or Chi squared test (for binary logistic regressions) on nested models with village
[3]Coefficients from final model

As individuals perceived themselves to have more of an influence in decisions surrounding the MPA they were more likely to harbour positive attitudes. Interestingly, self-perceived levels of participation were not found to be predictors of attitude or enforcement. Often this term "influence" is used in conjunction with participation. Maliao *et al* (2009) however clearly dichotomise between the two and explain that that participation in coastal resource management is the "level of involvement of local resource users" and influence over coastal resource management is the "level of bargaining power of local resource users over decision making related to coastal resource management". The degree of influence has indeed been found to be an important factor in coastal resource management success (Pollnac and Pomeroy,

2005; Pomeroy et al., 1997). I argue that if individuals have the power to influence decisions, it suggests that the MPA may be more adapted to support their local needs and that the MPA will match expectations and hence may lead to more positive attitudes towards the MPA.

Jentoft (2000b) argues that community based co-management can only work effectively if it is part of a larger scheme for community development which includes building trust between individuals. Indeed, as the trust of fishers towards other local fishers or the local *bantay dagat* (coastal police) increased, so did their attitude towards the MPA. It is possible that individuals with more trust towards their fellow fishers and MPA enforcers are less worried that free riders are reaping the benefits of the MPA at their expense (Ostrom et al., 1999) and are therefore more positive towards an MPA.

The amount of time an individual spent fishing a week, was negatively related to attitude toward the MPA. Dimech *et al* (2009) found that full time fishers expressed stronger opinions than part timers, who were neutral on most issues. Indeed in this case, it appears that those that spend more time fishing expressed more negative attitudes towards the adjacent MPAs. This may reflect a level of their dependence on the fishery which is also thought to influence the success of MPAs (Cinner et al., 2009b; Pollnac et al., 2001). The more dependent fishers are on the fishery, the more they may be likely to perceive immediate costs of MPA implementation and its consequent loss of fishing grounds and less likely to think about the potential future economic benefits for them or the environmental and aesthetic benefits that may arise. Some of these factors found to influence attitude may be manipulated by interventions such as awareness raising of more deliberative forms of management allowing individuals to have more of an influence on changes to the MPA and how it is managed. Other factors suggest where efforts should be concentrated, such as on those individuals who are less trusting of others in the community.

4. Barriers between actions and attitudes

Community support for MPAs is often conceptualized simply as attitudes with the assumption that positive attitudes will translate into pro environmental behavior

(Kollmuss and Agyeman, 2002). Indeed, I found a significant relationship between attitudes and enforcement with those more positive being more likely to enforce the MPA. Those who said they would enforce the MPA upon spotting an encroacher were significantly more positive towards the MPA than those that said they would take no action[1].

The forward and backward selection of factors affecting enforcement resulted in two different models. The forward selection was used as it had a lower AIC value, and included 'village', 'wealth of individuals', 'knowledge of why the MPA was implemented' and 'trust towards the *Bantay Dagat'* (Table 4.4).

The reduced model was statistically significant, explaining between 48% (Cox and Snell R square) and 51.3% (Nagelkerke R squared) of the variance in enforcement, and correctly classified 83.3% of cases (Table 4.4). However, not all factors found to significantly predict attitudes were identified as significant predictors of enforcement. Therefore, only a subset of the predictors of attitude was associated with action (Table 4.4). For example, increasing trust towards other fishermen in the community was associated with a positive attitude but not with higher levels of enforcement. This suggests that there are barriers at play, preventing positive attitudes towards the MPA to lead to positive actions. Tanner (1999) suggests there are objective (preventing performance of a particular behavioural alternative), subjective (preventing preference for a particular behavioural alternative) and ipsative constraints or barriers (preventing activation of a particular behavioural alternative) that prevent attitudes from becoming pro environmental actions. Furthermore, wealth was found to positively influence levels of enforcement but did not have a significant effect on attitudes suggesting that different factors can influence different aspects of community support.

It seems therefore that to get a clearer understanding of what constitutes community support, there is a need to uncover the specific barriers at play. The following empirical chapters which take a more qualitative and inductive approach, aim to seek out some of these barriers which may prevent positive attitudes from translating into positive actions.

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[1] T-test indicated that the attitudes of those that said they would enforce were significantly more positive (M=0.65, SD=0.18)than those that said they would not (M=0.44, SD=0.21, t(158)= -6, p<0.001)

Wealth was found to influence enforcement but not attitudes of individuals. Attitude is therefore not the sole predictor of actions such as enforcement. Although no information was gathered on individuals' compliance with MPA rules and hence levels of encroachment. This finding may be related to how wealth can influence encroachment. Wealthier individuals may be less likely to encroach as they are less dependent on fishing for food or money than others. Those poorer individuals may be less inclined to report encroachers as they themselves have encroached in times of need. This issue of wealth and how it relates to MPA related behaviours is discussed in more depth in chapter 7.

Despite the different factors found to predict attitude and enforcement towards the MPA, both knowledge of why the MPA is implemented and trust towards the *bantay dagat* which are found to influence enforcement, were are also predictors of the variance in attitude. It seems therefore that to a certain degree there is indeed a connection between attitudes of individuals and their actions in the context of MPAs in the Philippines. Therefore working to ensure positive attitudes of individuals towards MPAs by identifying significant predictors, may also increase their levels of pro MPA action.

5. Importance of village context

A large number of factors identified as influencing either social, economic and/or ecological success of MPAs operate at a village level (such as characteristics of the MPA and its' management). Given the large number of potential resource system, resource unit and institutional factors that differ between the different communities and their adjacent MPA, it is not surprising to find that attitudes [2] and enforcement [3] of fishers with regards to the MPA differed between villages (Fig.4.1 and 4.2). In particular, the overall attitudes and levels of enforcement at Suba were significantly lower than at Bonbonon and Candaping B.

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[2] A one way between subjects ANOVA showed a significant difference in attitude towards the MPA between the three different villages [$F_{(2, 157)} = 12.32$, $p < 0.001$].

[3] Chi-square test for independence indicated a significant association between individuals' villages and whether they felt they would act upon seeing an encroacher, $X2 (2, N=164) = 0.48$, $p < 0.001$.
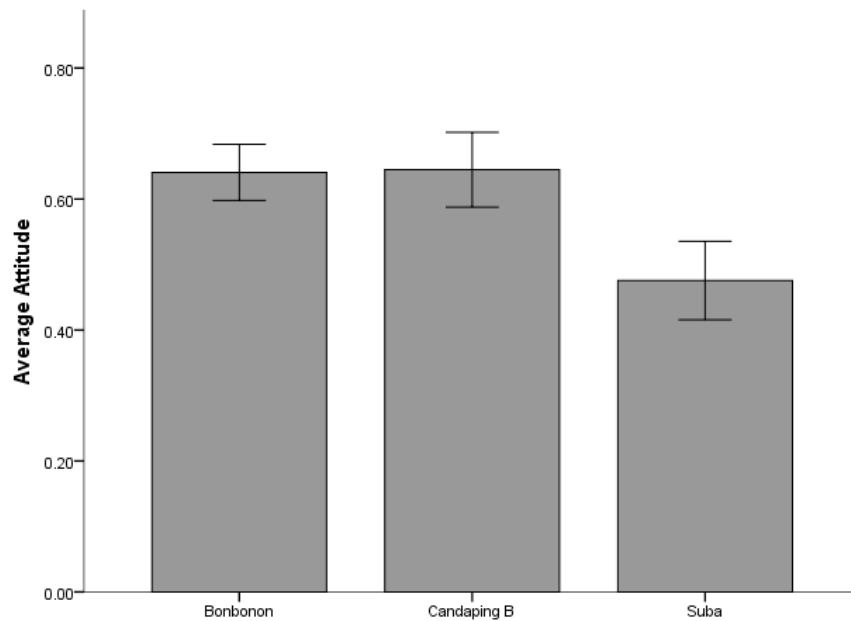
Fig. 4.1 Average attitudes (based on a calculated attitude index) towards the adjacent MPA of Bonbonon, Candaping B and Suba barangays with 95% confidence interval.
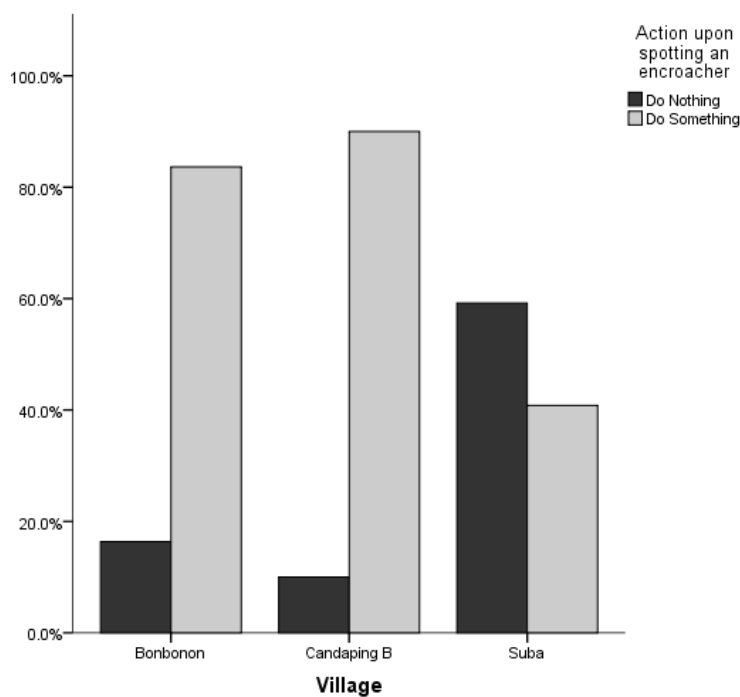
Fig. 4.2 Percentage of individuals that would act upon spotting an encroacher at Bonbonon, Candaping B and Suba barangays.

Furthermore, hierarchical regressions demonstrated that the inclusion of "village" made significant contributions to the multiple regression models predicting attitudes

and enforcement of individuals (Table 4.4). Village level factors were therefore important predictors of both attitudes and enforcement

Importantly however, the inclusion of individual level factors was found to have a significant influence on attitudes and enforcement irrespective of the differences attributed to village (Table.4.4). This demonstrates therefore that individual characteristics also make significant contributions in explaining the variance in support.

Comparing successes and failures of different MPAs, and looking at community level characteristics associated with MPA success are important to determine how best to ensure MPA success (Christie, 2004) and to prioritize locations to implement MPAs (Ban et al., 2009). However, the importance of characteristics that vary from individual to individual should not be ignored. An understanding of community support needs to appreciate both individual and village level factors, an issue I revisit throughout the thesis.

6. Conclusion

Although support differed between villages, differences between individual characteristics were also significant. This highlights the importance of looking in detail at the differences and similarities that occur between individuals within communities. Previous research (especially in the MPA literature) has focused on community-level predictors. Combining these scales of analysis may allow identification of the most significant predictors of support operating at both an individual and community scale. Furthermore, more qualitative work may be able to further elucidate why these indicators are so important in influencing support towards MPAs.

Four individual-level variables significantly predicted the attitudes of individuals towards the adjacent MPA. With the exception of maybe "trust towards fishers" they are also amenable to interventions. These findings may therefore help prioritize efforts that aim to boost attitudes towards MPAs and help prioritize areas that are more welcoming towards MPAs. Furthermore, this study agrees with much of the

PEB literature and demonstrates that attitudes are not the sole predictors of pro MPA actions. More work will therefore be required to determine why attitudes are sometimes weak predictors of MPA related actions.

This quantitative approach highlighted which are the most important predictors of support out of a number of individual level factors. This is of significance for MPA planners and managers who want to prioritize their efforts in improving support towards MPAs and consequently, their success.

Despite the significant findings of this chapter, there are still a number of issues that the following chapters will try to address. The analyses of this chapter are based on solely a small number of factors identified in the literature and hence this is a theory testing approach rather than theory building. It will be important to be more inclusive and incorporate a large number of potential factors in the following empirical chapters. Furthermore, due to the design of the research which only looks at three different communities, it was not possible to carry out statistical tests to determine whether certain differences between these three sites significantly influence support due to a small sample size of only three. Therefore this chapter focuses solely on factors that operate at an individual level and on contrasting the three villages without exploring the village-level factors contributing to differences between villages. The comparisons between villages will be described more fully in the following four empirical chapters.

The qualitative aspect of the following chapters allow for the inclusion of a wider range of potentially important influential factors. Factors obtained inductively are analysed, similar factors that may be correlated are still considered for analysis and community level factors are also explored. Furthermore, I will not solely look to see which factors are influencing support but also *how* they may be influencing support and through which mechanisms.

Chapter 5: The influence of MPA Design and MPA Benefits on Community Support

> "Don't design for everyone. It's impossible. All you end up doing is designing something that makes everyone unhappy."
> — Leisa Reichelt

Protected areas and other natural management strategies are increasingly being designed to reflect local contexts and the wants and needs of the community to ensure higher levels of support and acceptance (Bell et al., 2006; Christie et al., 2003; Christie et al., 2009; Cinner, 2007; Johannes, 2002). However, chapter 4 describes how individual level factors are also important predictors of support and how it may prove difficult to gain uniform support towards an adjacent MPA. It highlights how different people within a community will have different wants and needs. The above quote, therefore, although involved with product and website design (Reichelt, 2008) is particularly relevant for conservation, protected area and natural resource management. This chapter seeks to identify which design factors and whether MPA benefits are deemed important by those affected to ensure that MPAs are designed in a way that is supported by the community. It still takes a rather deductive approach as many of the factors examined had previously been identified from the literature (Table 3.1). The focus is also very much at the community level yet it acknowledges the fact that different individuals within the community may be affected differently by different MPA design factors, and attempts to understand how these factors are influencing support. This chapter therefore builds on from "interactive governance theory" which is itself influenced by SES thinking (Kooiman and Jentoft, 2009). It considers management strategies such as MPAs as being a governing system but also MPAs as a system to be governed and pays attention to the interactions between these systems. In the case of this chapter, I focus on MPAs as a governing system in terms of its design but also on its interaction with the wider social and ecological environment to see whether MPAs are leading to benefits and how MPA design can influence support towards these NRM strategies.

As I explained in chapter 2, MPAs are currently designed to meet two broad sets of expectations that are placed on them: Ecological and Socio-economic expectations (Pomeroy et al., 2005b). Whilst some believe that well designed and properly

managed MPAs can achieve both sets of expectations (Leisher et al., 2007; Maypa et al., 2002; Roberts et al., 2001; Stobart et al., 2009), others believe that MPAs often place the welfare of fishes above the well-being of fisheries-dependent coastal communities (West et al., 2006). It is even thought that using MPAs to maximise fisheries and conservation benefits simultaneously may, in fact be unrealistic (Christie and White, 2007; Cinner et al., 2005; Hilborn, 2007a; Jones, 2006; Pollnac et al., 2010). Furthermore, irrespective of whether fishery or socio-economic benefits are occurring, not all within the community will perceive similar costs and benefits arising from the MPA due to a number of different individual level factors (for example, fishing gear used, dependence on fishing etc…). It is unrealistic to believe therefore that these expectations could be fully achieved. I assume for much of this chapter that individuals are rational and selfish actors however it starts to become apparent as the qualitative data in particular unfolds, that this is a rather narrow view and that not all individuals may be acting with their sole current or future interests in mind.

Given that it may not be possible to design an MPA which achieves all ecological and socio-economic objectives that are expected of it, it is important for understanding community support, to think carefully about the design of the MPA and how it may influence the support of the adjacent community. This chapter takes a different approach to studies examining the various successes of MPAs described in chapter 2 and examines which attributes of an MPA are most critical for the support of the adjacent community. It may not be possible to design an MPA where everybody in the adjacent community is happy with the outcome, however by determining the critical MPA attributes and outcomes that influence support, it may be possible to minimize negative attitudes and actions towards the MPA and compromise on those issues that are causing conflict between different groups of stakeholders.

Much work argues that socio-economic and ecological benefits are thought to be essential for harnessing the support of the adjacent community (Alcala and Russ, 2006; Pollnac and Pomeroy, 2005; Roberts et al., 2001). However, not all within the community may perceive these benefits equally. Indeed some may not perceive that they are positively affected by the MPA and will perceive there to be costs. In this chapter, I therefore explore how various MPA outcomes can influence support and

how it influences attitudes and MPA related behaviours of individuals within the community. I examine a list of factors related to MPA design such as its size, location, whether it is part of a network and its' boundary delineations and factors related to MPA outcomes such as whether there are direct or non-direct benefits of MPAs. These factors have been highlighted in the literature as potentially important for success of MPAs and I use qualitative data to explore how they influence support of the community (in later chapters, I will move on to more inductive factors identified through my research). I not only seek to understand whether they have positive or negative influences but also identify the various processes and mechanisms by which they influence support. With the help of both descriptive statistics and qualitative analyses; questionnaire, interview and focus group data is examined at three villages to provide an understanding of how attributes of MPAs and their design may influence support.

1. MPA Benefits

Benefits arising from an MPA can be diverse (as highlighted in chapter 2) on the ecological and socio-economic expectations placed on MPAs. Throughout focus groups and interviews, respondents alluded to benefits they believed were important to them or the community. Furthermore, fishermen were asked what benefits arising from the MPA (if any) they perceived there to be (Fig. 5.1.).

Two clear distinctions could be made in the benefits fishers perceived. Direct individual economic benefits such as fishery spill-over on the one hand and non-direct benefits (not necessarily of an economic nature) which did not involve direct personal financial gain on the other. Benefits perceived such as fishery spill-over were clearly stated by those who felt they had obtained spill-over benefits themselves. Other benefits mentioned such as increases in tourism, increases in biomass, fish for the future and money generation for the community are all benefits that may not necessarily have a direct impact on the fisher questioned. It is others in the community that may be reaping those benefits such as dive operators, hostel owners, local government or future generations. This provides more evidence as to whether this assumption that those affected by the MPA are solely rational, self interested individuals which weigh up the economic costs vs. potential gains of such a strategy.
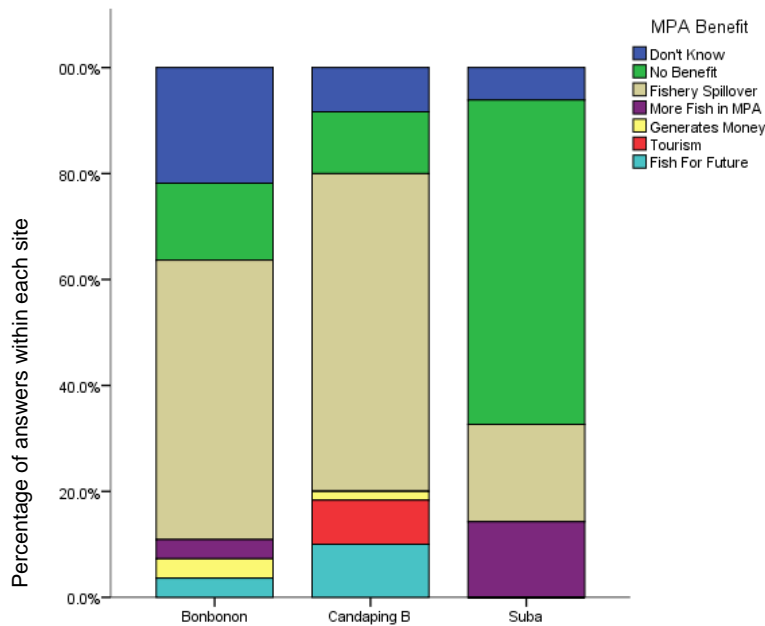
Fig 5.1 Percentage of respondents' answers within each site as to whether the MPA is providing any benefits

The Total Economic Value (TEV) approach can be used to help classify some of the Non-Direct benefits perceived of MPAs (IUCN, 2005). This approach distinguishes between the use value and non-use value of ecosystems which could be applied in this case, to MPAs. Whilst fishers identify a direct use value which in this case could mean direct economic benefits arising from the MPA such as fishery spill-over, in particular, they also identify a "bequest values" which include future benefits arising from the MPA that may or may not be used by oneself and an "existence value" which refers to the enjoyment people may experience simply by knowing that the MPA is providing benefits even if they do not experience these benefits themselves (Fig.5.2).
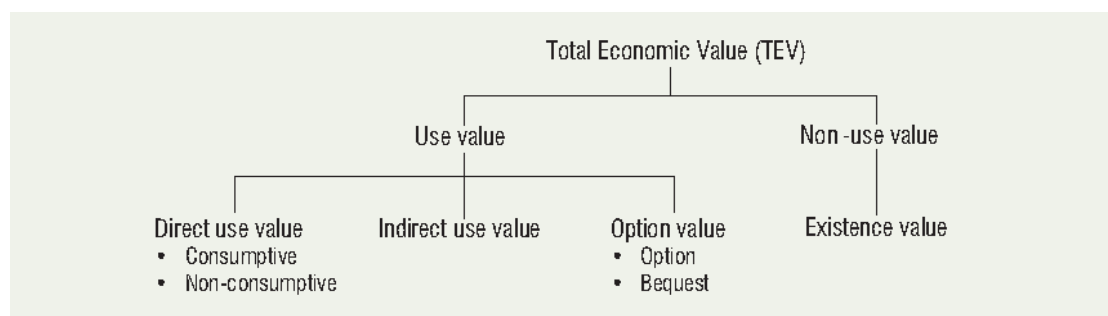
Fig.5.2. Total Economic Value; Source (IUCN, 2005)

Overall, those that perceived there to be MPA benefits were significantly most likely to be positive towards it than those that perceived there to be no benefits [4]. Furthermore, fishers perceiving benefits were significantly more likely to act upon seeing an encroacher than those not perceiving benefits[5]. Whether MPA benefits are perceived or not is therefore associated with both attitudes and actions towards the MPA. The following sub sections seek to understand which specific benefits are being perceived and how they can influence support towards the MPA.

Direct Individual Economic Benefits

The level of economic benefits that arise from an MPA is thought to play a vital part in the sustainability of reserves, as local residents will be unlikely to support the MPA if they do not perceive any positive impact on their well-being (Pollnac and Pomeroy, 2005). MPAs are often expected to provide economic benefits to local fishers enhancing adjacent fished areas (Gell and Roberts, 2003a; Halpern, 2003). The enhancement of fished areas is thought to occur either through transport of larvae from spawning stocks within the MPA (Gerber et al., 2005b) or by a net emigration of adult fish to adjacent fished areas, termed "spill-over" (Abesamis et al., 2006; Alcala et al., 2005). Whilst the impact of the transport of larvae may be hard for the adjacent community to determine (Goñi et al., 2010), the spill-over effects, even if small "are critical in helping to gain support for no take reserves from local fishing communities because spill-over can be detected" (Alcala and Russ, 2006).

I found that across the three villages; focus group, interview and survey data confirmed the notion that perceived fishery benefits can play a critical role in influencing community support towards the MPA. Fishermen were asked "in your opinion, have there been any benefits from the MPA?" Those who suggested there

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[4] T-test indicated those that perceived there to be MPA benefits were significantly most positive towards the MPA(M=0.70, SD=0.16) than those that did not perceive MPA benefits (M=0.43, SD=0.16; t(158)=-10.68, p<0.001, two tailed)

[5] Chi-square test for independence (with continuity correction) indicated a significant association between fishers perceiving benefits and whether they felt they would act upon seeing an encroacher, X2 (1, N = 164) = 17.35, p <.001

had been fishery spill-over benefits were significantly more positive towards the MPA than those who answered there had been no benefits[6] (Fig.5.3).
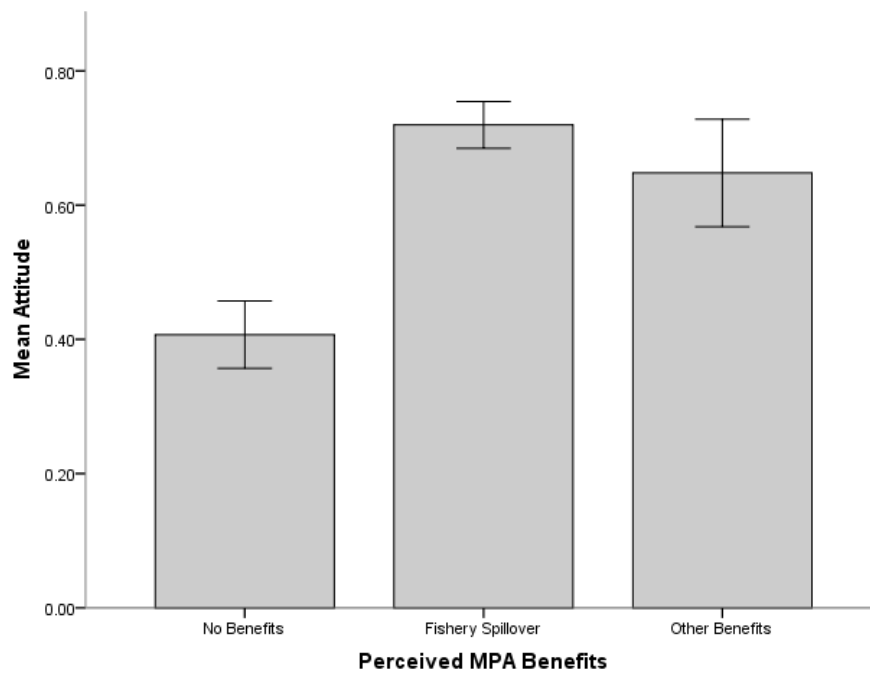
Fig.5.3. Differences in attitudes between individuals that perceived various MPA benefits

Focus group and interview analysis also revealed that attitude was influenced by perceptions of spill-over.

> P3: Ah, it's good. That sanctuary before was taken for granted and the fishes were getting fewer but now, it is getting better, we can get big fishes
> P4: Yes and also the small fish
> P3: But at least the fishes are protected because of the sanctuary
> P1: And fishes will also go out from the sanctuary (BFG4)
>
> P2: At first I didn't like the sanctuary because I was thinking that we would have no place to catch fish because it is prohibited to get inside, but now I realise that it is good because the fish from that area will go out and we are free to catch that fish. (CFG3)
>
> P4: There are lots of fish inside the sanctuary and the fishes will not stay to the sanctuary all the time (SFG5-Fisher's Wives)

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[6] A one way between subjects ANOVA indicated a significant effect of MPA benefits perceived on attitudes [$F_{(2, 159)}$ =59.72, $p < 0.001$]. Post Hoc comparison using the Tukey HSD test showed that the mean score for attitudes of those that said they did not perceive any benefits (M=0.43, SD=0.16) was significantly lower than that of those that said they perceived fishery spill-over (M=0.72, SD=0.15) and other benefits (M=0.65, SD=0.19). No significant differences were found between any other groups.

The above extracts summarize the general comments made when asked what they thought about the MPA. These comments emphasize how important fishery spill-over may be for positive attitudes towards the MPA. However, there is also an implied causality here that attitudes become more positive as benefits were accrued. It seems that in time, there was a shift in attitude as spill-over benefits were perceived, this adds credibility to the comments as they are implying they were dubious or negative towards the MPA initially but became more positive over time. Unfortunately, I found no secondary sources or data on historical and current fish catches, so this information could not be corroborated and independently verified.

Despite the potential costs arising from an adjacent MPA, some want the MPA to remain as they want to reap the fishery spill-over benefits. Others go further and have specified how these positive attitudes arising from fishery spill-over can translate into pro-MPA actions of enforcement.

> P4: If someone will go inside the MPA we will have to scold that someone so that our sanctuary will not be disturbed. Fish will not always stay on the sanctuary, they will go out also and that is for us. (BFG6-Fisher's Wives)
>
> P2: We have to monitor, we have to fight for it because we also benefitting from it (CFG5)

This suggests that perceived fishery spill-over benefits can also lead to increased monitoring and enforcement of the MPA as fishermen want to continue to receive these economic benefits.

The survey data collected also demonstrated a relationship between whether fishery spill-over or other benefits were perceived and whether action was undertaken as a response to encroachment [7]. Almost 85% of those that perceived fishery spill-over acted upon encroachment compared to 46.7% of those that perceived no benefits (Fig.5.4).

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[7] Chi-square test for independence (with continuity correction) indicated a significant association between fishers perceived fishery spill-over and other benefits and whether they felt they would act upon seeing an encroacher, $X2$ (2, N = 139) = 14.94, p <.001
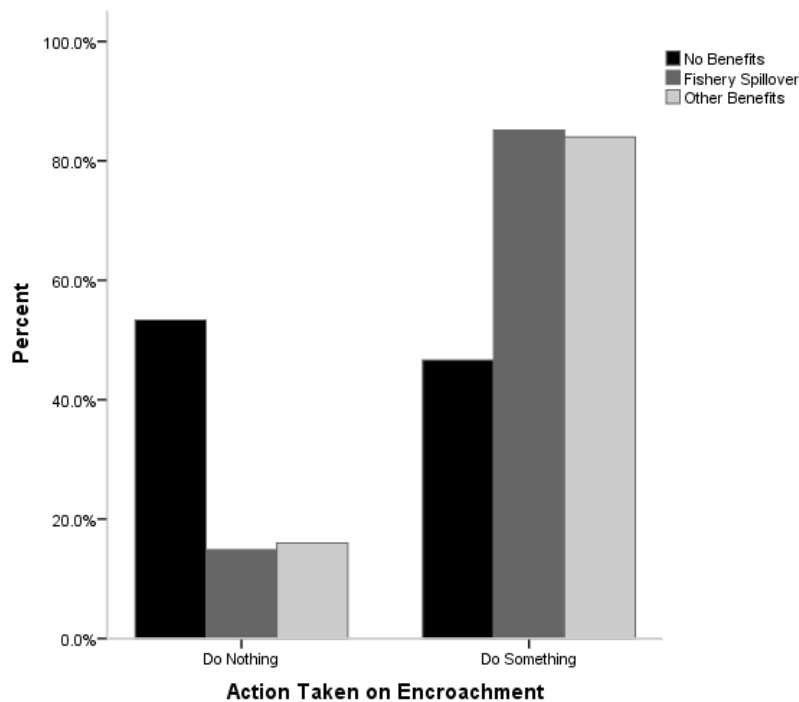
Fig.5.4. Differences in whether action was undertaken upon spotting an encroacher between individuals that perceived various MPA benefits

These findings therefore consolidate a growing number of studies indicating the importance of fishery spill-over for MPA support and acceptance of affected communities (Agardy et al., 2011; Gelcich et al., 2005; Yasué et al., 2010). However other fishery benefits were also uncovered as being important. Especially in Candaping B and in Suba, many believed that fish were less wild and easier to catch since MPA implementation. For example, in a Candaping B focus group (CFG1-P2) we were told that due to the MPA it was "easy to catch fish because they are not so wild". This idea that fish "catch-ability" and fisher-naïve behaviour of fish also spills out of the MPA is a type of MPA benefit that has frequently been ignored and is recently gaining favour amongst fishery scientists (Januchowski-Hartley et al., 2013).

Perceptions of fishery spill-over and ease of catch may therefore be very important for community support. However, over 54% (N=144) of fishermen surveyed across the three sites did not perceive fishery spill-over benefits. Although the majority of fishermen perceived the MPA to be an area "where fish can stay", be protected and lay their eggs, this doesn't necessarily mean this translates into perceived fishery spill-over. Furthermore, when asked how much they caught on an average day pre MPA implementation, 98% (N=150) of fishermen across the three sites answered that more

was caught before than currently. With fishing effort on the rise and increasingly deteriorating environmental conditions surrounding the MPA due to pollution and climate change (Burke, 2011), this statement is not so surprising. This suggests that fishery spill-over may not compensate for general decreases in catch and some may not perceive there to be any fishery spill-over, which may in turn lead to negative attitudes towards the MPA. It is also possible that there is a problem of "memory illusion" which could bias fishers to perceive a decline even if catches have been stable or increased (Daw, 2010).

> M: Ah, you can catch more fish now than before?
> P2: We can catch more before because (now) we can't catch inside, only outside.
> P3: Before we could get 50 coolers, but now it is less (BFG7- Fisher's Wives)

This focus group extract suggests that an MPA without fishery spill-over presents the fishermen with costs. The MPA results in a reduction in traditional fishing grounds accessible to them for fishing and these costs may outweigh perceived direct individual benefits. Also implied in this statement is how there are benefits to be had by re-opening the MPA for fishing. The notion that there are plenty of fish residing within the MPA is a widespread one. It is perceived as an area where fish can stay and be protected, which may tempt some to encroach and hence decrease the levels of compliance. Qualitative evidence was found for perceived biomass increase within MPAs to influence action at all three sites. When asked why certain individuals encroached the MPA, similar answers alluding to the "large and plentiful" fish inside the reserve were frequently made.

> P5: Don't you know that they (encroachers) can get big fishes, maybe one fish is equivalent to one kilo or more and that is very expensive. (BFG6-Fisher's wives)
>
> Q: What are the other reasons for these people (encroachers)?
> A: If you caught someone who gets inside you have a share or a little amount from the fines but if you get inside you can earn big money, much bigger than from your share of the penalty. Maybe that is one of their reasons. If you get 5kg it is a lot of money. (BDID5)
>
> M: Why do others go inside even if it is prohibited?
> P6: Big fish ma'am (CFG5)

The larger perceived abundance and (especially) the size of fish inside the MPA can lead one to conclude that there is potential for fishery spill-over, however it can also be enticing and can tempt fishermen to encroach. Where MPAs are successful from an

ecological perspective and accumulate fish biomass, but provide limited spill-over. This may lead to lower levels of compliance as increased encroachment occurs. It is also possible that despite positive attitudes towards the MPA some have incentives to encroach which can be greater in times of hardship. A semi structured interview with an experienced fisher from Suba, who has encroached before, suggested that as the overall number of fish outside the MPA started to decrease, more individuals were tempted to encroach as they knew there were more fish inside the sanctuary. Fishery spill-over benefits may be masked over time as other external pressures such as increasing fishing effort and climate change occurs. Community support arising from direct benefits may therefore not guarantee prolonged support from the adjacent community.

Byers and Noonburg (2007) suggest that encroachment could eliminate the positive effects of fishery spill-over. If this is the case, a vicious cycle could occur with ever increasing encroachment leading to fewer spill-over benefits which in turn will promote more encroachment and more negative attitudes towards the MPA (Fig.5.5).
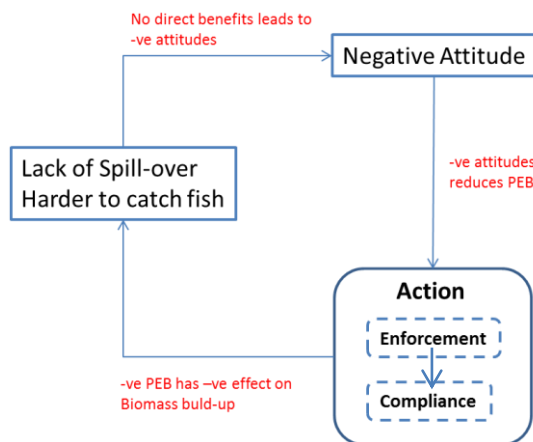
Fig.5.5. Vicious cycle of direct economic benefits and support towards MPAs

Whilst it is clear that the perception of fishery spill-over can influence attitudes and actions towards the adjacent MPA, it is unclear why some individuals within a village perceive there to be spill-over whilst others do not. It is possible that differences in the characteristics of individuals such as education, wealth, gear used, mobility, fishing experience and dependence on the fishery (chapter 8) can influence one's ability to perceive spill-over. It is also possible that the individuals that said they perceived fishery spill-over were trying to please me or my research assistant by

providing the "correct answers". Indeed Andres (1981) argues that seeking the approval of others is a strong cultural norm in the Philippines and hence providing the "correct answer" may be a priority for many of the respondents. The fact that there is fishery spill-over has been explained by officials and NGOs therefore some respondents may not have directly experienced fishery spill-over but may be taking these officials at their word. Indeed, due to the variability of fish catches, it may prove hard for fishers to perceive spill over directly. MPA advocacy however could lead some to think they perceive spill over.

It should be noted that perceived spill-over may promote both positive attitudes and pro-MPA behaviour whilst a lack of this perceived benefit may promote encroachment. Spill-over may or may not be occurring, be perceived or may not be sustained over long periods of time. It is important therefore to consider other less direct "benefits" of the MPA. For example, the current and future ecological or socio-economic situation may be worse if the MPA is not there, even if direct fishery benefits are not perceived.

Non-Direct Benefits

Although there is some evidence that MPAs can enhance adjacent fisheries (Gell and Roberts, 2003a), their perceived impact on improving the state of local fisheries resources in the Philippines remains limited (Maliao et al., 2009).

Instead of describing MPAs as "win-win" some argue that fishery benefits should be viewed as bonuses whilst conserving or restoring biodiversity should be the primary goal (Jones, 2006). It is equally possible that if the community accepts the MPA because of its economic benefits, they may reject it at some point in the future if a better economic alternative is present or if there is a decrease in spill-over over time (Hackel, 1999). High levels of support due to perceptions of fishery spill-over or personal economic benefits may therefore not be sustainable over time and hence other MPA benefits may be critical for community support.

When fishermen were asked if "there been any benefits from the MPA?", 15% (N=160) of respondents mentioned advantages of having an MPA that did not result

in direct economic benefit to themselves (Fig.5.6). These respondents were found to be significantly more positive towards the MPA than those that did not perceive there to be any MPA benefits[8] but no significant difference was found between attitudes of those that perceived there to be fishery spill-over benefits and those that perceive there to be other, non direct economic benefits [9] (Fig.5.3). This suggests that non-direct economic benefits of MPAs can also be successful in ensuring positive attitudes. The perception of non-direct benefits was also positively related to whether action was undertaken as a response to encroachment[10]. Of those that perceived there to be non-direct benefits, 84% acted positively compared to only 46.7% of those that did not perceive any benefits (Fig.5.4) suggesting that these benefits can also promote pro MPA behaviour. No causal inferences are made through these quantitative analyses however, and hence it is equally possible that the action of carrying out pro MPA behaviours may lead to the perception of MPA benefits. Indeed the social psychology literature argues that attitudes can sometimes be changed to justify behaviour and hence actions could influence attitudes (Harmon-Jones and Harmon-Jones, 2007).

Nevertheless, this suggests that fishers may also consider wider less direct benefits or benefits to others within the community. It may not be wise to assume that individuals are solely rational and self interested actors who think only of the economic benefits an MPA can is providing or can provide them in the future. Some consider other forms of benefits that may not directly benefit them, it is therefore important to consider social relations within the community and the broader implications of an MPA. This agrees with recent social psychological theory which suggests that people are not just motivated by narrow economic self interest but also consider the broader implications of their decisions for others and for the environment (Van Vugt, 2009)

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[8] T-test indicated those that perceived non-direct MPA benefits were significantly most positive towards the MPA(M=0.65, SD=0.19) than those that did not perceive any benefits (M=0.43, SD=0.16; t(158)=-5.46, p<0.001, two tailed)

[9] T-test indicated no significant difference in attitude between those that perceived non-direct MPA benefits (M=0.65 , SD=0.19)and those that perceived fishery spill-over (M=0.72, SD=0.15; t(94)=-1.89, NS, two tailed)

[10] Chi-square test for independence (with continuity correction) indicated a significant association between fishers perceiving non-direct MPA benefits and whether they felt they would act upon seeing an encroacher, X2 (2, N = 90) = 6.37, p <.05
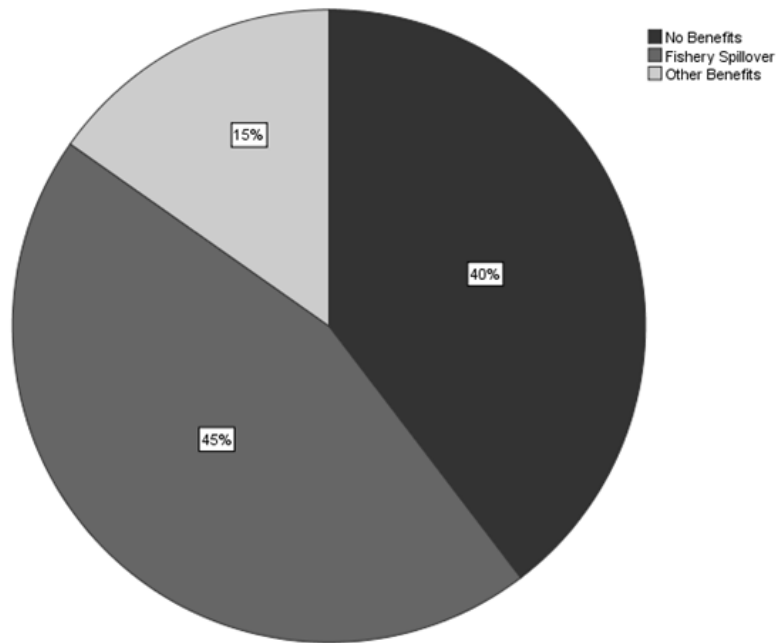
Fig.5.6. Types of MPA benefits perceived by fisher folk

It may be beneficial therefore to move away from solely looking at how the fishery benefits of MPAs can influence support and identify what other MPA advantages are perceived by the adjacent community and how and whether they influence support.

In the following comments participants articulated how the MPA will lead to a better outcome in the future, either for themselves or for the future generations. This could be thought of as the "bequest value" of MPAs. Although the MPA may not currently be leading to any personal economic benefits, people believe it is a good thing as it will protect fish for the future.

> "P3: For me, I like the MPA so that there will be lots of fish. Fish will not be getting fewer.
> P2: Yes, me too. I agree
> P3: Yes, because that's the place they can stay (BFG4-Fisher's wives)"

> "P6: Fish will run out so we are thankful to have the MPA (...) Pity for those children who are following us, time will come that they have no more to catch if the sanctuary will be destroyed"(BFG6-Fisher's wives)"

> "M: What else? Why you like the sanctuary?
> P3: For the future of our children
> P2: They will be the ones who will benefit
> P4: Yes it's true (SFG2)"

For some, it seems that even without direct economic benefits, they are positive towards the MPA as they expect it will be a benefit for the future. Thinking about the future is also stated as a reason as to why some decide to take action and enforce the MPA rules.

> "P6: I will let him pay the penalty
> M: What is the reason for doing this?
> P6: so that they will not abuse the MPA. So that they will never do it again because this is for the future (CFG5)"

The implication in the above statement regarding thinking for the future, is that their children and grandchildren will be able to fish and make money in the future due to the MPA. It should be noted that these parents highlighted in the above extracts may want to appear as considerate and forward thinking parents which may also explain some of these answers. However, some seem pleased that the MPA is in place so that there is an assurance that there will be fish, no matter what happens elsewhere and that it may provide aesthetic benefits for the future generations.

> P3: This sanctuary is for the future for the children and for the coming years so they see what we see today in our sanctuary
> M: Ahh, so this is for the future?
> P4: yes for the future children
> P3: So they can see the real sanctuary, not just the pictures, that is very important (CFG5)

The purely aesthetical benefits, which can be considered as a type of "existence" value, may therefore be able to boost attitudes towards MPAs. Across the three sites, this indeed seemed to be an important factor.

> P1: Yes, and even if our place is poor we will think that we are rich because we can see beautiful corals and fishes (laughing)
> P6: Now the corals are more beautiful compared to before (CFG1)

> P5: If there is a sanctuary, there is an additional beautification on this area (SFG1)

It seems that there is also a level of pride in having a beautiful protected area with many corals and fish species and some individuals are indeed proud to have an MPA in their village. Some go further and argue that the MPA is a good thing for the barangay as a whole and they do not seem to perceive the MPA as solely for themselves.

> P5: It's for the good of every one of us. (P5-BFG1)

> For me, it's good if the people will obey the rules and regulations of the sanctuary because the sanctuary can help our barangay. (P1-BFG2)

> P2: In my part, it is good (the MPA) because of what they say, it will earn an income for the barangay (SFG2)

The benefits an MPA may have for the *barangay* in general could also be an important factor influencing attitudes towards the MPA. Although it seems that some may be considering future economic benefits, it is not necessarily for themselves but for the *barangay* and others within the community. This is a step away from considering individuals as selfish, rational actors. This idea that individuals are not evaluating their own benefits and costs more intensely than the total benefits and costs for the barangay itself has been identified as being crucial in overcoming common pool resource dilemmas (Ostrom et al., 1999).

Many also describe how revenue from dive tourism (due to the MPA) relates to positive attitudes towards the MPA despite the fact that money generated goes to the local government and the barangay rather than fishermen. When asked why individuals like to have an MPA, many respond that it can result in dive tourism which adds income to the barangay.

> P1: So that many tourists will visit in our sanctuary because of different kinds of corals. And that can add income to our barangay. Dauin also have this. (BFG5-Fisher's wives)

If tourism is a key justification for MPAs, failure to attract tourists might lead to negative attitudes, irrespective of it achieving its other objectives. This is especially the case in Suba where the MPA and others in the Anda municipality (which comprises Suba) are frequently promoted as tools to increase tourism in the area. For diverse reasons, the municipal government has stopped promoting Suba as a tourist destination and over time and fewer tourists have visited the area (pers.comm Department of Agriculture). This has led to negative attitudes towards the MPA.

> P1: Now there are no more divers or foreigners
> P2: The corals are now not good to see (SFG2)

> A: For me, the sanctuary has no improvement
> Q: Why?
> A: I haven't heard that there were tourists who want to visit here (SIDI3)

116

It is clear through both the quantitative and qualitative data, that the perception of MPA benefits is an important factor influencing both attitudes and actions. It has often been suggested that community support towards MPAs can be gained if individuals perceive there to be fishery spill-over (Alcala and Russ, 2006; Pollnac and Pomeroy, 2005; Roberts et al., 2001). I argue here however that fishery spill-over benefits may be small when considering the size of the MPAs at stake and the displaced fishing effort in surrounding areas. Furthermore, with increasing fishing effort due to technological creep and increasing population size, it is clear that support towards MPAs due to direct economic fishery benefits is not sustainable. A range of other non-direct benefits related to existence and bequest value of an MPA were also identified as being important factors influencing attitudes and actions towards MPAs. Indeed, it has been found that not all fishers are motivated by the same desire for financial gain (Dimech et al., 2009). Bamberg and Moser (2007) also describe how behaviours are best viewed as a *mixture* of self-interest and of concern for other people, the next generation and for other species or whole ecosystems. It seems that other types of MPA benefits also have a role to play in influencing support. To ensure that support towards MPAs is sustainable over time I argue it is important to consider the full range of direct as well as non-direct benefits an MPA can provide.

2. *MPA Size*

The benefits an MPA can provide discussed above are contingent in part on its size. The MPA size however also presents one of the major costs to fishers as it reduces the size of their fishing grounds and displaces them to other areas. There is much confusion in terms of how much should be set aside for an MPA (Agardy et al., 2003). It is argued that conservation effects of MPAs are critically dependent on the size of the marine reserve and the migration rate of fish (Hannesson, 1998). With many fish species being very mobile , MPAs would have to be very large to protect breeding stocks (Hilborn et al., 2004). Some believe that larger reserves may be necessary to meet the goals set for MPAs (Halpern, 2003), yet there is also evidence, pointing to the benefits of having smaller, more numerous MPAs (Roberts et al., 2003). There is therefore considerable ecological debate about whether there should be a few large or many small MPAs (Cinner, 2007).

Whilst the size of certain MPAs is often determined to meet conservation aims, it may also act as a stressor and exclude local people from any form of fishing. Walmsley and White (2003) argue that it is very difficult to implement large MPAs in the Philippines due to the dependence of people on the immediate livelihood benefits of the coral reefs. On the other hand, smaller MPAs are believed to lead to increased levels of encroachment (Kritzer, 2004). It is important therefore to examine both the ecological and socio-economic impacts of MPA size when designing MPAs (Hilborn et al., 2004). I analyse below how the size of an MPA and consequent loss of fishing grounds may influence support towards the reserve.

An initial comparison between villages studied provided no evidence that MPA size influences the support of villagers. Despite similar MPA sizes, I describe in chapter 4 how residents from Candaping had significantly more positive attitudes (Fig.4.1) and were more likely to act upon seeing an encroacher (Fig.4.2) than residents of Suba. Furthermore, although Bonbonon's MPA was almost three times bigger than the Candaping B MPA, no significant difference was found in the attitude of individuals on whether they acted upon seeing an encroacher. These quantitative analyses however are restricted as I am only comparing three sites which differ in a number of characteristics aside from their MPA sizes (Table 3.6).

Qualitative evidence paints a more complex picture. Focus group and in depth interviews demonstrate that those in Candaping B are indeed concerned by the large size of the adjacent MPA.

> M: Does the sanctuary affect the people of Candaping B?
> P2: Yes, I think that the area is too big
> P1: now we only have a small area to catch fish because getting inside is prohibited
> P2: It is too big (CFG3)
>
> M: What are your opinions about the sanctuary?
> P6: The sanctuary is too big (CFG7- Fisher's Wives)
>
> Q: Is the size of the sanctuary an important issue?
> A: About the size, there are complaints because the space where they can use their nets is very small because the sanctuary is so big. Most of the people say the sanctuary is good but it is too big. Hopefully they will make it smaller
> (…)
> Q: What can be done to make people less tempted?
> A: Of course is the sanctuary is small, less people will be tempted (CIDI3-Known Encroacher)

Despite the ecological or conservation benefits of a large MPA, the above comments emphasise the impact they have on fishers through reduced fishing grounds. Roberts et al (2003) mention how smaller MPAs may in fact be more efficient at exporting larvae and adults than large MPAs due to their large edge-to-area ratios. Furthermore smaller MPAs were more likely to result in increased food security for the adjacent communities (Mascia et al., 2010). With larger remaining fishing grounds available to fishermen and the potential of increased fishery spill-over, smaller MPAs may provide less temptation for fishermen to encroach.

The comparatively small MPA of Bonbonon also supports this notion as many mention that they are happy with the MPA, but would be unhappy if it was made bigger.

> P5: I want the size to stay the same, no bigger or smaller. (BFG3)

> P5: If they add more area, fishermen can get few fish because fish will always stay in the MPA they will not go outside because they already have a large area. (BFG6-Fisher's Wives)

The last comment is especially interesting as the fisher's wife is suggesting that a larger MPA would prevent fishery spill-over as well as reducing the amount of space where fishermen can fish. It is also important to note that I never suggested that changes in MPA size may take place; it is obviously an area of concern for the local fishermen who are scared the government may enlarge the MPA.

The MPA in Suba is an interesting case as the size has been reduced (see chapter 3) in recent years.

> P3: You know ma'am, actually the whole area of Suba was made as a sanctuary, that was the record of the old papers or the ordinance but when I sat as a barangay captain, many people came to me and beg me to make the sanctuary smaller. That's why I gave a chance, I cut the sanctuary and let them choose what part they like. So the people think that there are lots of fish on the left side (…).You know what? After two months, the fish was no more, now the fishes transferred to the right side which is the sanctuary because they were not disturbed in that area. (SFG7-MPA Involved)

It seems that despite this reduction in size of the MPA, it did very little to alter the negative attitudes or actions of the local fishermen.

Q: Does the change make them positive? Do they find it better?
A: No it's not, the first time or the first week, they find it better because they catch fish, lots of fish almost 10kg of fish everyday but when fish found out, they are now again in the first parcel so now they want again that they will encroach the first parcel because there is lots of fish and the size is big.
Q: Do people support after the change?
A: Still the same, still encroach
Q: Even if the sanctuary is small now compared to the last time?
A: yes (SIDI1-Ex MPA Leader)

It's suggested therefore by an ex-MPA leader (Roberto) that the large MPA in Suba led fishermen to pressurise the local government into opening up a parcel of the MPA to fishing. Indeed many fish were caught initially, but this decreased very quickly. Now many believe the fish to have gone to the smaller, remaining MPA and they are still not supportive of the MPA. This therefore suggests that the MPA size is not the sole factor influencing support. One needs to be careful when inferring causality here as it could also be that a lack of support made people feel negative towards the size of the MPA and not the other way round. The attitudes and actions of individuals towards the Suba MPA is comparatively very low (Fig.4.1, 4.2), it may be that they are more interested in the short term gains from opening up the MPA than the long term benefits. It is also possible that due to the initial large size of the MPA and reduced fishing grounds, many wanted to open up the MPA. Once the MPA size was reduced however, few benefits may be occurring making the remaining MPA redundant.

In summary, comparing the mean attitude and enforcement towards the three MPAs of different sizes suggests that the size of the MPA may have little influence on the support of individuals towards reserves. However, it may be hard to uncover any patterns when so many potential factors are influencing support towards MPAs. The three villages studied do not differ solely in MPA size but have many different characteristics in MPA design and the way these are managed. When using qualitative data and understanding mechanisms by which MPA size may influence support we get a more complex picture. Large MPA size may result in more negative attitudes and increased levels of encroachment through reduced fishing grounds and temptation to encroach . Interestingly however, reducing the size of MPAs may not necessarily boost support suggesting there are indeed other confounding and inter-related variables which influence support at play.

3. MPA Location

Much of the debate surrounding MPA design has not only included issues about the size of the MPA but also its location (Agardy et al., 2003). Where to put an MPA is clearly linked to its size, however it may also depend on habitat quality, fish habitat, oceanography, biodiversity, social acceptance, practicality of management, quality of management (Lowry et al., 2009). In the Philippines, MPAs are being implemented based on the following considerations (Lowry et al., 2009)

— Biogeographic and habitat representation
— Presence of species or populations of special interest
— Size of reserves necessary to protect viable habitats
— Presence of exploitable (target) species
— Vulnerable life stages of selected species
— Connectivity among reserves and links among ecosystems
— Provision of ecosystem services to people

With, perhaps, the exception of the provision of ecosystem services, these criteria do not take into account how the location of the MPA may impact the local stakeholders and how it may influence their support towards the adjacent reserve. This is surprising giving the rising importance attributed to incorporating interactions between societies and natural systems (Berkes, 2004) and of interdisciplinary approaches to NRM in general (chapter 2).

Interviews and focus groups with residents of each village identified certain themes and aspects of MPA location which influenced their attitudes and MPA related actions. The proximity of MPAs to the shoreline arose through discussions as an important consideration of MPA location. MPAs implemented further off-shore may be more difficult to monitor and hence difficult to spot encroachers and act in favour of the MPA. Indeed it seems that visibility of the MPA is crucial for the adjacent community to monitor the reserve.

P1: On my own it is risky because we cannot monitor all the time as we are living far from the sanctuary. (BFG2)

The monitoring is for those that live in Tambobo (part of village closest to MPA). (BSSI5-Fisher's Son)

People by the beach are always monitoring. (CSSI11-Barangay Tanod)

However, interviews and focus groups suggested that MPAs located too close to the shore can lead to lower levels of compliance of the adjacent community. When asked about the characteristics of encroachers, many responses had similar themes.

P5: They (encroachers) want to go fishing nearby and not have to go too far
M: What do you mean?
P4: They are lazy (BFG3)

Q: Why do people have different views?
A: Maybe they like to have more space near their homes to catch fish (CIDI1)

P3: That is one reason why they don't want to have that sanctuary. Because they can't catch at the nearer part because they are lazy and want an easy way (SFG3)

M: Why do others not want to have the sanctuary?
P4: They don't want to get tired in catching fish in other places (SFG4)

It seems that if the MPA is very close to the shore, this hinders the possibility of fishermen to catch fish easily without having to go out too far to sea. Encroachers are often termed "lazy" as they want an easier and quicker way to catch fish.

Cinner (2007) explains how depending on where the MPA is placed, it can lead to specific groups bearing the costs or burden of such a closure whilst other families are unaffected. It was indeed suggested that if the MPA is placed in an area where one did not traditionally fish, this presented the fishermen with little cost and hence seemed to reflect positively on their support for the reserve.

P6: We don't have any problem about the sanctuary, we don't go fishing on that area. And it is for the good of every one of us here. (BFG1)

P1: We want the MPA in Bonbonon area only, not in Agbagacay and Lagtanon [their homes]
P3: Yes, because that is the place we go fishing. (BFG2)

Some seem happy that the MPA is where they traditionally seldom fished. This emphasises that when implementing an MPA one needs to carefully think about the "winners and losers" that will arise out of the situation as the MPA will not affect the

whole adjacent community equally. For example, given that those living close to the MPA are important for its monitoring, one may want to ensure that the location of the MPA doesn't bear extra costs to this group of fishers relative to others.

The location of the MPA can therefore influence support. It seems that it specifically affects whether one monitors the MPA or not and whether one encroaches due to ease of catching fish close to shore. This section reinforced the idea that location of MPA should not solely reflect ecological debates but must also incorporate the wider social and economic aspects of the adjacent community. This however is not an easy task given the various impacts of the MPA and the different concerns of individuals within a community.

4. MPA Network

Properly managed, large MPAs, despite their effectiveness at protecting ecosystem function, fish biomass and biodiversity are not thought to be feasible in the Philippine context (Christie et al., 2002). Christie et al (2002) argue this is due to widespread poverty and a challenging institutional context. However small, isolated MPAs are not thought to maintain fish abundance and diversity on surrounding reefs in areas with increasing levels of fishing effort (Christie et al., 2002). Much effort is therefore being placed on scaling up MPAs to form networks (Lowry et al., 2009). Two or more MPAs that complement each other can form a "network". These can be either ecological, when natural connections between and within sites enhance ecological functions, or administration and management networks where sharing of information and coordination between institutions can occur (Pietri et al., 2009).

It is thought that, with full compliance, a network of small MPAs can protect a population of similar size and produce higher fish yield to that in a single large MPA (Kritzer, 2004). Some argue that by siting a network of MPAs in strategic locations, it can simultaneously enhance both the yields and the profits of a fishery as well as improving ecosystem service provision (Costello et al., 2010).

There are, it seems, many benefits that can arise from having a network of smaller MPAs. As we have seen from the section on MPA size, many fishermen dislike the

use of large MPAs and one from Candaping B even suggests that more numerous, smaller MPAs need to be implemented in the surrounding area.

> P3: I will put sanctuary in many areas but not as big as this one. I mean one in every barrio. (CFG1)

This fisherman's desire for a network of MPAs is not necessarily for the improved ecological or fishery spill-over benefits. It is also possible to be due to resentment or jealousy towards others who do not have an MPA as they do not bear the costs of having one but can reap the benefits of others who do have an MPA.

> P4: Others don't have the sanctuary because they don't like to have it. And we don't want them to go fishing in our area (CFG1)

> P3: Sometimes we go fishing to the next barangay
> M: Ahh, I think that, that barangay is lucky because the fish from the sanctuary will go out and go to their area (CFG3)

Especially in Candaping B, it seems there is jealousy towards those barangays that do not have MPAs. This can potentially lead to conflict as fishermen may not want them to come and fish in their area to benefit from fishery spill-over. This notion of fairness, jealousy and of equity is one that reappears throughout the thesis as mechanisms through which factors can influence support. Candaping B is a comparatively isolated MPA and so for the villagers, it may seem unfair for them to have such an MPA in place whilst all surrounding Barangays have no such restrictions to their fishing grounds. This jealousy is further aggravated by the large size of their adjacent MPA. Both Suba and Bonbonon, conversely are part of a network of MPAs with other MPA's close by. It seems that the proximity of other MPAs may reassure the villagers that everyone is in the same boat and no single village is bearing all the costs whilst others reap the benefits. MPAs that are isolated and not part of networks can therefore negatively impact attitudes towards the reserve and potentially lead to inter village conflict.

Furthermore, in Bonbonon and Suba where there are other MPAs nearby, some residents seem to develop a positive attitude towards the MPA as they have heard of other successful MPAs in the vicinity.

P1: So that many tourists will visit in our sanctuary because of different kinds of corals. And that can add income to our barangay. Dauin also have this. (BFG5)

This extract suggests that the fisherman has heard about an MPA in Dauin. His reasoning for having an MPA seems linked to the fact that he has high hopes that it can benefit the barangay via tourism due to the local success of an MPA in Dauin. This notion that nearby successful studies can influence support and lead to more acceptance of a nearby MPA confirms studies that suggest the benefits from well managed MPAs in the Philippines (for example, Apo island) have served as models for an expansion of no-take reserves in the Philippines (Alcala and Russ, 2006).

However, further interviews and focus groups across the three villages suggest that being part of an MPA network or having other MPAs nearby leads to some comparing their own MPA with others.

P2: In Apo there is a development of their sanctuary (BFG7-Fisher's Wives)

P6: Different because in Talingting they use guns and here we use Bolo (machetes)
P1: You know, in Talingting there are guards and they are paid the right amount unlike here (CFG4)

P4: But in Badiang, their sanctuary is very strict unlike here. They are fair even if whoever you are or your position
P2: Yes, very strict because it is a municipal MPA (SFG2)

It is difficult to conclude the attitudes of individuals from the above statements in isolation from the context of the whole focus group transcript. However the last two extracts in particular mention that "*they* are paid the *right* amount" or "*they* are *fair*", which I argue suggests they believe other certain MPAs to be better than theirs and could potentially promote negative attitudes. It is possible therefore that other perceived MPA successes may make some reproach and criticise their own MPA and feel more negative towards it. This issue is closely related to the expectations that are placed on an MPA and whether these are reached or not. In this case, nearby successes such as in Apo Island where dive tourism has boomed since MPA implementation, may have led some participants to believe their MPA would lead to the same outcomes. Consequent shattered expectations may then lead to negative attitudes towards their current MPA.

Whether an MPA is part of a network or not can therefore both positively or negatively affect attitudes towards the MPA depending on their perceived success. Whilst nesting MPAs as part of a wider network may be beneficial in terms of ecology and of MPA management, there is also evidence that it may promote MPA support as well. Nevertheless it is important to note that being part of an MPA network may not uniformly increase support towards the adjacent reserve. A mixture of shattered expectations and jealousy towards other more "successful" MPAs or those without MPAs may lead to negative attitudes towards their current MPA.

5. MPA Boundaries

I have spoken about the size, the location of MPAs and how they can form networks but none of these aspects are important unless the MPA boundaries are delineated. The presence of clearly defined boundaries have been found to be essential for successful common property regimes and collective action of community members towards the management of natural resources (Ostrom, 1990). It is suggested that without clear boundaries, exclusion may be difficult and fishermen may be faced with incentives to encroach and to shirk maintenance (Anderies et al., 2004). It is not surprising that without clear boundaries demarcating the MPA, encroachment by fishermen from within or outside the adjacent community may increase. Indeed the compliance of the community has been found to be significantly related to the presence of marker buoys (Pollnac et al., 2010).

In accordance with the literature, I have found that clear boundaries are consistently mentioned across sites as being an important factor influencing MPA related actions.

> P2: They get inside because they do not know that there is a sanctuary there already. This is because there are not buoys there. They get inside without knowing that they are inside the sanctuary already. (BFG2)

> P2: Before, the area was not clear because there were no buoys
> P5: Just like me, before, when I go fishing, I accidently went inside because the strong wind blew my fishing boat but that was not my intention, but I didn't know it was the sanctuary already until one man shouted and scolded me. I think that was the navy. I thought it was not the sanctuary because there were no buoys. (BFG6-Fisher's Wives)

> A: Buoys are important to warn people. For the people to know that it is already an MPA. Sometimes the people when they will go fishing, they forget that they are already inside the MPA because there are no buoys. So it is needed to put buoys (BIDI2)

126

P5: but there are some who get inside accidentally because the buoys disappeared with the big waves

P3: Buoys are still needed so that fishermen will know that there is still a mark and can't go inside (CFG2)

The above extracts suggest that encroachment could be greatly reduced if clear MPA boundaries were constantly present. Some comments are more specific and argue that it would especially prevent foreign fishermen from other landsites from encroaching.

Q: What I have observed most of the encroachers are not from here. Their reason why they get inside is there are no buoys that's why they don't know where the sanctuary is (BIDI3)

Q: Why, what's the reason?
A: Most of their (encroachers) answers are they don't know that there is a sanctuary in this place because there are no markers or buoys. (CIDI1)

It's OK for the people of Candaping if we don't have buoys because every fishermen who stays knows already the limits, so buoys is not for us but it's for the people who don't know that there's a sanctuary and to those who go fishing during the night time from other places.(CIDI5)

P4: The other people get inside because there are no markers. No buoys but we let them Understand and explain to them (SFG3)

Furthermore, it is also suggested that the lack of boundaries influences not only encroachment but also whether one can enforce the rules by monitoring and reporting encroachers.

A: The good thing to do there is to put buoys so that the area will be avoided and everybody will be aware. So it is easy for us to catch the encroacher (BIDI5)

P3: The people who are in charge of the sanctuary are very strict. If they see someone who gets inside. But when they are monitoring they must make sure that the fishermen is really inside the sanctuary. (CFG7- Fisher's Wives)

Q: Is this good that hook and line fishing inside the sanctuary is allowed?
A: There are no more markers in the area, so we allowed them just in the buffer zone, but now we can't do anything because they just go on where they believe (SIDI1-Ex MPA Leader)

Interviews also suggested that encroachers use the lack of boundaries as an excuse to encroach.

P3: If they (encroachers) were caught they have different reasons just like there are no buoys (BFG6-Fisher's wives)

P4: That's the reason if they get inside. They say they don't know if it's already the sanctuary because there are no buoys. So they have their reason but they still have to pay the penalty. (BFG4)

P1: others are making excuses. They use the absence of buoys as they reason for when they encroach, but they have to pay the penalty. (CFG3)

Indeed, it is thought that most know where the boundaries are despite there being no clear boundaries…

Sometimes when there are big waves, they [the markers] get lost, so all the people, especially if you are a fisherman, know and memorize already the limits of the sanctuary, Most of us, every day we are fishing so we know already where the marker is even if only bamboo sticks are there in every corner it is OK. (BIDI1)

The fact that the lack of clear boundaries are used as an excuse to encroach provides further evidence suggesting that clear, constant boundaries are needed to reduce encroachment. Furthermore, it is thought that buoys that are implemented are frequently cut and forcibly removed so that the "no clear boundary" excuse can be used and justify the encroachment of individuals.

P5: But if you will put buoys don't use ropes because it has happened before that they were stolen by someone. They get it in the middle of the night.
P2: You know buoys are one of the problems
P6: Others will cut the rope so that when they get caught inside, they have the excuse when someone will scold them. They just say "we don't know that it is a sanctuary because there are no buoys and rope". (BFG6-Fisher's wives)

People have cut buoys so they can encroach. They can then make excuses that they
Don't know where the boundaries are. (CSSI15-Barangay Official)

Many of the residents want the local government to implement long lasting buoys and markers to ensure a well delineated MPA boundary.

P3: I want the sanctuary to have buoys. (Talk about the buoys). How will I know if there is a sanctuary already if there are no buoys? (BFG3)

P4: I don't think the management is good, look at the buoys (BFG3)
P3: There should be a stable guard and buoys so people will know that it is an MPA (CFG2)

It's very important that there is a complete set of buoys for those people who don't know about the sanctuary and for those in charge of the management to be alert always even if there are big waves (CIDI2-Fisher's Wife)

Residents are therefore thinking negatively towards the MPA or its management if no buoys are implemented. The presence of clear boundaries may therefore influence attitudes towards the MPA.

At first glance it seems that boundaries are at the root of the problem and that clear boundaries would prevent encroachment and promotes monitoring. Indeed, when considering CPRs in general Ostrom (1990) argues that regardless of rules and regulations in place, in every group, there will be individuals who will act opportunistically when given a chance. The presence of clear boundaries may therefore discourage potential encroachers by making it easier to monitor and enforce MPA rules. However, boundaries may do little to sway attitudes towards MPAs. Those that are negative towards the MPA may cut the buoys and use their absence as an excuse to encroach.

6. Conclusion

The majority of MPAs are designed with their ecological and socio-economic expectations in mind (Pomeroy et al., 2005). However it is also important to consider how design can influence the support of the adjacent community. As one begins to explore this link, it becomes increasingly apparent that not only are there a number of different factors that affect how people feel and act about the MPA, but these factors can also influence support via a number of different complex and sometimes ambiguous mechanisms (Fig.5.7).

Leisa Reichelt's quote mentioned at the beginning of the chapter makes us think about how hard it can be to design something with everybody in mind. However, in the case of community based MPAs, if we design for only one group of individuals, the MPA will likely not persist over time. Those that are not supportive of the MPA undermine efforts made to sustain the MPA by actions such as cutting buoys, low levels of compliance and not reporting encroachers. Furthermore, it could lead to rising tensions within the community. It is important therefore to think about all those that will be affected when designing an MPA.

Similar factors were found to influence attitudes and actions towards MPA at all three sites. They influenced community support through similar processes and mechanisms. These factors and the main ways they influenced attitudes and actions are summarised in Figure 5.7. Despite these similarities across sites, different individuals and groups of individuals described different sets of factors. Although it proved difficult to explore the strength of influence of these factors via qualitative means, different individuals may ascribe different levels of importance to the different factors identified. It becomes clear that there is no winning combination of design factors that will lead to uniform support of the adjacent community, especially when one considers MPA location or MPA size which will clearly have varied impacts on different groups of individuals.
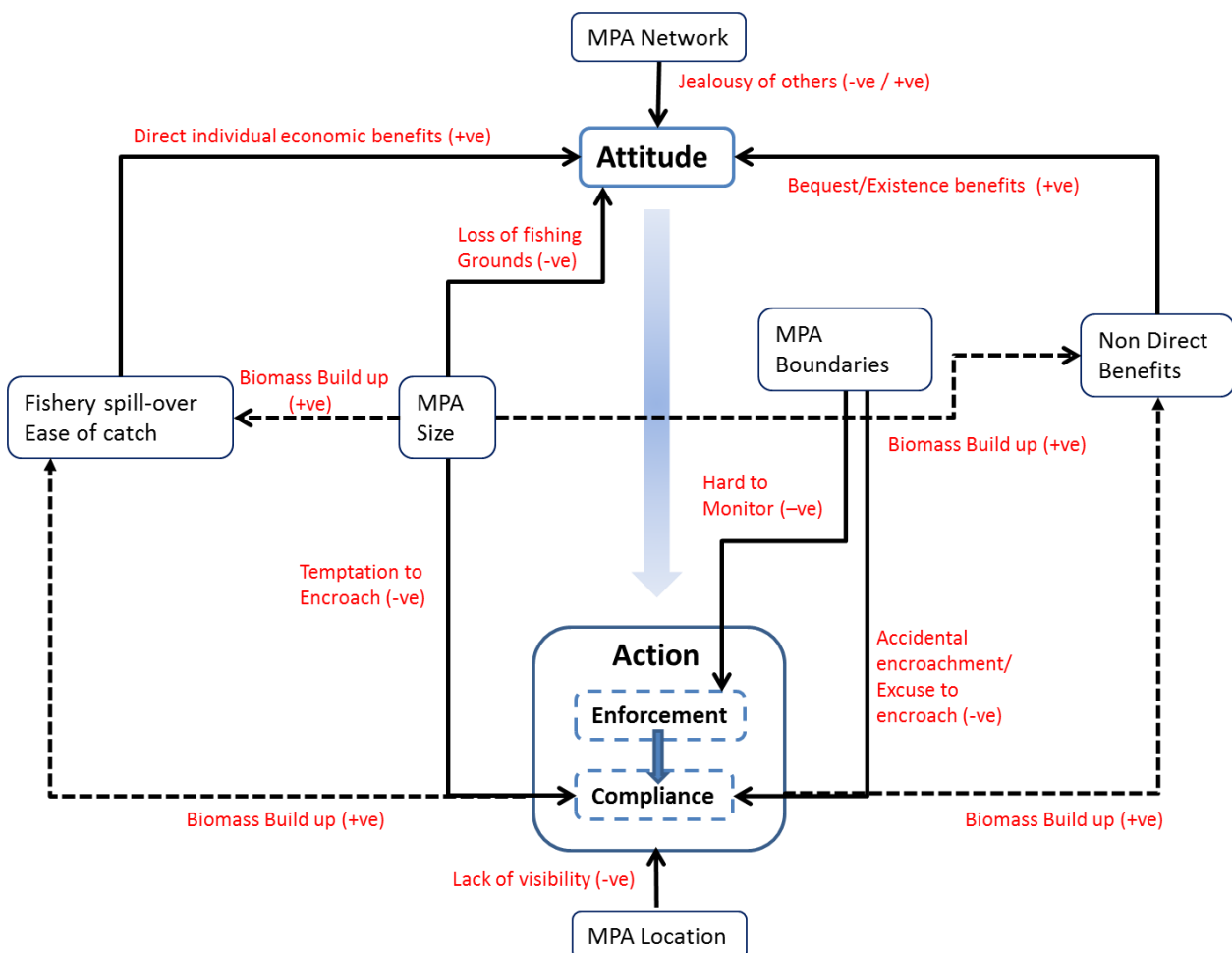
Fig.5.7. Summary of MPA design factors and how they influence the different aspects of support towards the adjacent MPA.

One pattern that is especially clear when considering MPA design factors and their influence on community support is their inter-connectedness. To ensure higher levels

of support towards an MPA, MPA design factors need to be considered holistically and their potential interactions need to be explored. For example,whilst a small MPA may boost support, it may prevent MPA benefits from occurring which are also important for support. One may therefore have the option of compromising MPA benefits for a small MPA size, increasing the size of the MPA or ensuring it is part of a wider MPA network in the surrounding area.

Another issue of importance is how certain factors unfold over time. Specifically, direct individual MPA benefits such as fishery spill-over may be expected based on other MPA successes elsewhere or environmental education. If these benefits are less than expected, it can lead to negative attitudes and shattered expectations. For small community based MPAs such as those studied, fisheries spill-over benefits may not be large and indeed may not be perceived by the adjacent community. Furthermore, with fishing effort on the increase and other external pressures occurring, fishery spill-over benefits may be obscured over time. It may be best therefore not to think of support towards MPAs as a static entity, but one that waxes and wanes over time. After implementation, fisheries benefits may occur and increase over time. However once these benefits have reached their maximum, increasing numbers of fishers may expand and reduce individual benefits and consequently, support towards the MPA. Highlighting the non-direct economic benefits of MPAs may be a way to counter this problem.

It is clear that the way the MPA is designed and the benefits it can accrue have some influence over community support towards MPAs. However to further our understanding of how the MPA is supported over time, it is important to consider a multitude of individuals and their interests, those important design factors identified and how they interact with each other.

This chapter continues a similar line of argument already made in chapter 4 in that it suggests a need to consider both individual and collective level factors to get a comprehensive understanding of community support towards NRM strategies such as MPAs. This chapter however provides some qualitative evidence as to why this is an important consideration to make. Firstly, individuals appear not to be purely rational and self-interested but consider wider implications and the impacts of MPAs for

others in the community. The relationships with others in the community can affect the way the MPA is perceived and the way they are affected by the MPA. However, it is also important to focus at an individual level. Changes to MPA design and benefits that arise out of it can influence different individuals within the community differently and consequently can have various impacts on their support towards the MPA. These themes will re-appear throughout following chapters as I take a more inductive approach to understanding community support and start to focus on individual level factors. This will help to understand how and why MPAs may affect different individuals within a community differently and explain differences in support within a community.

Chapter 6: The influence of Governance and MPA management on Community Support

"We are imperfect. We cannot expect perfect government."
― William Howard Taft

When considering MPAs and how to ensure they are reaching their social, economic or ecological objectives, not only do many consider the design of the MPA but also how it is managed. Indeed, design and management are often thought of as crucial for MPA success (see chapter 1). However, both these aspects involve changes that operate at a community level, yet resource management in the coastal zone involves multiple stakeholders and resource users (Jentoft, 2000a). It is unlikely therefore that all individuals have similar perceptions as to how the MPA is managed by their local, regional and or national governments. I describe in this chapter those MPA management factors perceived as important for support towards MPAs by individuals concerned and seek to understand how best to improve MPA management in such a way that both the resources are managed effectively and it is supported by the community.

Initially, I was unsure whether I should entitle this chapter MPA governance or MPA management. Given that most of the MPA literature focuses on the importance of MPA management factors for MPA success, it seemed natural to entitle the chapter "MPA management" as I aimed to discover how these management factors could influence support. However, as the qualitative work unravelled, more complex inductive themes started to arise. I soon realised that MPA management and its' relationship with support towards MPAs was about more than just a list of factors. Indeed when trying to understand why certain management factors influenced attitudes and actions towards the MPA, it was clear that other broader issues not solely to do with MPA management, such as power dynamics, equity, legitimacy or transparency of institutions, were of importance. This would suggest it is necessary to take a broader view such as a governance approach which is argued to be inclusive of normative theory, values, principles and goals (Chuenpagdee and Jentoft, 2009). Nevertheless, I still use the term "management" as part of the chapter title as I am primarily concerned with the specific ways in which the MPA is managed and how

this reflects on support towards the MPA. However, I remain appreciative of the broader governance view when trying to understand why some of these management factors may influence support.

I explain in chapter 1 how MPAs in the Philippines have evolved and proliferated. Although traditional fishing rights and village-based management systems existed in the Philippines before the Spanish colonial period, these have for the most part disappeared (Pomeroy and Carlos, 1997). For centuries, natural resource management in the Philippines has been strongly centrally-determined, top-down and non-participatory (Christie and White, 1997). Alternative methods of resource use and management were explored in the 1960s and there has since been a shift to community-based initiatives to conserve and protect resources (Pomeroy and Carlos, 1997).

The transfer of power from centralized government to local governmental units in the Philippines (LGUs) has transformed the local institutional landscape. It is argued that a devolution of management to the community level of this sort may even run the risk of reproducing and even reinforcing asymmetrical power relations (Angerbrandt, 2011). At the very least, it is clear that there is a structural mechanism of access at play where the ability to benefit or encroach the MPA is mediated by constraints established by the political frame (Ribot and Peluso, 2003). This chapter will explore this issue through a number of different inductive and deductive themes.

A central tenet of community based management is that people are more likely to comply with management regulations if they are aware of management objectives, are part of the decision making process and are able to participate in the implementation and maintenance of that management. (Russ and Alcala, 1999). The decentralization shift in the Philippines however has not necessarily lead to a higher rate of MPA success (White et al., 2005b). Other problems associated with decentralization need to be addressed. It is thought for example, that devolving power to local governments can have the effect of obscuring internal differences within the village (Ribot et al., 2008). This again reinforces the importance of considering the broader concept of MPA governance when considering MPA management and community support. MPA management is not politically neutral, it can affect social relationships and

134

support towards MPAs. Struggles for power and corruption for example are some of the issues that can arise out of this process which will be illustrated throughout this chapter.

I explained in chapter 4 whilst certain factors operating at the community level such as environmental education projects or MPA participatory meetings may influence support of the community, differences in the levels of participation between individuals within a community may still influence support. Those interested in natural resource management and common property resources often consider communities as homogeneous structures (Agrawal and Gibson, 1999). I argue that we need to consider the different perceptions and responses of individuals towards the ways in which MPAs are managed and rules and regulations that are put in place.

Despite efforts devoted to the generation and implementation of management policies, their impacts on fishers' attitudes and actions have not yet received significant attention (Gelcich et al., 2008). This chapter seeks to understand what aspects of MPA management can influence the support of the adjacent community towards the MPA and discusses how it could be managed in such a way which promotes support towards it.

1. Management in General

Many comments pertaining to MPA management were not so much on specific aspects which could influence support but rather on the general perceived success or failure of MPA management and its importance. Unlike many scientists, Hilborn (2007b) argues that the fisheries community recognises the difference between well managed fisheries and those that aren't. Indeed, throughout the interviews and focus group discussions, very general remarks were made about current or past MPA management emphasizing the importance of the participants' perceptions of the management.

> "A mayor or captain not interested in the MPA will not get elected" (BSSI3-Fisher's Wife).

> "If there is no management, the fish will run out because of the encroachers" (P5-BFG1)

"He doesn't believe the MPA is actually making any difference to the community as it is so badly managed" (BSSI17-Guesthouse Owner).

P1: We want a strong management. In case they (encroachers) will insist, we have the rules (SFG1)

The importance attributed to MPA management is a very pervasive sentiment across the three sites. These extracts suggest that the management is perceived to be crucial for the success of MPAs. Without efficient management, one could argue there is no point in having the MPA. The last extract, is especially striking as the individual is demanding "strong" management to ensure that there are enforced rules in place.

Furthermore, when asked to try and determine what influences attitudes towards the MPA, many fishers focused on the management of the MPA rather than the MPA itself.

"The management is not good, that is why we don't like it sometimes" (P5-CFG3)

"The (our) attitude depends on the management" (CSSI 9-Non Fisher's Wife).

M: So in your own opinions, what can you say about the MPA? What are your reasons why you (don't) like the sanctuary?
P1: It doesn't mean that we don't like the sanctuary. What we don't like about this is we don't like the governance. (SFG1)

M: How about the attitude of the people towards the MPA?
P4: They like it but the problem is the management (SFG2)

Often, when asking people's opinions of the MPA, a typical answer would indeed include "the management is not good" and not necessarily focus on the costs and benefits of the MPA itself. This suggests that indeed, MPAs can also manifest themselves as political entities. Regardless of the ecological and socio-economic motivations for the MPA, many seem to focus on who's in charge of the management and whether they believe they are doing " a good job". I attempt to unpack what is perceived as "good" or "bad" management throughout this chapter.

In Suba especially, some were more specific about why they were negative towards the management. They simply wanted better enforcement of rules.

P1: If we will tell the barangay council that someone gets inside the sanctuary they will just ignore us [he is a little bit angry about this].They don't listen to us, they make they own decisions (SFG1)

M: So what should be done?
P4: There should be an action
M; What action?
P4: if we made an action but the officials will not cooperate, it's useless
M: What is the best thing to do?
P1: The officials must support (SFG2)

Q: if you saw someone encroaching, what would you do?
A: Tell them that it is prohibited. I will not report because the barangay council doesn't make an action. They won't believe us because we are just ordinary fishermen. If we will scold them they will just say that "who are you? Do you have a position?" so there is no justice and that's the problem (SIDI5)

These comments may in fact be complaints about the "corruption" of *barangay* councillors an issue I explore further later on in the chapter. These councillors may be taking leadership positions for power but not actually taking their MPA managing and enforcement role. Again, this re-emphasises that MPAs are not politically neutral but that power struggles are involved whereby certain individuals involved in MPA management are making some encroachers pay whilst others are let off. Nevertheless, it is mentioned that they want stricter and more regular enforcement of the rules and the positive attitudes of certain individuals with regards to the MPA has decreased over time as they perceive there to be a lack of enforcement. Here again, we see there is a desire for more input from the government and "stronger" management to ensure fairness and equity of management. It is even suggested that this disillusionment with management undermines compliance with MPA rules as they do not believe in the management, or want to "test" the management.

"M: What are the reasons (why someone would encroach)?
P5: They want to try and see if the penalty and management is true, that is why they get inside" (CFG7-Fisher's Wives).

P5: Others don't believe the management, that is why they get inside because it's not so strict (SFG5-Fisher's Wives)

If the management is not strict, some may encroach to test if the rules and regulations are enforced.

It seems that management of the MPA can influence both attitudes and actions of individuals towards the MPA. I explain in chapter 3 how the management of the MPA in Suba has disintegrated in recent years, this is also made clear through some of the comments made by *Subanons* in the above extracts. Not surprisingly, those in Suba were significantly most negative towards the management of their MPA than those in other villages (chapter 4, Fig.4.1).

It proved difficult to isolate what respondents meant by "management" in each case. For different individuals "management" may mean the local government, municipal government, fisheries association, the *bantay dagat* or the barangay captain. In hindsight, more follow-up questions and probes could have elucidated these comments further. Nevertheless this section emphasizes that the views and perceptions of the community towards the management of the MPA are crucial for their support. The following sections examine which aspects of management influence support of the adjacent community. I begin by looking at perceptions of who is in charge of managing the MPA by analysing MPA leadership, FAs and how the provision of help from outside the community can influence support towards MPAs. I then focus on the rules and regulations such as sanctions and how these are enforced and whether this enforcement is perceived as fair or appropriate.

2. MPA Leadership

The previous section focused on how perceived management success is important for support. Yet for successful fisheries management, the presence of a clear leader is deemed to be an essential factor (Christie et al., 2009; Gutiérrez et al., 2011; Pietri et al., 2009; Wamukota et al., 2011).

Indeed, strong leadership was mentioned as being important for the enforcement of MPA rules and regulations.

> "If he is a good leader of course we will follow (the rules)" (P3-BFG4-Fisher's Wives)

> If the leader is strict all followers will be strict e.g. the Tanod [village police] would also become stricter. (SSSI11-Ex Barangay Official)

These extracts suggest that people are more likely to respect the rules and regulations surrounding the MPA if those in charge are enforcing the rules and are ensuring that encroachers are penalised. This relates to Ostrom's (2009) argument that nobody likes to be a "sucker" . Individuals are less likely to cooperate with the rules if they perceive others to be benefiting from breaking the rules. Although few extracts clearly demonstrate the importance of MPA leadership, it was a pervasive sentiment, which was broadly alluded to within the three sites.

I describe in chapter 3 how different individuals are involved in enforcing MPA rules and regulations at each site. The FA President and to a lesser extent its members are principally involved in enforcing rules at Bonbonon. Candaping B has two individuals appointed to enforce the rules and has strong help from the municipal and regional government in MPA enforcement. In Suba however, a barangay official (Roberto) was acting as an MPA leader but was not re-elected when the new *barangay* captain came into power. At the time of my fieldwork in 2011 there was no clear leader and the following extracts describe how this has influenced support towards the MPA:

Without a clear leader in charge of the MPA the position is given by default, to the *barangay* captain who oversees village matters. This can be problematic as the captain may not always be supportive of the MPA.

> M: How about the community, do they give support?
> P2: The captain doesn't, he doesn't even say that "I support" (SFG2)

Although the current captain may not be interested in the MPA and may not "support" it, he is nevertheless in charge and this could lead to low levels of enforcement and can harbour negative attitudes towards the MPA. It is possible that after acknowledging what had previously happened to Roberto, some individuals believe it is best not to enforce MPA rules if one wants to remain in power as a barangay official or MPA enforcer. Whilst strictly enforcing rules may prevent free riders from encroaching and consequently boost support towards the MPA, those that are caught may refrain from voting for the enforcer in the following election.

> M: Do encroachers get caught?
> P2: Sometimes the captain just lets them encroach because when somebody reports to the
> captain, the captain doesn't have any reaction (SFG5-Fisher's Wives)

Conversely, Roberto was thought to have a positive effect on the MPA and his presence led to higher levels of enforcement.

> P4: In the barangay, the barangay councillor. Before, Roberto when he was still a barangay councillor he moves fast when he hears someone who gets inside the sanctuary and catches them
> M: Ahh
> P4: That's the official of Suba before that is very strict when it comes to the sanctuary. He is not afraid. But now when he loses the election the sanctuary was also neglected (SFG2)

> Q: Who is Roberto?
> A: He is our founder, the president of the Fisheries and Aquatic Resource Management Council (FARMC). He is very important because he knows everything about the sanctuary. But he lost the election
> Q: Why was he not voted back?
> A: Because the people said that he is very strict. He is fair in monitoring the MPA. (SIDI4-Barangay Tanod)

Overall, it seems that in Suba, a clear and active leader such as Roberto positively influenced attitudes and the likelihood of reporting an encroacher. On the flip side, a leader who is not involved or interested in the MPA undermines support towards it. This is important to consider as if no clear leader is present, it seems that the responsibility of MPA management goes to the local barangay captain, who may not necessarily be interested in this role.

However, given the importance attributed to clear and active leaders, why was Roberto not re-elected at Suba? I spoke to Roberto and asked him why he thought he was not voted back as a barangay councillor.

> You know, people in the barangay, almost all are relatives, they protect each other even if one is wrong and some say that I was very strict in serving the sanctuary, so they didn't vote for me again (SIDI1-Ex MPA Leader)

This thought was echoed by others throughout the focus groups carried out at Suba

> M: Why did he lose the election?
> P4: He fails to win because the people didn't vote for him because he is strict to the sanctuary (SFG2)

> P1: Before Roberto is a councillor, he then lost the election because the encroachers didn't vote for him
> P2: Yes it's true; you can't understand the people why they are like that (SFG5-Fisher's Wives)

It seems therefore that in the case of Suba an active leader perceived to be enforcing MPA rules and regulations is less likely to be elected in the coming election. The following extracts from Roberto and the DA reinforce this notion.

> If a politician like the captain, if he has a political ambition, he must be good to deal with the people so that in the coming election he will win again. That's why even if someone did something wrong, and the encroacher asks a favour from the captain, the captain will give him a chance. And it also happens to me and it never works, because most of them are tolerating their relative family members who are encroaching and during the election, nobody voted for me because I was very strict. (SIDI1-Ex MPA Leader)

> P4: There are times that there are someone who are doing illegal things to the ocean and I just close my eyes because I don't want conflicts, others know about it and also my close friend saw these things also. (SFG7-MPA Involved)

MPA leadership is hence an important factor in influencing support. However it seems that its effect on support can change quite rapidly as those in charge and those wanting to be in charge are constantly in flux. Those expressing a desire to be an MPA leader may not harbour much concern towards MPAs and the expectations placed on them but may be playing a political game to improve their chances of securing a position in the local government such as a barangay official.

3. Fisherman's Association

MPA Leadership can involve the barangay captain, barangay officials or even individuals outside the village such as members of municipal or regional government (chapter 3). However, as is the case in Bonbonon leadership can also occur from other interested individuals such as members of the fisherman's association (FA). FA's are generally thought to be important platforms which can enable knowledge sharing towards the management of fisheries (Evans et al., 2011). In the sites studied, FAs have been active at various times and could include male fishermen, but also women and non-fisher folk. It is possible therefore that various ideas, concerns and queries with regards towards the MPA can be discussed openly at these FA meetings.

As discussed in chapter 3, although all sites had an FA at some point, the one in Bonbonon is the only one that has remained active. Therefore, most of this section focuses solely on quantitative and qualitative information obtained from Bonbonon.

I hypothesized that FA members would have a higher degree of knowledge of MPA rules, MPA objectives and perceive themselves to participate more in MPA related activities. Although FA members perceived themselves to participate more in MPA related issues[11], FA members were not significantly more aware of MPA objectives[12] or MPA rules[13]. These findings are surprising, but upon consideration suggest that non MPA issues may be primarily discussed during FA meetings and concerns of MPA objectives and rules are not important discussion topics. The information obtained from focus groups and interviews also suggested that some were joining the FA for other reasons than MPA and natural resource management purposes.

> "FA members like to stay because they want benefits like nets and livelihoods (…) most people used to be FA members for livelihood projects and nets as benefits. He argues these were given fairly to all active members" (BSSI11-Known Encroacher)

> "Non FA members need an incentive to become members [e.g. like a net which is what used to happen]" (BSSI2-FA Member)

> "There are now fewer FA members [since incentives have stopped]" (BSSI5-Fisher's Son).

> "Some individuals join the FA just to reap the benefits" (BSSI2-FA Member)

Some therefore have joined the FA for certain monetary incentives. Again, this illustrates that concerns towards the MPA and its outcomes are not necessarily at the forefront of those involved with MPA management. These incentives have since been dropped in Bonbonon. Unfortunately it proved very difficult to determine whether those that initially joined, left when the incentives dropped or whether they are still active parts of the FA. However, without the incentives it became clear that some that harbour positive attitudes towards the MPA may not join due to time and economic constraints.

> "To become a member of the FA you need to register your boat which takes time and costs 200P" (BSSI12-Fisher)

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[11] Chi-square test for independence indicated a significant association between FA members and their perceived levels of participation in MPA related issues [X^2 (1, n=42) = 8.85, p<0.05]

[12] Chi-square test for independence indicated no significant association between being a member of FA and knowledge of MPA objectives [X^2 (1, n=42) = 1.29, NS]

[13] Chi-square test for independence indicated no significant association between being a member of FA and knowledge of MPA rules [X^2 (1, n=42) = 0.7, NS]

> "Non FA members want others to do the work so they can reap all the benefits [of having a managed MPA but not expending time to manage it]" (BSSI3-Fisher's Wife)

The above extracts highlight that some join the FA for other motives not related to fishery resource management and coastal management. However, others specify the contrary and that those who join the FA are concerned about the MPA.

> "(FA) members are concerned with the welfare of the MPA (…) non FA members are not interested" (BSSI3-Fisher's Wife).

> "Me and my husband have an agreement that we like the sanctuary. Because that is for the good of everybody. That is why we joined the association" (P3-BFG4-Fisher's Wives).

> "To become a member or not is often due to the likes and dislikes towards the MPA" (BSSI13-Barangay Official)

> "Others don't want to become members as these are the ones who encroach the MPA" (BSSI2-FA Member)

These quotes suggest that some are also joining the FA as a consequence of their positive attitudes and concerns towards the MPA and not solely for economic incentives as outlined above. There is no suggestion though, that being an FA member has influenced members to be more positive towards the MPA. However, there seemed to be an association between MPA enforcement and being part of the FA.

> "Non FA members are not concerned with the MPA (…) it is mostly FA members that are not scared in reporting encroachers" (BSSI3-Fisher's Wife)

> "Mentions that they (FA) are the ones in charge of sanctioning encroachers" (BSSI5-Fisher's Son)

> "People tend not to be so vigilant in Bonbonon and do not usually monitor the MPA. It is usually the FA and barangay officers that will monitor the MPA" (BSSI7-Ex MPA Leader)

> "Non FA members will fail to report encroachers as they will say-why should I do anything, it's not my position" (BSSI7-Ex MPA Leader).

> "Non FA individuals can attend meetings and talk but have very little influence" (BSSI2-FA Member)

The FA may therefore give its' members a sense of responsibility and a platform in which they can act in favour of the MPA. I would argue however that this FA in Bonbonon has a clear and active MPA leader, and it may be this factor that is having a positive influence on levels of enforcement rather than being part of an FA. Indeed, it

was also mentioned that not all FA members act in favour of the MPA, some are thought to abuse this membership and encroach themselves.

> "Even members will go in there (encroach) because they are members and are abusing" (P3-BFG3)

> "Very few FA members are actually monitoring the MPA (...) you can count them on one hand" (BSSI7-Ex MPA Leader).

> Q: What is the other work of the FA and sanctuary association?
> A: That's all to put buoys and to guard. One thing there is you also have to guard you co-members
> because I think they might get inside so each one of you has to be careful (BIDI3)

It is clear therefore that for some, being part of the FA does not necessarily lead to positive attitudes and actions towards the MPA. Although some may join the FA due to concerns about the MPA, others join for economic incentives. Whilst some may feel a sense of responsibility and may act in accordance, others may abuse their membership and encroach. I would argue therefore that being part of an FA does not necessarily influence support towards the MPA. This is corroborated with the quantitative data as no significant differences were found in attitudes [14] and actions upon seeing an encroacher [15] between FA members and non-members.

4. Cooperation between Institutions

The MPAs at the three sites are all to a certain extent community-based MPAs as each is locally managed. However, it may be best to think of them as co-managed which involves the simultaneous coordination of various stakeholders (Christie and White, 1997). I explain in chapter 3 the various institutions involved in assessing, planning and managing the MPAs at each site. Indeed I have already demonstrated that different individuals and institutions can be involved in managing the MPA. Whether it is the barangay captain, barangay officials, members of the FA or other individuals from higher levels of government it is clear that there is a plurality of actors involved.

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[14] T-test indicated no significant differences in attitudes occurred between FA members (M=0.68, SD=0.13) and Non-FA members (M=0.65, SD=0.18 t(38)=-0.54, NS, two tailed)

[15] Chi-square test for independence indicated no significant association between being a member of FA and whether action was undertaken upon spotting an encroacher [X² (1, n=42) = 0.7, NS]

Despite the difference in types and amount of help the three sites received from various external institutions, each site mentioned how important it was to receive help from higher levels of government such as municipal or regional government.

> "People affected most (by the MPA) are at the grass roots level, what can they do if people at the top are not supportive" (BSSI7-Ex MPA Leader)

> "Q: What will happen to the MPA if the DA and municipality no longer support the MPA and no longer provided any assistance?
> A: I think lots of people would encroach because if there are only people from Candaping B involved, encroachers won't listen." (CIDI4)

> "Q: People often say that more meetings are required so that everyone can voice their opinions, but would people attend? What would be required?
> A: I think they will attend but not all, if the barangay will be the one to conduct the meeting I don't think so, but if the DA or municipality does, there is a possibility that 90% attends the meeting" (CIDI1)

There seems to be a desire for help from higher levels of government in managing the MPA. The first extract for example suggests that nothing can be done if those at the "top" which often means those in municipal or provincial government are not supportive. In particular, the second extract suggests external help may affect levels of encroachment. Many extracts on this issue arise from Suba where despite the proximity of the village to the Municipal town of Anda, it appears they receive less help from the municipal government than Bonbonon or Candaping B.

> P4: In barangays, it [management] is not strong. You only have a word and they have their gun
> P5: The management from the municipal must monitor always if someone gets inside and destroys the stone (SFG1)

> P4: It is good to turn over to the municipality so that the management will be strict, just like in Badiang.
> P3: in barangays it is just useless (SFG2)

> P4: Everyone here in Suba must cooperate or with the barangay officials and in my opinion we want assistance from the municipality because if there was something bad happening, we will have assistance. Anyway we can ask the police or the mayor (SFG7-MPA Involved)

> A: If they [barangay officials] turn it (MPA management) over it will be more strict. Municipal [management] is very strict. The barangay must have a strong management. The barangay doesn't have strong rules (SIDI4-Barangay Tanod)

Many Subanons are therefore keen for collaboration to occur and for the municipality to become involved in MPA management. Some even mention this would result in

stricter management and imply that it could reduce levels of encroachment. This notion that members from higher levels of government may have more authority to enforce MPA rules and regulations and penalise encroachers is one I will explore further in the next chapter. Nevertheless, it seems that cooperation with the municipality may boost support.

Conversely, in Candaping B where there is more cooperation between the village government, municipal government and NGOs, the emphasis was on how this cooperation has "saved" the MPA from failure

> "Despite a bad captain, the MPA will still remain because the DA supports the people that are in favour of the MPA" (CSSI3-Ex Captain)

> "Because of the help from the DA, province, CCEF and Bulakna, the MPA is doing well" (CSSI19-Municipal Government)

This is an interesting notion that highlights some potential limitations of devolving power to communities for community-based NRM. Despite devolution of authority it seems that there is a desire for help from external institutions, and may be why some have expressed a need and an importance to external institutions in ensuring the MPA perseveres. This agrees with Ribot et al (2008) who argue that a devolution of power can lead to conflicts within the community, inequity and lead to certain individuals furthering their own personal interests. Indeed, a global fisheries review of decentralization programs highlights how their outcomes have not been positive and can alter the distribution of power and responsibility amongst different stakeholders (Béné et al., 2009). Nagendra and Ostrom (2012) argue that there is a need to consider "polycentric governance" which recognizes the polycentric nature of governance and does not assume that there is a single government at one level taking charge. Their proposed approach considers the interactions between different actors at different levels and hence present a more nuanced understanding of governing outcomes. In my research context it appears that despite devolution of power, there is still a need for help from other institutions and levels of government and it may be best to consider the polycentric nature of governance.

This devolution of authority in MPA management can therefore influence and have an effect on many other aspects of the community which needs to be acknowledged, as

these can have significant repercussions in influencing community support towards these NRM strategies. However, although help from external institutions may be helpful they need to be able to cooperate with the local government for this help to be received.

> "The captain sometimes attends meetings, but Wilson and the captain have contrasting ideas. He gave the example that the captain will want to let off friends and relatives of hers and her other barangay officials, Wilson however disagrees" (BSSI2-FA Member)

> "The people in charge of the MPA (those in the municipality and provincial government) don't visit the MPA anymore as they don't get on with the current captain" (CSSI1-Fisher)

In these instances, institutions that do not cooperate with each other may be more of a hindrance than a benefit.

Milne and Christie (2005) argue that since coastal resource management responsibilities were devolved from national to a more local level, local management authorities were largely unaware of the tasks associated with managing coastal resources and found technical and financial support from the central government to be insufficient. It is clear that throughout the three villages people believe external help and cooperation of institutions is important for the MPA. It is also suggested that these types of collaboration could lead to lower levels of encroachment as a result of stricter enforcement. It seems therefore that cooperation of institutions has the potential to boost both attitudes and actions towards the adjacent MPA.

5. Continuity of Management

The previous section looked at how the MPA is managed and who is involved in its management. However, it assumes that these institutions will constantly provide the same amount of support and will not change over time. Many of the institutions that were involved in MPA implementation are now no longer involved in its management and no longer provide assistance. Furthermore, elections for local barangay governments and municipal governments are held every three years. Local governments can therefore potentially change every three years. This therefore needs to be acknowledged when considering MPA management and its support.

In Bonbonon for example there have been 3 different captains in the last 15 years; this has also had repercussions on the captain of the FA that has also changed as a response. In Candaping B, the previous captain was involved in the MPA and would liaise with the municipal and regional government; this is not the case with the current captain. And in Suba, there have been two different barangay captains in the last 15 years although the mayor has remained the same. Changes in governance therefore occur regularly at all three sites which may impact on the support the community has towards the adjacent MPA.

A job in the government is a prestigious position in the Philippines and many aspire to working as a barangay official . Whether those given a formal position in MPA management or enforcement are already in the government or aspiring to be, they may play a political game (Andres, 1981) whereby encroachers are let off and are indebted to them and are expected to vote for them in the coming elections. This form of buying votes is common practice in the Philippines (Karnow, 1990).

> P4: Because they were in politics, they were protecting their image as a politician. Because if they were against the majority they might lose the election, that's why I am happy that you are here. There are times that there are some who are doing illegal things in the ocean and I just close my eyes because I don't want conflicts, others know about it and also my close friend saw these things also. (SFG7-MPA Involved)

> Q: Are the people happy about this situation?
> A: Maybe some are happy and some are unhappy? The captain is in favour, there are some councillors who are not in favour. If a politician like the captain if he has a political ambition, he must be good to deal with the people so that in the coming election he will win again. That's why even if someone did something wrong and the encroacher asks a favour from the captain, the captain will give him a chance. And it also happens to me and it never works, because most of them are tolerating their relative family members who are encroaching and during the election, nobody voted for me because I was very strict. (SIDI1-Ex MPA Leader)

These extracts are made by the DA and an ex-barangay official respectively and hence provide some extra weight to this argument that buying votes is common practice. This idea that some individuals involved in MPA management will not enforce MPA rules and regulations for certain individuals is closely related to the unfair management theme which I discuss later in the chapter. This provides further support towards the idea that MPAs can result in power struggles which in turn are thought to lead to corruptibility (Sundström, 2012).

The continuity of governance was not a theme that came up much via the focus group interviews, but arose principally through semi structured and in depth interviews where more information was gathered about the historical aspects of the community and its associated MPA. Through these interviews, many comments were made comparing past and present management of the MPA.

> "Before, the captain was very supportive but not anymore. This could cause the MPA to fail again" (CSSI18-Municipality)

> Q: Why did the sanctuary or the location of the sanctuary change?
> A: The management doesn't understand each other
> Q: Who are they?
> A: The management now is different before. I think its Roberto (SIDI6)

> The MPA was only good in the initial months but this was not sustained. In the longer term, the Tanod were rarely there. (SSSI19-Fisher)

It is clear that the re-arrangement of institutions and who is involved in MPA management can affect individuals' support. Some seemed disenchanted at the current status of the MPA and harboured more positive attitudes in previous years. Furthermore, I described earlier when considering MPA leadership, how more respondents in Suba would report encroachers to a previous barangay official in charge of the MPA. However as he has not been re-elected, there has consequently been less frequent reporting of encroachers.

Whilst some individuals may bring with them a set of norms and values that support cooperation with MPA rules and regulations, preferences based on these norms can be altered by bad experiences (Ostrom, 2000). Although some may initially be supportive of the MPA it may fade over time. Indeed it is thought that durable institutions that last beyond leadership change can improve the sustainability of Integrated Coastal Management (ICM) projects (White et al., 2005a). Changes in MPA management can therefore have severe consequences on the support of individuals.

The change-over period between different governments is also perceived to be an important factor.

"When the new barangay captain came in, the MPA and FA changed. The MPA therefore went from being protected and well managed to a standstill. It took over a year for the barangay officials and the new FA to get organised and return to managing the MPA. Therefore if a new captain comes into play, it might affect the MPA. There is often no coordination" (BSSI16-Barangay Official)

"No continuity between elections. A new mayor may lead to new departments, whilst a new barangay captain may lead to new FA members. If this is the case, it is back to square one" (BSSI17-Guesthouse Owner)

Q: I learned that the MPA stopped and opened up [to fishers] after a while…now is closed (to fishers) again. How did it happen?
A: When the ex-president stopped, things changed and no more president of the sanctuary. That is why people come and go inside the sanctuary, especially people from other barangays. (BIDI1)

It seems that when a new government comes into power, a lack of coordination between the old and new governments leads to the MPA being neglected whilst the institutions are re-arranged and new FA leaders are appointed. This may be solely due to a lack of interest on behalf of the barangay captain who may be more keen to tackle other issues within the community. It may also be that new MPA leaders arise when a new barangay captain is elected, as for leaders to be efficient, it is important for there to be cooperation between them which may not be possible if they are associated with different political parties.

This notion of continuity of governance can therefore influence support towards the MPA. Whilst some compare past and current management practices which can influence their attitudes towards the current situation, others seem disenchanted with the lack of coordination between previous and newly appointed governments which has serious repercussions for the MPA and its' management. Support towards MPAs may not solely be about its outcomes and impacts on the community but the "images" that are formed towards it (Song et al., 2013). If it's image is one of a political game whereby individuals can further their interests in working as a barangay official or as part of the local government, then it may negatively affect support towards MPAs in the long run despite potential social and ecological benefits as the MPA is considered to be a political tool rather than an NRM strategy that could provide ecological and socio-economic benefits in the long run.

6. Sanctions

I have shown how those in charge of MPA management can influence support of the community towards the MPA. This section focuses specifically on the sanctions in place to penalise those caught encroaching the MPA.

Graduated sanctions are thought to facilitate collectively managed resources (Ostrom, 2000) and indeed all sites supposedly had a set of graduated sanctions for MPA encroachers (chapter 3). Comments were indeed made about how the presence of fines can reduce levels of encroachment.

> "Fishermen say that they will not go inside the sanctuary because there is a penalty that is why they are affected because they cannot go fishing near the area" (P1-BFG5-Fisher's Wives)

> "I am afraid if my husband will go inside the sanctuary accidentally, so I always tell him not to go inside because we don't have enough money to pay the penalty" (P6-CFG6-Fisher's Wives)

> M: Why they are afraid?
> P5P: Because of the penalty ma'am (SFG5-Fisher's Wives)

It is clear that fines may deter encroachment. It seems that people do not encroach for the most part because of the fines and not for the love of the MPA. In fact some that do not like the MPA do not encroach due to the fines.

> "P6: Just like me, I don't like the sanctuary but I am positive because I follow the rules
> M: Why don't you like the sanctuary?
> P6: Because I can't go there (Laughing). Because of the penalty" (BFG3)

> "I like it (to encroach) but there are people who monitor and I don't want to be imprisoned and pay the penalty" (P6-BFG5-Fisher's Wives)

> "Maybe the people want to go inside because that is what they want, but that I prohibited. You can't get inside or else you will pay the penalty" (P2-CFG6-Fisher's Wives)

The presence of sanctions also seems to motivate individuals to warn potential encroachers as they do not want them to have to pay the expensive fine.

> M: What else? What if one of your friends will get inside? What will you do?
> P5: (Give him a) Warning. If they get inside he must pay the penalty (BFG8-MPA Involved)

> "P2: The others who are positive now shout at the encroachers "hey that's a sanctuary, you are not allowed to go there"

P1: They do this because they already know it is an expensive penalty" (CFG5)

"There is pity for the poor. I will warn someone so they can't pay the penalty so there is no trouble" (P6-CFG7-Fisher's Wives)

Penalizing encroachers and the presence of sanctions can therefore boost actions undertaken which benefit the MPA by increasing levels of compliance and warnings given to potential encroachers.

Nevertheless, despite the presence of sanctions, it is clear that this will not prevent encroachment in its entirety.

"(Talking about sanctions)
M: That is why they don't get inside?
P1: Yes, but there are still others who get inside like Juan" (CFG5)

For every group involved in NRM there are some who will violate the rules. It is important to remember therefore that policy, rules and regulations do not necessarily dictate individuals' actions (Ostrom, 1990). Not surprisingly, very few were willing to describe those that do encroach the MPA. However some explanations were provided as to why some may encroach despite the sanctions that are imposed.

It is thought for example that some can encroach as they can afford the penalty:

"M: Why do they encroach?
P3: Maybe he has money for the penalty" (BFG7)

P1: Others who has money will also get inside much more than the people who don't have money (SFG5-Fisher's Wives)

It could be that those wealthier individuals are less scared of the fines and are more likely to encroach. One would assume however, that if graduated sanctions were in place, these individuals could only be caught several times before the cost increases too much. Indeed some seem to see MPA encroachment through a cost and benefit lens. If the individual believes the worth of the catch from encroachment to be greater than the potential cost and the likelihood of being caught, they may be more tempted to encroach.

"They don't think that the penalty is too expensive compared to the fish they sell" (P1-BFG5-Fisher's Wives)

> If you caught someone who gets inside you have a share or a little amount from the fines but if you get inside you can earn big money, much bigger than from your share of the penalty. Maybe that is one of their reasons. If you get 5kg, it is much money. (*BIDI5)*

> "Maybe they like to pay It's OK if you can catch 50kg so you can pay the penalty" (P6-CFG7-Fisher's Wives)

Furthering this notion of the cost/benefit model of compliance, some believe that the sanctions are too mild and that stricter penalties would further decrease the amount of encroachment.

> "I want them to be imprisoned so that they will not do it again" (P3-BFG4-Fisher's Wives)

> "For me, increase the penalty so that no one will encroach" (P1-CFG2)

> P5: Yes, the penalty is only 5000P; they can afford this that is why they get inside. The penalty must be higher so that nobody will be afraid of the penalty. (SFG1)

It is also possible that these individuals believed me to be an advocate of MPAs and wanted to provide the "correct" answer to the question, and proving that they take the MPA seriously. Indeed an increase in fines seems like a rational approach involving a simple technical fix to a rather complex problem. Nevertheless, it seems that graduated sanctions do therefore seem to prevent encroachment, the fact that the fines increase tends to scare potential encroachers. The rising fines were mentioned on a number of occasions especially in Candaping B where these are most likely to be enforced due to help from municipal or regional government.

> "P1: Now if you will encroach you will be paying 5000, it's getting bigger
> P2: First offense was 2500, now the second time is 5000" (CFG5)

> "M: Ah, so they are afraid of the fines?
> P1: Yes because it is getting bigger" (CFG5)

> "The penalty is already 5000 we can't even buy rice and now the penalty is increasing" (CFG7-Fisher's Wives)

It seems that the thought of graduated sanctions and that fines increase for re-offenses is one that can scare encroachers and may prevent re-offenses.

Others argue that those encroaching are those that have not yet been caught or not yet made to pay the penalty.

Q: Are they not scared of the fines?
A: They are not afraid because they haven't been caught (BIDI2)

"They want to try and see if the penalty is true, that is why they get inside" (P1-CFG7-Fisher's Wives)

M; Why they don't follow the rules?
P5: They (encroachers) will always get inside because they haven't paid the penalty (SFG1)

This argument will be explored further later in the chapter, but it emphasizes the importance in catching and fining regular offenders. The findings above agree with Ostrom's (2000) argument that graduated sanctions can promote collective action and cooperation. She describes how repeated rule breaking can be a real threat to self-organised management regimes and that the capability to escalate sanctions enables the regime to prevent this from occurring. The evidence in this context agrees with this notion and even a small fine may prevent these types of encroachers if they are aware that the chances of getting caught are high. Although as I described earlier, this may not prevent those wealthy individuals that can afford to pay fines or those expecting potential benefits of encroachment to outweigh the costs.

Overall there seems to be overwhelming evidence that the presence of graduated sanctions can decrease levels of encroachment. Those that continue to encroach may be those that are wealthy enough to pay the fine or those that have not yet been caught. These extracts suggest however that it can influence the actions of individuals but not necessarily their attitudes. If this is the case, one needs to ensure that the MPA is well enforced as the absence of a guard will likely lead to high levels of encroachment if the community harbours negative attitudes towards the MPA. I argue this is an issue for the sites studied and most likely many CB-MPAs in the Philippines where low levels of monitoring by guards or those in charge of MPA enforcement may occur due to insufficient funding allocated to guards.

7. Guards

Whilst the importance of sanctions for community support has been acknowledged, it is clear that without any guards or enforcers, the potential positive effects that graduated sanctions have for support towards an adjacent MPA may be negligible.

In almost any group of individuals subjected to regulations, there is a core subgroup of chronic violators who are motivated by high returns from their actions (Ali and Abdullah, 2010). Enforcement of MPA rules and regulations is therefore critical for the compliance of resource users and the sustainability of MPAs (Christie et al., 2005; Tissot et al., 2009). However, few have highlighted the difficulties involved in enforcing MPAs and the level of enforcement that is required (Jones, 2006).

Secondary sources and key informant interviews at all three sites suggested that guards were on a rota both day and night to ensure that the MPAs are constantly monitored. It was also mentioned that there were guard stations/huts at each site for them to stay and shelter from rain. However there was no longer a hut in Bonbonon, and those in Suba and Candaping B were not used and in disrepair. In practice, constant monitoring was not feasible and the MPA was frequently not monitored by specific MPA guards or enforcers at each site (pers. obs).

Most comments regarding MPA guards and monitoring emphasized the dissatisfaction with the current situation and further illustrate how enforcement of the MPA is not in accordance with official documents and discussions with municipal government.

> There should be a guard 24 hours so that fish will not be disturbed (P3-BFG6)
>
> M: What else? Why do they want to encroach?
> P6: Because there is no permanent guard in the evening (CFG1)
>
> P3: Because there are times especially during the evening that someone gets inside
> P5: No guard, that is why it is like that
> M: Why?
> P2: There is a guard but sometimes they can't monitor
> P3: The people who monitor the MPA are not always around (SFG3)

There is dissatisfaction with the current levels of enforcement and a desire for better, more regular guard presence. Literature suggests that if free-riders are benefitting from the MPA by encroaching and not getting caught, resentment towards the MPA will be fostered (Jones, 2006). Etiegni et al (2010) argue that in the case of illegal fishing in Lake Victoria, Kenya, immediate and adequate actions against a violator can dramatically reduce the violation rates of the entire group. It is clear that a constant guard could boost not only attitudes towards the MPA but also could result in

155

less encroachment. The main problem identified by those interviewed is that the guards are not paid a decent salary (if any) for the job that they are carrying out.

> There should be a salary for the guard, to feed the family (P2-CFG1)

> You know, in Talingting, there are guards and they are paid the right amount unlike here (P1-CFG4)

> P5: There should be enough finance for the guards during night time even for the coffee and bread (SFG1)

A higher wage may encourage guards to spend more time enforcing and less time on other jobs that can provide them with a sufficient income. However, barangays may not have sufficient funds to provide an adequate salary for MPA guards, requiring higher central government expenditure, a cost that the government may not be able to bear (Ali and Abdullah, 2010). It is interesting to note that few comments were made on this issue in Bonbonon. It seems that the active MPA leader within the village is happy to enforce the MPA without a significant salary and hence there is less discussion on the topic.

Enforcement is a vital factor for the MPA and is of great concern to the community which could boost both attitudes and actions towards the MPA. However, it may not be possible or practical to provide guards with sufficient salaries for them to want to give up their other jobs or activities. A counter intuitive suggestion may be to remove guards that are officially in charge so that it is the role of the community to work together and cooperate to enforce the MPA rules. It is thought that without strong external monitoring and sanctioning, individuals within the community may develop a set of norms and values that can support their cooperation, in this case to ensure that the MPA is not encroached (Ostrom, 2000). However, a case like this where there is a mild degree of external monitoring, where a guard is rarely present, it may discourage the formation of these norms whilst also making it attractive for some to deceive and defect and to take the low risk of being caught (Ostrom, 2000). The following extract seems to suggest this may be the case:

> M: So all of you in the barangay don't help in monitoring?
> P5: No, because there are barangay tanod and other barangay officials who monitor the MPA (SFG1)

Although very few comments were made on this issue, it is a difficult issue to explore via interviews or focus groups furthermore, I explore later (chapter 8) how some are "scared" to enforce rules as the encroachers believe it is up to the officials (and not the layman) to enforce. I therefore argue that this issue is one worth considering. Once it becomes someone's role to enforce the MPA rules, others believe it is not "up to them" to enforce the rules.

A constant presence of guards may boost attitudes and actions towards the MPA, but it is an unlikely scenario for many sites, given the lack of funds available to local and regional governments. I argue therefore that demonstrating that MPA enforcement is up to the whole community and not solely one or two guards may boost support towards the MPA.

8. Unfair/Corrupt Enforcement

Simply having guards permanently posted adjacent to MPA's may be a naïve and ambitious target to ask of the Filipino government, given the costs involved. However, even if this were the case for the three sites studied, it may not necessarily lead to a well enforced MPA and may not necessarily boost support towards the MPA.

For a start, guards, like everyone else, can make mistakes and succumb to pressures, especially when one considers there are rarely clearly defined boundaries (chapter 5) and often they lack the necessary equipment such as binoculars and fast boats to make judgments based on accurate information.

> The management is not good because even if we fish by the MPA, not inside they will scold us (P5-CFG1)

> The people who are in charge of the sanctuary are very strict if they see someone who gets inside. But when they are monitoring they must make sure that the fisherman is really inside the sanctuary (P3-CFG7-Fisher's Wives)

> The DA will always side with the one who reported, not the one that is thought to have encroached (CSSI3-Ex Captain)

A sign that the MPA is working effectively and providing benefits to the adjacent community often involves fishermen fishing close to the MPA boundary, or "fishing

the line" (Kellner et al., 2007). There is a suggestion in this case however that as there is no clearly defined boundaries, one is at risk of being fined or cautioned if they carry out this form of activity. Not being able to benefit from the MPA or being scared to be in the vicinity of the MPA may lead to negative attitudes towards the MPA or its management. It is not surprising that there is a call for those in charge to make sure the accused was actually inside the MPA. However, often an encroacher may have moved by the time the guard arrives, in this case it is one man's word (the reporter) against the other (encroacher) which can lead to conflict. Furthermore, it appears the guard will often favour the reporter rather than the encroacher. It is interesting to note that most extracts pertaining to this issue arose in Candaping B where enforcement is arguably the strongest and these situations presumably occur more regularly. Indeed discussions with fishermen in the village made clear that some individuals contested their fines as they argued they were not actually inside the MPA.

The majority of comments however were made on the many encroachers that are not caught or fined. This is an argument that was mentioned across all three sites.

> Sometimes it is unfair because some can get inside, that's why we are also tempted to go inside (P5-BFG1)

> The management is not fair because there are times that they let the encroachers pay the penalty and sometimes they don't (P5-CFG3)

> P1: If we will tell the barangay council that someone gets inside the sanctuary they will just ignore us [he is a little bit angry about this]. They don't listen to us; they make their own decisions (SFG1)

> P4: One time, someone got inside and nobody cared, the second time there is someone who encroaches then they pay the penalty. That's not fair; it should be everyone that gets inside who will be punished. If you are famous and you are known that you have lots of money, you will not be punished, but if you are a poor fisherman you will be punished. (SFG2)

These extracts provide a number of insights as to how unfair management can influence support. Overall, these respondents are expressing discontent as to how the MPA is enforced which suggests that this unfairness can lead to negative attitudes towards the MPA. They suggest that some encroachers are not caught; some enforcersdo not listen when an encroacher is reported, different penalties can be given out of various severities and similar types of encroacher frequently "get away" without being caught. These factors also may influence compliance as the first

extracts explains it can "tempt" them to encroach. These extracts agree with Ostrom's (2000) argument that individuals are less likely to cooperate with the rules if they believe they may be a "sucker" and other individuals are "free-riding", reaping the benefits by encroaching and not being caught. This topic is also explored in chapter 3.

In all three villages, those in charge of enforcing the MPA were permanent residents and had friends and family within the barangay. This may explain why many extracts suggest that it is the friends of the enforcers that "get away".

> They favour those people who are their friends and then how about us? Of course we have to pay the penalty and that's unfair to us (P1-BFG5-Fisher's Wives)

> Some (encroachers) are trusting their friends in politics. If they will want help in paying the penalty they will be given money and they will pay 500P instead of 5000P (P2-CFG1)

> P1: Sometimes when the friend of the tanod is encroaching, he will just let them because it's a friend (SFG2)

> When it comes to their friends or relatives, they just ignore it when the friend gets inside, which is not fair to us. But if we were the ones to get inside, they will catch us and we will pay the penalty, it should be fair. (SIDI2)

Those that do enforce the rules fairly and report or fine their family or friends, may eventually regret it.

> Friends of Juan (Bonbonon FA president and MPA leader) are also encroaching the MPA. But he still punishes them. He has hinted that he wants to leave the FA position as he is scared he will lose all his friends and turn them against him (BSSI14-Fisher).

Others have argued that it is encroachers from other villages that escape from having to pay the fines

> Sometimes it's unfair because others will not pay the penalty, especially people from other land sites, and we will be fined (P5-CFG1)

> People from here who encroach will be caught and the people in the other place will not be which is not fair (P3-CFG6-Fisher's Wives)

These encroachers are from other sites and are therefore more difficult to catch as they do not return to the village where the enforcer may question them. Furthermore, enforcers often do not know who these encroachers are and may be scared that they

are armed with machetes or guns and will therefore turn a blind eye. This notion of being "scared" of encroachers is a theme that is explored in chapter 8.

There seems therefore to be a negative attitude towards this unfair management of the MPA as friends or family of the enforcers or foreign encroachers from other villages tend not to have to pay the full fines. It wasn't only friends of enforcers that were thought of as the lucky ones that can escape the sanctions but also the empowered or those close to the government or MPA managers that would benefit from encroachment without enforcement.

> It is the small fishermen that get caught (BSSI12-Fisher)
>
> People who are friends with the captain can catch fish inside the MPA (BSSI3-Fisher's Wife)
>
> Q: Is the captain and barangay council in favour with the MPA?
> A: Yes, they like it because they are not fishermen. They like to have their sanctuary is for themselves only and not for the people
> Q: Why?
> A: Because if they want to eat big fish they will let someone get inside and eat the caught fish. Nobody will scold them because they have their position (SIDI2)

It is clear therefore that respondents perceived unfair enforcement was occurring across the three sites. Whether enforcers are "letting off" friends, family or foreign fishermen, or whether they are playing a political game and are trying to gain extra votes for the coming elections (as explained in the continuity of governance section), this unfair enforcement was influencing the attitudes of the community towards the MPA and its management. There is indeed, a desire for fairer and stricter enforcement.

> We have to fight for what is right for us, to be fair (…) we have to scold all encroachers (P3-CFG2)

Unfair enforcement may not only lead to negative attitudes towards the MPA but may prevent some individuals from acting in a way that benefits the MPA. It may be some individuals are 'conditional co-operators' who will only act in favour of the MPA if they perceive others as doing so (Ostrom, 2000). Indeed, by analysing the questionnaire data, those that acted upon seeing an encroacher were significantly more trusting of the local enforcers than those that did not act upon seeing an

encroacher [16] and trust of *bantay dagat* or coastal police was indeed found to be an important predictor of support (chapter 4).

These findings echo the thoughts of Pita et al (2010) who argue that if fishers perceive the managing body to be untrustworthy or dominated by interests which are unfavourable to fishers, it will impact negatively on their perceptions and responses to new fisheries interventions and their cooperation is likely to be reduced.

Unfair enforcement of MPA rules and regulations seem to play a big role in influencing both attitudes and actions towards the adjacent MPA. It seems that it may not only negatively impact the MPA but may also erode social solidarity by causing conflict and weakening social bonds. Again, an issue that may be exacerbated due to a devolution of authority in managing the MPA. Solidarity is a theme I will discuss further in chapter 9.

Whilst it is clear that unfair enforcement has a negative effect on the MPA it is not so clear how to prevent it from occurring. Some argue that making those involved in enforcement accountable for their actions may prevent unfair enforcement. Ostrom (1990) argues that most long surviving resource regimes have enforcers who are accountable to the rest of the community. Indeed, the most common problems in community based natural resource management in the forestry sector are thought to be that "the committee does not represent nor is accountable to the local populations" (Larson and Ribot, 2004). Agrawal and Gibson (1999) also agree that the accountability of stakeholder representatives and of management structures to their constituents is essential for effective local level natural resource management.

I argue therefore that one way to improve levels of unfair enforcement is to implement a framework which enables the community to complain or question whether the enforcer is being fair. However, ensuring fair enforcement is an issue which will prove very difficult to resolve. Given the strong kinship ties and the importance of family, the vote buying system and the importance attributed to

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[16] T-test indicated those were reported an encroacher were significantly more trusting of local enforcers (M=8.84, SD=2.92) than those that did not act upon seeing an encroacher [16] (M=6.07 , SD=3.68 ; t=-5, p<0.01, two tailed)

reciprocity (Andres, 1981), ensuring a fairer enforcement system would prove both difficult and involve a deeper understanding of Filipino culture and values. These are indeed, I argue, the main reason why those in charge of enforcing the MPA are not held accountable in the first place for any mistakes or unfair enforcement. This is an issue which is explored further in chapter 8.

9. Angry Enforcement

The previous three themes have emphasized that graduated sanctions, presence of full time MPA guards and fair enforcement could lead to higher levels of compliance and reporting. Furthermore, most respondents expressed a desire for stricter and fairer enforcement. One would expect therefore that by imposing stricter and fairer enforcement of MPA rules it would boost these different aspects of support towards the MPA. Unfortunately however, it is not that simple, not only is it important to be a fair and strict enforcer but one may also have to be careful about how to go about enforcing MPA rules and regulations. The following comments illustrate the importance of the manner of enforcement to its palatability:

> There is no need to shout. They should just say it in a nice way so that they will be respected by the encroachers (P3-CDG3)

> Their role is to protect the sanctuary and let people understand the purpose, not to shout at encroachers, because encroachers get mad if someone shouts at them. It sounds like an insult to everyone and if someone encroaches, all they should do or their role, is to warn encroachers. If they don't mind [don't listen], that is the time that they will call the police (CIDI2-Fisher's Wife)

These extracts from Candaping B clearly demonstrate that shouting is frowned upon. However, similar arguments were also made at both Bonbonon and Suba to lesser degrees (Table 3.5). It seems that if the enforcers were to be gentler in their approach, people would be more willing to respect the enforcers and the MPA rules and be more likely to support the MPA. This becomes clearer in chapter 8 when I describe the importance attributed to smooth interpersonal relations between individuals in the village and the strong Filipino value of *hiya* which relates strongly to shame.

Nearly all comments about "angry" enforcement were made in Candaping B, probably in part because most strict enforcement occurs here due to help from the

provincial government and an NGO (CCEF). It seems that some are not happy with the way encroachers are treated and feel there is no need to act this way. This is especially true when combined with the issue of unclear MPA boundaries whereby some individuals may be wrongfully accused of encroaching. It seems that attitudes towards the MPA are affected because of this but also there is a suggestion that MPA related actions may also be affected.

> Q: If they are friendly, I'm sure the encroacher will be tempted again?
> A: I think no, because most encroachers encroach just to let enforcers get mad at them because they are not friendly and even if they will just pass by, they shout at them, put flashlights on their faces and make them angry. Some get their revenge by cutting the buoys (CIDI1)

> They don't report because these people are their friends, and where will they get the money for the fine? And some will say mind your own business. If you want, you can report to the crazy in charge [implying one would not want to do that]…that is why most remain silent (CIDI2-Fisher's Wife).

Encroachers therefore may solely be breaking the MPA rules to seek revenge and to further annoy the enforcers and may even cut the buoys to make their lives more difficult. The second extract suggests that others simply will not report friends or family (to the "crazy" enforcers) as they do not want them to be treated badly by the enforcers. It seems in this case that non-compliance or a lack of action upon seeing an encroacher may be as a result of a political act. Despite positive attitudes towards the MPA, they may not act in favour of it.

This desire for enforcers to take a "softer" approach came as rather a surprise given the earlier comments on strong and fair MPA management. However, it becomes clearer when exploring certain Filipino values and culture (chapter 8) that dealing with encroachers in a way that is culturally sensitive and strong management are not mutually exclusive. Indeed taking the encroachers' feelings and emotions into account when enforcing MPA rules and regulations may not only boost attitudes towards enforcers and the way the MPA s managed in general but may also decrease levels of encroachment and increase levels of reporting if more respect is harboured towards enforcers.

10. *Unfair distribution of money obtained from fines*

Sanctions, guards and fair enforcement may all lead to positive attitudes towards the MPA and decreased levels of encroachment. However what happens to the money obtained from fines from encroachers and its' repercussions for support still remain to be explored.

As mentioned in chapter 3, little money is generated by the MPA at each site. This could be problematic as it is thought to be important to develop revenue generating mechanisms to fund conservation or natural resource management efforts over the long term (Milne and Christie, 2005). The only source of income arising from the MPA which is apparent at each of the three sites is the money collected from fines obtained from encroachers. Although these benefits may be small, the equitable sharing of these economic benefits is deemed to be important for the success of coastal management operations (Christie et al., 2005; Pollnac and Pomeroy, 2005; Pomeroy et al., 2005a).

Christie (2004) argues that many coastal managers at the village level lack the expertise or the resources to effectively establish revenue generating strategies and a subsequent plan for managing the associated funds,. Indeed I found evidence suggesting that the money obtained from fines is not managed effectively and most do not know what happens to the money generated from the MPA.

> The money is used for food to have a meeting and show to the people how much money is generated from the MPA (P1-BFG7)
>
> The money was said to be available to borrow for FA members if in need (BSSI4-Fisher)
>
> The money goes to the general barangay funds (CSSI16-Barangay Official)
>
> No income generated from the MPA (CSSI19-Municipality)
>
> There are so many encroachers who get caught and are made to pay the fines but where is the money (P1-BFG7)

There seems to be some confusion within each barangay as to whether money is generated from the MPA and where it may be distributed. Many are unclear as to what happens to any money generated from the MPA. Most of these extracts however,

arise from semi-structure interviews and hence were prompted about what happened to money obtained from fines. This further provides evidence that some are not aware of fine money being collected and distributed. The following extracts go further and suggest that being aware of what happens to any money generated from the MPA may boost attitudes towards the adjacent MPA.

> The income from the penalty must be used for developing the sanctuary and not be kept in their pockets (P1-BFG7)

> If people knew where the money was going, it is possible that people are more positive (CSSI3-Ex Captain)

> Even a drop of Tuba [coconut wine] as compensation would make a big difference (CSSI4-Known Encroacher)

These extracts highlight how by being clear as to what happens to the money generated by the MPA and by making sure it is put to good use for the community can positively influence attitudes towards the MPA. One individual goes as far to say that if the money doesn't go back into the community, it would be best to remove the fines altogether:

> If money from fines is not recycled back into the community, it would be best to remove fines as these are time consuming and dangerous (BSSI3-Fisher's Wife)

Another related theme that arose through the interviews and focus groups involves the issue of whether those that report an encroacher should get a cut from the fine imposed. Most fishermen and other village members argued that all individuals that bothered to report should be getting a cut from the fines, it is even suggested that a cut from reporting would boost levels of monitoring and reporting of encroachers:

> P1: Good if we monitor [the MPA] and they will give the money or percentage but they don't even give us one peso
> P2: We will hope that we were given a percentage from the penalty if we report
> P6: If that happened I would stay on the seashore and wait for encroachers (CFG7-Fisher's Wives)

> If there is a percentage [cut], I think there are lots of people who will monitor more, maybe they will also help monitor during the night (CIDI1)

> M: Does your community support the MPA?
> [Everybody is talking]
> P1: They don't give support if someone monitors. They don't even give snacks (SFG1)

Whilst the first two extracts suggest getting a cut from fines may boost reporting, the latter extract from Suba explains how many aren't bothering to monitor the MPA as there are no incentives. These suggest therefore that getting cuts from reporting may boost support and especially pro MPA action. Some individuals in Candaping B and in Bonbonon did suggest that they could sometimes receive cuts from the fines after reporting an encroachers however the majority of individuals were not aware of such a rule. The following extract suggests that even receiving a proportion of the fine may not be enough for certain individuals to report.

> Q: If people knew they would get a percentage from the fine if they reported, how would this affect the community?
> A: I think some of the people know about that because I hear from Maria that 25% of the fines goes to the person who can report. That is why Alvin told me that I have to be alert if I see encroachers because I will receive a percentage of the fine. But I don't want to do that, I will let the in charge do this because I don't want that there are people who hurt me and get upset if I do that (CIDI3).

This participant did not want to upset others and reap the benefits whilst inflicting costs on others, they would prefer leaving those "officially" in charge to carry out the reporting. Whilst receiving cuts from fines may boost support, may increasemonitoring and reports of encroachers, it could also lead to conflict within the community and I would also argue, is open to corruption. Furthermore, the enforcement of MPA rules and collection of fines would need to occur fairly and regularly for this theme to be of any importance for community support.

11. Conclusion

Despite the progression and evolution of coastal management in the Philippines (Christie and White, 1997), this chapter highlights that the ways that MPA's are managed are not necessarily supported by all within the adjacent community. This is concerning for the future of these MPAs in the Philippines as management plans aimed at sustainable development are often thought to fail unless the human factor is included (Vella et al., 2009).

Ostrom (2000) argues that there is a need to understand how institutional context can affect the types of individuals involved in a collective action situation. In a similar way, this chapter explores how MPA management can influence the cooperation of

the affected community with the MPA rules. It explores how MPA management can influence compliance with the rules and whether they report encroachers (Fig.6.1). Certain factors such as the presence of MPA guards (day and night) and the implementation of graduated sanctions were, not surprisingly, found to influence MPA related actions. These act as deterrents to encroachers and may increase levels of reporting. However, it is an unlikely scenario as permanent guards are an extravagant expenditure for local governments, and graduated sanctions may not always be enforced and apply to all. Furthermore, it can result in individuals carrying out actions which benefit the MPA whilst still harbouring a negative attitude towards the MPA. It is important to be realistic and keep in mind therefore which factors are achievable in practice.
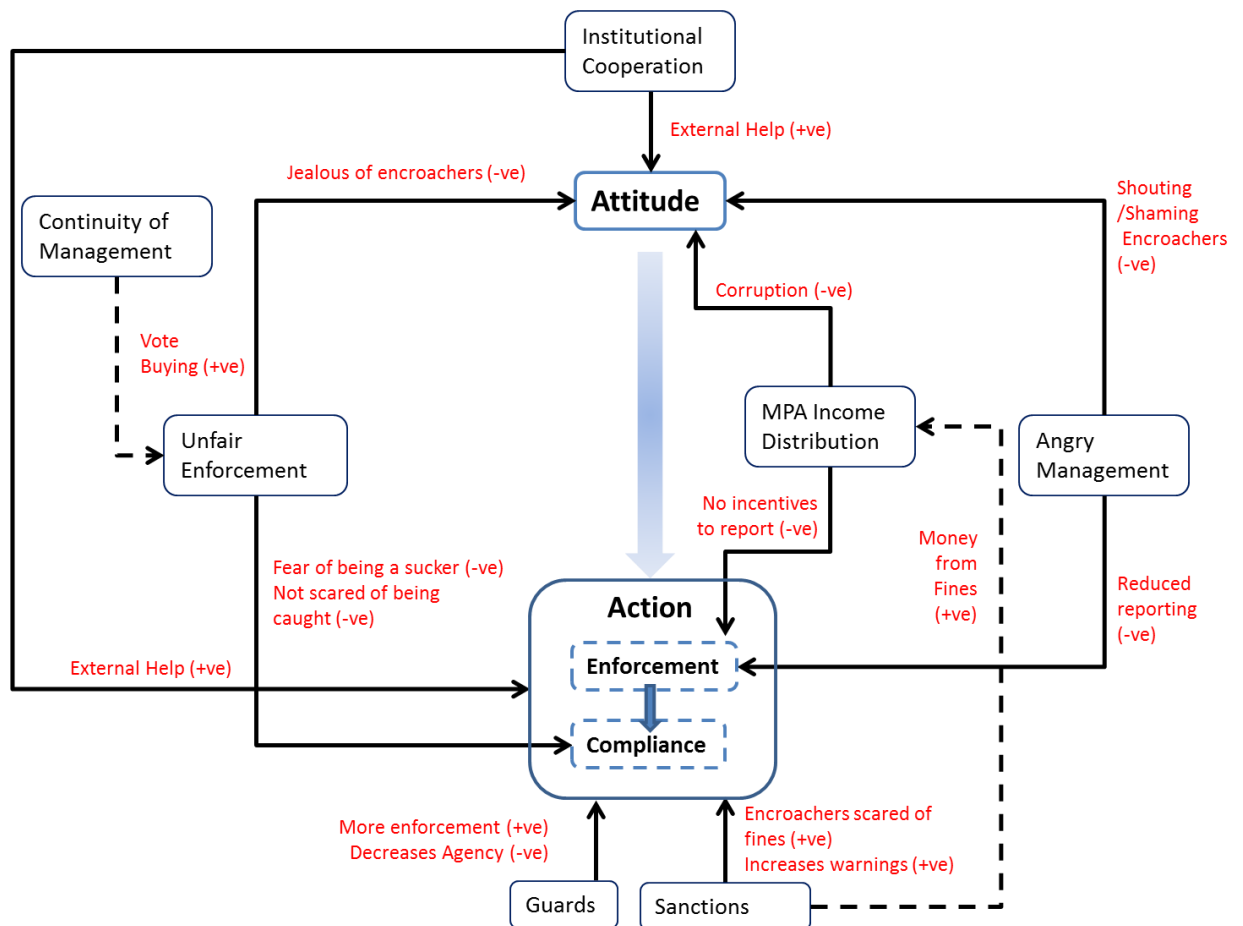
Fig.6.1. Summary of MPA management factors and how they influence the different aspects of support towards the adjacent MPA.

One important consideration is that many of the factors explored in this chapter may change frequently; new leaders get elected, salaries for guards are increased or

decreased, help from external institutions is frequently withdrawn and policies may change. These changes are for the most part inevitable and I suggest that MPA management and consequently support towards it will also change and fluctuate over time.   An understanding of attitudes towards protected areas are thought to be important if their management is succeed in the *long term* (Allendorf, 2007). I would argue that boosting attitudes towards the MPAs in this context is also of huge importance in buffering these fluctuations of MPA management. If one has a negative attitude towards the MPA but is only acting in favour because he is scared of the current leader for example, he may be more likely to encroach if a weaker leader gets elected. It is important therefore to have explored attitudes as well as actions when considering community support towards MPAs in the long term.

It is also important not to consider the management factors studied, in isolation, one has to consider them together, as an inter-connected network which are both place and time specific. The presence of graduated sanctions for example may have a positive effect on support towards the MPA, however it's effect will be limited if there are no guards to enforce these rules. Similarly, a strict and fair MPA leader may boost support but again, without recognition and support from the local or municipal government, his influence on community support towards the MPA may be hindered. Likewise, one needs to appreciate the different needs and interests of individuals within the community. As I have shown, not everyone within the community will respond in the same way. This is a consideration that is often overlooked in the MPA literature. The potential reasons as to why individuals react differently will be explored further in chapters 7 and 8.

This chapter alludes to the limitations of a "checklist" approach to ensuring efficient MPA management. Certain issues may look good on paper such as graduated sanctions, a fisherman's association, and cuts from reporting etc.. However they may not work adequately in practice if there are no guards, few members or rare meetings, little enforcement and unfair wealth distribution respectively. These factors can contribute to wider governance issues of equity, accountability and corruption amongst others. They may therefore not boost support but in fact hinder it. Furthermore, with elections every three years, changes at the village level occur regularly. There is a need to consider more context specific management factors and

to allow for flexibility given the changes that often occur within these villages. This has been an advantage of the qualitative aspect of this research which sought to not only identify which factors influence community support but to take into account how these factors influenced attitudes and actions of individuals towards the MPA and through which mechanisms.

Finally, although it is unlikely that all within the village will be happy with the management of the MPA, it may be wise to experiment with management systems instead of having a "rigid" structure or a specific set of rules to abide by. William Howard Taft, the first Governor-General of the Philippines, also understood the benefits of learning by doing. Chagrined that his political experiment to organize a civilian government in the Philippines had failed, reflected on what he may have done differently (Karnow, 1990). Similarly, in this context, I argue there should not be a set of rigid co-management structures in place but these management systems should evolve, change and be specific to different MPAs and their adjacent communities. It may be, for example, that although the presence of guards may boost support by preventing compliance in some settings, in others it may prevent individuals from reporting as they feel it is "not their job" to do so.

Another important issue that transpires throughout the chapter is that community support towards MPAs is not necessarily about MPA outcomes, it's about a myriad of other factors. An MPA is not a politically neutral entity but can act as a platform for some to further their own interests (such as aspiring or current government officials, MPA leaders and FA leaders) and have very little do to with concerns about the MPA, it's future and whether it is achieving the expectations placed on it. In turn, community support towards MPAs is also about whether its management is perceived as fair and about perceived levels of corruption.

This chapter demonstrates how MPA management can play a vital role in influencing support towards the MPA. Regardless of the MPA objectives and whether they are being achieved, negative perceptions towards aspects of MPA management can have a negative influence on individuals' support. Although there is no one clear solution to managing an MPA in a way that is supported by all individuals affected, by understanding how certain aspects of MPA management can influence support it may

be possible to understand why certain MPAs are not supported and how to boost support towards it.

Chapter 7: The influence of Socio-Economic Characteristics on Community Support

<center>"One man's loss is another's gain"</center>

In many instances, communities are not thought to be unified wholes (Agrawal and Gibson, 1999) and the support of a community towards the adjacent MPA is unlikely to be unanimous. As seen in chapter 5 and 6, certain aspects of an MPA and its management can both increase and decrease levels of pro MPA action or attitudes depending on the individual. These chapters illustrated how community level factors can have different impacts on and are perceived differently between individuals within a community. Individuals however vary in their support towards the MPA and not all individuals respond in the same way to MPAs and their management. This is highlighted by the quantitative analyses carried out in chapter 4 where although support differed between the villages, individual level factors were also found to be important predictors of support towards MPAs. This chapter and chapter 8 seek to identify the factors that may explain this variation and aims to understand this in support between individuals.

As I describe in chapter 1, many fisheries management initiatives are thought to fail because they do not adequately understand, address and incorporate the socio-economic needs and concerns of fishers (Cinner et al., 2010). It is even thought that the sustainability and success of fisheries management strategies such as MPAs are based on participant reactions to the project which are in turn based on user perceptions of its impacts (Pomeroy et al., 1997). In particular Nunan (2006) argues there is a need to consider the diversity of socio-economic differences within communities. Indeed, if we assume that individuals are rational actors that act in their own self-interest, socio-economic factors will be essential to understanding how individuals behave. Socio-economic factors may explain how individuals weigh up the costs and benefits of behaving in a particular way. I suggest therefore that differences in socio-economic characteristics of individuals may explain why some individuals will be differently affected by the adjacent MPA and may perceive there to be different MPA impacts. This in turn may determine their attitudes and actions towards an adjacent MPA. This chapter hence seeks to determine how and why

differences between socio-economic characteristics of individuals can influence their support towards the MPA.

1. Wealth

When considering differences between individuals and how they may respond to NRM strategies, differences in wealth is one important factor that may first spring to mind. Indeed, it is thought that "individuals who have satisfied their personal needs are more likely to act ecologically because they have more resources (time, money, energy) to care about bigger, less personal, social and pro-environmental issues"(Kollmuss and Agyeman, 2002). Maslow's theory of hierarchy of needs (Maslow et al., 1970) also suggests that higher tier needs such as self-actualization could not be achieved unless basic needs such as hunger have been addressed. Cinner and Pollnac (2004) argue that environmental conservation can be included in Maslow's hierarchy (Fig.7.1) and would "likely be in the third tier (because it can fulfil a sense of belonging or place in the natural world) or on top of the hierarchy (because it can fulfil aesthetic needs, a sense of purpose, and/or self-actualization)".
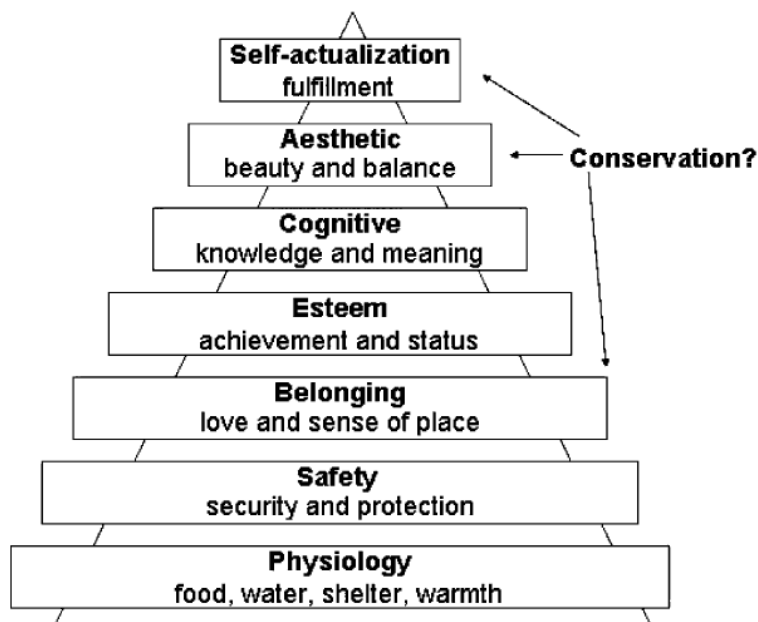
Fig. 7.1. Maslow's hierarchy of needs adapted from Maslow, 1970 (Cinner and Pollnac, 2004)

In the context of Filipino MPAs, we can see therefore that a person who cannot meet the basic demands of physiology such as food and basic shelter cannot be expected to act in favour of the MPA unless they believe it can help them materially . This

thought was echoed throughout the three villages as the influence that wealth or poverty can have on encroachment was frequently alluded to.

> "M: Why do they encroach?
> P2: Economic crisis, they can't buy enough food" (BFG2)

> A: He (an encroacher) will go inside because he can catch many fishes. If you go inside you will be sure that you can get fishes, that is also because of poverty that's why they get inside. (BIDI2)

> "M: What is the reason they go inside?
> P1: Because of income and they don't have enough money to feed their family" (CFG4)

> M: So now what is the reason why they get inside and encroach, why?
> P1: Because of poverty. Food for their children (SFG6-Fisher's Wives)

It becomes clear that many believe encroachment is strongly related to poverty. If in need of food or money, it is not surprising that temptation to encroach the MPA may increase. Within the MPA, fish biomass is often thought to increase within only a few years (Roberts et al., 2001) and hence there are greater chances for catching fish. I argue therefore that poverty can accentuate a "temptation" to encroach. It is also interesting to note that these comments pertaining to wealth were made across all sites irrespective of their differences in average wealth (Fig. 7.2). This could suggest that relative wealth of individuals or of households is what is of importance irrespective of the average absolute wealth that occurs within the village.
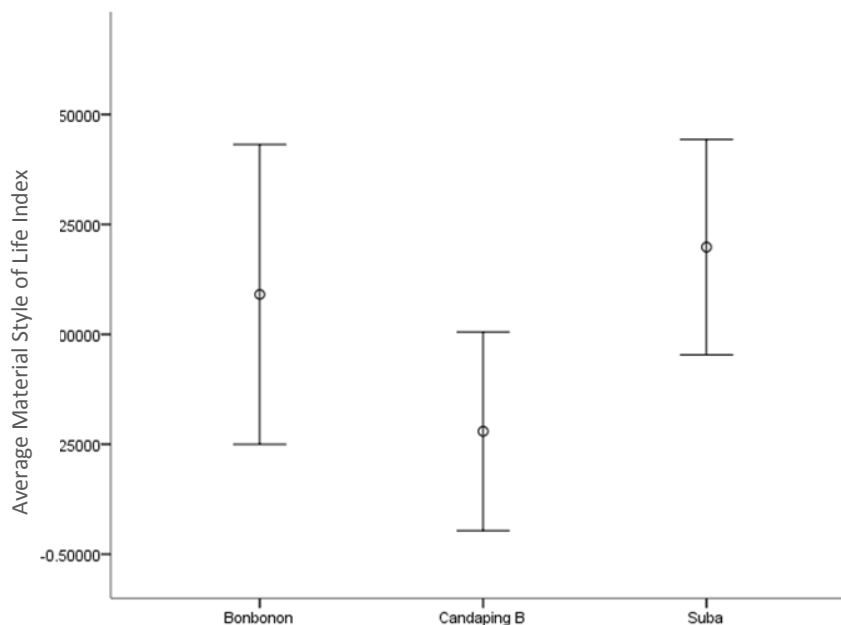
Fig.7.2 Error bars demonstrating average wealth index for each site N=166

It is thought that changes in patterns of wealth or asset holding can make big differences in the ability of families to withstand shocks or changes (Allison and Ellis, 2001; Cinner et al., 2009a). Indeed for those poorer individuals it is possible that the need to survive outweighs any long term advantages to conservation or sustainable management such as MPAs (Steneck, 2009). This may help explain why those in poverty are more likely to encroach.

Attitudes were also perceived to be influenced by wealth of individuals. It is possible therefore that although some may comply and seem to be in accordance with MPA rules and regulations they remain negative towards the MPA.

> "There are times those that like and there are times that they don't like. Because we are thinking for financial support. What happens to our family if we are not paid?" (P5-BFG1)

> "P3: Others like the sanctuary because they have more income" (CFG6-Fisher's Wives)

It seems that those less wealthy may be more concerned about how to address the immediate basic needs of the family rather than the potential long term benefits that can result from an MPA. Conversely, richer individuals are perceived as more positive towards the MPA because they have more income" and are in less immediate need of food or money from the MPA. The first extract even suggests that attitudes towards the MPA change over time as the families' needs for money or food fluctuates.

Both attitudes and compliance are therefore thought to be influenced by wealth of individuals; fishers' wives in the following extract from Bonbonon even specify that the link between attitudes and compliance can also be influenced by wealth.

> "M: Does this encroacher like the sanctuary?
> P2: Yes, but he will go inside even if it is prohibited
> M: Why, what is the reason?
> P4: Because of poverty, he is poor so that he can buy what he needs. Of course he will sell the fish because of poverty.
> P3: People are forced to encroach because of poverty" (BFG4-Fisher's Wives)

This extract demonstrates how encroachment may be occurring despite positive attitudes towards the MPA due to poverty. Poverty of fishermen may therefore be acting as a barrier preventing positive attitudes lending themselves to compliance. Fewer comments were made about how wealth can influence attitudes, and I suggest

that indeed many individuals may be encroaching the MPA out of necessity (to achieve basic physiological needs-Fig.7.1) despite positive attitudes towards it. Poverty may therefore act as a barrier preventing positive attitudes lending themselves compliance with MPA rules.

Focus groups and in depth interviews strongly suggested that wealth can influence both attitudes and compliance towards the MPA. However, quantitative analyses suggests otherwise. Although it was not possible to explore illegal activity such as encroachment through the questionnaire data, a correlation [17] and t-test [18] of the questionnaire data found no significant relationship between wealth and attitude and whether one reported encroachers respectively. This agrees with the multiple regression analysis in chapter 4 where wealth was not found to be a significant predictor of support. I argue these differences in results between the qualitative and quantitative analyses arise due to a number of different reasons

a. Those less wealthy may be more shy or unwilling to share their negative attitudes towards the MPA via questionnaire. These same individuals may be more happy to share the attitudes and actions of others throughout focus groups and in depth interviews

b. Wealth only impacts compliance (through necessity) but not attitude or reporting (which may be costless)

c. There is no consistent association between wealth and support towards the MPA.

d. There are other related, confounding variables.

It is likely that a mixture of the above points are in operation and further complicating the relationship between wealth, attitude and enforcement. Indeed, the relationship is not clear cut. Some qualitative evidence was found for less wealthy individuals being grateful and positive towards the MPA

> "The sanctuary is so good because it supports the poor people like us for our food because fishes will go out." (BFG6-P3)

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[17] Pearson's Correlation indicated no significant correlation between attitudes and wealth of individuals (r=-0.06, NS)

[18] T-test indicated no significant difference in wealth between individuals who felt they would act upon seeing an encroacher (M=0.07, SD= 1.07) and those who felt they would not report encroachers (M=-1.11, SD=0.81; t(156)=-0.97, N,S two tailed)

In complete contrast to the argument mentioned earlier, some mention that the wealthy were *more* likely to encroach as they could afford to pay the fines and were therefore less scared of getting caught. It should be noted however that the following extracts were not made by full time fishermen entirely dependent on the fishery (an issue I discuss in the next section).

"M: Why do they encroach?
P3: Maybe he has money for the penalty" (BFG7)

"If they have money to pay the penalty, they can get inside" (P5-CFG3)
P1: Others who has money will also get inside much more than the people who don't have money (SFG5- Fisher's Wives)

Overall, the qualitative data collected shows that people believe wealth can play an important role in influencing support. It is therefore a factor that may explain why different individuals within a community regard the MPA differently and may have various levels of support. The majority of comments made were on how poverty can lead to encroachment and to a lesser extent negative attitude towards the MPA. It agrees with other empirical (Pollnac and Pomeroy, 2005) and more theoretical studies (Kollmuss and Agyeman, 2002) which suggest that wealth can play a part in influencing attitudes and or actions towards conservation or environmental management schemes such as MPAs. However this association is not clear-cut. Whilst some wealthy may be more welcoming of an MPA, they may also be less scared of the fines imposed and could be more tempted to encroach. This notion that some wealthy individuals can encroach and afford to pay fines also leads to perceived unfairness and injustice contributing to unfair management in (see chapter 6). On the other hand, those poorer fishers may be "tempted" to encroach but may also be thankful for the MPAs fishery spill-over benefits and an assurance that there will be fish for the future (chapter 5). Furthermore, there seem to be barriers occurring for both wealthier and poorer individuals. Despite positive attitudes, poorer individuals encroach due to necessity, whilst the wealthy encroach due to temptation and sanctions that are a lower proportion of their income.

2. Dependence on fishing

One other socio-economic characteristic which should be explored is fishers' dependence on fishing. Irrelevant of whether fishers are comparatively rich or poor,

the impact of an MPA may be far less for those fishers who are not entirely dependent on fishing for food or for their income. Again, this follows on from the assumption that fishers are rational actors that will be weighing up the costs and benefits to themselves of an MPA and form attitudes and behave accordingly.

In this case I explore dependence on fishing primarily as dependence in terms of food and income. Therefore three main inter-related aspects of fishery dependence are explored:

a. Percentage income derived from fishing

b. Job diversity and alternative livelihoods

c. Part time or full time fishermen

Although I initially wanted to treat dependence as one main factor, I realised that dependence on the fishery could mean different things to different individuals. It was also clear that each village differed in terms of their dependence on the fishery depending on the different aspect studied (Fig.7.3.). Candaping B for example, derives most of its income from fishing, it also has a majority of individuals who have alternative livelihoods whilst Suba has a majority of fishers that are solely dependent on fishing for a livelihood. Furthermore, different aspects of dependence could influence support towards MPAs in different ways. I therefore distinguish between these different, related aspects.

Income from fishing

The proportion of individual income derived from fishing is thought to influence the perceptions of individuals towards resource or conservation management strategies such as MPAs (Dimech et al., 2009). In this context however, no significant differences were found between the attitudes of fishermen who derive different proportions of income from fishing[19]. Furthermore, no significant differences were

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[19] A one way between subjects ANOVA showed no significant difference in attitude towards the MPA between those with different proportions of income derive from fishing [F (3, 159) =2.14, NS].
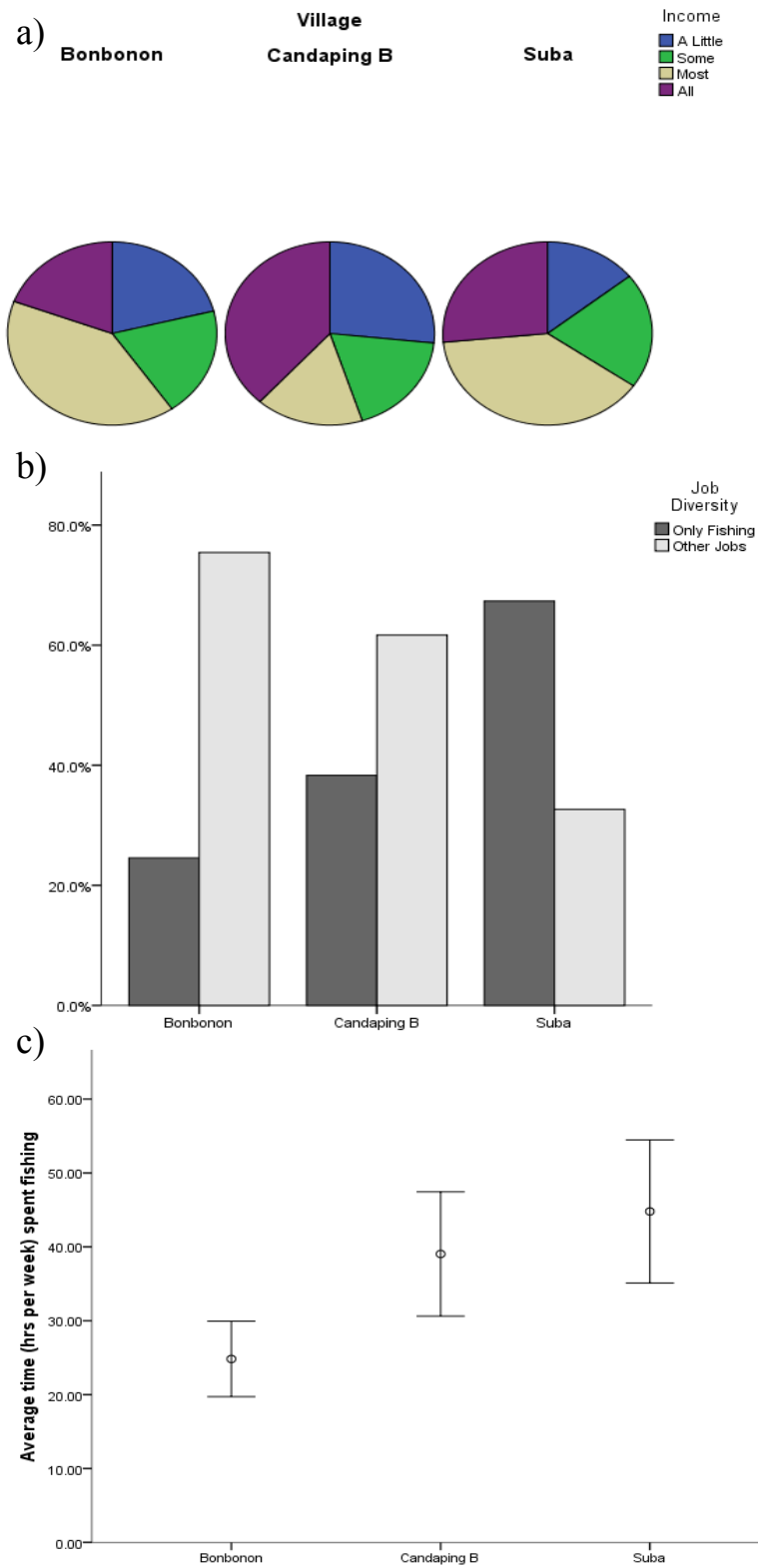
Fig. 7.3 Differences in dependence on the fishery across the three sites in terms of a) percentage of income derived from fishing, b) job diversity and c) time spent fishing per week

found between whether one would report upon seeing an encroacher between the different income groups of fishermen[20]. No comments were made during in depth interviews and focus groups on this aspect of dependence, further suggesting it may not have an important role in influencing support.

Job diversity

Job diversity is very closely related to the proportion of income obtained from fishing. It seems obvious that as one carries out an increasing number of jobs, the proportion of income obtained from fishing would decrease. Indeed job diversity and the proportion of income were negatively correlated[21]. Conversely to the proportion of income however, comments were made by both full time and part time fishermen respectively about how job diversity can influence attitudes and compliance.

> "They [those not supportive] depend on fishing for their food. It is not so much a problem for those who have their own farm for rice" (P2-BFG2)

> M: Why do they not like to have the sanctuary?
> P2: They only depend on their catch, they don't have a better job (SFG5-Fisher's Wives)

For a number of individuals, a lack of alternative livelihoods may explain why they harbour negative attitudes towards the MPA. It seems that for those that do not have other jobs, one may encroach out of desperation for food. As the first extract points out, this aspect of dependence on the fishery is much more to do with fishing for food rather than for money. This may explain why job diversity appears to be more important in influencing support towards an MPA than the proportion of income from fishing. It is whether fishers' can *switch* to other sources of food or income in times of need and not their current proportion of income derived from fishing that has an influence. Those who are also farmers are more likely to have another source of food in times of limited catch or bad weather (at which time fishing close to shore, where most MPAs are located, is favourable) and may be less "tempted" to encroach.

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[20] Chi-square test for independence indicated no significant association between the proportion offishers' income derived from fishing and whether they felt they would act upon seeing an encroacher, $X2$ (3 ,N=164)= 1.77, NS.
[21] Spearman's Rank Correlation indicated a significant negative correlation between job diversity and proportion of income derived from fishing (r=-0.65, N=166, p<0.001)

In accordance with the qualitative data, the quantitative analyses of the questionnaires also highlight the fact that job diversity can influence attitudes and enforcement of the MPA. Fishermen that only fish were significantly less positive towards the MPA than those that had other livelihoods [22] (Fig.7.4.). This agrees in part with other findings that suggests where individuals can readily switch between occupations, MPAs may be more accepted (Cinner, 2007).

Furthermore, those with alternative livelihoods were more likely to act upon seeing an encroacher than those whose sole job is fishing [23] (Fig.7.5). It is possible that there is solidarity between full time fishers whereby they refrain from reporting other fellow full time fishers to the MPA enforcers. This solidarity between full time fishers is explored more in the following section on time spent fishing but it is also explored in chapter 8. It is equally possible however that those without other jobs are more likely to encroach themselves in times of need and therefore will not report other encroachers from fear of the same happening to them the next time they encroach.
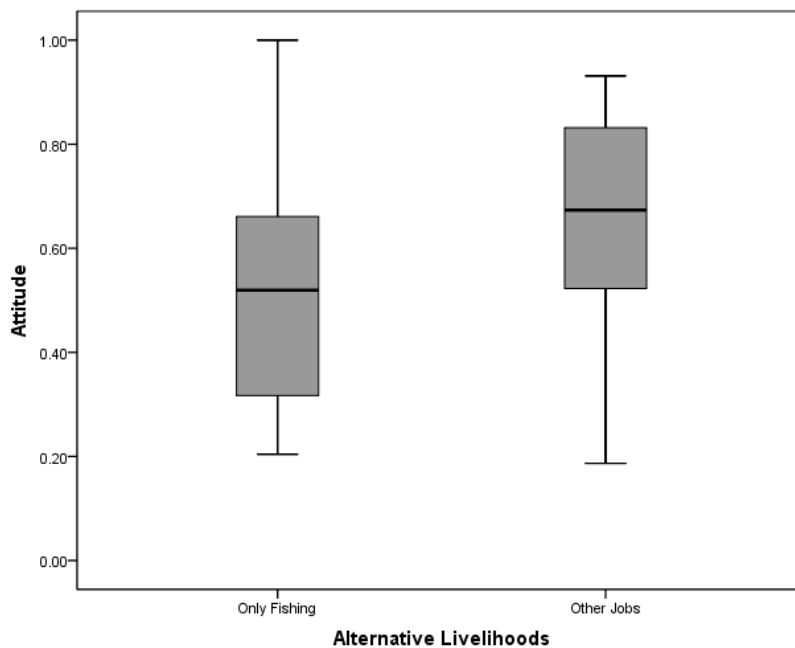
Fig.7.4. Average attitudes of fishers with alternative livelihoods and those without (N=158)

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[22] T-test indicated that the attitudes of those that only fish (M=0.51, SD=0.21) were significantly less positive than those that have other livelihoods (M=0.65, SD=0.20, t(158)= -4.26)
[23] Chi-square test for independence demonstrated that those with lternative livelihoods were significantly more likely to act upon seeing an encroacher than those whose sole job is fishing [X2 (1, N=164) = 9.18, p<0.005]
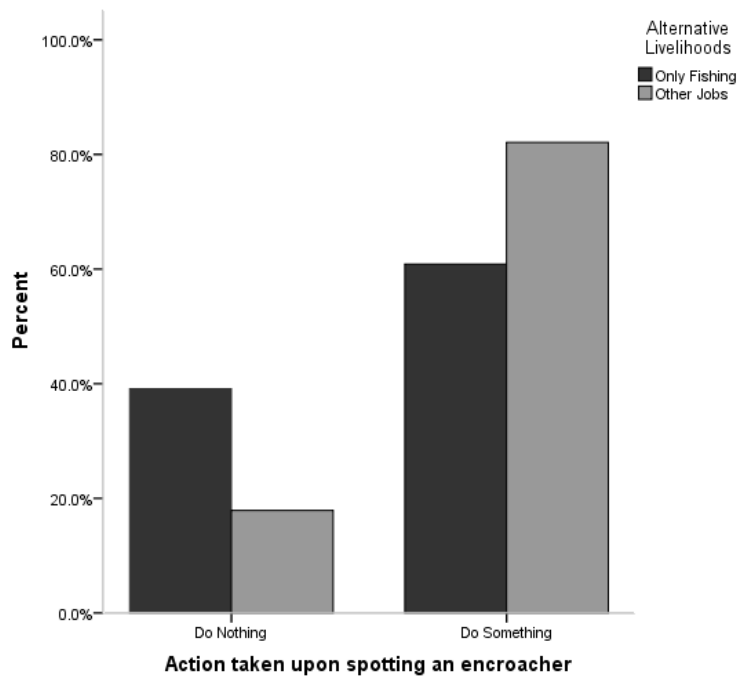
Fig.7.5. Differences in enforcement of the MPA between fishers with alternative livelihoods and those without (N=164)

Whether one has other forms of livelihood may therefore influence MPA related actions. This agrees with Gelcich *et* al (2005) who argue that understanding the complexity in livelihoods of fishers is crucial to understanding the driving forces behind their behaviours. The following statement also suggests that this form of dependence on fishing may also influence the link between attitudes and action.

> "Despite a positive attitude, if fishermen cannot get fish outside the sanctuary, they will fish inside" (BSSI8-Barangay Official).

Livelihood diversity can therefore influence most aspects of support towards the adjacent MPA as it can influence attitudes and actions as well as barriers operating between the two.

Time spent fishing (Part time or Full Time fishers)

Time spent fishing is not surprisingly closely linked to job diversity. Indeed, those with alternative livelihoods spent significantly less time fishing [24]. However, whether fishers are part time or full time is an issue worth discussing as separate from job

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[24] Mann Whitney U test indicated that those that have alternative livelihoods spent significantly less time fishing (Mean Rank = 66.09, N=96) than those that were solely fishers (Mean Rank= 107.37, N= 70, Z(166) = -5.47, p<0.001)

diversity as these two aspects of dependence on the fishery are clearly distinguished in the qualitative data.

Dimech *et al* (2009) found that in Malta, full time fishers expressed stronger opinions than part timers and were more negative towards the use of MPAs. This also seems to be the case for the three villages I studied in the Philippines. Attitude and time spent fishing were significantly negatively correlated [25]. Those that spend more time at sea were therefore more negative towards the MPA. Furthermore, those that said they would act upon seeing an encroacher spent significantly less time fishing that those that said they would not[26] (Fig. 7.6).
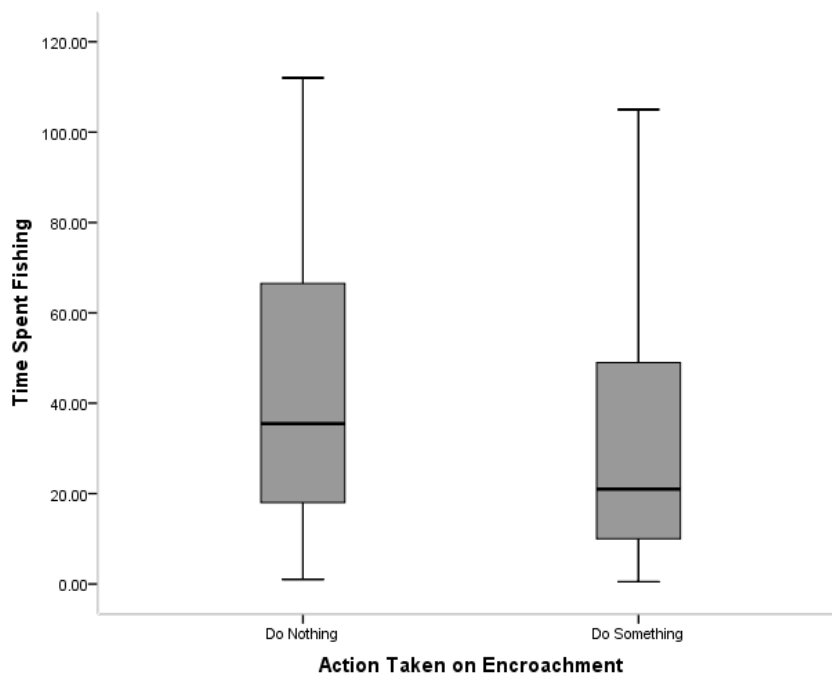
Fig.7.6. Differences in time spent fishing between those that acted upon seeing an encroacher and those that did not (N= 164)

Whilst the quantitative analyses suggest that support towards the MPA decreases as one spends more time fishing, very little was mentioned throughout interviews and focus groups on the subject. The little qualitative evidence obtained was contrasting.

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[25] . Spearman's Rank Correlation indicated a significant negative correlation time spent fishing and attitudes of individuals towards the MPA (r=-2.1, N=160, p<0.01)

[26] Mann Whitney U test indicated that those that said they would act upon seeing an encroacher spent significantly less time fishing (Mean Rank = 77.48, N=120) than those that wouldn't (Mean Rank= 96.20, Z(164) = -2.24, p<0.05)

Through most of the qualitative evidence, it is suggested by full time fishers and fisher's wives that it is those that fish less often (part timers, not "true" fishermen) that are not in favour of the MPA.

P3: others don't like it because they are not purely fishermen. They are fishing just for fun.
P4: That's true (SFG3)

M: What else? Why do others not like the sanctuary
P5: They just go fishing for fun (SFG6-Fisher's Wives)

This idea that they are just fishing for fun seems akin to recreational fishers or those that do not depend on fishing for food or money. Further qualitative evidence suggests that these part time fishermen are also less likely to act in favour of the MPA.

"Because they were not pure fishermen, they just go fishing If they want to [whenever they want]" (P1-BFG6)
"The people who get inside are not really fishermen" (P3-CFG5)

It may be therefore that those part time fishermen are less caring about the future of the fishery than full time fishermen that may want to ensure they have continued catches in the future for themselves and for their families for food and as a livelihood. However these results do not coincide with the quantitative data discussed above, furthermore it is in sharp contrast to the previous section which sees those with other jobs as more supportive towards the MPA in terms of attitudes and in levels of reporting and compliance. Furthermore, one would assume that MPA rules and regulations, together with a reduction in available fishing grounds may have a more severe impact on full time fishermen than on part timers.

It is noteworthy that none of the above comments are made by part time fishermen. The comments made about part time fishers being "not real" fisherman suggests these extracts may be a more about general feelings of solidarity of full time fishermen and their wives and potentially some resentment towards recreational or part time fishers who are fishing in "their" waters as they can afford to spend less time in the ocean.

In summary it seems that dependence on fishing means different things to different individuals. Overall however, throughout the different aspects explored, dependence on fishing can be seen to influence attitudes, compliance and enforcement towards an adjacent MPA. Again, this socio-economic characteristic may contribute to an

understanding of the variation in support between individuals towards MPAs. Surprisingly, despite suggestions in the literature that proportion of income derived from fishing could influence support; this was not found to be significant in this context. It seems that dependence on fishing and its influence on support may not be an issue of money but rather one of dependence and food security. It is important when one seeks to understand the dependence on fishing of various individuals that they look at the various aspects of "dependence" and explore certain subtleties that may be missed in solely quantitative studies.

3. Fishing Experience

Fishers' ages and their years of fishing experience are often thought to be an important factor when considering MPAs as the behaviour of fishers is thought to be partially based on previous experiences in fishing and fisheries management (Gelcich et al., 2005). One could argue that it is another aspect of dependence on fishing which may not be as intuitive as the previous aspects discussed above. Many attempts have been made to reduce pressures on fisheries by providing alternative jobs and sources of income to fishers, however these attempts have in many cases been futile due to a seemingly "irrational" attachment of individuals to fishing (Pollnac and Poggie, 2008). The risky nature of fishing is thought to attract those with active, adventurous, aggressive, and courageous personalities which an in turn has a positive influence on their levels of happiness. Pollnac and Poggie (2008) conclude that some fishermen resist leaving the occupation even when other, better, economic opportunities are available. I argue therefore that those that have stayed within the fishery for many years may also have formed an attachment to fishing and may be depending on it for a livelihood despite other opportunities. One could consider the experience of fishermen as yet another aspect of fishery dependence to be explored. However, in this case the experience of fishermen was not correlated with the amount of time they spent fishing[27] and no significant difference in years of fishing experience was found between those with alternative livelihoods and those sole fishers[28] nor between groups

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[27] Spearman's Rank Correlation indicated no significant correlation between years of fishing experience and amount of time spent fishing (r=-0.01, N=164, NS)
[28] Mann Whitney U test indicated no significant difference between individuals solely fishers (Mean Rank = 81.93, N=70) and those that have other jobs (Mean Rank= 82.93, N=94, Z(164) =0.13, NS)

of fishers deriving different proportions of income from fishing[29]. Nevertheless when considering fishing experience and age of fishers, it is often the notion of "shifting baselines" which is considered.

Older fishermen are thought to be able to recall greater past abundances of fish (Ainsworth et al., 2008). Saenz-Arroyo *et al* (2005) argue there are shifting environmental baselines occurring where rapid inter-generational changes in perception of the state of the environment occurs within fisher populations. They surveyed three generations of fishers in Mexico and found that the younger generation did not perceive the marine environment to be in as poor a condition as the older generation as they had not seen how large the catch and individual fish were in previous generations and hence had not perceived the decline in size and catch. It is possible that this may affect the individual's support towards an MPA. Older and more experienced fishermen may therefore have perceived a decline in fish over time and be more accepting and supportive of an MPA.

Age of fishermen[30] and years of fishing experience[31] however were not significantly correlated with attitude towards the MPA and no significant differences in levels of reporting were found in the ages [32] and experience of fishermen [33]between those that said they would enforce the MPA and those that did not. Furthermore, I found no qualitative evidence alluding to the age or experience of fishermen and their support towards the MPA.

These findings are contrary to other studies suggesting fishing experience is a strong factor in influencing differences in perceptions towards conservation strategies such as MPAs (Gelcich et al., 2008; Smith et al., 2010). Fishing experience and age of

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[29] A Kruskal Wallis test indicates significant differences in years of fishing experience between individuals deriving different proportions of income from fishing [Z(3, 164) =2.93, NS]

[30] Pearson Correlation indicated no significant correlation between age of fishermen and attitude (r=0.15, N=158, NS)

[31] Spearman's Rank Correlation indicated no significant correlation between years of fishing experience and attitude (r=-0.02, N=158, NS)

[32] T-test indicated no significant difference in age between individuals who felt they would act upon seeing an encroacher (M=43.14, SD= 12.74) and those who felt they would not report encroachers (M=-45.52, SD=13.12; t(160)=-0.27, NS, two tailed)

[33] Mann Whitney U test indicated no significant difference between individuals who felt they would act upon seeing an encroacher (Mean Rank = 82.27, N=118) and those that wouldn't (Mean Rank= 79.43, N=44, Z(162) =0.34, NS)

fishermen did not appear to significantly influence support towards the MPA in a community based MPA Filipino context. One potential reason for this is the strong family ties and respect towards elders that occur within these villages (see chapter 8). This may lead to much transfer of information between generations and individuals within the village. Consequently even the younger generations may be aware of past abundance of fish. Furthermore, younger generations that get taught environmental education at school may transfer this information back to the older generations and hence can lead to heightened awareness of the potential benefits that MPAs can accrue. This notion of shifting baselines may therefore not be so strong in this context. I should note however, that other studies have indeed found shifting baseline syndrome to be prevalent in the Philippines (Lavides et al., 2009). Whilst I looked at knowledge transfer and age, I did not specifically ask questions pertaining to shifting baselines which may account for the lack of evidence of this phenomenon.

4. Gears used and Mobility

Amongst individuals across the three villages, different fishing gear is used including net, hook and line, gleaning and spear-fishing (Fig.7.7). Some owned different types of gear whilst others had only one (Fig. 7.8). Furthermore, some had paddle boats or pump boats and were able to reach different parts of the ocean, whilst others were reliant on walking or swimming out to sea and had to fish closer. The presence of an MPA may therefore impact these individuals differently and consequently result in different levels of support towards it.

Ribot and Peluso (2003) suggest that the concept of access can help determine who actually benefits and through what processes they are able to do so. I demonstrated in chapter 5, how MPA size and location and whether any benefits arise from it can impact the adjacent community and influence their support. Here I argue that these factors can impact individuals within the adjacent community differently depending on gear used and mobility and ease of access to these benefits or to other parts of the ocean.
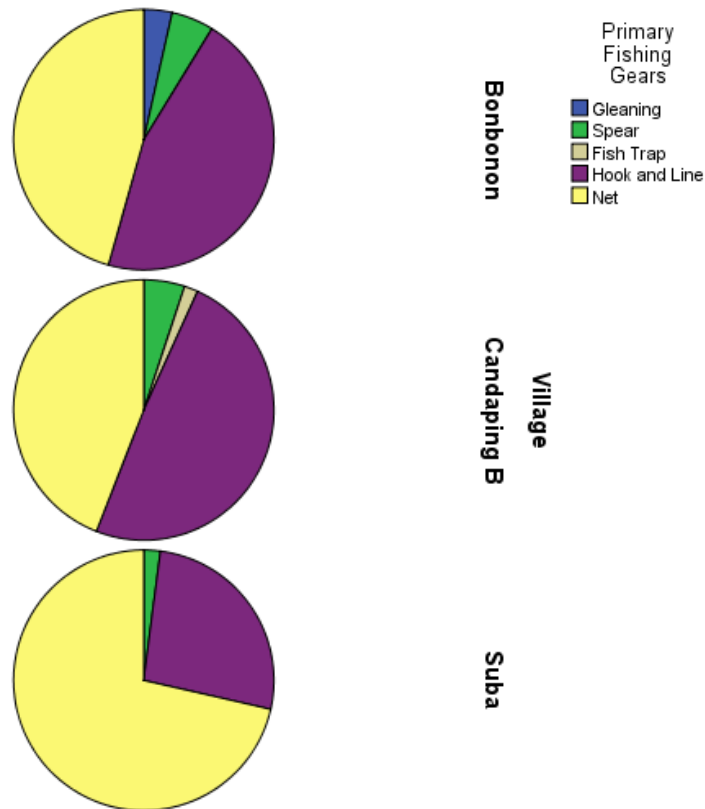
Fig.7.7. Primary fishing gear used across Bonbonon, Candaping B and Suba (N=165)

Gear used

Studies have suggested that attitudes to MPA management do indeed vary among groups of fishers using different types of fishing gear (Angerbrandt, 2011; Blyth et al., 2002; Dimech et al., 2009). However I found very little evidence supporting this notion.

Little mention was made through focus groups and in depth interviews about the current fishing gear that the fishermen used and how this may lead to differences in attitudes or actions undertaken that may affect the MPA. Quantitative analysis of the questionnaire data also clarified that no significant differences occurred in attitudes between groups of different fishers using different gear[34]. Over 63% of fishermen owned nets and 53% use hook and line across the three sites (the two most commonly used types of fishing gear, Fig.7.7), yet no significant differences in whether one

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[34] A one way between subjects ANOVA showed no significant difference in attitude towards the MPA between fishers using different primary fishing gear [$F_{(4, 158)} = 0.6$, NS].

would report an encroacher was found between those using nets or not[35] or those using hook and line or other gear[36].
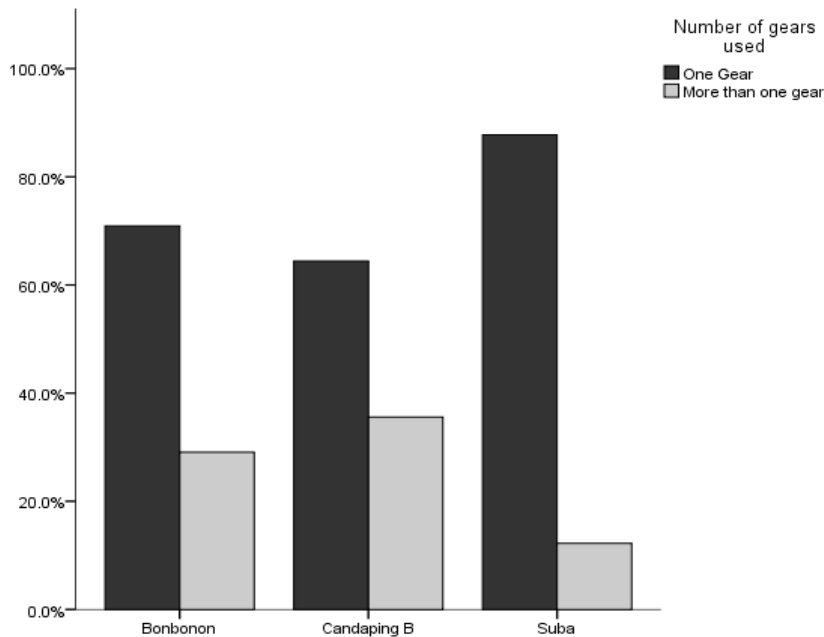
Fig.7.8. Number of different types of gear used across Bonbonon, Candaping B and Suba (N=163)

It might not be the fishing gear used so much as the possibility of fishing further away, and going further out to sea which is important.

> "The government must give fishing gears so that they will not encroach anymore. They need gears which allow them to catch fish in the far areas" (P2-CFG5)

The type of fishing gear that is used may therefore not influence support significantly in small Filipino community context. However, whether one can get access to other parts of the ocean that are further away may also influence how one is affected by the MPA and in turn, one's support towards it.

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[35] Chi-square test for independence indicated no significant association between whether fishermen use a net or not and whether they felt they would act upon seeing an encroacher, X2 (1 ,N=164)= 0.161, NS.

[36] Chi-square test for independence indicated no significant association between whether fishermen use a hook and line or not and whether they felt they would act upon seeing an encroacher, X2 (1 ,N=164)= 2.35, NS.

188

Mobility

As discussed in chapter 5, a consequence of closing an area to fishing is for the fishing effort to move elsewhere. This suggests that those who have access to a paddle or pump boat (motor boat) may find it easier to find alternative fishing grounds whilst those without a vessel will find it more difficult or time both to contour the MPA and to fish elsewhere. Indeed, Hannesson (1998) suggests that marine reserves may cause extreme hardship to communities or individuals that have limited mobility. By forcing fishers to travel much farther to unfamiliar grounds, increasing risk may occur to those with smaller vessels. Throughout the three villages studied however, no significant difference in attitudes were found between fishers who had access to paddle boats, pump boats or no vessel at all[37]. The qualitative data collected however, suggested how those that had access to pump boats and that could fish far away from the MPA were less opinionated towards the MPA.

> "For me it is OK (the MPA) because my husband will go far to fish" (P4-CFG6- Fisher's Wives)

> "It's OK if we cannot get inside because we will go to the middle of the ocean" (P4-CFG7- Fisher's Wives)

These extracts from fishermen's wives suggest that they are not really affected by the MPA (and hence do not seem to harbour negative attitudes towards it) as their husbands have the ability to fish far out to sea. Mobility may therefore mediate the impact of community level factors on the attitudes of fishers.

> P3: It (the MPA) can affect to the fishermen who catch fish on the near area (SFG5- Fisher's Wives)

Another Fisherman's wife in Suba mentioned that the MPA can have a stronger impact on those that catch fish closer to the shore. Although it was not explicitly mentioned, it may be that fishers who did not have access to boats were more prone to encroachment as the MPA location and size and

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[37] A one way between subjects ANOVA showed no significant difference in attitude towards the MPA between fishers with access to paddle boats, motor boats or no boat [$F_{(2, 159)} = 1.46$, NS].

consequent reduction of fishing grounds was a hindrance. This fact may also help explain why, when considering fishers' dependence on the fishery, full time fishers were suggesting most encroachers are part time fishers, as those that spent less time at sea were significantly less likely to have access to paddle or pump boats[38] (Fig.7.9). This reinforces the notion that there are many different aspects of fisheries dependence that can influence attitudes and action towards the MPA in different ways. This is in sharp contrast to what was mentioned before with regards to the dependence on fishing. Those that spent more time fishing were thought to be most negatively impacted by the MPA. This highlights many interrelated factors that can influence support in both positive and negative ways.

Whether one has access to a boat or not however, did not significantly influence the perceived likelihood of one acting upon observing encroachment. Furthermore no mention of boat use and access and its relation to enforcement or compliance was mentioned throughout the focus groups and in depth interviews. One could argue that those without boats may spend more time close to the MPA and hence be more likely to observe ,and hence potentially report, encroachers. However, there may also be a sense of solidarity between those "near shore" fishers which prevents individuals from reporting encroachers. I discuss further why some individuals may refrain from reporting encroachers and the importance of solidarity in chapter 8.

It seems therefore that boat access can mediate the impacts of an MPA on fishers. Although there is some suggestion that boat access can influence attitudes of fishers the argument I provide which links enforcement and compliance and boat access is a more theoretical than empirical one.

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[38] A Kruskal Wallis test indicates significant differences in time spent fishing a week between whether individuals who have access to paddle, motor or no boats [Z(2, 166) =21.52, NS]
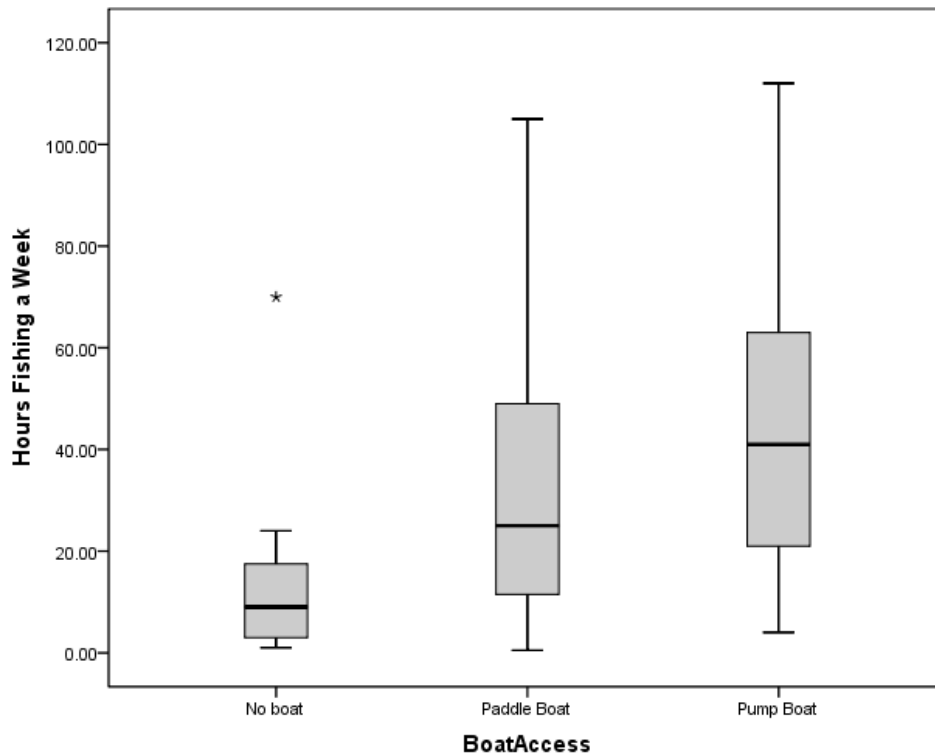
Fig.7.9. Differences in hours spent fishing a week between fishers who have access to paddle, pump or no boats (N=166)

5. *Empowerment*

Another important individual characteristic that remains to be explored is whether individuals perceive themselves as "empowered" in MPA relevant decision making. In contrast to the previous chapter on MPA management, I approach empowerment at a more individual level and consider to what extent individuals perceive themselves to have participated or had an influence in MPA decision making and management. Much of the literature that looks at the relevance of empowerment of individuals such as levels of participation and influence in decision making, focus on the frameworks that exist within the community which can improve empowerment of individuals (Christie, 2005a; Pollnac and Pomeroy, 2005) . The conclusion is often that an adequate framework needs to be put in place so that residents can be involved in the NRM process (Ostrom, 2000). However, in this study, I look at not only the different levels of participation and influence between villages but also between individuals across the three villages.

Participation and Influence

Continuous participation of the community is regularly mentioned as being key to the success and sustainability of their MPA and other NRM strategies (Pollnac and Pomeroy, 2005; Pomeroy et al., 1997; White et al., 2005a). This type of involvement may help adapt the MPA to local needs and also help participants gain a better understanding of the problems involved in MPA implementation as well as giving them a sense of empowerment. Increased participation is thought to ensure that the benefits of the MPA will match expectations (Christie et al., 2005). Individuals that have participated in MPA design and implementation may therefore be more supportive towards such a management strategy.

Individuals were asked to rate their perceived levels of participation and influence in MPA decision making. This entailed whether they felt they could voice their opinions, take part and discuss matters and whether they felt they actually had an influence in the whole process of MPA implementation and management. At first glance, the quantitative data collected does seem to support this idea that participation of individuals can influence their support towards the MPA. Self-perceived levels of participation in MPA decision making was found to have a significant effect on their attitudes towards the MPA [39]. However, only a significant difference was found between the attitudes of those that said they did not participate and those that said they participated in all decisions (Fig.7.10).

There was also a significant relationship between levels of participation and whether one acts upon seeing an encroacher[40]. Those who perceived themselves as participating in all decisions surrounding the MPA were more

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[39] A one way between subjects ANOVA indicated a significant effect of perceived levels of participation on attitudes [F (4, 155) =2.58, p<0.05]. Post Hoc comparison using the Tukey HSD test showed that the mean score for attitudes of those that said they did not participate (M=0.52, SD=0.31) was significantly lower than that of those that said they participated in all decisions (M=0.70, SD=0.33). No significant differences were found between any other groups.
[40] Chi-square test for independence indicated a significant association between self perceived levels of participation and whether fishermen felt they would act upon seeing an encroacher, X2 (4 ,N=164)= 14.25, p<0.005.

likely to act upon seeing an encroacher than those who said they did not participate at all. However, the relationship with other intermediate levels of participation was again, not very clear (Fig. 7.11).
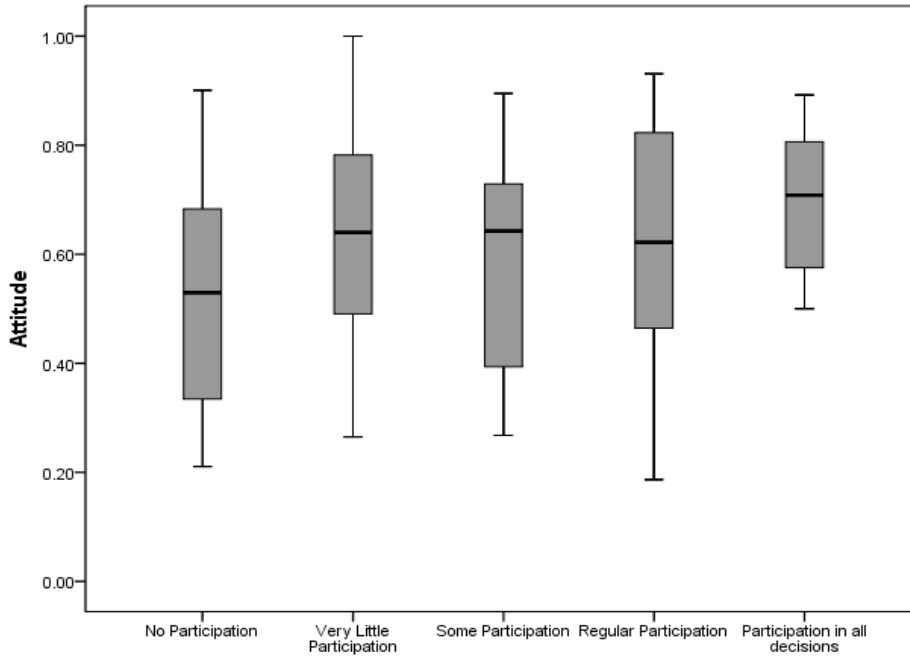
Fig.7.10. Differences in attitudes towards the MPA between different self-perceived participation levels in MPA decision making (N=155). Significantly different groups are represented by letters.
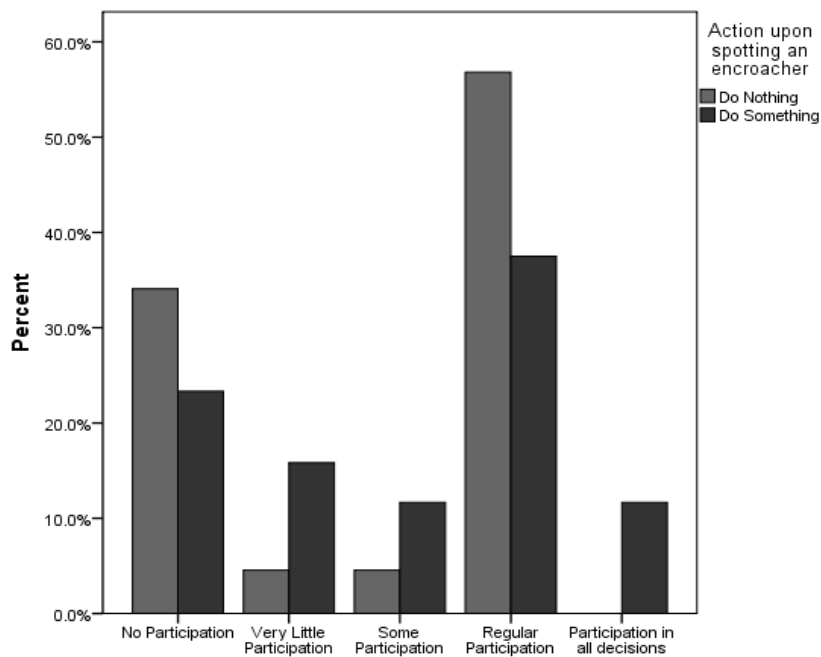
Fig.7.11. Difference in levels of action upon spotting an encroacher between different self-perceived participation levels in MPA decision making (N=164)

Only 14 people (8.5%) answered that they had participated in all decisions surrounding the MPA. I argue that these individuals may be those that have been formally acknowledged as being involved in MPA implementation or management and may have been given at some point a formal MPA related role such as helping in MPA implementation or in MPA management. They may therefore be positive towards the MPA as they are or were in part responsible for its implementation or its current state. Following this, I argue that those that have said they have no, very little, some and regular participation are more likely to be those who do not have a recognised role in managing the MPA. In hindsight, it may have been better to distinguish between the participation of those that were or are currently formally involved in MPA implementation and management and those that are not. It may have also been useful to distinguish between different forms of participation (Pretty, 1995) to get a clearer idea as to how it can influence attitudes and MPA related actions. Nevertheless, it seems that those fishermen that feel they have participated are more likely to act upon seeing an encroacher and have positive attitudes towards the MPA.

The qualitative data proved interesting in elucidating why so few people felt that they had high levels of participation. For some, it seems that the meetings held about the MPA were pointless and only occurred so that the villagers could sign the relevant papers which was considered a sign of approval for its implementation.

> "(In the meeting) they just wanted us to sign" (P1-CFG6- Fisher's Wives)

> "They didn't ask us if we agreed about the sanctuary, they just made their own decision" (P3-CFG1)

These comments made by a fisherman's wife and a part time fisherman in Candaping B suggest that although an MPA meeting was held, it was mainly to get enough signatures for MPA implementation to be approved. A semi structured interview with a part time fisher in Candaping B, and an advocate of the MPA, mentioned that

> "the signatures required was only to signify their attendance and not a signature demonstrating their support"

This suggests that some may have misunderstood and signed in approval of the MPA without realising what it was for. It seems that in certain cases, village meetings about the MPA may be a simple pretence and not actually increase the participation of many members in the community. This reinforces the notion highlighted in chapter 6 that those involved in MPA management may not solely have concerns about the MPA and its outcomes at heart and be involved in MPA management to primarily further their own political agenda. This is an important issue as it is thought that without communication, very few individuals will make positive contributions to NRM management or CPR (Ostrom, 2000) and hence may not act in favour of the MPA. In addition, other semi structured interviews in Bonbonon and Suba suggested that individuals did not actually participate despite attending the meetings.

> During the assembly, some didn't say anything but after would disagree. (SSSI4-Fisher's Wife)
>
> "Non FA Individuals can attend meetings and talk but have very little influence" (BSSI2-FA Member)

Some therefore did not use the meeting as a chance to voice their opinions and hence weren't involved in the MPA implementation or management.

For all three villages, meetings were carried out before MPA implementation but many feel the decision to implement the MPA was already made and this was just an opportunity to let them know what was happening. Since then however, although local government officials or official documents may state otherwise, semi structured interviews and personal observation suggests there are no meetings specifically held for the MPA (see chapter 3). With the exception of a relatively active fisherman's association at Bonbonon there is little opportunity to discuss MPA related issues. Although there is an annual or bi-annual assembly where all the community can discuss village issues, there is rarely much time to tackle important issues at length (pers. Comm with ex barangay captain).

It's not surprising therefore that many have suggested throughout the focus groups and semi structured interviews that more meetings and increased participation is important for their support towards the MPA. When asked what can be done to make people harbour more positive attitudes towards the MPA, many argue that more meetings are required.

> "P2: I will let everybody in the community have a meeting regarding the sanctuary and the community
> P1: Yes, we let them understand about the rules and regulations of the sanctuary so that nobody will encroach. I want once a month meeting" (BFG2)

> "P2: Call up a meeting. Explain to people so that they understand what the reason is and purpose to have the MPA in order for them to understand (CFG1)

> "Regular meetings for the community where we talk about what is good for the sanctuary and let everybody follow the rules" (P3-BFG3)

> "That is what people want, a meeting so that they can express their feelings" (CIDI4)

The last two extracts are made by full time fishermen whilst the previous are not, nevertheless they all suggest that increased participation could boost attitudes towards the MPA and prevent encroachment. Another full time fisher from Suba mentions how meetings had changed his attitude in the past.

> P5: Before we made an argument because I disagree in having an MPA here in Suba but then when I attended the meeting, I understood the purpose of having one and now I realise that it is very important (SFG1)

Furthermore, a lack of participation may explain why some encroach the MPA as they are not aware of the purpose of the MPA and its rules and regulations (a theme which is discussed later in the chapter).

> P4: They don't understand the reason why there is a sanctuary
> M: Why?
> P4: Because they don't attend when there was an assembly meeting
> P5: They don't get involved in any activity in our barangay (SFG4)

It's clear that for many, there is a strong desire for more involvement in MPA planning and decision making. For both fishers and non-fishers it seems that more inclusive assembly meetings may lend itself to more positive attitudes and improve levels of compliance.

It also seems that those that have been involved and have been able to participate in MPA or conservation activities in the past are very proud to recount past experiences. This suggests that previous actions could influence attitudes. This agrees with cognitive dissonance theory whereby attitudes are changed to justify behaviour (Harmon-Jones and Harmon-Jones, 2007).

> "P1: Actually, before, when the MPA started we made artificial corals so that fish can lay their eggs
> P2: Yes that's true, we put it on tires" (BFG7)

> "We have to take care of it. Me, even if I am not a pure fisherman, I will still defend the sanctuary because that is for the good of us. We have to agree on the rules of the sanctuary. We were the ones who built the sanctuary before" (P6-CFG4)

> "We really love the sanctuary because we are the people who built it" (P1-CFG4)

> P5: The other fishermen cut the buoys in the sanctuary. My husband is one of the people who put the buoys in the sanctuary (SFG5- Fisher's Wives)

It may be that some are trying to impress me as I am interested in their MPA, or may be that they are trying to prove their love of the MPA. Nevertheless, it shows that they are proud to have spent some time working for "the good of the MPA".

Solely increasing the number of meetings however may not result in more participation. A number of reasons as to why there is a lack of participation were identified throughout the focus groups and interviews.

Despite there being meetings, many are thought not to attend

> "All meetings are open to all people within the Barangay but only a handful of people attend, these are mostly fishers that live in coastal areas" (BSSI7-Ex MPA Leader)

> "An FA would be good if people attended" (CSSI17-Fisher's Wife)

Some argue this is because of a lack of time

> Q: How we can say that this man is good and this other man is not?
> A: IF you want them to call for a meeting they will say that they will come but on the final hour they are not coming and they say that the meeting is a waste of time (BIDI5)

> "People are well informed, whether they participate or not is due to whether they are busy and whether they are in favour of the MPA" (BSSI13-Barangay Official)

One fisherman in Candaping B suggested that an incentive is required if villagers are going to sacrifice their time to attend MPA meetings. Although rather "tongue in cheek" it highlights that some need some kind of incentive to attend meetings. I learnt this quickly when trying to get enough candidates for the focus groups I carried out, and had to provide a small monetary incentive as well as ample snacks and drinks.

> "So simple, you will just tell them that there is free snacks and free food and drinks (like tanduay rum) and I'm sure people will attend" (CIDI1)

Furthermore, a carpenter from Bonbonon mentioned that out of those that do attend meetings they may not be taking it seriously

> Q: Why are there no more meetings?
> A: During the meeting before, the other members are just joking, they don't take it seriously. They just keep on shouting. (BIDI3)

It's interesting to note that much discussion about participation occurred at Candaping B. This may be because the current captain is not very active with respect to the MPA and the fisherman's association is no longer active. There has therefore been a decrease in the amount of opportunities for members of the community to voice their opinions and discuss MPA issues.

We can see therefore that participation was predominantly thought to be important for attitudes of individuals towards the MPA. By attending more meetings and discussions about the MPA, it was thought that many will be more aware of the MPA objectives. Furthermore by being involved in MPA activities, they may feel proud and have more of a vested interest with the MPA. However, increasing the participation of individuals within the community is not simple as only some may be willing to sacrifice their time, and many may attend meetings but will not participate. I describe in chapter 6 how some may form negative "images" of the MPA, as they may believe it is a tool for some to further their own agenda for example. It is also possible therefore that some may not want to attend meetings.

Power to Enforce

Another theme that emerged through the focus groups and interviews was whether an individual felt he had the power to enforce MPA rules and regulations. Whilst it is

possible for all to spend time monitoring the MPA, some felt it was not their role to warn/shout at or report encroachers.

> "You have no right to scold someone because you are not an official" (P5-BFG6)

> P5: There are some who monitors the MPA. Just like me, I like to monitor. I tried once, when I scold someone, the encroacher says " is that your role here?"…So I think I don't have the right to say anything if someone encroaches. (SFG1)

These two comments made by a carpenter and full time fisher at Bonbonon and Suba highlight the fact that some do not monitor and enforce the MPA as they feel they do not have the "right" to do so. Even if they do something, it is thought that the encroachers will not care as they do not have the power or authority to enforce the rules. This can therefore reduce levels of enforcement.

> "P3: We will help but when we scold them and tell them that it is prohibited they don't believe us because we don't have the power and we are not the bantay dagat" (CFG1)
> "We can't force them if they don't like" (P4-CFG5)

These fishermen from Candaping B illustrate the helplessness they feel when trying to enforce the MPA. The first extract specifies that it is up to the *bantay dagat* or coastal police to do this type of work. They may not feel it is up to them to confront an encroacher. The formal authority to enforce has not been devolved to all individuals by local, municipal governments or NGOs involved with MPA management. Therefore if one is to act upon seeing an encroacher, all he/she may be entitled to do is to report to barangay officials or those in charge of the MPA such as the president of the fisherman's association, barangay *tanod* or *bantay dagat*.

Some indeed do report encroachers to enforcers or those responsible for MPA management and refrain from warning or catching the violators themselves. I explain in chapter 9 why this may be done as they are scared of the violators but it may also be because they feel it is not up to them and that encroachers will not listen unless a formally recognised individual in charge of MPA management is involved.

> "In my place, even if I am not a bantay dagat I will still report encroachers. I don't have the right to catch someone. All I can do is report to the *bantay dagat*" (P3-CFG5)
> "We have to report that (encroachers) to our leaders or the captain" (P2-BFG6)

> "P6: We have to report to the municipal so that they will stop
> P5: The officials are very important on that case because that is for the community" (BFG6)

However some will not even report as they feel that the whole process of enforcement should be carried out by formally recognised individuals in charge of the MPA. In fact they argue that all MPA related actions are not 'up to them' and leave this up to those "in charge"

> "He himself spends no time monitoring and argues that this job is up to those within the FA" (BSSI6-Retired Fisher)
> "He won't report and he argues that Wilson is always watching, it's his job to report" (BSSI14-Fisher)
>
> "If he reports, some people will say, why does he report, he's not even an FA member" (BSSI6-Retired Fisher)

These semi structured interview extracts are obtained from fisherman in Bonbonon. It seems that due to the current active leader and FA in place in Bonbonon, it is thought that any form of enforcement is no longer up to fishermen but to those within the FA and formally involved in MPA management. There seems to be a notion of "passing the buck" to somebody else. By doing this, although some may even have a positive attitude toward the MPA, they justified themselves by saying it was not their job or role to do anything! This implies that a hard-working enforcer may actually deter others from acting in favour of the MPA as they feel somebody else is doing the necessary work. This provides further evidence suggesting that strong levels of enforcement from guards may discourage the formation of cooperative norms. Mild external monitoring however may allow all to be involved in the monitoring and enforcement of the MPA (Ostrom, 2000).

It is clear that not all had or felt that they had the power to enforce the MPA rules and regulations and in particular refrained from actively warning encroachers. In this case, reporting to those enforcers that do have the authority may indeed reduce levels of encroachment. Some however, believe that any form of MPA related action such as reporting is 'not up to them'. Two clear MPA related actions are apparent in this section, the warning of an encroacher by an individual or the reporting of an encroacher to an enforcer with authority. I argue that if active leaders and MPA guards are in place at a site, then promoting the reporting to enforcers is essential for support and hence individuals within the community must be made to feel this is their responsibility to do so. If however, no clear leaders are in place and no rota or formal monitoring is in place at a site, then the formation of cooperative norms should be

encouraged whereby individuals work together to warn those violating MPA rules and regulations.

6. *Knowledge and Expectations of MPA*

Knowledge and expectations of the MPA are very closely related to the participation of individuals discussed above. One major goal of having meetings about the MPA for the community is to increase their awareness of the MPA objectives and also to explain the MPA rules and regulations. Discussion with CCEF, an NGO involved with MPAs   in the Philippines (and information obtained from interview and focus groups) suggest that for the three villages studied, information diffusion and meetings were carried out especially pre and during MPA implementation in an attempt to explain the purpose of the MPA, its objectives and the rules that would be imposed. Indeed, at first glance it would seem that those within the three villages are very knowledgeable about the MPA objectives and MPA rules (Fig.7.12.). Candaping B appears in particular, very knowledgeable, and this may be due to higher levels of help from government and NGOs outside the community (see chapter 6).

However, despite these various mechanisms and arrangements in place across the three villages, there is heterogeneity within villages in levels of knowledge of MPA objectives and laws which may influence their support towards the MPA. Not all, within the three sites were fully aware of MPA objectives for example. These differences may be explained in part by various levels of participation in MPA related meetings. However it was an important theme that arose throughout focus groups and in depth interviews and is argued to be important for NRM and MPA success (Causey, 1995; Christie et al., 2005; Ostrom, 2003; Pietri et al., 2009)
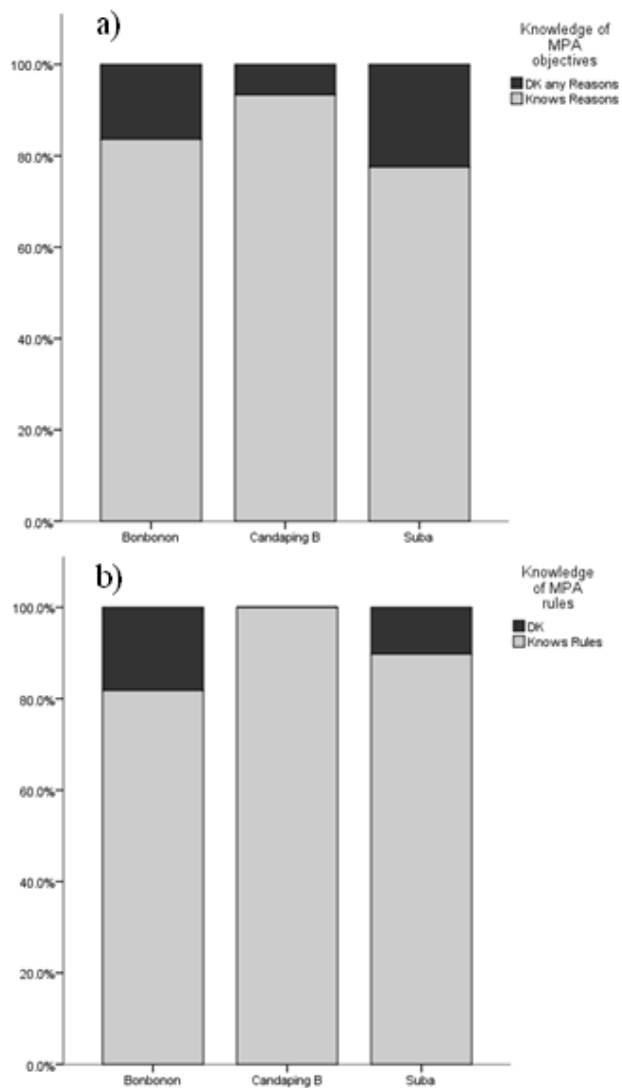
Fig 7.12. Differences in knowledge of a) MPA objectives and b) MPA rules between the three sites

Knowledge of Objectives

MPAs can provide a range of various social, ecological and economic benefits. The reasons why MPAs are implemented are to achieve certain of these benefits. I explain in chapter 3 how very little information is available as to why the MPAs were implemented at each site and what their objectives were. The general consensus however is that the MPAs were implemented to conserve and protect biodiversity and to "rehabilitate fishery resources". Interviews with local government officials involved with the MPAs such as the DA, suggests that the emphasis is on the socio-economic benefits that may arise from MPAs rather than the conservation benefits.

When asked about the objectives of the MPA, the DA at Bonbonon and Suba had similar answers (unfortunately the head of the DA at Candaping B was unavailable).

> To increase fish population, most are aware of this (Suba DA KI).

> Objective is to rehabilitate the fishery resources in the area and to protect and conserve them.(Bonbonon DA KI)

Not all individuals within the village however may perceive there to be the same MPA objectives as the DA. This is important to consider for support towards the MPA, as the knowledge of MPA or other NRM objectives is thought to influence the actions or behaviours towards these strategies. Some argue that an understanding of benefits arising from an MPA or NRM management strategy can increase success and efficiency of management (Lowry et al., 2009; Ostrom, 2003). Others however are more specific and suggest that knowledge of environmental issues, awareness of the problem and hence the potential benefits of MPAs are linked to behaviours (Bamberg and Möser, 2007; Kollmuss and Agyeman, 2002). Thus, knowing the objectives of the MPA may lead to pro-MPA action.

Data obtained via the questionnaire supported this theory. Those fishers who could give reasons as to why the MPA was in place were significantly more likely to act upon seeing an encroacher than those who couldn't' provide any reasons [41].

The qualitative data also uncovered that compliance can be influenced by knowledge of MPA objectives.

> "Maybe he (an encroacher) doesn't like it because he doesn't understand. If someone understands, would you think that he will go inside? Of course not…right?" (P3-BFG4-Fisher's Wives)

> "Maybe they (encroachers) don't understand, they don't know what the purpose of the MPA is. Those people are just thinking for today and they don't think about what will happen for the next days" (P2-CFG4)

> "They (encroachers) don't understand the reason why there is a sanctuary" (P4-SFG4)

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[41] Chi-square test for independence indicated a significant association between a knowledge as to why the MPA is implemented and whether they felt they would act upon seeing an encroacher, $X2 (1 ,N=164)= 27.73, p<0.001$. Fishers who gave reasons as to why MPA was implemented were more likely to act upon seeing an encroacher.

These three extracts made from a Fisherman's wife, a part-time and a full-time fisherman respectively are illustrating why they think encroachment occurs. For them, a lack of compliance with MPA rules is thought to occur simply because encroachers are not aware of the reasons as to why the MPA is there. However, it could be that encroachers are constructed as being ignorant, in a similar way that the speakers or non encroachers construct themselves as being well informed. Those encroachers may also deny any rationale for having an MPA to justify their actions. Furthermore, it is equally possible that they are making excuses for the encroachers. Indeed in chapter 8 I discuss the importance of 'smoothness of interpersonal relations' prevalent in Filipino culture and also that of pity that is often expressed towards encroachers or those less fortunate. More work would be needed here to elucidate whether increasing knowledge of MPA objectives would necessarily boost compliance.

Not only actions but attitudes of individuals were also found to be influenced by whether they knew why the MPA was implemented or not. Those that could provide a reason for the presence of the MPA were significantly more positive towards the MPA than those that did not know any reasons for having any MPA[42]. This finding supports the qualitative data which also suggests that attitudes can be influenced by knowledge of MPA objectives.

> "But for us who really understand, having a sanctuary is good because fish will not always stay in the sanctuary" (P5-BFG1)

> "M: Why do other people not like the MPA?
> P2: Because they don't understand. The MPA is only good for those who understand. They need more explanation" (BFG7)

> "We understand and we know the purpose of the sanctuary so there is no problem. There is a time when the fish go out and we can catch them" (P4-CFG4)

These comments were all made by full time fishermen, not only does it assert their own knowledge of the MPA but it also suggests that being aware of what the MPA is for and what benefits it can achieve, such as fishery spillover (as the first and last extract suggests) can therefore influence attitudes as well as actions. It's not solely whether or not the MPA provides perceivable benefits to the adjacent community that

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[42] T-test indicated that those providing a reason as to why the MPA was implemented had significantly more positive attitudes(M=0.63, SD= 0.2) than those who did not provide any reasons (M=0.38, SD=0.16; t(158)=-5.46, p<0.001, two tailed).

is important but also whether individuals are aware of what the MPA aims to achieve. Some even specifically mentioned that support towards the MPA could be boosted by informing individuals about MPA objectives.

> "M: What do we need to change so that a person will think positive towards the sanctuary?
> P5: To let him know what the sanctuary was for and what it is all about. And let him know what's good about having that sanctuary" (BFG4-Fisher's Wives)

> "That man can be changed (from a negative to a positive attitude) if he really understands what the sanctuary is for. It is good for him to attend the meeting so that he will understand" (P6-CFG1)

> M; So what are we going to do here so that other people will be encouraged in having the sanctuary?
> P5: To explain to them what is the good thing about the MPA (SFG1)

These comments were made towards the end of the focus group where we asked what could be done to improve support towards the MPA. Many respondents proposed that support towards the MPA can be changed simply by informing individuals about the purpose of the MPA. This may be a rather naïve response to a complex question, and it is possible that respondents wanted to answer quickly and correctly to please me or the moderator. Nevertheless, a seemingly large importance is attributed to knowledge of MPA objectives.

Both the qualitative and quantitative evidence suggested that knowledge of MPA objectives can influence attitudes, compliance and enforcement and therefore should be considered an important factor influencing support.

Unfortunately, only those that perceived themselves to be aware of MPA objectives were happy to discuss this issue throughout the focus groups and in depth interviews. The questionnaire data however highlighted that only 14% of individuals did not know reasons as to why the MPA was implemented (see chapter 9), so it is very unlikely that this is the only factor which influences a lack of support. It should be noted that for the questionnaire data, some individuals may have not believed or supported these MPA objectives, but just re-hashed information obtained from others or via meetings. However the findings suggest that by targeting those that are unaware of MPA objectives and ensuring they are aware of the costs and benefits that can arise out of the MPA may increase support towards the MPA.

Expectations of MPA

Depending on what MPA objectives are perceived to be, will lead to certain expectations of what the MPA should or can achieve. Whether or not individuals believe these objectives can be achieved or not may also be of importance. For recent MPAs, whether it is expected that these objectives will be reached or not may influence support. For older MPAs, these expectations can in turn be shattered, reached or surpassed which may in turn influence support towards the MPA.

Although this issue was not explored via the questionnaire, it has been suggested in the literature that in some instances, whilst there is initial support towards the MPA, this is lost in time as many lost interest or their hopes and expectations of the MPA were not met (Christie, 2004). The fact that certain expectations are not met, is not surprising, MPAs are not always the solution (Beddington et al., 2007), and do not always provide the adjacent community with benefits (White et al., 2005a). Furthermore, even if there are benefits in place, as we have seen earlier in the chapter, not all individuals within the community may necessarily regard the changes as positive.

Sandersen and Koerster (2000) for example, found that fishers expressed disappointment and distrust because their catches were not increasing and felt they had been misled because the reserves had not resulted in more fish. With 90% of MPAs rated as ineffective in the Philippines (Beger et al., 2004), there is a growing concern that there are frequently unrealistic expectations of what MPAs can deliver (Pomeroy et al., 2005b; Rosendo et al., 2010). This in turn can lead to disappointment in the MPA and a lack of support (Sandersen and Koester, 2000).

Throughout the focus groups, the expectation that the MPA will eventually provide benefits did seem to be associated with positive attitudes towards it.

> "Some are positive as they are expecting a positive change in the future" (P5-BFG5-Fisher's Wives)

> "He is positive that there will be many more fish in 20 years time Believes that tourism will generate money in the future" (CSSI1-Fisher)

These extracts from fisherman's wives from Bonbonon and a Fisherman from Candaping B suggest that they are positive towards the MPA as they are "expecting" MPA benefits in the future through more fish or increased tourism in particular. Conversely a number of full time fishermen from Suba seemed disenchanted with the MPA as expected benefits had not accrued.

> M: Why you say that before you like it and now you don't like it?
> P1: We like it
> P5: because we had already an experience what a sanctuary is and now it is not as good as it can be (SFG1)
>
> Q: Have you attended the assembly meeting?
> A: The first meeting I attended but on the last I didn't
> Q: Was all that was explained in the meeting come true?
> A: They said fishes will become more and more
> Q: Does it all come true?
> A: There were lots of fish but then suddenly it's getting fewer. (SIDI6)
>
> Although people accepted the MPA initially as they expected fishery benefits. They have since changed their mind. (SSSI16-Fisher)

These extracts suggest that expectations of future benefits can lead to positive attitudes, however if these do not come true, negative attitudes towards the MPA can follow. Raising expectations may therefore boost attitudes towards the MPA but if the MPA objectives are too optimistic, unlikely, hard to detect, fluctuate over time or can only be reached over very long periods of time it is possible that this can have a negative effect on attitudes towards the MPA in the long run. It is interesting to note that most comments pertaining to shattered expectations arise from Suba. I argue this may be because nearby MPAs have had increases in tourism over the last few years but MPA tourism has not been promoted in Suba. Furthermore, the management of the MPA has fluctuated over time and the current size is so small that benefits may not be accrued or hard to detect.

I argue that it is best to have conservative, achievable MPA goals in the first instance, so that expectations are less likely to be shattered. Furthermore, when considering the different types of MPA benefits perceived or desired from MPAs discussed in chapter 5, the focus of MPA objectives could shift from economic goals which are hard to predict, to more achievable goals such aesthetic benefits or future benefits for the next generation.

Knowledge of MPA Rules

Not only was knowledge of MPA objectives and why the MPA was implemented found to be important but also the knowledge of the rules and regulations surrounding the MPA were also deemed paramount in influencing MPA related actions. Qualitative data has suggested that knowing the rules and laws in place surrounding the MPA prevents encroachment.

> "Yes, we should let them (encroachers) understand the rules and regulations of the sanctuary so that nobody will encroach. I want once a month meeting" (P1-BFG2)

> "They don't encroach because of the penalty and they understand the rules" (P4-BFG7)

These two extracts from a *habal habal* (motorbike taxi) driver and a full time fisherman suggest that if people knew the rules surrounding the MPA, and the fines that could be imposed on them if they encroach, it could reduce levels of encroachment. It is interesting to note that most of these comments were made in Bonbonon, which has the highest levels of those unaware of MPA rules (Fig.7.12). In Suba or Candaping B, knowledge of rules and regulations may not be as important as the MPA is not monitored as often and rules are not enforced. Those involved in the management of the MPA at Bonbonon also argue that knowledge of MPA rules could reduce encroachment:

> M: What else (why do people encroach)?
> Ex-Barangay Captain: They don't understand the rules of the sanctuary
> MPA/FA Leader: Lack of knowledge about the sanctuary
> Ex-Barangay Captain Lack of information that it is a sanctuary
> Current Barangay Captain: They don't understand the rules and what it is a marine sanctuary
> (BFG8-MPA Involved)

It is even suggested that due to knowledge of the laws, one may comply despite a negative attitude towards the MPA.

> "I don't like the sanctuary but I am positive because I follow the rules"(P6-BFG3)

A full time fisher has gone as far as to suggest that meetings and information diffusion should be carried out so that more are aware of these rules.

> "We want that we are also included in the meeting so that we will be aware of other rules" (P5-BFG1)

Conversely, a full time fisherman in Suba suggests that if the rules are complicated or changing, this can be an issue and cause confusion and could lead to negative attitudes towards the MPA and its management and potentially, encroachment.

"I think it is not well managed because every year the rules are changing" (P5-BFG1)

Q: Is hook and line allowed?
A: Yes, I don't know why. Their rules are useless because they don't have permanent rules. Before it's not allowed, I can't understand. That's the reason why others get discouraged and others will encroach (SIDI3)

It seems therefore that clear knowledge of rules surrounding the MPA may therefore reduce encroachment. Furthermore, clear knowledge of rules may also promote enforcement as it has been suggested that some may be less likely to report an encroacher who is unaware of the rules and they may feel pity towards them and be more forgiving.

"There are times that the people who get inside are innocent. They don't know that is a sanctuary. So we don't need to scold that someone, we only give them advice so that they will be aware" (P1-BFG7)

Q: Do they care about the community of Bonbonon?
A: Some who understands the rules they will not get inside but for those who don't understand they will get inside. They were innocent maybe? (BIDI6-MPA Leader)

I explore this notion of "pity" towards some encroachers later in chapter 8, yet it seems that some will not report encroachers as they believe it is simply a mistake that they encroached as they were not aware of the rules.

Overall, these findings suggest that knowledge of laws influence MPA related actions and agrees with work undertaken on community based management projects in the Pacific islands where knowledge of relevant laws led to broader acceptance of the project (Christie, 2005a).

Nevertheless, it should be mentioned that solely having rules in place that all are aware of, will not necessarily prevent encroachment. Despite being aware of rules, some fishermen and fishermen's wives mention that others encroach.

"There are some people here, even if they are aware already, that really want to get inside (the MPA)" (P2-BFG4-Fisher's Wives)

"Most encroachers are poor and fish inside the MPA despite them knowing it is prohibited. They do this as they find it inviting" (BSSI4-Fisher)

M: do the encroachers understand the rules of the sanctuary?
P3: Yes ma'am but they just want to get inside (SFG3)

Furthermore, the questionnaire data did not demonstrate significant differences in attitude [43] or enforcement [44] between those that had no knowledge of the rules surrounding the MPA and those that did. However, only 15 fishermen (9% of total) said they had no knowledge of MPA rules, compared to 91% that said they had at least some knowledge. This may not be surprising as most will have some knowledge that at the very least the MPA is an area where not all forms of fishing are allowed. I would also argue that some may not want to say they are unaware of MPA rules as this implies that they have encroached or may have acted illegally, whether intentionally or unintentionally. Specific questions pertaining to different aspects of MPA rules and regulations, such as whether they know if they can get a cut from reporting, or if they know the fines that can be incurred, may have led to more accurate and helpful quantitative information as it does not imply whether they have encroached or not in the past.

7. Conclusion

Previous chapters have argued how various village level factors such as MPA characteristics or management factors can influence support. Whilst some evidence suggests that certain factors uniformly influence the support of individuals in the same way (for eexample all comments suggested that lack of fishery benefits or absence of boundaries leads to a decrease in support), it is clear that these factors may not be as important for some individuals as they are for others. Furthermore, there are many factors which were found to boost support for some individuals but decrease the support of others (Fig.7.13).

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[43] T-test indicated no significant difference in attitudes between those those said they had some knowledge of the MPA rules and regulations (M=0.6, SD=0.21) and those that said they had no knowledge of MPA rules (M=0.5, SD=0.17; t(158)=-1.62, NS, two tailed)
[44] Chi-square test for independence indicated no significant association between fishers' knowledge of MPA rules and whether they felt they would act upon seeing an encroacher, X2 (1 ,N=164)= 3.31, NS.
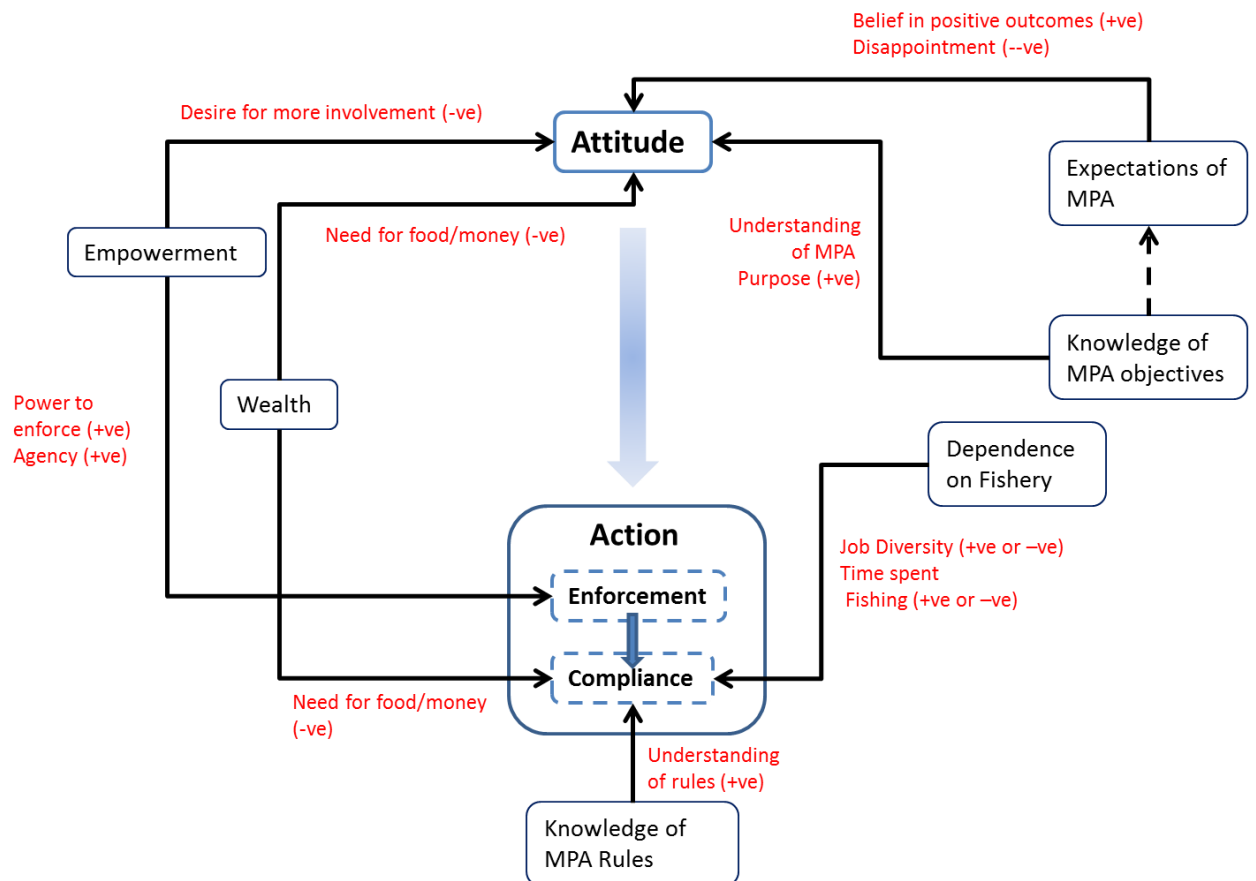
Fig.7.13. Summary of personal characteristics and how they influence the different aspects of support towards the adjacent MPA.

This chapter starts to unpack why there are differences between the support of individuals towards the MPA. The differences between socio-economic characteristics of individuals can influence the impact they perceive the MPA can have on them and in turn, their support towards the MPA. Aspects of wealth, dependence on fishing, gear used and mobility, empowerment and knowledge of the MPA were all found to influence support towards the MPA. The MPA may therefore be one man's gain. It may provide some limited fishery spill-over, larval export to other areas, ensure fish for the future generations whilst providing limited cost to the individual in question (he may for example be wealthy, own a boat and fish further off shore, and only be a part time fisherman). The same MPA however can also be another man's loss, where all the costs are incurred, reduction in fishing grounds, large sanctions imposed, increasing fuel use or energy to circumvent the MPA with limited benefits to offset these costs.

Whilst more work is needed to determine how varying levels and types of participation in MPA implementation and management processes can influence support, it is clear that knowledge and awareness of the MPA rules and objectives can influence the perceptions of what benefits and advantages individuals may derive from an MPA and can hence influence support.

Differences between the characteristics of individuals are therefore important to consider and understand when exploring the differences in support towards the MPA within a village. In the previous chapters I describe how MPA characteristics and MPA Management can influence support. Furthermore I highlight the inter-connectedness of many of the factors involved. This chapter further adds to this complexity by not only including another host of factors that can influence support but also explaining how community level factors can affect individuals within a community differently. It is important therefore to consider a wide range of factors both at the individual and community level, as well as their inter connectedness when understanding support towards an MPA.

These findings however, should be viewed in conjunction with the previous empirical chapters. These individual level factors can then explain why certain village level factors, such as MPA characteristics or governance factors, can differently influence the support of individuals. This chapter therefore highlights why it may be hard to predict how community level factors can influence support given the heterogeneous nature of the community and variation in socio-economic characteristics. It assumes however that individuals are solely rational actors whose attitudes and behaviour are a consequence of how they view and weigh the benefits and costs of the MPA. Whilst it seems that indeed many are to a certain extent rational actors, and that many socio-economic characteristics can influence support and mediate the impacts of the MPA, the following chapter retains its individual level focus but takes a different approach. It is thought that people are not solely motivated by narrow economic self interest. They also consider the broader implications of their decisions for others and for the environment. Hence chapter 8 will take a broader view and look at the importance of the feelings and emotions of individuals and consider cultural norms, values and relationships with others in the community as important factors influencing support.

Chapter 8: Feelings, Emotions and how they influence Community Support

This chapter follows on from the previous chapter in that it recognises the heterogeneity of individuals within a community and continues to understand the varied support different individuals harbour towards their MPA. However, whilst chapter 7 focuses on individuals' socio-economic characteristics, this chapter seeks to understand how feelings and emotions can influence support towards MPAs. It takes a more inductive approach than the previous chapter and does not necessarily assume all individuals to be narrow minded rational actors.

Support towards MPAs, either in terms of attitudes or actions however, is not solely made by rational economic individuals. Some argue that it would be advantageous for future conservation efforts to acknowledge not solely the costs and gains that can arise through these efforts but also to build on the local aesthetic values and traditional beliefs (Gadd, 2005). Others mention that it is important to ensure that management systems do not erode social solidarity among resource users by weakening social bonds, traditional values and responsibility as this can lead to selfish, profit seeking individuals (Jentoft, 2000b). I suggest this can have repercussions with regards to their attitudes and behaviours and hence support towards management strategies such as MPAs.

I describe below a number of instances where an importance has been attributed to understanding Filipino culture, values and customs.

Juan Manuel de la Matta, a 19th century Spanish official in the Philippines found it difficult to "draw a moral picture" of Filipinos: he argued they are "a mixture of abjectness and ferocity, timidity and wonderful courage, indolent laziness and slovenliness, industry and avaricious self-interest...superstitious, peaceful, respectful, heedless, distrustful and deceitful" (Karnow, 1990, p 54). Aside from reflecting the diversity of the Philippines, it also reveals the extent to which the Spanish never quite grasped what they had wrought in the archipelago when colonizing the Philippines. Even though they pacified the country, they were repeatedly surprised to discover that the "natives", "beneath a passive exterior, simmered with resentments that could erupt

in fiery uprisings" (Karnow, 1990). One could argue that the Spanish failed to understand how Filipinos would react to their rule and their presence in the country.

Although the American reign in the Philippines was far from exemplary (Karnow, 1990), an importance seems to have been attributed to further understanding Filipino traits, values and customs by the American military. It was recognized that the armed forces alone would not convince the Filipino population to accept U.S. rule and therefore the army also worked to win the "hearts and minds" of the Filipino people (Hill, 2012). General MacArthur for example began recruiting Filipinos to form several companies of Philippine scouts to serve with the U.S. Army, an inventive move as it relates to an important Filipino value; that of social acceptance. Lynch (1964) identifies social acceptance as an aim that predominantly motivates and controls the behaviour of the Filipino. This notion of social acceptance is revisited throughout the chapter. Further understanding of Filipino values and feelings may have proved helpful when attempting to govern the country.

There is also a similar viewpoint in the world of business which suggests that if you win the hearts of consumers, their minds will follow (Feig, 2006). The idea is that you have to vary your pitches according to what satisfies these emotions and adapt the produce accordingly (Feig, 2006). This is thought to explain why 90% of new products fail no matter what the price, because marketers are selling through intellect while consumers are buying from the heart (Feig, 2006).

Similarly to the governance and business examples outlined above, it is also believed that in Filipino business management, one must consider "Filipino values" to determine which they can capitalize on and how they could develop management strategies that are adapted to the values of the Filipinos. Foreign managers who are unaware of their employees' different value systems are thought to commit the mistake of designing a system of management that is good for them and not one that is good for their employees (Andres, 1981). Indeed, Andres (1981) suggests that a lack of management by values may explain why many organizations have found that their management systems have not been efficient in the Philippines.

I argue that an MPA could be viewed as a product or a service which in turn is governed or managed and hence we could learn from these fields and attribute an importance to the cultural values, norms and customs of those affected. However, I refrain from considering these as factors directly influencing MPA related attitudes and actions. Whilst they undoubtedly are linked to support and may help understand why certain factors influence attitudes or action (cultural values, norms and customs have provided explanations of why certain factors influence support in previous empirical chapters), I focus on individuals' feelings and emotions. These are thought to be closely linked to behaviours of individuals (Carrus et al., 2008; Ekman, 1992; Ketelaar and Au, 2003) as well as attitudes (Bamberg and Möser, 2007) and can therefore influence support towards MPAs or other NRM strategies. For example, certain individuals may feel a sense of pride by cooperating (or acting in favour of the MPA) and these feelings may be accentuated if this behaviour is known by the rest of the community. These emotions can therefore enhance cooperative behaviour and are sometimes known as pro-social emotions (Lopez et al., 2012).

Cultural values, norms and customs in turn, will prove crucial in understanding these feelings and emotions. Whilst some feelings and emotions are universal and are experienced in similar ways across all cultures, other emotions show considerable cultural differences (Lipset, 1982; Mesquita and Walker, 2003). In this case, exploring cultural contexts is thought to be key to understanding these emotions (Mesquita and Walker, 2003).

There are other factors also at play such as individual characteristics and personalities influencing feelings and emotions. I therefore focus at an individual level and consider the differences between feelings and emotions of individuals within a community rather than focusing on the cultural traits and social norms of the community itself.

I argue in this chapter that these feelings and emotions can play an important part in influencing support towards MPAs. They may also help further elucidate why certain factors were deemed important in influencing support in preceding chapters. I start the chapter by explaining themes arising from interviews and focus groups which have been discussed in the MPA, collective action or pro environmental behaviour literature and then turn to themes that that also arose from discussions with the

community members that are rarely alluded to in these fields and may be more specific to the Filipino context.

1. Solidarity

A theme which highlights the importance of considering the feelings and emotions of those affected by the MPA is that of solidarity. Many MPAs are built to provide economic or ecological benefits yet Oracion *et al* (2005) argue that these benefits have very little influence on support. They argue that a community may support an MPA "not so much from the obligations of a conservation ethic or a sense of environmental urgency but instead from grass-roots cultural and political satisfactions found in a barangay (meaning village) solidarity" (p395). In this case, people choose to become active in the MPA movement because the process itself has solidarity value in bringing people together and motivating people to take action. It highlights how attributing an importance not solely to individuals in isolation but to their social relations and interactions with others in the community may help in explaining support towards MPAs. This has strong ties with social capital theory which looks at connections within and between social networks. Indeed, it is thought that social capital can improve environmental outcomes through decreased costs of collective action, and increased levels of environmental behaviour (Claridge, 2004).

Oracion *et al* (2005) study coastal resource management in the Philippines further argue solidarity has some historical foundations in the Philippines. *Bayanihan* or "respect for mutual help" is an important Filipino value which is embedded in the culture. Indeed in many barangays, the policeman plays a minimal role if he exists at all. Community harmony, including all forms of crime control is maintained by the entire community who resolve disputes largely through a group consensus (Roces and Roces, 1986). Although this may no longer be true for some sites and is not always the case for larger villages and towns, this still applied to the three sites I studied. Most disputes were resolved via the Barangay Council, and no policemen worked or patrolled within the villages (although some barangay officials are known as barangay tanod and can act as village level police if required). According to Steinberg (2000), *bayanihan* denotes "team spirit, an atmosphere of unselfish cooperation, and a sharing of labor and spirit for the common good" (p24). An MPA could therefore provide an

opportunity for those in the affected community to exercise and demonstrate their "*bayanihan*" which has a solidarity value, and could in turn influence their support towards the MPA.

Data obtained from the focus group interviews provides evidence that indeed many seem to have positive attitudes towards the MPA as it is for the "good of everybody" or for the "good of the barangay".

> P1: For me, it's good if the people will obey the rules and regulations of the sanctuary because the sanctuary can help our barangay.(BFG2)
>
> P6: Yes this is true, I agree with that. It is so that fish will not run out. That is for the good of the people in our community. (CFG4)
>
> P2: We have to take good care of the sanctuary
> M: OK, what are your reasons?
> P6: Because we are living in Candaping B and I love Candaping B (smiles) (CFG6-Fisher's Wives)
>
> P2: When I hear sanctuary, for me it is for the future of the Bario (village)
> P3: For the people and for the children of Suba
> P4: It is good for the community (SFG2)

These extracts from both fishermen and fishers' wives at the three sites demonstrate that many harbor a positive attitude towards the MPA as they feel it is a good thing not just for themselves but for others in the community or barangay itself. A heightened sense of social capital may transform individuals from self-seeking, rational economic actors with little sense of obligation to others, into members of a community with shared interests and a commitment to the common good (Adler and Kwon, 2002). Most comments are somewhat vague about the actual material benefits that are supposed to emanate from the MPA. It is possible that it is because these are irrelevant as it is the notion of *bayanihan* that they are alluding to. Fishers from Candaping B and Suba even suggest that similar reasoning may influence some to act positively and enforce the MPA.

> P3: We will also watch over the MPA even if we are not a member of the Bantay Dagat. We also have to follow the rules of the MPA and this is for the good of all of us. (CFG1)
>
> P2: We have to scold them [encroachers] because the sanctuary is for the good of everybody not for just one person. Fish will be more and more (CFG3)

P1: If the management is strong enough we will help and there is a unity. We will help in reporting so that the ocean will not be destroyed. (SFG1)

P5: Every one of us has the right to scold someone because that is our sanctuary (SFG3)

Steinberg (2000) who writes about Filipino history explains how *bayanihan spirit* involves unselfish cooperation between individuals. Cooperation between individuals was indeed alluded to by fishermen throughout the focus groups and interviews across the three sites.

P6: Even if we don't have a salary we have to protect the MPA. We have to show a good example like not encroaching and show that to the others so that they will follow us and we will work together as one. (BFG3)

P2: Even if there's no salary we can monitor that as long as we are all together (BFG6)

There is strong solidarity between Candaping B residents. For e.g. if someone encroaches but [*bantay dagat*] isn't present, the residents will group up together and work as a team to warn the encroachers. (CSSI1-Fisher)

P5: We have to work in one group and so all of us will help in monitoring the MPA. (SFG1)

If individuals within the community are prepared to cooperate with each other, it seems therefore that this can stimulate pro MPA action, especially monitoring the MPA and reporting or warning encroachers. This supports studies which argue that cooperation between individuals are important for the collective action and the management of common pool resources (Ostrom, 2000). Nevertheless, it is still essential to retain a level of scepticism as if "bayanihan" spirit is a valued ideal, people may make unrealistic claims about how their community represents it. Whilst it appears here that bayanihan is strong and valued some may not behave cooperatively but feel there is a need to say so.

Trust is also thought to play an important role in cooperation, as conditional co-operators (where the more others contribute to the public good, the more they will contribute themselves) will often be trustworthy and will trust others (Ostrom, 2000). Data obtained via the questionnaire reinforces this notion. Fishers were asked to score on a graphic scale how much they felt they trusted fellow fishermen within the community. Those that argued they would act upon seeing an encroacher specified they were significantly more trusting towards other fishermen than those that said

they wouldn't act in favour of the MPA[45]. Indeed, trust was found to be an important predictor of community support in chapter 4.

However, very little qualitative information was provided on trust within the community throughout the interviews and focus groups. It may be that this notion of trust is a more western concept that may have been lost in translation and hence this may be due to data collection issues rather than it being a reflection of its importance.

Overall, these findings suggest how a sense of solidarity and of *bayanihan* within the barangay can lead to increased support towards the MPA. To ensure support towards the MPA, I argue it is important to retain the *bayanihan spirit*. Oracion et al (2005) however, argue that the *bayanihan spirit* is in danger of being eroded due to external pressures such as the development of tourism. Without *bayanihan*, increased value would be placed on personal economic gains which may undermine barangay solidarity. The following extracts obtained from semi- structured interviews with a local village policeman (barangay tanod) and a full time fisherman respectively suggest that for Suba barangay, this *bayanihan spirit* may be considerably weakened.

> But when it comes to money for you is for you and what is for me is for me (SSSI13-Barangay Tanod)
>
> In Suba, they unite for fun but when it comes to the MPA or other projects everyone is individual. (SSSI18-Fisher)

There may be solidarity or *bayanihan spirit* when it comes to fiesta, or fun, but when it comes to money or an investment of time; it seems that this "*spirit*" is lost. This could serve as a warning for those involved in implementing MPAs; the focus of the MPA and its various objectives and the way it is explained or "sold" to the affected community may erode this *bayanihan spirit*. When investigating how Filipino culture can facilitate cooperative behaviour in Filipino farmers, Palis (2006) states that by cultural orientation, many Filipinos are thought to be relationalists and to despise individualism. If an MPA focus is to maximise individual catch and profits, it may serve to undermine the solidarity of the village and the *bayanihan spirit* together with its positive effects on support towards MPAs. This negative impact on solidarity may

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[45] Mann Whitney U test indicated a significant difference in levels of trust between those that would act upon seeing an encroacher (Mean Rank=90.68, N= 120) than those who felt they would not report encroachers (Mean Rank= 60.18, N=44; t(156)=-0.97, U= 3622, Z= 3.65, p<0.001)

be accentuated if an MPA focus is on tourism as these benefits can be privatised and only a certain few may benefit from the MPA.

Conversely, solidarity could also undermine support towards MPAs. Given the relatively small size of many barangays including the three barangay studied (chapter 3) many want to remain friends, and do not want to upset family members and may not report or warn encroachers within the community.

> M: if your friend will go and encroach inside, what will you do?
> P2: I will lend him my money so that he will not encroach. Because I don't want him to be caught and have to pay the penalty. (BFG7)
>
> Q: Some have mentioned that FA or sanctuary members are not doing their job. They don't scold encroachers or warn them. What do you think is the reason, why are they like this?
> A: As what I told you a while ago that they have the same feathers and colours. (BIDI 2)
>
> M: What are the reasons?
> P4: Because they were friends that's why they don't report
> (Everyone agrees)
> P3: Friends will get mad if they were reported by their friends. To avoid misunderstanding, it's better to keep quiet (SFG6-Fisher's Wives)
>
> A: If you and I are close friends and I saw you encroaching of course the encroacher will say "oh we are relatives" so that's the problem now. That is what we call "mawi-od".
> Q: does it affect the sanctuary?
> A: yes of course
> Q: Why?
> A: Because the fish are stolen from friends and relatives (SIDI5)

These findings share strong ties with work involving social capital theory which refers to connections within and between social networks. It has been suggested that social capital can act as a double edged sword which can cut both ways. On the one hand it can bring about greater control over wayward behaviour (such as encroachment in this case as described earlier with cooperation), but at the same time excessively strong ties within a group can threaten the collective good (Gupta and Maiti, 2008). In this case it seems that many will refrain from reporting or warning an encroacher if it is a friend or family. Nevertheless, the first extract suggests that some may offer to help their friends instead of reporting so that they will not encroach which would also improve compliance.

These comments can also be explained by two values which are thought to be predominant in Filipino society. One is the strong kinship ties. Obligations to the

family are of highest order and one's family obligations or issues is argued to take precedence over everything else (Jocano, 2000). Another important shared notion is that of *mawi-od* or *hiya* which is thought to control and motivate both individual and social behaviour in the Philippines (Andres, 1981; Soriano et al., 2007). It is best described as a sense of shame. What is good for one person is also good for others and conversely what is detrimental to one person is detrimental to others (Soriano et al., 2007). If one violates a norm he will ordinarily feel a deep sense of shame, a realization of having failed to live up to the standards of society. This can invite conflict and even violence as a Filipino's self esteem is in jeopardy (Andres, 1981). This helps explain why many will refrain from reporting or warning a friend of family as they do not want to provoke friends or family and cause conflict.

Overall, we can see how a feeling of solidarity within the barangay can boost support towards the adjacent MPA, and that the *bayanihan spirit* should be encouraged. One needs to consider solidarity value (akin to value of social capital) as an MPA benefit. This solidarity can in turn increase attitudes and actions of individuals towards the MPA. MPA design and management should therefore attempt not to threaten or prevent "*bayanihan*" *spirit* from developing. However other Filipino values such as that of *hiya* and of kinship ties can threaten the positive effects that *bayanihan spirit* can have on community support. It is important therefore to be aware of the range of cultural values and customs at play.

2. *Environmental Concern*

The previous section highlights the importance that Filipinos ascribe to harmonious relationships and that they are culturally relationalists rather than individualists. It is also argued that they are especially likely to despise individualist ways of thinking if they are bad for community affairs (Palis, 2006). This may also lead to concern for the environment as it is an issue which affects the community as a whole. I argue in this section that those who are concerned for their marine environment and its future may be more likely to act together and support the MPA.

Some individuals mention how those that support the MPA are those that are "concerned" about the environment and future state of the fish stocks.

M: So now there are people who likes the sanctuary and monitor what is the reason?
P3: they care about the sanctuary
P4: he is concerned (SFG4)

"The man who doesn't not go inside is thinking that he cares and loves the sanctuary. That is why he doesn't violate, he is thinking that the sanctuary can help our community" (P1-BFG2)

I want to help (in monitoring), I have my children and I'm looking forward for their future. What will happen to them if they don't have that sanctuary anymore. I have my son, if they don't manage that what will happen to my grandchildren? (BIDI2)

The last extract is of particular interest as it suggests that those concerned about the future state of the fish stocks are more likely to act in favour of the MPA. This coincides with the literature on environmental education. Stapp *et al* (1970) defines environmental education as "aimed at producing a citizenry that is *knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems and motivated to work toward their solution"*(p34). This should imply that environmental knowledge will lead to awareness of these issues and motivation of individuals towards pro environmental action and hence increase support towards the MPA. Pietri *et al* (2009) did indeed find the presence of community environmental education programs as a predictor of compliance with MPA rules.

However, the assumptions that environmental education may lead to motivation and behaviours of individuals have been criticised (Gigliotti, 1990) and indeed much work is still trying to explain this discrepancy between environmental knowledge and awareness and pro environmental action (Bamberg and Möser, 2007; Kollmuss and Agyeman, 2002).

I find that environmental concern was indeed found to influence attitudes towards MPAs across the three sites. The majority of comments pertaining to environmental concern were made on how those with negative attitudes towards the MPA harboured a lack of "concern" towards environment or future fish stocks.

"M: Why other people don't want to have the MPA?
P1: I guess that man is only thinking for himself and not for nature. This type of person will do whatever he wants. I mean he doesn't have discipline to himself, for him there is no limitation" (BFG5-Fisher's Wives)

"M: Why do people think negatively towards the MPA?

P3: That man is only thinking about himself and not for the others, that man is selfish. He doesn't think about his family or for his future children" (CFG1)

M: Why (are people negative) cap?

P3: Because their concept or what they understand is "while we are alive, we have to get what we can get from the ocean. So the law implemented by the captain is useless because they don't follow it. They were thinking maybe that we will eat first and then think about the others (SFG7-MPA Involved)

These extracts from a fisher's wife, a part time fisherman and a barangay captain respectively suggest that those negative towards the MPA are more concerned about themselves rather than the environment or for the future of their children. The second extract reflects a perception of these individuals as "selfish" who put themselves before everybody else. Some very general comments (notably by the FA president of Bonbonon in the next extract) were made perceiving those individuals that do not "care" about the sanctuary as those most likely to encroach or refrain from reporting.

M: Then why the others like the sanctuary but they don't report

P1: They don't care about the sanctuary (BFG8-MPA Involved)

Q: Ahh, how about the people? Do they not care about the rest of the community

A: They don't care because if they do care they would not go inside (BIDI2)

"Some will go there and destroy the MPA because they don't care about the nature. So people don't care even if the fish will eventually run out" (P1-BFG2)

These are very general remarks about encroachers, previous chapters and sections have described various instances where individuals may encroach despite being concerned about the state of the environment, the future or despite positive attitudes towards the MPA. However these comments portray encroachers as less concerned about the environment or the future than others that act in favour of the MPA.

When asking individuals to describe an "encroacher", or why some encroach, many responses used the term "hard headed".

"M: Why do others like the sanctuary but they don't have an action?

P3: They are hard headed" (BFG4-Fisher's Wives)

A: Some are hard headed and still encroach even if they know that there are some people monitoring, they don't mind, that is why people shout at them" (CIDI4)

Determining what is meant by "hard headed" proved to be a difficult task, it seems that many distanced themselves from these encroachers by using this term and grouping them as such. When asking what makes such individuals "hard headed", the answers given were very similar to the factors identified as influencing encroachment.

> "Q: Could you give me an example of a hard headed person?
> A: Those people who have less income can make people hard headed" (CIDI1)

> A: One thing that can make people hard headed is laziness. Those who are lazy. Because if they can catch easier and more, they can have easy income. And when they go fishing outside the sanctuary it is hard to catch fish and it is a long paddle" (CIDI4)

These two extracts suggest that laziness and poverty are thought to "make someone hard headed". However, most describe these individuals as both "selfish" and stubborn.

> Q: Can you explain to me what they mean by people that are hard headed? What does this mean?
> A: Hard headed people are the people who encroach numerous times, that even if they are caught by the office of the navy or even if they go to the barangay office several times, they are not ashamed
> Q: Why are they hard headed?
> A: Because the only think of what is today, they are not thinking what will happen someday or the future of the children. They don't also care the feelings of other people who are positive of the sanctuary.
> Q: What are their priorities? Values?
> A: They prioritize their selves, their wants of their family who have no food or any money for drink and gamble (BIDI1)

> Q: How can you tell if a person is hard headed?
> A: Even if you always scold that person he will always get inside the MPA (BIDI4)

> M: what will you do so that people are more positive?
> P1: Explain to them, let them understand slowly and clearly so that they will be positive
> P3: Others are still hard headed. They don't understand (SFG5-Fisher's Wives)

> Most of the people here are very hard headed, like now that the full moon is coming lots of them are encroaching, most of them are using hook and line. If you warn them, they just don't mind" (CIDI3-Known Encroacher)

These comments were made by full time fishers and fishermen's wives. It's interesting to note that the last extract was provided by an individual who is known to repeatedly encroach the MPA. Encroachers were therefore perceived as selfish individuals who do not care about others in the community and who will encroach despite the economic and social sanctions that are in place. These extracts agree with

CPR Theory which argues that in every common pool resource scenario there are a subset of users that "behave in a narrow, self-interested way and never cooperate in dilemma situations" (Ostrom et al., 1999). It is not explicitly stated but there is nevertheless a clear linking between these "hard headed" individuals and levels of economic desperation. It may be that these "hard headed" individuals cannot afford to care.

These notions of concern with regards to the environment and what it can provide for the future is one that appears to be important. Those that are considered less selfish and more concerned about the future state of the marine environment are thought to be less likely to encroach and more likely to harbour a positive attitude towards the MPA. Conversely those less concerned about the environment and more about the here and now are less likely to support the MPA. Furthermore, encroachers are often viewed as selfish individuals who do not care about the future or others in the community and act despite the social pressure that may be imposed against them. It should be noted however that there are some who, despite concern towards the environment, may still encroach as they can't or won't change their behaviour due to other factors.

3. *Jealousy*

The two previous sections highlight how solidarity and environmental concern can lead to increased support towards MPAs. However these impacts may be negated if "free riders" are perceived to occur. Indeed, Ostrom (1999) argues that due to the difficulty of excluding beneficiaries when considering common pool resources, the free rider problem is a potential threat to efforts to improve the long term outcomes achieved from the use of such resources. When free riding is a major problem it is thought that those who would be willing to reduce their own appropriations if others did (conditional cooperators) are unwilling to make a sacrifice for the benefit of a large number of free riders. I argue that in this case those free-riders or individuals who are acting in an individualistic way and disregarding the potential negative environmental impacts of their actions (by encroaching) may lead to inequity, perceived unfairness and jealousy amongst others in the community and affect their

support towards the MPA which in turn could lead to a decrease in support towards the MPA, including actions such as compliance and enforcement.

Many were found to be jealous of encroachers that were not caught. The following extracts suggest how one may feel less positive towards the MPA if they believe others are "free riding" and can escape without being caught.

> "They can think negative (towards the MPA) because they can see encroachers from other places who violated and that is unfair to them. That means the management is not working" (P5-BFG1)

> "P4; There were others (encroachers) that they get inside and they were not punished and the others they get inside and they paid the penalty so they are jealous because it is not fair. Which is not good
> P1: Yes, they will say "why is it that we pay for the penalty and they don't?" (SFG5-Fisher's Wives)

These comments involve "the others" or people that are from "other places". Encroachers are in fact often said to be from other villages.

> P4: But most of the people who encroach are not from Bonbonon
> P2: They are from the other places (BFG8-MPA Involved)
> P5: Others must follow the rules. I think people here like the sanctuary, the people who get inside are not from here, they are from other land-sites (CFG1)

> P5: Many people from the other place encroach
> P4: most of the encroachers are from the other place
> M: who are they?
> [They answer in chorus]
> P4: from Bacong and some other places here
> P1: from the up hill
> P3: from the other barangay (SFG1)

It is hard to prove whether encroachers are predominantly from other villages given the small number of people that are caught and sanctioned. However, this is the story and feeling given by the local villagers. What is important here is that many appear jealous specifically of foreign encroachers not being caught. Again this notion of inequity and fairness first identified in chapter 6 also appears to be relevant here.

> P2: And that's unfair for us because sometimes they don't pay the fines (BFG6)

> P4: Yes, it's true that we get mad and sometimes jealous because if we were caught we will pay for the penalty. (BFG6)

P2: The bantay dagat sometimes catch encroachers and sometimes they don't because they are from the other land-sites and that is unfair to us.
P5: Yes, that's true, they were caught and we were not, that's the reason (some are negative of the MPA) (CFG1)

Overall, the above extracts suggest that jealousy towards individuals encroaching and not being sanctioned can lead to negative attitudes towards the MPA. Some also mention how this jealousy can also lead to encroachment.

"Others will encroach because they saw someone who is encroaching. Maybe he is jealous" (P2-BFG6)
P5: They get jealous and they want to imitate. (SFG4)

P1: Some of the people from Suba will do encroachment and so the other people from the other barangay will imitate (SFG1)

A: What I did is to imitate what they did in my mind I can see bantay dagat are encroaching so I will also do what they did" (CIDI3-Known Encroacher)

In the last extract, a known encroacher admits to having encroached as he is following in the footsteps of other encroachers. It seems that the presence of encroachers who reap the benefits of poaching fish from the MPA but not getting caught can make others jealous and spur them to imitate these encroachers. This reinforces Ostrom's (2000) argument that individuals are most likely to cooperate with the rules if they believe that they will be effective in producing higher joint benefits. Monitoring and enforcement is thought to protect them against being a "sucker" and ensure (in this case) that individuals are not encroaching the MPA, reaping the benefits and not being caught. Furthermore, some co-operators will only initiate cooperative action if a sufficient proportion of others reciprocate. Some however are easily disappointed if others do not contribute and so reduce their own contribution, this in turn discourages other conditional co-operators from further contributions (Ostrom, 2000). It seems therefore that in this case, individuals are jealous of these free riders and may feel that they are a "sucker" which could lead to negative attitudes towards the MPA and a decrease in levels of their enforcement and potentially make them want to "imitate" the encroachers.

Others however mentioned that seeing other "free-riders" or encroachers, reaping the benefits without having to pay any fines made them jealous but would spur them to report and enforce the MPA.

"P5: We will also get jealous when others will encroach and we are not, and that is our sanctuary. So we will also report when we are jealous.
P3: We think, why are they not caught but we are?" (CFG1)

"P3: We are not allowed to go inside, we don't let others also get inside so that is fair to us
M: Ahh
P1: They will be happy if they get big fish. So we don't let them get inside" (CFG2)

"If I have more catch [than others in the community], most of them will say, try to monitor X because he has more catch, this means maybe it is from the sanctuary. Follow him if he goes fishing because that fish is from the sanctuary." (CIDI3-Known Encroacher)

We can see therefore that this idea of equity and fairness is very important; if one is not allowed to encroach then one ensures others respect the rules also. Jealousy towards others that are free-riding may therefore actually promote enforcement. Fehr and Gächter (2005) agree and argue that free riding can cause strong negative emotions among co-operators, these emotions in turn may trigger their willingness to punish the free rider. It is also interesting to note in the last extract by a known encroacher that encroachment can be indicated by experienced observers by the catch itself whether or not the fishing activity is observed.

Some have been caught previously and been made to pay the fines, this makes them even more jealous of others that can escape without bearing the costs and hence they may want to report them.

"They will report especially when they already had to pay the penalty so that it is fair on their part" (P3-CFG1)

"Others who have been caught, must report because they were also reported by other people before" (P2-CFG5)

"I will report because my husband was reported and paid the penalty. So I will also report to be fair" (B3-CFG6-Fisher's Wives)

It is interesting to note that these comments suggesting that those that are caught are more likely to report have occurred predominantly in Candaping B (Table 3.7). I argue this is because there are higher levels of enforcement and sanctions in Candaping B due to frequent visits from the provincial and municipal coastal police. More encroachers have therefore been caught and are jealous that other encroachers may have been lucky enough to reap the benefits without being caught and made to pay the fines.

There are different aspects of jealousy that can therefore influence support in rather contradictory ways. Whilst other encroachers not getting caught may result in negative attitudes towards the MPA and negative actions, it can also encourage some to report encroachers themselves.

4. Locus of Control

Whilst solidarity, jealousy and concern for the environment may motivate some individuals to cooperate and act in favour of the MPA, some may feel that they themselves cannot make a difference and will be less likely to take action. If free riders are occurring, instead of trying to remedy the issue, they may feel that the best course of action is to carry on as normal as they themselves feel that their actions will have no impact. The concept of locus of control has often been alluded to principally in psychology and behavioural research. It represents an individual's perception of whether he or she has the ability to bring about change through his or her own behaviour (Newhouse, 1990). In contrast to previous sections on empowerment and power to enforce, locus of control is more to do with agency and how individuals who are not formally recognized feel they can make a differences by their actions. A meta-analysis of 128 pro-environmental behavior research studies found that the locus of control was associated with pro-environmental behavior (Kollmuss and Agyeman, 2002). This may influence individuals' MPA related actions and therefore it is important to determine whether locus of control may be influencing support towards MPAs in this Filipino context.

I suggest that ones' locus of control may influence behaviours with respect to the MPA. For example, one may not help monitor or enforce the reserve if they feel it will not make any difference. Those who believe their actions can bring about change are said to have a strong "internal locus of control" and may be more supportive of the MPA as they feel that their contributions may help sustain the MPA in the long run. Those with an "external locus of control" may feel that change can only be brought about by others and may be less likely to act in favour of the MPA.

Those with a higher internal locus of control may therefore have better control of their behavior and may be more involved in specific situations or issues than those with a

lower internal locus of control (Elster, 2009). In the Filipino MPA context, it seems that a number of respondents did not want to get involved in answering questions surrounding the MPA and people's support towards it.

> "M: Ah, OK. Does your community support the MPA?
> P2: We really don't know ma'am, the man that knows about that is only Wilson" (BFG3)

> "M: Do you think all of the people here in Bonbonon support the MPA?
> P3: I don't know, maybe the FA leaders know about that" (BFG1)

Despite being aware of the adjacent MPA, it seems that some did not want to provide any information on the issue. This may be due to feelings of solidarity and not wanting to discuss others' lack of support towards the MPA. However it is also possible that these fishermen from Bonbonon do not want to get involved and are unaware of what others think about the MPA. The fishermen are also suggesting that the question be asked to someone with more power or more involvement with the MPA. This is closely linked to some arguments made in chapter 7 about how many feel that it is not their "right" or "role" to enforce the MPA by warning encroachers or even by reporting encroachers. They themselves do not get involved and they may feel it is up to "others" whose job it is to do the work. These respondents may have an external locus of control with regards to the MPA, meaning that they believe that some higher power or other people control their life and are less likely to support the MPA or act in favour of the MPA.

Especially in Candaping B, it seems that some part time fishers are relying on "others" to act and feel that their actions themselves will make no difference.

> "Even if we don't like the sanctuary we will have to follow the rules because it is already there" (P3-CFG2)

> "That is the project of the government. We can't do anything about that because it is already there" (P5-CFG3)

> "I have nothing to do but to agree because it is already there" (P6-CFG6-Fisher's Wives)

These extracts demonstrate how some perceive their lives to be controlled by external factors such as people or circumstances and are less likely to believe that they themselves can make a difference. Some could be more judgemental and argue that certain individuals are keen to let others do the work on their behalf. It is difficult, and

outside the scope of this thesis, to determine whether individuals feel powerless or whether they would simply rather that somebody else acts on their behalf. I should specify that these comments are made by non full time fishers and hence dependence on the fishery may also be closely linked to whether one feels they can make a difference in terms of the MPA. Furthermore these comments pertaining to an external locus of control were made from Candaping B. This may be because there is a lot more influence from higher levels of government and other NGOs from outside the community and a more top down approach is implemented than in Bonbonon or Suba (chapter 3). In Bonbonon and Suba, many of the decisions come at the village level and there is far less external support.

Interestingly, it seems that an external locus of control could prevent attitudes from translating into actions, that despite potential negative attitudes towards the MPA, many will respect the MPA and its rules as it is, rather than negotiate or complain.

This perceived external locus of control may be partly explained through an understanding of Filipino history. Andres (1981) argues that many Filipinos tend to look at the world and nature as controlled by other beings different from himself and governed by forces above him. This fatalism thought to lead to a belief that one's life is shaped and directed by superior forces beyond one's control. Indeed some of the above extracts do support this notion. However some respondents do feel they can make a difference:

> "I will make people follow me and I want to be a good example so that they will not abuse" (P6-BFG5-Fisher's Wives)

> "We have to discipline ourselves so that the shells will not be fewer" (P5-BFG3)

> M: Does the sanctuary affect the people?
> P1: The people affect the goodness of the Sanctuary (BFG8-MPA Involved)

> "We will also watch over the MPA even if we are not a member of the bantay dagat" (P3-CFG1)

> "In my place, even if I am not a bantay dagat, I will still report encroachers" (P3-CFG5)

Given that many of the Filipino MPAs are known as "community based", it is surprising to hear that many individuals have an external locus of control and feel that it is up to others such as the local government to take care of the MPA. It is clear that

some individuals have an internal locus of control and feel that as fishers or members of the community they can have an impact on the MPA. However others are less likely to act as they feel they will make no difference. Ones locus of control can therefore play a large role in influencing attitudes and whether one enforces the MPA or not and can hence influence support. It is however is a complex personality characteristic which is in turn influenced by a number of different factors (Kollmuss and Agyeman, 2002; Mitchell et al., 1975). Some factors already discussed may encourage those with an external locus of control to act in favour of the MPA. Ensuring there is cooperation between individuals and a "*bayanihan spirit*", or allowing for mild external monitoring so that all feel it is their right to enforce the MPA (see chapter 7) for example, may spur some to report encroachers and comply with MPA rules through facilitating an internal locus of control.

5. *Fear*

Locus of control is a relatively general theme that can influence whether an individual undertakes an MPA related action. However other more specific factors may also prevent MPA related actions, these will be explored in the following few sections. Fear or "being scared" to act for example is a theme which was extensively discussed in all three villages. Two specific aspects of this theme arise from the focus group and in depth interviews; whether individuals are scared or not to encroach and secondly whether individuals are scared or not to report enforcers.

As discussed in chapter 6, sanctions were found to influence support towards the MPA. It is indeed suggested that those that do not encroach are those that fear and are most "scared" of the fines. This is illustrated well by an extract from a known encroacher from Candaping B:

> "No, I didn't do it again (encroach), it is so difficult because on the 3rd time they will put us already in jail so I will never do it anymore, and you need to pay 5000 pesos and one year in jail. Now I still have to pay because my case is in court already but I don't have enough money because I don't have a job" (CIDI3-Known Encroacher)

Likewise, some also mentioned how those that do encroach are those that are less scared of the fines, the guards or of getting caught.

"Others don't care if they have been scolded and fined many times, they still do that (encroach)" (P5-BFG6)

"Others encroach because they are les scared" (CSSI4-Known Encroacher)

It is specifically mentioned how those that do encroach may be more likely to be drunk

"Some are drunk and are not afraid to violate" (P4-BFG2)

"Usually the encroachers are drunk, that's why they have the courage to encroach" (P6-BFG6)

"Usually the encroachers are drunk, that's why they have the courage to encroach and when they get more fish they sell it and buy tuba [local coconut wine]" (P6-BFG6)

It is also suggested that encroachers use the fact that they were drunk as an excuse.

Drunkenness is just their reason when they are caught. They just make it as their alibi so that they will have a reason (BIDI2)

Interestingly fewer comments were made by those from Suba towards fear of getting caught (Table 3.5), this may be because the enforcement in Suba is considerably poorer (chapter 3) than in Candaping B or Bonbonon. It seems however that for the latter two, whether individuals are scared to encroach or not and different levels of fear is an important factor influencing MPA compliance.

The second important aspect of this theme is whether individuals are scared to report encroachers. Frank Lynch (1964) argued that social acceptance is an important Filipino value and hence smooth interpersonal relations are highly regarded by many. There is therefore a desire to get along with others in such a way as to avoid outside signs of conflict and smooth relations often take precedence over other value (Pe‑Pua and Protacio‑Marcelino, 2000). This suggests therefore that individuals may not be keen to report encroachers as it may impinge on their relationship with them. Furthermore, it is argued that when some violate a norm they may feel a deep sense of shame, a realization of having failed to live up to the standards of society. If one is shamed, or this value is attacked, it is a wound to the ego, self-esteem or "amor propio" and may result in violent retaliation. For example, there are cases in which incompetent school teachers were not fired because such an action would make both the dismissed person and his relatives shamed or "*kahiya-hiya*". The supervisors themselves fear that the relatives of the dismissed person may do them actual physical

harm, in addition to the inevitable threats and reprimands for the supervisors harsh and terrible treatment. It is as if one family member is "shamed", all the family is implicated (Andres, 1981).

Being scared to report is consistently mentioned throughout the three villages as a factor influencing individuals' action towards the MPA. Indeed many respondents argued that they themselves or others are scared to report as they do not want to make the encroachers "angry".

> Others (encroachers) get mad, sometimes if someone will scold that person who encroaches, the encroacher will fight back and so it will cause trouble (BIDI4)
>
> "Others are afraid to report because the encroachers will get angry with them and it can cause trouble" (P2-CFG3)
> "Sometimes people will text, sometimes not depending on if they are scared of getting into trouble or not" (CSSI4-Known Encroacher)

It seems from the above extracts from fishers and non-fishers that many do not want to damage their relations with others and hence are not keen on enforcing MPA rules and regulations by reporting encroachers. A high praise for many is that one is "*marunon makisama*" (easy to get along with) and therefore it may be important to report anonymously so that relations are not damaged (Macalma, 2002). Athough some may report unknown encroachers; some also mentioned that they wouldn't report family or friends due to strong kinship ties.

> M: What are the reasons?
> P4: Because they were friends that's why they don't report
> (Everyone agrees)
> P3: Friends will get mad if they were reported by their friends. To avoid misunderstanding, it's better to keep quiet (SFG6-Fisher's Wives)

There is a strong suggestion that individuals are not solely scared to upset encroachers, make enemies and hinder interpersonal relations. The following extracts highlight how many are scared and fear for their safety if they report encroachers, as the self-esteem or amor propio of fishers and their wives is damaged and they can become violent.

> "M: Why were they not caught?
> "P3: Because if you scold that encroacher they will be angry and may then bring in their deadly weapons and so people are afraid" (BFG6)

> "If the encroachers are bringing their guns, we will be afraid" (P6-CFG6-Fisher's Wives)

> "For the encroachers from other barangays, people will just let the in charge warn them because they are scared that maybe these people have guns or machetes or possibly witchcraft. That is why people leave them" (CIDI2-Fisher's Wife)

> P2: they have guns, maybe the will shoot us if we report (SFG1)

Some therefore perceive reporting encroachers to be quite a dangerous activity, especially when they are unsure as to who the encroacher is.

Wanting to remain friendly with other individuals and being scared to "hurt their pride" or "amor propio" both seem to prevent individuals from reporting encroachers. The following extract suggests that despite incentives such as cuts from fines, some may still remain unwilling to report encroachers.

> "Q: If people knew they would get a percentage from the fine if they reported, how would this affect the community?
> A: I think some of the people know about that because I hear from Maria that 25% is for the person who can report. That is why [a barangay official] told me that I have to be alert if I see encroachers because I will receive a percentage of the fine. But I don't want to do that, I will let the in charge do this because I don't want that there are people who hurt me and get upset if I do that" (CIDI3-Known Encroacher)

Being afraid to report encroachers appears to be a big issue. It suggests that despite potentially positive attitudes towards the MPA, many will fail to act in favour of the MPA by reporting infringements. The extracts further suggest that even those involved in managing the MPA are scared; they face similar fears to the fishermen as they have to confront friends, family, empowered individuals and potentially dangerous individuals with weapons.

6. Laziness

Fear of reporting is not the only barrier mentioned which may be preventing individuals from acting in favour of the MPA. Laziness is another theme that arose throughout the three sites as being an important factor for compliance.

Many mentioned that it was "lazy" individuals that were more likely to encroach:

> "P5: They [encroachers] don't want to go fishing too far, maybe because they are lazy
> P3: Yes, that is the reason because they can get fish faster and much easier" (BFG6)

P1:To make the story short, he is lazy to catch fish in the ocean that is why he gets inside the sanctuary

P4: That's true because there are lots of fish inside and you're sure to catch more and it is easier (BFG8-MPA Involved)

"Because they are lazy that is why they don't go further out" (P4-CFG6-Fisher's Wives)

P2: Others are lazy because they don't want to go fishing at the middle of the ocean, they go inside the sanctuary (SFG2)

This theme is quite closely related to that in chapter 4 on MPA location. It is mentioned across the sites and by full time fishers, non fishers, fisher's wives and those involved in MPA management. In all three cases studied, and in many cases in the Visayas MPAs are close to shore, and hence boats have to go around the MPA and further out to the ocean to catch fish. The extracts presented above suggest that "lazy" individuals may be less likely to expend the extra effort and "tire" themselves out by contouring around the MPA and further out to shore. Furthermore, as one points out, they can "get fish faster and easier" within the MPA.

The rather derogatory term 'lazy' is also mentioned to act as a barrier between positive attitudes and compliance.

"They like the sanctuary but because they are lazy they will encroach because it is closer. So it is easy to get money" (P4-BFG4-Fisher's Wives)

"Some still encroach despite a positive attitude…it is easier to catch food" (CSSI2-Fisher)

It seems therefore that those "lazy" individuals are more likely to encroach, potentially despite a positive attitude towards the MPA. It may be that these individuals are thinking about the short term benefits and are less worried about how they are perceived by others in the community.

7. *Pity*

Pity was also invoked as being a reason for not acting in favour of the MPA. "Awa" or "*Kapwa*"; pity, sympathy, compassion is another strong Filipino value. Although the common translation of *kapwa* into English is "both" or "fellow being" the social significance or meaning of *kapwa* is actually thought to be the unity of the "self" and "others" (Aquino, 2004; Enriquez, 1986). It is at the core of interpersonal relations in

the Philippines and highlights the importance that many give to harmonious relationships (Jocano, 2000). Andres (1981) argues that it is a value which is much abused and it is often evoked by individuals who wish to overturn established policies and procedures. Indeed, across the three villages, many individuals feel pity towards certain (or all) encroachers, irrelevant of how they feel towards the MPA itself.

> "Yes, that someone will be pitied because he would have to pay the penalty" (P2-BFG7)
> "M: If someone or one of you is getting inside and they paid the penalty, what will you feel? Do you still like that man?
>
> P1: For me it is pity but that is his fault so he has to pay the penalty. We feel pity only." (CFG3)
>
> Even the people in favour of the MPA don't report as they feel pity for the fishermen and therefore leave them.(SSSI10-Ex Barangay Official)

Some individuals however are more specific and only feel pity towards certain types of encroachers. In the Philippines, one's family obligations often take precedence over everything else and this can involve not only the immediate family but also distant family and close friends (Andres, 1981; Aquino, 2004). It is not surprising therefore that some specifically mention that they would pity friends and family if they were to be caught encroaching.

> "M: If your friend will go and encroach inside, what will you do?
> P2: I will lend him my money so that he will not encroach because I don't want him to be caught and have to pay the penalty" (BFG7)
>
> P5: Family will be pitied if you only depend on the ocean and your wife also doesn't have a job. The family will be hungry (SFG5-Fisher's Wives)

The above extracts suggest that many individuals do indeed feel pity towards encroachers, especially when it involves friends and family. There is also mention however that pity may influence *how* one acts upon seeing an encroacher and enforces the MPA.

> "[Pity] That is the reason why we scold them [instead of reporting]" (P3-CFG3)
>
> "We will warn someone if they go inside because we feel pity for them because they are poor and others don't have the money to pay the penalty" (P4-CFG4)
>
> "If he is alone, he won't report someone encroaching as it is often somebody who is poor and is his livelihood" (BSSI5-Fisher's Son)

If one pities an encroacher therefore, it seems that they are less likely to report to an official or impose the fines, it is more likely that they will warn the encroachers that they are not allowed to be inside the MPA or turn a "blind eye" entirely at the situation. This does not necessarily lead to a decrease in enforcement of MPA rules and regulations as encroachers are warned and it may increase levels of compliance.

It is clear that "pity" is an important factor to consider when looking at MPAs and their management. However it is difficult to ascertain whether these notions of "pity" influence support in a positive or negative way. Nevertheless it seems that it can promote the warning of encroachers rather than the number of reports made to enforcers.

8. Freedom

At a very crude level, regardless of the positive or negative impacts an MPA may have on social, ecological or economic aspects of the affected community, it imposes a set of rules and regulations which restricts the freedom of those affected. Irrespective of how some feel about "free riders" and whether encroachers are made to pay penalties or not, some simply resent the fact that some of their traditional fishing grounds are now "closed off" and no longer available to them.

> "M: What do you think, other people don't like to have the sanctuary?
> P5: They want to be free in going fishing." (BFG1)

> "M: Why don't you like the sanctuary?
> P6: Because I can't go there [Laughing]. Because of the penalty" (BFG3)

> "Because of that [the MPA] we are not able to go fishing anywhere we want. That is why I don't like to have that sanctuary. I don't know about the others" (P3-CFG2)

So it seems that this notion of freedom or of being told what one can or cannot do does not lend itself to a positive attitude towards the MPA with some fishermen as they perceive it as a threat to their freedom. Others go further and explain how it is their "right" to fish where they want as a Filipino.

> " If someone will go inside the MPA, he will do something to the sanctuary and someone will scold the person. So where is the right as a human being living here? I mean why is it that he can't go inside even if he has the right" (P1-BFG5-Fisher's Wives)

> "The Filipino attitude towards conservation is different to a Western one. Filipino's will catch even the smallest fish for any income. They think it's their right" (BSSI7-Ex MPA Leader)

238

M: do you like the new law?
P3: No we don't because the fish is in the ocean already so it's free to catch (SFG4)

It's interesting to note also how, gear restrictions for example also can result in resentment of being told what to do and being restricted as to what they can do to feed their families.

"It's good to have the sanctuary but sometimes others don't like the sanctuary because they cant use other kinds of net." (P1-BFG3)

M: What are the other reasons why they don't like to have the sanctuary?
P4: Others don't want to have the sanctuary because they can't use their nets (SFG2)

9. Conclusion

I highlighted in the introduction how a lack of consideration of Filipino values and culture can contribute to failures of a number of different strategies undertaken throughout different settings. I argue in this chapter how an understanding of Filipino values and culture can help in interpreting the various feelings and emotions relevant to MPAs that arise and can influence support towards it. Whilst some of these feelings and emotions may be held by ones'self (e.g. locus of control, environmental concern) others may arise out of judgement and in relation to others (e.g. pity, fear, jealousy). In contrast to the previous chapter which also focuses at individual level factors, this chapter considers the wider community, interactions and social relations and recognizes the importance in not considering individuals in isolation from others within the community.

If one fails to take into account the feelings and emotions, or "hearts" of the people affected by the MPA it can have a negative impact on the support of individuals towards the MPA. It is important to consider the Filipino value system and design and manage an MPA in a way that doesn't contradict such a system.

A number of values and cultural factors are suggested as being important factors influencing both attitudes and actions towards the MPA (Fig.8.1). The importance ascribed to smooth interpersonal relations, kinship or family ties and that to "hiya" or shame can influence whether one acts in favour of the MPA or not. Whilst it may initially suggest that individuals will prevent their kin or family to encroach the MPA

as they do not want to be "shamed" or cause tension within the community, the converse seems to be occurring across the three sites. Individuals fail to report as they are "scared" to shame their own family and do not want to cause friction within the kinship system, and would prefer to keep interpersonal relations as calm or smooth as possible.
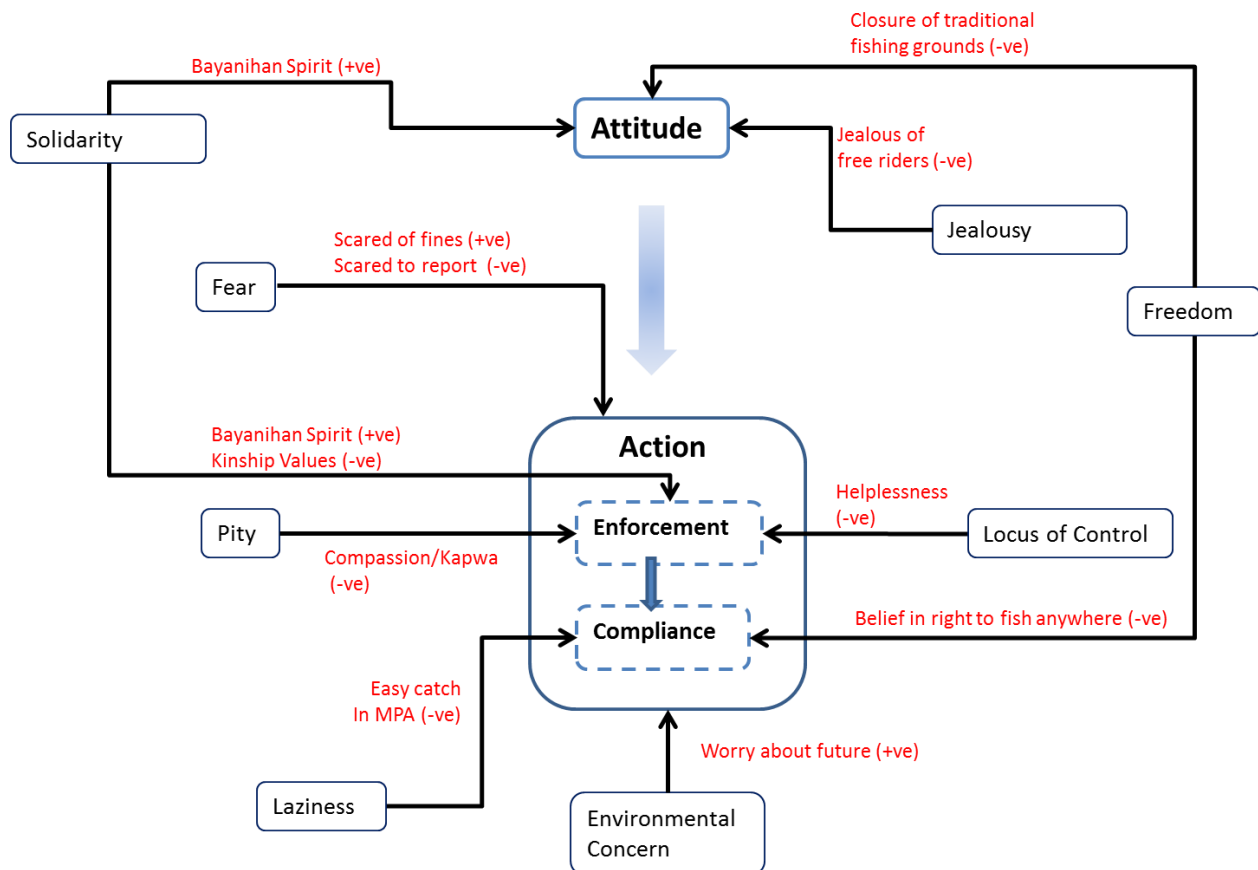
Fig.8.1. Summary of feelings and emotions and how they influence the different aspects of support towards the adjacent MPA.

Similarly, the "*bayanihan*" team *spirit* could also be encouraged to increase the solidarity value of MPAs by having individuals cooperating with each other and acting in favour of the MPA. Some may feel helpless and powerless, as they believe that one's life is shaped by forces beyond one's control. This may prevent individuals from cooperating and acting in favour of the MPA irrespective of their attitudes, represented by a high external locus of control.

Other individual feelings and emotions were best explained by differences in personal characteristics and personalities (Fig.8.1) rather than Filipino culture and values. Issues such as jealousy towards other encroachers, laziness to act, a lack of

environmental concern or concern about the future of the community and a desire for freedom were all factors that were also found to negatively influence attitudes and actions towards the MPA.

Recognizing the feelings and emotions of affected individuals, which could arise from the implementation of various natural resource management strategies is rarely accomplished. This chapter identifies a range of feelings and emotions which can arise due to cultural factors and values, differences between individual personalities and characteristics and highlights their importance in influencing support towards MPAs. It emphasizes that there is a need to develop and manage MPAs that take into consideration and reflect these factors.

Chapter 9: Synthesis Chapter

There is always an easy solution to every problem - neat, plausible, and wrong.
- H. L. Mencken

The rationale of this thesis initially was to try to understand community support towards MPAs or other NRM strategies. Many MPAs are often considered as "failing" to reach their various objectives. A large amount of work has already been carried out attempting to determine which factors influence the success and failure of these strategies (Christie et al., 2009; Milne and Christie, 2005; Pajaro et al., 2010; Pollnac et al., 2001) and an overwhelming number of studies suggest that a lack of "community support" is a major obstacle (Aldon et al., 2010; Allegretti et al., 2012; Beger et al., 2004; Christie, 2005b; Christie and White, 1997; Courtney and White, 2000; Infield and Namara, 2001; Russ and Alcala, 1999; Stoffle and Minnis, 2007; Tissot et al., 2009; Yasué et al., 2010). This study attempts to deepen our understanding of community support by explaining what it involves and what influences it in the case of three community based MPAs in the Visayas region of the Philippines.

Much to my frustration, understanding community support proved to be a challenging and at times a rather confusing endeavour. As can be seen from the previous chapters, a large number of factors were identified as having an influence on support, many of which are inter-connected and can't be treated in isolation from each other. Furthermore, different factors had influenced different individuals within the community differently. Together with the fact that different factors play different roles over time, many of which cannot be changed and just need to be accepted, building and managing MPAs in a way that positively affects support seems like a difficult task to accomplish.

Mencken's quote serves to reassure me that there is no easy or clear way to develop an MPA or NRM strategy that is supported by the community. When one considers socio-ecological systems and their interactions at a fine spatial scale, it becomes apparent that there will be no clear and easy solution. The start of this chapter seeks to

explain how and why determining what influences support has become such difficult question to answer.

Nevertheless, the concept of community support has allowed the investigation of how to contribute to improvements to NRM strategies and MPAs through a different lens to those seeking to make improvements by looking at factors correlated with success and failure. I briefly summarise the findings in previous chapters as to what influences the attitudes and MPA-related actions of individuals and discuss the link between attitudes and actions of individuals. The latter part of this chapter then looks to see how the PEB and CPR literature has both contributed to this work, and vice versa how this work has contributed to those fields, but also highlights how a community support approach can contribute to work on NRM and MPA success.

Finally I will discuss where this notion of community support leaves us and how it may contribute to different fields of research in the future. Despite the complexities of the issue, I hope to convey the importance in considering the support of the community when working with MPAs or other NRM strategies and to provide new ways of thinking about "community support".

1. Why there is no clear and easy solution

A number of factors were found to influence different aspects of community support, however, I argue here that this does not mean there is a clear, straightforward and general way to create and manage MPAs in a way that is supported by the community. This thought echoes one made by Ostrom et al (2007b) who highlight that although most practitioners and scholars assume that resource governance problems can be represented by simple models of linked SES and deduce general solutions, most of these simple models fail. The following sub sections attempt to explain in detail why this is the case in my research context.

Plurality of Factors and Interconnectedness

One issue that became apparent early on in the analysis of the data is the sheer number of themes and factors identified as influencing support. Although many

factors were consistently found across the three sites, 28 broad factors were found to influence attitude, enforcement or compliance of individuals towards the MPA (Table 9.1). Furthermore these factors were argued to influence support through 58 different ways or mechanisms. It is clear therefore that determining what influences community support is a complex issue.

The fact that so many factors were identified can make it difficult to carry out multivariate quantitative analyses. If one wants to determine which factors best predict attitudes or actions, a very large sample size would be needed if all factors were to be included in the analysis (Tabachnik and Fidell, 2007). This highlights a limitation in solely quantitative work which is concerned with predicting behaviour and suggests qualitative work or at least mixed methods research is required to get a fuller picture, and the complexity of the issue at hand. To look at each factor independently from each other would be problematic as many of these factors are highly interrelated. I highlight throughout this thesis some of the connections between factors that have been explicitly stated by respondents, some factors that are statistically correlated with each other whilst some other links are purely common-sensical.

This is an especially important consideration if municipal, local government, NGOs, Fishermen's associations etc want to design, implement or manage an MPA and ensure that it maximises support from the community. Consider for example the desire for guards to be present (chapter 6). This is thought to lead to both more positive attitudes and MPA related actions. However if these guards treat encroachers differently or shout and threaten the encroachers (chapter 6), the potential benefits of having permanent guards enforcing the MPA may seriously be hindered. Hence, support towards the MPA may not increase but in fact decrease in response to the intervention.

Table 9.1. Factors and their mechanisms found to influence attitude, enforcement or compliance of individuals towards the MPA in this thesis. Grey cells represent no empirical evidence of influence.

	Factors	Mechanisms	Attitude	Enforcement	Compliance
MPA Design	**MPA Benefits**				
	Economic	Perceived Fishery Spillover	Positive	Positive	Positive
		Ease of Catch	Positive		
		Temptation			Negative
	Non Economic	Conservation Value	Positive		
		For Future	Positive	Positive	Positive
		Aesthetic	Positive		
		For the community	Positive		
	MPA Size	Fishing ground reduction	Negative	Negative	Negative
	MPA Location	Visibility		Positive	
		Temptation			Negative
		Busy Area		Negative	
	MPA Network	Jealousy of others' lack of MPA	Negative		
		Success stories	Both		
	MPA Boundaries	Clear Boundaries/No excuses	Positive	Positive	Positive
Socio-Economic Characteristics	**Wealth**	Poverty/Necessity	Both		Negative
		Ability to Pay Fines			Negative
	Asset Holding	CellPhone		Positive	
		Flashlight		Positive	
	Dependence on Fishing				
	Fishing Experience				
	Income from Fishing				
	Job Diversity	Ony Job/Necessity	Negative	Negative	Negative
	Time Spent Fishing				
	Gears Used and Mobility				
	Gears Used				
	Mobility				
	Empowerment				
	Participation/Influence	Formal Involvement	Positive	Positive	Positive
		Pride/Status of Participation	Positive		
		Awareness			Positive
	Power to Enforce	Not up to them		Negative	
	Knowledge/Expectations				
	Knowledge of Objectives	Knowledge of potential benefits	Positive	Positive	Positive
	Expectations	Belief that objectives will be attained	Positive		
	Knowledge of Rules	Knowledge of cost of being caught			Positive
		Clarity of Rules		Positive	
		Pity towards those unaware of rules		Negative	
Management	**Managenent in General**	"Strong" Management	Positive	Positive	Positive
	MPA Leadership	Clear Perceived Leader	Positive	Positive	
	Fisherman's Association	Members responsability to report		Positive	
	Institutional Cooperation	Abandoned by external institutions	Negative		
		Involvement of powerful institutions	Positive	Positive	
		No Communications between institutions		Negative	
	Continuity of Governance	Changes in Governance	Both	Both	
		Coordination between governments	Both	Both	
	Village Politics	Corruption to be re-elected		Negative	
	Sanctions	Fines		Both	Positive
	Guards	Continuous Guard	Positive		
		Free Riders	Negative		
		Wage for Guards	Positive		
	Unfair/Corrupt Enforcement	Not all are fined	Negative		Negative
		Trust of enforcers		Positive	
	Angry Enforcement	Shouting at encroachers	Negative	Negative	Negative
	Unfair Wealth Distribution	Unaware of where money generated is	Negative		
		Cut from fines	Both	Both	
Feelings/Emotions	**Solidarity**	Bayanihan (for good of everybody)	Positive	Positive	Positive
		Kinship Value		Negative	
		Hiya (shaming)		Negative	
	Locus of Control	Up to others/Fatalism		Negative	
	Fear	Scared to Encroach			Positive
		Avoidance of Conflict		Negative	
	Pity	Pity towards encroachers		Negative	
	Laziness				Negative
	Environmental Concern	Concern	Positive	Poitive	Positive
		Selfish (hard headed)			Negative
	Jealousy	Towards Free-riders	Negative	Positive	Negative
	Freedom	Resent restrictions	Negative		

The above highlights an example where a change in one factor can lead to an increase in support via one mechanism and a decrease in support via different mechanisms due to its relationship with other factors. In this case, it is imperative to be clear of the potential consequences of certain interventions on support. It may not be easy to accomplish, but I would argue that being aware of the range of factors and the ways they influence support, it becomes easier to predict the potential repercussions of these interventions and prevent mistakes.

A change in one factor or theme also may result in positive changes in other factors or themes and hence they operate synergistically. Consider another example; suppose that corrupt or unfair enforcement levels are curbed or minimised substantially. This would lead not only to positive attitudes, levels of enforcement and compliance as trust would increase towards the enforcers but it would also lead to increased levels of fear of encroachment for some (fear of being caught by all, bribes no longer work, powerful are also caught) and hence have a positive effect on compliance, would decrease levels of jealousy (no free riders to be jealous of) and also lead to more positive attitudes and MPA related actions.

Whilst this study does not explicitly state all the potential links between factors, it is nevertheless important to consider the plurality of these factors when estimating how interventions may influence community support.

Differences at the Individual Level

Another issue that needs to be acknowledged when investigating support of the community is the differences that occur at an individual level. Not only does one need to consider the different factors that influence support and how they relate to each other, but one also needs to appreciate how these factors can influence certain individuals or groups of individuals differently. As mentioned in chapter 2, whilst it is important to focus at the community level, the interests of a group are not the same as the actions and beliefs of that group and it is important to distinguish between groups and individuals (Agrawal, 2005). Certain interventions or effects of an MPA may impact some within the community positively but others negatively (Fabinyi, 2008)

246

and hence it is important to consider different individuals within the community and their support towards MPAs. Chapters 7 and 8 focused on these individual level characteristics, how they influence support and how they may mediate the impacts of community level factors on their support towards MPAs.

Chapter 7 for example, highlights the fact that there are different individuals or groups of individuals with varied socio-economic characteristics that may occur within a village. MPAs have been argued to have varied effects on different individuals within a community depending on their wealth (Christie et al., 2003), dependence on the fishery (Gelcich et al., 2007) or types of fishing gear used (Dimech et al., 2009) for example. Although I have found these factors to influence support towards MPAs, any intervention which focuses on these factors may only influence the support of certain individuals or groups. Providing alternative livelihoods for fishermen therefore may increase support towards the MPA but only for those fishermen that were highly dependent on the fishery in the first place. This could be problematic as some respondents argued that it is those less dependent part time fishers that were less supportive of the MPA in the first place. It is therefore important to consider the fact that certain interventions may have different ramifications for different individuals within the community when attempting to develop, implement or manage an MPA.

The same logic applies to self-perceived levels of participation in MPA decision making or environmental education. I identified both these factors as having an influence on support towards MPAs. However, improving environmental education within communities may only have a strong impact on these individuals with little environmental education or knowledge of MPA costs and benefits in the first place. I would argue for example that although those that were aware of potential benefits of the MPA were significantly more likely to support the MPA (chapter 7), only 24 respondents (14% of total) could not provide a valid reason as to why the MPA was implemented. Environmental education or MPA awareness initiatives, although important for support may not have a big impact in the three villages studied as many were already aware of the MPA and its rules and objectives (Fig.7.12).

Individuals may vary in their socio-economic characteristics but also have various emotional responses towards MPAs and NRM interventions which may not easily be

measured quantitatively. The notion of "bayanihan" (for the good of everybody) for example was described in chapter 8 as being an important cultural value which may have a positive effect on community support. However some individuals may have a strong external locus of control and believe that they themselves can make no difference to the situation and are unlikely to act despite the fact that the bayanihan spirit motivates other individuals to cooperate and act in favour of the MPA. Furthermore, some individuals may be more likely to be scared of encroaching irrespective of the chances of being caught or fines depending on their personal and emotional characteristics, in which case, increasing guard patrols or the fine imposed, may make little difference to their MPA related actions for these individuals.

Certain factors may therefore influence individuals differently. These differences between individuals in their socio-economic or personal and emotional characteristics can also help explain why certain factors can influence their support towards the MPA.

It becomes increasingly clear that one cannot just look at "the community" as a homogeneous structure (Allison and Horemans, 2006; Coulthard et al., 2011a). To investigate what influences support and help explain it, one needs to look at the different individuals within the community and how their social relationships with others in the community and interactions can also influence support. Although environmental psychologists and the PEB literature focus at the individual level, those interested in natural resource management and the common property resource literature often consider communities as a homogeneous structure (Agrawal and Gibson, 1999). Whilst certain factors operating at the community level such as environmental education projects or MPA participatory meetings may influence support of the community, differences in the levels of participation between individuals within the community may still influence support (chapter 4). Frequent meetings may only have a positive effect on those few individuals that want to or can attend. Many individuals may not be able or not want to participate despite the participatory framework occurring within the community.

This has some important implications for the concept of "community support" itself. Whilst this is often called for when considering NRM strategies such as MPAs, it is fundamentally flawed as it involves individual attitudes and actions that cannot be

simply "summed up" to form an overall level of support. Furthermore whilst context or community level factors such as cultural norms, MPA size and location etc.. may influence attitudes, encroachment and enforcement, there are also differences between individuals in terms of their personality or socio-economic characteristics and therefore it may be best to also consider the support of individuals towards NRM strategies and MPAs.

I should make clear at this point that although individuals may respond differently to various factors, this does not mean that factor X will have an influence on individual A and have no influence at all on individual B. Different factors may influence different individuals to different extents, i.e. the direction of influence may or not be the same but the strength of its influence will differ between individuals. Measuring the strength of influence of different factors on individual attitudes or MPA related actions would prove very difficult to carry out. Whilst I investigate overall importance of different predictors of support in chapter 4, these are their importance for the whole community and not for specific individuals. For the latter, a more detailed questionnaire would be required with a list of deductive factors to explore and respondents would have to ascribe their perceived levels of importance to analyse strengths of influence of various factors on specific individuals. Despite the difficulties in assessing the strength of influence of certain factors, it is clear that not all are equally affected by the same factors.

In conclusion, different factors may influence different individuals differently and to different extents and in some case may have opposite effects. It is therefore important to consider individuals within the community when trying to understand their support towards NRM strategies such as MPAs.

Temporal Uncertainty

So far, I have explained the need to consider the plurality of factors influencing support, their interconnectedness and the need to explore these factors at both a community and an individual level. A temporal dimension however also needs to be considered when exploring community support. When going through the list of factors identified as influencing support throughout the previous chapters, it becomes

apparent that these are not static but will change over time. This in turn explains why support towards MPAs is variable, and indeed I argue that support for MPAs may wax and wane over time (albeit to different extents) irrelevant of the community or the MPA considered.

Let us consider factors that are related to the management of the MPA which can influence support. Throughout the villages, there was desire for "strong" management of the MPA and clear, fair leaders in place. Even if this is achievable, this is unlikely to remain the case over long periods of time. This is highlighted in Suba (chapter 3) where a number of individuals have mentioned that the management of the MPA used to be good but has deteriorated over time. This is likely in the Philippines where Barangay Captains get re-elected every 3 years. Furthermore, corruption and vote buying is rife in the Philippines (chapter 3) and due to the importance attributed to interpersonal relationships and reciprocity (Soriano et al., 2007) if a political leader buys you a gift or provides you with a favour, this is normally reciprocated with a vote in this leaders favour. The potential consequence of this is that despite a previous leaders' positive attributes, other different barangay captains may be elected. These leaders can have a very influential impact on the MPA and its support. As mentioned in chapter 6, a previous barangay official was very active in managing the MPA and was designated as the "MPA chairman". When the leader changed, so did the barangay officials and nobody was given a similar role under the new captain's management. This highlights how the MPA exists within a social and political setting, the struggle for political control can play a big part in MPA management. This has implications for MPA management which as a consequence can frequently change and become stronger or weaker over time, in turn influencing support.

Similarly, FAs offer another example as they are often dependent on help from barangay captains and local officials. These associations have been active and dormant over time at the three sites, mostly depending on whether the barangay captain is supportive of these associations or not (chapter 3). This in turn can affect individuals' participation and involvement with the MPA and can influence their support also.

It is not only the way the MPA is managed that is likely to change over time however. Socio-economic characteristics are bound to change as individuals' wealth may fluctuate, especially if some members of the family get jobs abroad and send money back which is a common occurrence (Andres, 1981). Individuals' gear used may change due to technological creep or wear and tear of old gear. Even the MPA characteristics can change. In Suba for example, the size and location of the MPA was altered a few years after its implementation, with important consequences for its support (chapters 6). Importantly, in early years many may have high expectations as to the benefits the MPA can produce, but these expectations may shatter if the benefits are not perceived by most over time.

Many of the influential factors and consequently the support towards MPAs can therefore change over time. This is an issue that my factorial analysis ignores and hence there is scope for future work on this issue. Some of these factors may change slowly over long periods of time (for example, MPA benefits), whilst some may change quickly (MPA leadership) and it is clear that support towards the MPA is unlikely to remain static.

Unalterable factors

The majority of this thesis seeks to understand and investigate what influences community support. It is important to mention however that actively influencing support towards the MPA may prove to be a very difficult endeavour for NGO's, MPA managers/leaders or municipal government officials to tackle. Not only because of the plurality of factors, their inter-connectedness, changes over time and different effects on individuals, but also because of the fact that some factors just can't be changed, they are "unalterable".

Some MPA design factors can be changed such as the size of the MPA and its boundaries. However, the presence of MPA benefits such as fishery spill-over is one that is difficult to control as it involves a wide range of factors. Indeed I describe in chapter 2 how the nature and type of MPA benefits such as fishery spill-over are still contested in the MPA literature. Furthermore, benefits such as fishery spill-over are dependent on a large array of factors. Current increases in the Filipino population (Salas et al., 2012), offshore trawling and IUU fishing from other countries (Palma et

al., 2008) and other environmental impacts such as climate change could mask, prevent or limit any fishery benefits occurring or being perceived from the MPA irrespective of what happens at the community level. This is especially the case when considering relatively small scale MPAs such as the ones studied here. However, whilst one could argue that these MPAs are simply tokenistic, the scaling up of a number of small MPAs to form a large connected network is thought to lead to a number of social and ecological benefits (Costello et al., 2010; Kritzer, 2004).

The number free-riders that benefit by encroaching but not being fined could also be reduced via interventions such as increasing the fines, the number of guards and fair enforcement for example. However, it would prove far more difficult to alter the importance attributed to kin-ship, smooth interpersonal relations and of "*hiya*" which lead to lower levels of reporting by individuals.

So it is important to note that although certain factors may influence support, they may not be susceptible to change through interventions and may prove to be unalterable. It may also be unethical to seek to change certain factors. Very broadly, most community level factors such as MPA design and MPA management could potentially be amenable to change whilst differences between individuals such as personality traits and socio-economic differences may prove more difficult or impossible to change.

Conclusion of Section

Calls to increase the support of the community towards MPA's by designing, implementing and managing MPAs in specific ways are frequently made (Aldon et al., 2010; Allegretti et al., 2012; Beger et al., 2004; Christie, 2005b; Christie and White, 1997; Courtney and White, 2000; Infield and Namara, 2001; Russ and Alcala, 1999; Stoffle and Minnis, 2007; Tissot et al., 2009; Yasué et al., 2010) as it is thought to increase the "success" of MPAs. This is an easy suggestion to make, however in practice it may be difficult to undertake. Understanding what influences support towards the MPA in a particular context is a complex endeavour due to the large number of factors identified, their interactions and the fact that their influence can vary from individual to individual. This also means that interventions to certain

factors may lead to more support towards the MPA for some individuals and less for others. There are therefore trade-offs at stake that need to be considered before interventions are made. Furthermore, many factors will prove difficult to change as they are "unalterable". Support towards the MPA is also not static and is continuously changing as many of the factors that influence it are constantly in flux. Any interventions may therefore only be temporary.

This implies that management of MPAs is an on-going challenge that is not amenable to solely one remedy or by following a simple set of rules. Indeed it is thought that there are no panaceas for social-ecological problems and that there is a need to learn from outcomes of governance and adapt appropriately in light of effective feedback (Ostrom et al., 2007b). Not only does it require an appreciation of the particular context, local history and cultural values and customs, but also an appreciation of the diversity of needs, interests and characteristics of the individuals within it. It requires frequent reflection of the current MPA situation together with consultation and coalition building of the affected community.

2. What influences support towards MPAs

Following on from the previous section which highlights the difficulties in understanding "community support" and how and why it is influenced, this section seeks to summarise what has been identified and explained through this research. After having disaggregated support into attitudes and actions, I seek here to understand how they relate to each other and combine them to help in understanding community support towards MPAs. I do not however explain each important influential factor in detail and how it influences support. This work is covered by previous empirical chapters. Rather it looks at the broader perspective and aims to distinguish between what influences attitudes, compliance and enforcement. It also starts to pick apart why these differences may be occurring and start to identify what may prevent positive attitudes from becoming positive actions.

Attitudes

Many studies that refer to the importance of community support for natural resource management strategies (such as MPAs) suggest that it relates to positive attitudes or feelings which are in turn supposed to lead to compliance and better enforcement (Ballantine, 1994; Pollnac and Pomeroy, 2005). Attitudes are indeed often thought of as a precursor or determinant for most models which attempt to explain pro environmental behaviour or action (Bamberg and Möser, 2007; Kollmuss and Agyeman, 2002).

My preliminary results which compared the attitudes of fishers towards the MPA (Fig 4.1) suggested that attitudes are relatively high, even in Suba which has a significantly more negative attitude than Bonbonon and Candaping B[46]. One question asked which illustrates attitudes towards the MPA is whether the respondent had perceived any benefits from the MPA, and if so what these were. As described in figure 5.1 in chapter 5, those in Suba mentioned fewer types of MPA benefits and were more likely to perceive no benefits arising from the MPA than in Bonbonon or Candaping B. Fewer differences occurred between Bonbonon and Candaping B in the types of responses expressed and their frequencies with the exception of Candaping B perceiving there to be tourism benefits. This may be due to the presence of one resort nearby which may be attracting a few visitors. Nevertheless, over half of the respondents (60.4%) across the three sites mentioned that the MPA had provided them with specific benefits.

Furthermore, whether one wanted to keep or get rid of the MPA is another factor contributing to the overall attitude index variable which illustrates respondents' attitudes well. Again, most individuals seemed to respond positively on keeping the MPA rather than removing it (Fig 9.1). It should be noted however that I do not distinguish between the attitudes of different individuals and their levels of influence or power within the community. My definition of community support allows me to investigate individual attitudes and behaviours and to see how these are influenced by

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[46] A one way between subjects ANOVA indicated significant difference in attitude towards the MPA between the different villages [$F_{(2, 157)}$ =12.32, $p<0.001$]. A Tukey post-hoc test showed that the mean score for attitude was significantly lower than at Bonbonon and Candaping B ($p<0.001$ in both cases)

community and individual level factors and processes, it implies however that to get a level of community support, this simply involves aggregating individuals' support. As I discuss in chapter 2 however, it is also important to consider social relations within the community when exploring community support. One could argue community support to be about power dynamics within the community as well as just the aggregate of individuals. Positive attitudes of more powerful community members may actually translate into a greater level of community support towards MPAs in practice. So although most individuals seemed keen to keep the MPA, this may not necessarily mean that there are high levels of community support towards the MPA and that indeed the MPA will be kept, as some more powerful individuals either in the local government or that are highly respected, may have more influence and sway towards the future of the MPA.
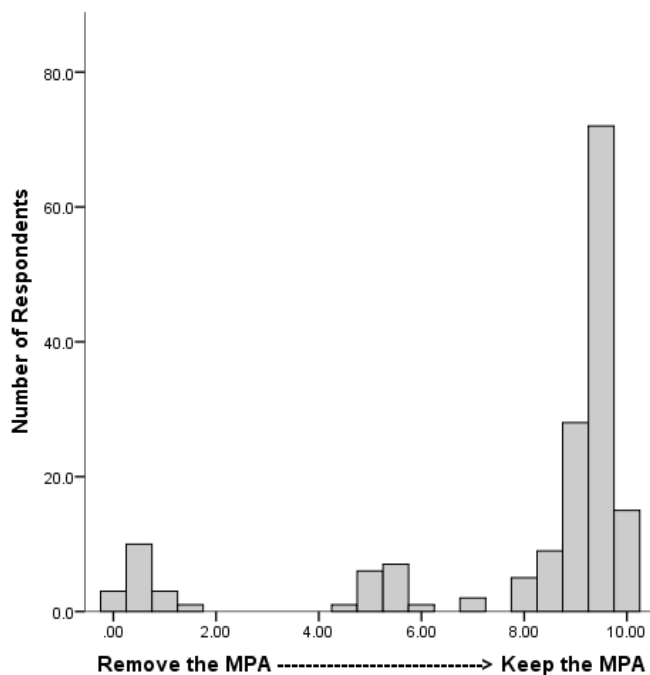
Fig 9.1 Respondents' level of desire to remove or keep the MPA (all sites)

When considering MPAs and their success in achieving their various objectives, figure 5.1 and 9.1 are good news. Most people have perceived there to be MPA benefits and although there is a disgruntled minority, it appears that a majority are willing to keep the MPA in the future. Positive attitudes towards the MPA could in turn lead to pro MPA actions being undertaken. One could argue that given the temporal uncertainties of MPAs, their benefits and their management, positive

attitudes may increase the resilience of MPAs and improve their ability to bounce back from MPA related problems (such as lack of funds, buoys washed away, high levels of encroachment) and to persist and evolve over time. However, it is important to consider what influences these attitudes, how to ensure that positive attitudes persist over time, and how to develop NRM strategies that will harbour positive rather than negative attitudes towards them.

As mentioned earlier, the perception of MPA benefits is considered as a crucial aspect of attitude towards the MPA and forms part of the attitude index (chapter 3) created for the quantitative analyses of this thesis. It is not surprising therefore that throughout the focus groups, whether or not the MPA provides benefits to the adjacent community was consistently ranked as one of the most important factors influencing attitudes (Fig 9.2a). This agrees with much of the MPA literature which believes MPA benefits such as fishery spillover (no matter how small as long as they are perceived) can be vital for ensuring the communities' support towards the MPA (Alcala and Russ, 2006; Pollnac and Pomeroy, 2005). It may also help explain why knowledge as to why the MPA was there (or which objectives and benefits it aims to achieve) was identified as an important predictor of attitudes (Table 4.4). Indeed, this is often an argument made in the NRM and MPA literature (Christie, 2005b; Milne et al., 2004; White et al., 2005b). Fishery spill-over and other MPA benefits are often thought to be crucial to the support of the adjacent community (Russ and Alcala, 1996a). In this sense therefore, these findings coincide with some of the literature.

As described in chapter 2 however, the ecological and fishery benefits of MPAs are not clear and may not occur in all circumstances, especially when considering small MPAs (as is often the case for community based MPAs in the Philippines). Furthermore, with population increase and potential increases in fishing effort in the Philippines and climate change, the potential fishery or economic benefits that MPAs can provide are debatable(Chuenpagdee et al., 2013). This may undermine positive attitudes over time.

Not all individuals however are necessarily rational and self-interested, solely relying on direct economic individual benefits(such as from fishery spill-over) from the MPA (Van Vugt, 2009). Other factors were deemed important. When asked what reasons

256

the MPA was implemented (only their single main reasons were listed) fishery spill-over only accounted for less than 2% each of the answers (Fig 9.3) and other factors such as "it allows there to be fish for the future" or it is there to protect the corals accounted for 8 and 10% of answers respectively. Answers such as the MPA serves as a home for the fish or an area for fish to breed, or that is in place to manage fish also
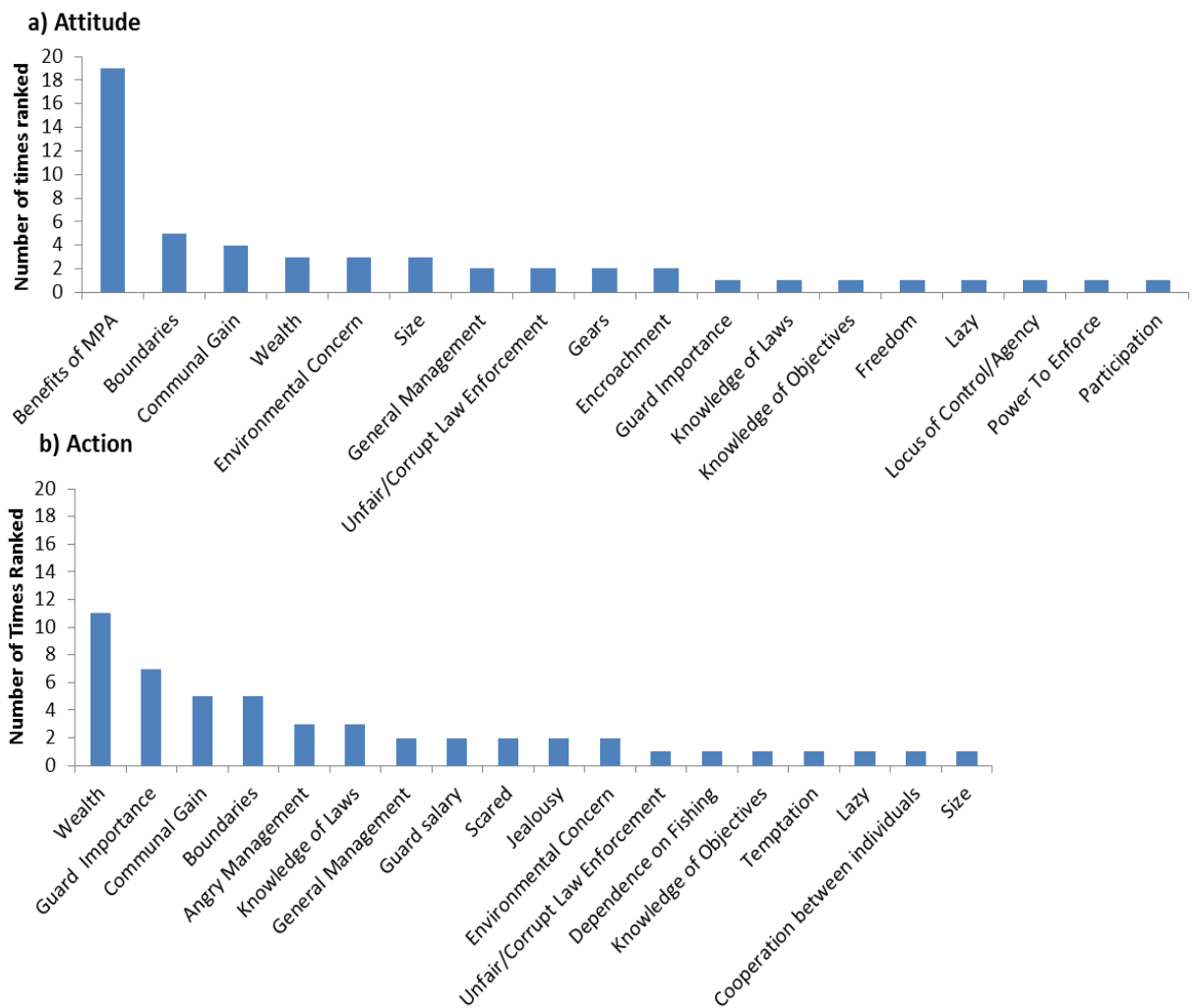
Fig 9.2 Number of times these factors were ranked as top three most influential for a) attitudes and b) actions towards MPAs in focus groups

suggest that respondents are thinking for the future and not solely for short term economic benefits to themselves. Furthermore, factors such as communal gain, environmental concern and other management issues were ranked as being important factors influencing attitudes throughout the focus groups carried out at the three villages.
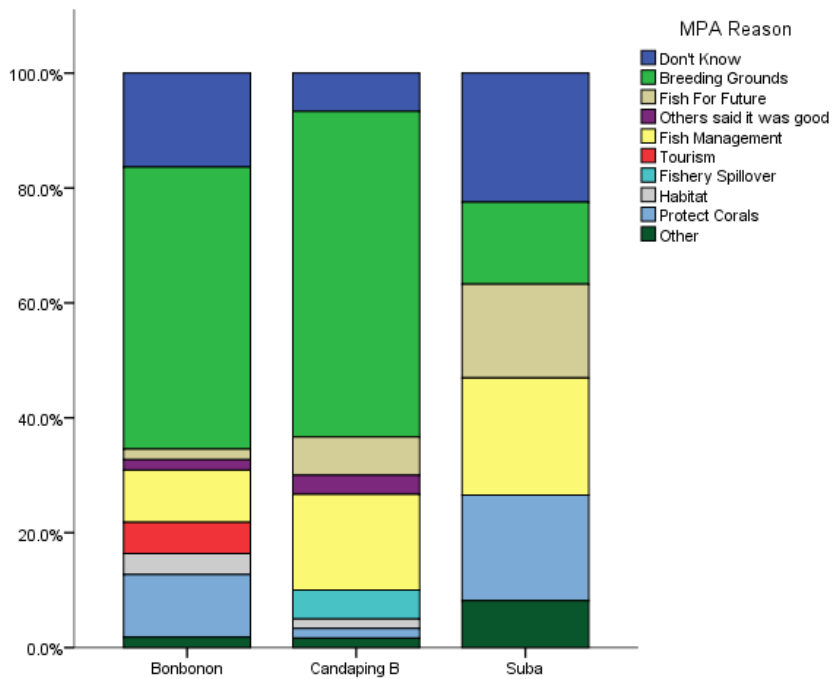
Fig 9.3 Percentage of respondents' answers within each site as to why the MPA is implemented across each village

I argue therefore that MPAs shouldn't be "sold" to communities as a tool which can lead to individual fishery benefits. A more realistic approach would be to argue that although benefits may not be perceived, an MPA is a precautionary NRM strategy that may reduce the costs that environmental pressures and increasing fishing effort may have on fisheries. There is a risk of shattering expectations and making it a "perceived failure" if the objectives are too ambitious (Chuenpagdee et al., 2013).

Although general attitudes towards MPAs were positive, and most would like to keep the MPA (Fig 9.1), this may mask the desires of a large proportion of individuals who would like for it to change somewhat. For example, fewer are positive towards the way the MPA is managed (Fig 9.4). This is also highlighted through the quantitative analysis which seeks to predict attitudes. In this case, management factors such as trust towards the guards and participation are all important predictors of attitude (Table 4.4). Furthermore, general management, unfair enforcement and other management factors were ranked as being important factors influencing attitude throughout the focus groups (Fig 9.2a).
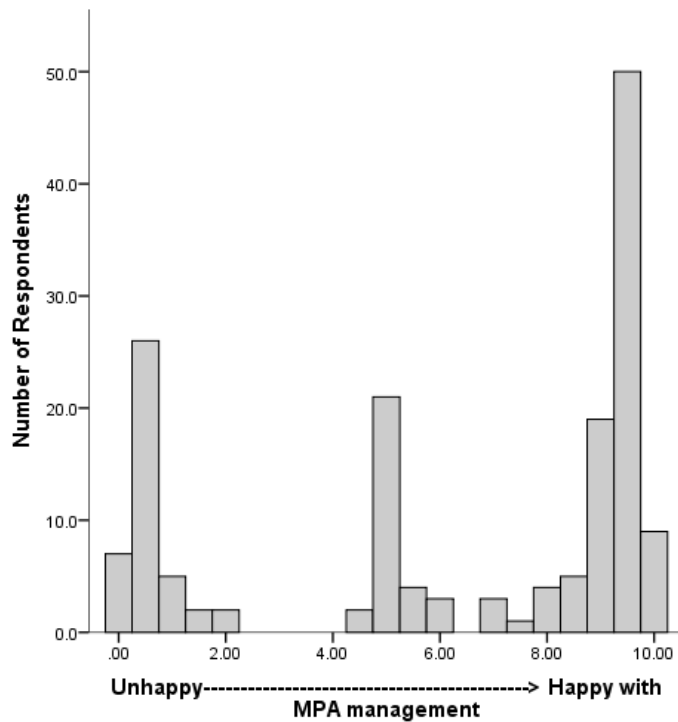
Fig 9.4 Respondents' perception towards the way the MPA is currently managed

Some answers to questions such as "are there any benefits arising out of the MPA" may lead to respondents providing me with the answer they believe I want, or repeating what they have learnt, or even what they are expecting or hoping from the MPA rather than what they are experiencing themselves. Indeed it is argued that social research methods such as interviews and questionnaires or focus groups can produce a "reactive effect". This refers to the effect that a researcher can have on the respondents, the latter behave less naturally due to the fact they are being studied (Heppner et al., 2008). Webb argues that a "guinea pig" effect occurs whereby the respondent has a desire to create a good impression and may therefore express attitudes he or she would not normally exhibit (Webb et al., 1966). And indeed, it is clear in the qualitative work throughout the empirical chapters that despite these apparent positive attitudes towards the MPA a huge range of MPA design and management factors as well as individual differences are influencing individuals' attitudes negatively.

It seems from personal observation and from the qualitative data that many like the *idea* of an MPA but are not necessarily all that positive towards the one they have. An MPA in this sense can act like a "boundary object". Star and Griesemer (1989) define boundary objects as "*objects which are both plastic enough to adapt to local needs*

259

and the constraints of the several parties employing them, yet robust enough to maintain a common identity across sites". This means that it can facilitate communication across disciplinary borders by creating shared vocabulary, although the understanding of the parties would differ regarding the precise meaning of the term in question (Brand and Jax, 2007). It could therefore apply to MPAs as for different people it can mean different things. This is made clear in Fig 9.3 by looking at the diversity of perceived reasons as to why the MPA is there. Although many may be positive towards the concept of an MPA, they may each desire different things from it. This is not surprising as MPAs can impact different individuals differently.

Whilst these generally positive attitudes and levels of acceptance towards MPAs may be a driving force for MPAs to be implemented and to develop in the Philippines, it may not necessarily mean that there will be high levels of compliance and enforcement of MPAs. Another important issue therefore is whether individuals are acting or behaving in a way that benefits the MPA and doesn't undermine it.

Attitude-Action Link

As mentioned in the previous section, attitudes are often thought of as "predictors" of actions or behaviours (Kollmuss and Agyeman, 2002). Pita *et al*'s (2011) work on commercial fishers' attitudes towards MPAs for example, states that "understanding the attitudes and perceptions of fishers towards MPAs (it) could help predict their likely behaviour towards this management tool and contribute to its success". Indeed statements are often made that imply a strong causal link between attitudes and actions.

Attitudes though, are now seen as being very weak predictors of individual actions or behaviour (Young, 2008). However *specific* attitudes towards *specific* behaviours remain significant predictors (Schultz et al., 1995). This supports Ajzen and Fishbein's (2009) assertion that in order for attitudes to predict behaviours a precise correspondence needs to exist between the attitude and behaviour being measured.

For this thesis, one would therefore assume that attitudes are significant predictors of MPA related actions as specific attitudes towards a specific MPA were elicited.

Furthermore, specific actions or behaviours were explored such as whether one would report an encroacher or whether one would comply with rules or not. The anticipated gap between attitudes and actions was therefore reduced. However in hindsight, I could have quantitatively assessed attitudes towards the *MPA related behaviours* to have an even closer link between attitudes and actions (Fishbein and Ajzen, 2009).

Nevertheless, I found evidence that attitudes towards the MPA were significant predictors of MPA related actions (chapter 4) such as whether one would report an encroacher or not. Furthermore, qualitative analyses highlighted how a number of factors influenced both attitudes and actions in similar ways and through similar mechanisms (Table 9.1). This could either mean that these factors influence attitudes and actions independently (Fig. 9.5b) or that attitudes are influenced which in turn influences actions as the PEB literature would suggest (Fig. 9.5a). It is most likely that a combination of these two mechanisms highlighted is in occurrence in this context. Irrespective of this however, the outcome remains the same, that through changes to certain factors (be it natural or through interventions), both attitudes and actions will be affected in similar ways.
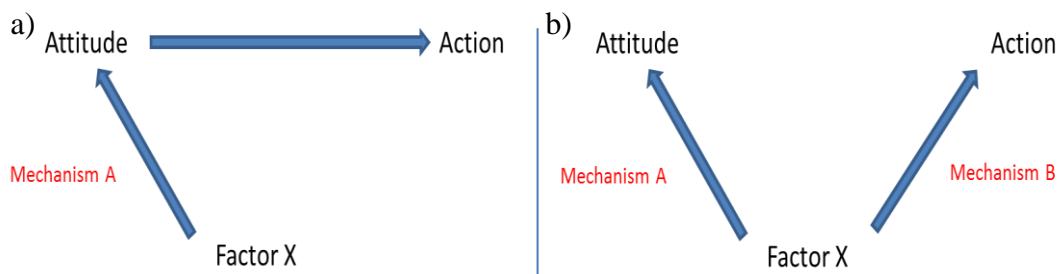
Fig. 9.5 a) Factors influencing attitudes which are predictors of action or b) factors influencing attitudes and actions independently

However, attitude was not the sole factor predicting actions in the quantitative analyses (chapter 4). Other factors such as wealth, trust of the *bantay dagat* and trust towards other fishers for example were important predictors of whether one would report an encroacher or not (Table 4.4). Furthermore, by looking at the qualitative data obtained through focus groups and interviews, it is clear that although there are some similarities, certain behaviours were influenced by different factors than those influencing attitudes, and sometimes through different mechanisms (Table 9.1). For

example factors such as sanctions and fear of encroachment were only related to compliance or enforcement and not attitudes. Other factors such as solidarity or jealousy may have different effects on attitudes than on actions (Table 9.1).

Not all positive attitudes therefore translate into pro MPA actions. Different factors affect each, and indeed there may be barriers preventing positive attitudes becoming positive actions. Indeed Corner and Randall (2011) argue that external and contextual influences on behaviour can often conspire to prevent even those with strong intentions to change their behaviour from doing so. These potential barriers are highlighted and explained in detail within the empirical chapters. In summary, it is clear that certain factors will have a negative impact on actions despite positive attitudes towards the MPA. For example jealousy of other free-riders and poverty may lead to encroachment despite positive attitudes. Furthermore, fear or trust of guards and unfair enforcement may have a negative impact on reporting despite positive attitudes. Given that positive attitudes are generally held towards the MPA, focusing on barriers that are amenable to change may be a priority where MPAs are "failing" to reach their objectives as these may lead to increases in pro MPA action.

On the other hand, there are also certain barriers which may prevent negative attitudes translating into negative actions, although these appear to be less common. Presence of guards or fines and fear of getting caught as well as strong values such as "hiya" may prevent encroachment occurring despite negative attitudes towards the MPA. This could boost the chances of ecological success of an MPA and potentially its socioeconomic benefits for the adjacent community.

Actions

Given this often "weak" relationship that can occur between attitudes and actions because different factors can affect them differently and that barriers exist which prevent attitudes from becoming actions, it is important to identify what influences actions separately from what influences attitudes.

It is thought that many environmental problems are "rooted" in human behaviour and that this can be managed by changing the relevant behaviours to reduce their impacts

(Steg and Vlek, 2009). Indeed fishers behaviour is often thought to lead to the failure or poor performance of many MPAs (Ali and Abdullah, 2010; Pita et al., 2011). Environmental behaviour is however a complex phenomenon that is driven by multiple variables. No one theory of behaviour change suffices in effectively predicting pro-environmental behaviour, Young (2008) argues that it is therefore important to remain cognizant of all the various factors that have been found to influence behaviour.

For this research, I have attempted to remain inclusive of all factors identified either deductively or inductively, through both qualitative and quantitative methods, as being influential on compliance or reporting towards the MPA. A comparison of the ranking of the top three factors listed as important across all the focus groups highlights the differences perceived as to what influences attitudes and what influences action (Fig. 9.2)

When comparing the ranking charts of important factors between those thought of as being important for attitudes and those being important for actions (Fig 9.2), two contrasts spring to mind. Firstly, there are differences in the factors identified. Secondly, a larger number of factors have been given higher rankings when looking at actions compared to attitudes (4 factors ranked 5 times or above when considering actions compared to only 2 factors when considering attitudes). Whilst attitudes were perceived to be determined mostly by benefits arising from the MPA, actions seem to be affected by a range of factors. Furthermore, those factors related to feelings and emotions had a more prominent role and were ranked higher when actions were considered rather than attitude. As feelings and emotions operate on an individual level, this also highlights the fact that when considering behaviours of fishers in particular, it is imperative to consider the differences between individuals and to not solely pay attention to factors that operate at a village or community level.

There is a potential to research those factors that solely influence behaviours directly and which are not mediated by attitude. Further work would be necessary to elucidate the implications of such an approach. I would argue however that attempting to influence pro-environmental behaviours despite a negative attitude towards MPAs could be costly as it would involve constant external monitoring, and may not be

sustainable in the long run as many with negative attitude would attempt to undermine the system. However, given the overall general positive attitudes identified in this research and by others (Allendorf, 2007) towards MPAs, I argue that to improve MPAs, the focus should be to further understand fishers' behaviours with regard to the MPA. This thesis begins to pick out which factors influence individual MPA related actions but also attempts to explain the mechanisms through which these factors operate. As mentioned earlier, not all factors are malleable and attempts to increase support for MPAs should focus on those that are.

3. Pro-Environmental Behaviour and Community Support

As described earlier, environmental behaviour is a complex phenomenon and a large host of theories have been developed to attempt to explain these behaviours and their links to attitudes (Young, 2008). This field of work has been vital for developing an understanding of community support towards MPAs.

A primary contribution to this thesis was to help decipher and understand the link between attitudes and actions. A rather naïve statement often made is that increasing environmental awareness and concern (such as knowledge of MPA objectives) can lead to pro-environmental behaviour. As I describe in chapter 2, knowledge and awareness if often thought to be a predictor of behaviours and is considered a precursor of attitudes and actions in many PEB models. However whilst environmental awareness may boost attitudes towards the MPA, this may not necessarily significantly affect behaviour. Indeed, many barriers are thought to occur preventing attitudes from translating into actions (Kollmuss and Agyeman, 2002). When thinking about community support towards an MPA therefore, it is imperative to consider both aspects of attitudes and behaviours as separate entities that are somewhat linked to different degrees.

Due to the number of theories and the amount of work attempting to understand environmental behaviour a large number of factors have been found to influence behaviour (Kollmuss and Agyeman, 2002). The question of what shapes behaviour is complex one. A large array of factors deemed important predictors of behaviour from a number of different theories need to be considered (Young, 2008). Another

important contribution of this thesis therefore was the description of a large number of factors and variables (chapter 3) argued to influence MPA related behaviours. Although some of these factors (for example, environmental awareness, wealth, participation) have been identified in the MPA or NRM literature, many (for example, locus of control, emotional involvement) have often been ignored. Young (2008) summarises a list of common factors thought to influence behaviour and classifies them as internal or individual characteristics (worldview, values, attitudes, motivation, environmental knowledge and awareness, emotional involvement, locus of control, habit and routine), external or contextual factors (institutional factors, economic factors, social and cultural norms) and demographic factors (gender, age, income, marital status, social class, environmental concern and education). These provided part of my list of factors to explore deductively as potentially influencing support. Indeed, a number of these factors were found to influence either actions, attitudes or both in the Filipino MPA context (Table 9.1).

Nevertheless, the exploratory nature of my research which mixed both deductive and inductive approaches has allowed for the inclusion of other important factors that can influence attitudes or actions of individuals (with respect to the MPA) that were not pre-identified and emerged inductively. Certain factors such as "angry" management, jealousy, laziness arose specifically out of qualitative and exploratory research methods. The use of focus groups and in depth interviews therefore allowed for certain themes and factors to emerge which were found to have an important influence on attitudes, compliance and enforcement with regards to the MPA. Furthermore, I would argue that many influential factors described in the PEB literature are often factors that can be measured quantitatively (Bamberg and Möser, 2007; Young, 2008). Many factors however can be very complex and prove difficult to measure and assess solely using numbers. A more qualitative approach allowed me to explore factors that are difficult to measure.

Qualitative data also allowed further prompting and questioning to help understand how and why these factors were deemed important so one could illustrate the mechanisms by which these factors operate. This level of detail is often missing in the PEB literature and is only explored post hoc once a significant correlation is found. Understanding why certain factors are influential can be very important. For example,

Shove (2010) argues that anything can qualify as an influential factor as either a driver or a barrier to environmental behaviour, it will depend on context and on the individual. An appreciation of how and why these factors influence actions may help prevent this confusing issue.

Whilst there are many benefits of an individual focus when considering PEBs, Shove (2010) also specifies that an emphasis on the individuals within a community may be a political and not just a theoretical position which shifts the emphasis from governments and institutions to shift the blame to the individual level. Many of the factors that solely emerged inductively were indeed feelings and emotions (Table 3.2) which in turn were in part explained via social norms, customs and cultural values (chapter 8). It is important therefore to highlight the importance of institutional, cultural and social context of the situation when one is attempting to understand or predict support towards MPAs. When considering support towards MPAs it is necessary to therefore not solely focus on individuals in isolation but to see them as part of a network or a group within a specific context.

4. Common Pool Resources and Community Support

Research on common pool resources and their management entails ideas of collective action, cooperation and free rider theory (Ostrom, 1990). Ostrom and colleagues suggest conditions which facilitate sustainable CPR management and identify a number of principles which are prerequisites for stable CPR arrangement (Agrawal, 2001; Agrawal and Goyal, 2001; Ostrom, 2000). In a similar way to the PEB literature I found that these principles and conditions are in many cases also important factors influencing community support (for example, clear boundaries, sanctions, participation etc.) towards the 3 MPAs studied. Yet in contrast to the PEB literature they focus at a more community level and seek to study conditions under which groups of users will sustainably govern resources (Agrawal, 2001).

Although much of the theory and reasoning obtained from the CPR literature has been invaluable in explaining a number of factors deemed important in influencing support, I argue that a limitation of CPR work and collective action is its focus on the community level. Whilst this is important when considering institutions, the MPA

itself and village characteristics for example, the individual level factors should not be ignored (as mentioned above). However, both CPR and PEB literature work well synergistically and are not mutually exclusive when considering community support towards MPAs. Indeed these two streams of literature have suggested a number of factors which have been found to influence support, but they have also helped in explaining why certain factors were deemed important through either the qualitative or quantitative work carried out at the three sites.

Again however, much of the CPR work focuses on quantitative work which I have already argued earlier in the chapter can be problematic. Agrawal (2001) illustrates this point nicely as he explains that the large number of variables identified (influencing CPR governance) has implications for data analysis. These can lead to spurious correlations and multiple causation and he then argues ways to reduce the number of variables by forming indices. Indeed, it was essential to greatly reduce the number of factors studied for the multiple regressions carried out in chapter 4. This is one reason why some variables were grouped together to form wealth and attitude indices and other variables were omitted from the analysis as they were correlated with others (chapter 4).

I have found using qualitative data in combination with quantitative data to be useful in reducing the number of variables pertinent to a specific setting. When considering one's dependence on fishing for example (chapter 7), a factor often deemed important in the PEB or CPR literature, it is difficult to determine whether one should look at income derived from fishing, job diversity, alternative livelihood present or whether one is labelled a part time or full time fisherman. In my case only job diversity was alluded to in the focus groups and interviews as income from fishing did not encompass the need for food whilst having a number of jobs (often farming or fishing) meant that one could obtain food from a different source in times of need. These factors are undoubtedly related, but by understanding why they may have an impact in a particular context can help in determining which factors are most important. This is similar to another issue I discussed in chapter 2 on whether to focus on MPA governance or on MPA management. The latter is often considered in the MPA literature and is more amenable to quantitative analyses as management factors are often quite specific and relatively easy to measure. Governance however is a broader

term which considers in this case MPA management as a socio-political enterprise(Chuenpagdee et al., 2013). It does not solely focus on MPA rules and regulations but also on how it interferes with the community and how it is perceived by them. Issues such as power struggles, inequity, accountability and transparency arise when considering MPA governance which are less amenable to quantitative analyses and may best be explored using qualitative methods.

The PEB and CPR literature has been invaluable when considering community support towards MPAs, especially when these two strands of literature are considered in tandem. However both seem focused in predicting individual behaviour or predicting which communities may be able to govern their resources sustainably by considering a number of influential factors. This implies that an informed decision can be made about where to implement MPAs. Areas where individuals are predicted to act in favour or areas where communities are believed to be able to organise themselves to manage resources effectively could be highlighted as MPA suitable sites. In practice however this may be rather difficult to carry out. As described at the beginning of the chapter when considering support there are many factors involved, many of which are inter-related. Furthermore these factors can change over time (in particular governance and MPA management factors). Given this unpredictability, I wonder if it is appropriate that there is such an interest in predicting behaviour of individuals or identifying *suitable* communities a priori. Furthermore when one considers the fact that many individuals respond differently to different factors and that many factors cannot be changed, this begs the question as to whether one should or can intervene to boost support even if we could predict the response. Indeed, as I illustrate in figure 3.11, my approach has shifted from predicting community support to trying to understand it which I believe is far more achievable, realistic and helpful when informing policy or NRM management.

Instead of attempting to determine "suitable" MPA sites, to predict behaviours or even to produce lists of criteria required for MPAs and their management, I argue that it may be best to first understand the attitudes and behaviours of individuals in relation to the MPA. An understanding of how and why interventions would manifest themselves in terms of individuals' attitudes and MPA related actions could in turn, help ensure support towards the MPA.

5. Conclusions and Further Work

The support of the community towards NRM or conservation schemes is often considered an important factor in the success and sustainability of these strategies (Aldon et al., 2010; Allegretti et al., 2012; Beger et al., 2004; Christie, 2005b; Christie and White, 1997; Courtney and White, 2000; Infield and Namara, 2001; Russ and Alcala, 1999; Stoffle and Minnis, 2007; Tissot et al., 2009; Yasué et al., 2010). Yet very little has been done to understand what is meant by community support. I initially immersed myself in the NRM, CPR and PEB literature which seeks to identify what influences success, sustainable management or pro environmental behaviour respectively. This work is often carried out through comparative studies and correlations between factors. Consequently I rather naively believed I could use quantitative data I collected to list the factors which were found to influence attitudes and actions. Based on this work, one could then determine which areas would be most supportive of MPAs or propose specific interventions which could lead to increases in support towards current MPAs. Given the issues highlighted at the beginning of this chapter, this is far from simple to accomplish. This notion of community support once untangled, is much more complex than I had once believed.

The qualitative data obtained from interviews and focus groups proved to be useful in helping to understand what factors were important and why they influenced attitudes and actions in specific ways. A solely quantitative analysis focusing on wealth of individuals for example may hypothesize that poorer individuals are more likely to encroach but may find no significant result. This may be because although poor individuals encroach for food, the rich also encroach as they can pay the fine or can easily bribe the guards. Although using both quantitative and qualitative techniques proved advantageous, and triangulating data served to improve reliability of results, I found that the qualitative data often led to some of the more interesting findings.

I argued that efforts to predict behaviours and to determine specific guidelines for effective CPR management may prove futile due to the number of factors considered, their interconnectedness, the heterogeneity of communities, the temporal element and the fact that certain factors cannot be changed. Likewise however, I have started to question whether "predicting" community support is a worthwhile endeavour. It is

clear that there will rarely be clear and constant support towards MPAs from all individuals in the affected community. Furthermore, individuals' support towards the MPA is dynamic and will change in time. Community support has been used as one factor amongst many which can contribute to the success and failure of NRM strategies and in this case of MPAs. A deeper understanding of what community support is and how and why it changes shows that it is far from a simple "factor"; It is a very complex concept.

A pessimist may argue that due to the complexities that arise when unravelling this notion of community support, it would prove almost impossible to boost support towards MPAs through interventions. One could argue that the potential costs of intervening may exceed the benefits of heightened support and that other avenues should be pursued to improve NRM strategies given the uncertainties and trade offs between individuals involved. On the other hand, an optimist could argue that the fact that many harbour positive attitudes towards MPAs, would like to keep one and are concerned about the state of the reefs suggests policy makers and NR managers should carry out a business as usual scenario. This would most likely involve the continuation of environmental education and the "selling" of MPAs as "win-win" scenarios I described at the beginning of this thesis. Both these stances would involve no attempts to improve support towards MPAs.

Whilst I remain sceptical that there is potential to have an MPA fully supported by the community, I argue there are a few lessons learned that could be applied to most community based MPAs in the Philippines which could potentially be extended to other forms of NRM strategies. Firstly, when considering any interventions, during MPA implementation or changes to its design or management, it is important to explore the potential repercussions on different individuals within the community. As Chan et al (2012) state; " few decisions result in true win-win situations and those who feel losses deserve the opportunity to accept them as reasonable". This would require *barangay* meetings which are representative of most individuals affected, not solely those more empowered or more involved, and an honest discussion about the potential negative and positive impacts of the MPA or MPA changes suggested. Whilst it is difficult to incorporate multiple and marginalized voices into decision making (Adger et al., 2012), I have highlighted how this is important to ensure

support towards MPAs. Furthermore it is argued that differences in priorities are likely to escalate unless these different voices are considered (Hicks et al., 2013). It is thought to be particularly constructive to engage those affected in a process that explores their priorities. It ensures that respect can be built towards alternative views, improves trust between those involved and highlights areas of agreement (Hicks et al., 2013). I argue that an honest representation of the potential benefits and costs of an MPA (or various proposed changes) for various stakeholders should be clearly articulated by those in charge of the NRM strategy. Only then can we explore the potential trade offs, reach compromises and ensure that most are supportive of the MPA.

Secondly, it important to realise that support towards MPAs is not solely based on monetary or economic incentives. Whilst it is clear that the prospect of fishery spillover and increased fish catch or tourism is an attractive prospect for many, and would undoubtedly boost support of individuals towards the MPA, there are a whole range of other factors that can influence support. As I have highlighted, other non-economic benefits of MPAs are of importance and indeed others have confirmed this (Coulthard et al., 2011b) Furthermore, even if an MPA could lead to economic benefits to all within the community, I would argue that inequalities between how much different individuals received (e.g. income obtained through tourism versus income obtained through increases in fish catch) would still lead to a lack of support through issues of fairness, jealousy and equity described in the empirical chapters. It is essential therefore to not solely describe MPAs as "win-win" scenarios for all, but as a precautionary tool which can potentially reduce negative impacts of overfishing, climate change and ensure that *future* generations may be better off than if no MPAs were implemented. A shift in focus from MPA benefits, to a reduction of costs arising from MPAs may help prevent issues of jealousy, and of shattered expectations and could help boost support in the long run.

Finally, building support towards MPAs may not necessarily involve the MPA or issues surrounding its management. I describe in chapter 8, various cultural values that may be important factors influencing support. *Bayanihan* spirit for example, highlights the importance of unselfish cooperation, and respect for mutual help. I would argue that with increasing globalisation, some of these values are becoming

eroded. There may be other ways to boost support by promoting cooperation and trust between individuals and improving solidarity between individuals within the community which could have little to do with the MPA and issues surrounding it. As I describe in chapter 8, the bayanihan spirit is felt during fiesta but not when it comes to day to day activites. One could argue that by promoting community activities such as fiestas, beach clean-ups and mangrove planting for example, it could foster cooperation, solidarity and a feeling of *bayanihan* which is apparently important when considering support towards MPAs.

Despite the above conclusions, the findings presented in this thesis have led to the development of three further overarching questions for future research. I believe there is still a need to understand the relationship between various types of MPA "success" or objectives and different levels of community support. I also suggest there is a need to investigate how and why support towards MPAs changes over time. I list some of my future research aims and justifications below:

1. *Do similar factors influence community support towards different NRM strategies elsewhere?*

I found a consistency in factors reported as being important for support between the three sites. However my case study approach only allowed me to quantitatively test for differences between individuals but not between sites. Unlike individual level factors, many community level factors such as MPA design and MPA management are amenable to intervention and hence may prove important to focus on when considering how to boost support towards MPAs. My findings highlighted the need for a much stronger appreciation of context, culture and history when considering community support towards MPAs. A less factorial approach and one which considers the power and gender dynamics within the community may further help an understanding of community level factors. Given the importance attributed to community support for NRM strategies in general, a more in depth research focus on what influences support between sites may prove to be an important step in improving NRM strategies such as MPAs.

2. *Why and how does support towards NRM strategies change over time?*

I argue that many factors that influence support will vary over time and hence support towards CB-NRM strategies will wax and wane and not remain constant. Whilst I

undertook a factorial approach for this thesis, issues that arose during MPA implementation and previous management issues in particular were deemed important. A more historical approach may shed more light on what previous issues may influence current support towards MPAs. Indeed it these previous experiences that will form part of individuals' images of the MPA regardless of its current positive or negative impacts. Understanding how and why support varies over time may help in building resilience of these management regimes and ensure they achieve their various objectives. Once implemented, CB-NRM strategies do not remain static, their management changes, their rules change and support towards them change. There is therefore a level of unpredictability. This question seeks to address some of the causes of this uncertainty.

3. *How are NRM strategies sustained by changing levels of support?*

I describe in chapter 1 how much work has emphasised the importance of support for success of MPAs. Little research however, has explored the link between community support and the success in achieving NRM objectives despite the importance attributed to it. I found that the presence or absence of MPA benefits were indeed constantly listed as important factors for both attitudes and behaviours of individuals. However, I have no way to test if MPA benefits are linked to support as no empirical data is collected on the various MPA benefits that are or can be accrued. This question would therefore seek to understand the relationship between community support and CB-NRM success. Given that support can change from individual to individual and change over time, can community support towards MPAs be an indicator of their success?

By understanding what influences community support, I initially hoped it would be relatively easy to maximise or increase support towards MPAs. I soon realised that it would prove very difficult to ensure support of all affected individuals and that there is no clear answer or solution as to which set of factors are necessary for prolonged support over long periods of time. However, I argue this research is a step in the right direction. We now have a clearer idea as to how the design of the MPA, the way it is managed and its impacts can influence attitudes and behaviours of the community. Furthermore, I also describe how different socio-economic characteristics of individuals can influence support and alter the way they are impacted and perceive the MPA. Finally, I highlight how it is not only cultural values but also the feelings and

emotions of individuals that need to be considered. These sometimes supercede the thoughts and actions of the *rational* self-interested individual. Although it may be impossible to have an MPA that is fully supported by the whole community over time, maybe striving to develop and manage MPAs or other NRM strategies to increase support is better than not acting at all.

Appendices

Appendix 1. Comprehensive list of resource systems, resource units, user and institutional factors influencing MPAs and their references

	Factors	References
Resource System Factors	MPA Size	(Agardy et al., 2003)
	MPA Type (No Take/Multiple Use)	(Agardy et al., 2003; Christie et al., 2009; Milon et al., 1997)
	MPA part of network	(Christie et al., 2002)
	MPA Boundaries	(Armada et al., 2009; Christie and White, 2007; Lowry et al., 2009)
	MPA Age	(Stobart et al., 2009)
	MPA Objectives	(Hilborn et al., 2004)
	Perceived Crisis Pre-MPA	(Christie, 2005b; Pollnac et al., 2001)
Resource Units	Perceived Fishery Benefits	(Alcala and Russ, 2006; Christie, 2005a; Christie et al., 2009; Gelcich et al., 2007; Pollnac and Pomeroy, 2005; Pomeroy and Carlos, 1997; Pomeroy et al., 2005a; Russ and Alcala, 1999)
User Factors	Fishers' Age	(Ainsworth et al., 2008)
	Population Size of Community	(Agrawal and Goyal, 2001; Christie, 2005a; Pollnac et al., 2001)
	Participation in community affairs	(Christie, 2005a; Pollnac et al., 2001; Pollnac and Pomeroy, 2005; Pomeroy et al., 1997; White et al., 2005b)
	Participation in coastal management	(Jentoft, 2000b; Maliao et al., 2009; Olsen and Christie, 2000; Pollnac et al., 2001; Pollnac and Pomeroy, 2005)
	Influence in community affairs	(Maliao et al., 2009; Pollnac and Pomeroy, 2005; Pomeroy et al., 1997)
	Influence in coastal management	(Nunan, 2006; Pollnac and Pomeroy, 2005)
	Self-Efficacy	(Christie, 2005a; Jentoft, 2000b; Olsen and Christie, 2000; Pomeroy and Berkes, 1997)
	Gears used	(Allison and Ellis, 2001; Blyth et al., 2002)
	Specialist vs Generalist Fisher	(Dimech et al., 2009)
	Type of boat used	(Gelcich et al., 2007; Hilborn

	et al., 2004)
Where they fish	(Allison and Ellis, 2001; Aswani and Hamilton, 2004)
Fishing Experience	(Dimech et al., 2009)
Part Time vs Full Time	(Allison and Ellis, 2001; Dimech et al., 2009)
Income from fishing	(Dimech et al., 2009; Pollnac and Pomeroy, 2005)
Alternate livelihoods	(Allison and Ellis, 2001; Armada et al., 2009; Christie, 2005a Cinner et al., 2009a; Gelcich et al., 2009; Pollnac et al., 2001; Pollnac and Pomeroy, 2005; Pomeroy and Carlos, 1997; Pomeroy et al., 2005a)
Individual Assets	(Allison and Ellis, 2001; Nunan, 2006)
Satisfaction of Personal Needs	(Kollmuss and Agyeman, 2002)
Quality of Life	(Pollnac and Pomeroy, 2005; Pomeroy et al., 1997)
Income	(Cinner et al., 2009a; Maliao et al., 2009; Pollnac and Pomeroy, 2005)
Socio-economic Development of Village	(Cinner et al., 2009b; Steneck, 2009)
Education Level	(Armada et al., 2009; Jones, 2006; Pomeroy and Carlos, 1997; White et al., 2005a)
Knowledge of Laws	(Christie, 2005a)
Knowledge of Fisheries and their management	(Johannes, 2002; Pietri et al., 2009; Pollnac and Pomeroy, 2005)
Awareness of environmental problems	(Bamberg and Möser, 2007; Milne et al., 2004; White et al., 2005a)
Understanding of MPA objectives	(White et al., 2005b)
Relevant coastal management training	(Pomeroy and Carlos, 1997)
Expectations of MPA	(Christie, 2005b; Leiserowitz et al., 2006)
Trust between individuals	(Mascia, 2004; Ostrom, 2000; Ostrom et al., 1999)
Solidarity	(Oracion et al., 2005)
Social Capital	(Hicks et al., 2009; Ostrom, 1990)
Communication with other stakeholders	(Ostrom, 2000)
Cooperation	(Pomeroy and Carlos, 1997)
Property Rights	(Johannes, 1978; Ostrom, 2003; White et al., 2005b)
Migration Issues	(Christie et al., 2002; Maliao et al., 2009; Ostrom, 2000)
Trust of implementing organisation/government	(Lowe, 2000)

Institutional and Governance Factors	Institutional Coordination	(Christie et al., 2009)
	Institutional Cooperation	(Pomeroy and Carlos, 1997)
	External Help	(Christie, 2005a; Maliao et al., 2009; Milne and Christie, 2005; Pollnac et al., 2001; White et al., 2005a)
	Financial Help	(Christie, 2005a; Milne and Christie, 2005; Olsen and Christie, 2000)
	Continuous Monitoring of Resources	(Hilborn et al., 2004; Pomeroy and Carlos, 1997)
	Sanctions	(Christie et al., 2009; Christie and White, 2007; Hilborn et al., 2004; Ostrom, 2000)
	Strong Leadership	(Christie et al., 2009; Ostrom et al., 1999; Pietri et al., 2009; White et al., 2005b)
	Equitability of shares of money generated	(Christie, 2004; Christie et al., 2005; Pollnac et al., 2001; Pomeroy and Carlos, 1997; Pomeroy et al., 2005a)
	Supportive Legal and Policy Framework	(Hilborn et al., 2004; Johannes, 2002; Maliao et al., 2009; White et al., 2005a; White et al., 2005b)
	Type of co-management	(Gelcich et al., 2008)

Appendix 1 Reference List

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Appendix 2. Fisher folk Questionnaire

Date
Village

I. **DEMOGRAPHIC INFORMATION**
   1. Age _____
   2. Gender M/F
   3. Educational Attainment:: elementary_____ High School _____ College _____
      Professional ___
   4. Member of Fisherman's association Y/N
   5. Bantay Dagat Y/N

II. **MIGRATION ISSUES**

Within the community
   6. What is your place of origin (village/Location)
   7. If not from here, how long have you lived in this village?
   8. Do you plan to stay in this village for the next 2 years, 5 years, 10 years?

III. **WEALTH**

Material Style of Life
   9. Do you light your house? If yes how?

Car Battery	Kerosene Wick	Candle	Light Bulb
Generator	Solar Panel	Hurricane Lamp	Other?

   10. Do you own a vehicle of any kind?

Bicycle	Motorcycle	Car	Other?

   11. How do you cook food in your house?

Firewood	Charcoal	Kerosene	Gas/Electric	Other?

   12. What is the roof material of your house?

Thatch	Metal	Tile	Other?

   13. What is the floor material of your house?

Dirt/Soil	Bamboo/Palm	Plank Wood	Cement	Finished	Other?

   14. What is the wall material of your house?

Bamboo/Thatch	Plank Wood	Stone	Mud	Cement	Other?

   15. Which household items do you own?

Radio/cassette player	Piped Water	TV	VCR/DVD	Refrigerator
Electric Fan	Satellite Dish	Washing Machine	Computer/Laptop	Karaoke
Electric Iron	Rice Cooker			

   16. What is the average monthly expenditure of the household?

IV. **GEARS AND MOBILITY**

Gears
   17. Which gears do you use? (spear fishing/hook and line/net/fish trap)
   18. Do you own these gears?
   19. If not, how do you access these gears?

Gear(s)	Own (Y/N)

Mobility
   20. Do you own a boat?

21. If not, how often do you fish from a boat?

22. How is the boat powered?

V. DEPENDENCE ON FISHERY

Fishing Experience

23. How long have you been a fisherman?

Fishing Frequency

24. Do you fish all year round or at specific times of the year?

25. How many days per week on average do you normally spend fishing?

26. How many hours per day on average do you normally spend fishing?

Income from Fishing

27. How much does your fishing contribute to the household income?
(A little, 1-20%/some, 21-50%/ most 50-95%/all, 95+)

28. How many people depend on your income as a fisherman?

Alternate Livelihoods

29. Do you have any other jobs/activities apart from fishing that bring food or money to the household? If so, rank them in order of importance

VI. KNOWLEDGE AND AWARENESS

Knowledge of MPA and its objectives

30. Are you aware there is an MPA in your area?

31. How old is the MPA?

32. What are the reasons for having an MPA in the community?

33. How familiar are you with the rules and regulations surrounding the MPA (Didn't know there were any rules/ Not familiar with the rules/ Know the rules but not the details/Very familiar with the rules)

34. Could you briefly list and explain any rules and regulations that you know of?

VII. PERCEPTIONS TOWARDS MPA

Attitudes towards the MPA

35. In your opinion have there been any benefits from the MPA? (be specific)

Using the graphic scale, please mark a line to indicate how you feel towards the following MPA characteristics. For each of these a why question may also follow.

36. What effect do you think the MPA has on local fisheries?

MPA has a positive effect on local fisheries----It has a negative effect

37. How effective is the MPA at preserving the reef?

MPA is effective at preserving the reef----It is ineffective

38. How is the MPA managed?

MPA is well managed---It is poorly managed

39. If you had the choice, would you like to keep or remove the MPA?

You would like to keep the MPA---Remove the MPA

40. How has your attitude changed towards the MPA since it has been implemented?

You are more positive since MPA implementation-----Less positive

41. How do you think the MPA has affected the community?

MPA has been good for the community----bad for the community

VIII. ACTIONS TOWARDS MPA

Monitoring

42. How much time do you spend monitoring the MPA to ensure there are no encroachers/no illegal activity (never, rarely, sometimes, often, constantly)

Enforcement

43. What would or do you do if you spot someone encroaching the MPA or breaking any MPA rules you know of?
44. *Does this apply to everyone you spot?*
45. If you did not report them, why not?

Compliance
46. To what extent do you think others within the community comply with MPA rules? (never, rarely, sometimes, often, always) (Give examples of rules).

IX.   SOLIDARITY
Trust

47. *In general, how much do you trust:*

People in your village	1-No at all ------------5-Trust all
Local government officials	1-No at all ------------5-Trust all
Bantay Dagat	1-No at all ------------5-Trust all
Fishers from other landing sites	1-No at all ------------5-Trust all

X.   EMPOWERMENT
Participation
48. How much do you feel you participated or were involved in any decision making surrounding fisheries/coastal management? (No participation, very little participation, some participation, regular participation, participation in all decisions)

Influence
49. How much do you feel you have can influence any decision making surrounding fisheries/coastal management? (No influence, very little influence, some influence, regular influence, influence in all decisions)

Appendix 3. Discussion guide for Focus Groups carried out at each site

I would like to thank you all for coming to this meeting. My name is Tomas Chaigneau from the University of East Anglia in the UK. I am conducting discussion groups as part of a research project on determining what influences the support of people towards their adjacent MPAs. Our research team is going to speak to different groups of people who live near MPAs about their views on what they feel is important in influencing the support of people towards their MPA. The discussion will cover a range of topics including what you feel is important in influencing attitudes, specific actions such as monitoring the MPA, complying with MPA rules and whether someone reports encroachers. Furthermore, we will also discuss the relationship between attitudes and these actions. Even if you are unsure about these topics, your views are still very valuable to us, so please do not feel shy during the discussion. I would like to say that there are no right or wrong answers; we will simply be discussing your views, opinions and experiences, so please feel comfortable to say what you really think.

As we have already told you, your participation in this group is voluntary. Whatever we discuss today will be confidential and used only for this research project. During the discussion _____ will be taking notes and reminding me if I forgot to ask something. However, so that she does not have to worry about getting every word down on paper we will also be audio recording the whole session. The reason for tape recording is so that we do not miss anything that is said. Please do not be concerned about this, our discussion will remain completely confidential; we will use only first names in the discussion and the information will only be used for this research project which aims to improve MPAs. Is it OK with everyone to audio record this discussion? It is also important that only one person talks at a time. We will not be going around the room; just join in when you have something to say. Remember we want to hear all your views, so it's OK to disagree with everyone else if you have a different opinion, but please also respect the views of the others here as well. This discussion will probably last about an hour or so. Are there any questions before we start? Let's start…

Opening Questions

1. As an introduction, let's go around so that you can introduce yourselves and perhaps tell us your favourite fish (to eat!)?

Introductory Questions

2. What is the first thing that comes to mind when you hear the word "MPA" (for e.g. Candaping B MPA)?
3. What is the MPA there for?

Transition Questions

4. What are your opinions of the MPA? (For what reasons/Have these opinions varied over time?)
5. Support of the community towards MPAs varies from location to location. How supportive do you think this community is? (What makes you say that? Has this support varied over time? In which way?)
6. How has the MPA affected the community? (What makes you say that/what about its effects on you/do others feel the same way?)

Key Questions

A. Site Level Factors Influencing Attitude
7. What do you think makes people have a positive attitude towards an MPA? (For what reasons).
   i) **Probes**:
      (a) Think about the characteristics of the MPA (can you think of any MPA characteristics/or changes to the MPA that would make people more positive)
      (b) Think about the type and amount of fish that you catch and that are in the sea (can you think of any changes in the amount of fish that would make people more positive?)
      (c) Think about the types and characteristics of the individual (are different people more likely to be positive, who,why?)
      (d) Think about how the MPA is managed and the governance (can you think of any changes to the governance or the way the MPA is managed that would make people more positive?)
      (e) Think about the community and other people in Bonbonon (do others and their actions make people more positive?)
8. What do you think makes people have a negative attitude towards an MPA? (for what reasons)
   i) **Probes**:
      (a) Think about the characteristics of the MPA (can you think of any MPA characteristics/or changes to the MPA that would make people more negative)
      (b) Think about the type and amount of fish that you catch and that are in the sea (can you think of any changes in the amount of fish that would make people more negative?)
      (c) Think about the types and characteristics of the individual (are different people more likely to be negative, who,why?)
      (d) Think about how the MPA is managed and the governance (can you think of any changes to the governance or the way the MPA is managed that would make people more negative?)
      (e) Think about the community and other people in Bonbonon (do others and their actions make people more negative?)
9. Could you rank these site level variables in order of how important they are in influencing attitudes of people towards MPAs?

        i) After selecting the top 3/5 important factors, probe further as to the reasons they were selected

B) Relationship between attitude and action

    10. Does a positive attitude lead to a positive action? (Maybe give example of an individual with positive attitude-does he have a positive action?)

    11. Under what circumstances do you think someone would have a positive attitude but not carry out actions that benefit the MPA (i.e. monitoring/enforcement/compliance) (what is it about these circumstances that stops them from acting)

    12. Under what circumstances do you think someone would have a positive attitude and carry out actions that benefit the MPA (i.e. monitoring/enforcement/compliance) (what is it about these circumstances that promotes action).

C. Site Level Factors Influencing Actions

    13. What do you think makes people comply with the MPA rules and regulations (NOT encroach the MPA) (for what reasons)?

        i) **Probes**:

            (a) Think about the characteristics of the MPA (can you think of any MPA characteristics/or changes to the MPA that would make less people encroach)

            (b) Think about the type and amount of fish that you catch and that are in the sea (can you think of any changes in the amount of fish that would make less people encroach?)

            (c) Think about the types and characteristics of the individual (are different people less likely to encroach, who,why?)

            (d) Think about how the MPA is managed and the governance (can you think of any changes to the governance or the way the MPA is managed that would make less people encroach?)

            (e) Think about the community and other people in bonbonon (do others and their actions make less people encroach?)

    14. What do you think makes people encroach the MPA (NOT comply with MPA rules and regulations)? (for what reasons)

        i) **Probes**:

            (a) Think about the characteristics of the MPA (can you think of any MPA characteristics/or changes to the MPA that would make more people encroach)

            (b) Think about the type and amount of fish that you catch and that are in the sea (can you think of any changes in the amount of fish that would make more people encroach?)

            (c) Think about the types and characteristics of the individual (are different people more likely to encroach, who,why?)

            (d) Think about how the MPA is managed and the governance (can you think of any changes to the governance or the way the MPA is managed that would make more people encroach?)

(e) Think about the community and other people in Bonbonon (do others and their actions make more people encroach?)

15. Could you rank these site level variables in order of how important they are in influencing actions of people towards MPAs?

     i) After selecting the top 3/5 important factors, probe further as to the reasons they were selected

Closing Question

16. Do you think it is possible to increase the attitudes of individuals towards the MPA? (If you were the barangay captain, how would you do it?)

17. Do you think it is possible to increase the level of pro MPA action towards the MPA? (If you were the barangay captain, how would you do it?)

Appendix 4 Focus Group Descriptions

1. Description of Suba Focus groups

Focus Group Code	Focus Group Type	M/F	Age	Occupation	Education	Monthly Income	Number
SFG1	Fisher	M	48	Fishing	High School	2000	1
		M	63	Farming	Elementary	1000	2
		M	39	Fishing	Elementary	3000	3
		M	33	Caretaker	High School	3000	4
		M	45	Fishing	Elementary	4000	5
SFG2	Fisher	M	40	Carpentry	Elementary	2000	1
		M	57	Farming	Elementary	500	2
		M	57	Carpentry	Elementary	2500	3
		M	34	Painter	High School	3000	4
		M	63	Fishing	Elementary	2000	5
SFG3	Fisher	M	44	Fish Seller	Elementary	2000	1
		M	52	Fishing	High School	3000	2
		M	48	Fishing	Elementary	3000	3
		M	57	Fishing	Elementary	3000	4
		M	60	Fishing	Elementary	3000	5
SFG4	Fisher	M	36	Fishing	High School	2500	1
		M	63	Farming	High School	2500	2
		M	46	Fishing	High School	3000	3
		M	44	Fishing	College	3000	4
		M	39	Carpentry	College	3000	5
		M	40	Fishing	High School	3000	6
SFG5	Fisher Wives	F	42	Carpentry	Elementary	2000	1
		F	57	Housewife	Elementary	3000	2
		F	31	Housewife	Elementary	2500	3
		F	39	Caretaker	High School	3000	4
		F	55	Housewife	High School	2000	5
SFG6	Fisher Wives	F	55	Housewife	Elementary	3000	1
		F	45	Housewife	Elementary	2000	2
		F	63	Housewife	High School	2000	3
		F	52	Housewife	Elementary	2000	4
		F	55	Housewife	High School	2000	5
SFG7	MPA Involved	M		Bantay Dagat			1
		M		Barangay Councillor			2
		M		Barangay Captain			3
		M		DA			4

2. Description of Bonbonon Focus groups

Focus Group Code	Focus Group Type	M/F	Age	Main Occupation	Education	Monthly Income PHP	Number
BFG1	Fisher	M	43	Fishing	Elementary	1500	1
		M	27	Fishing	High School	1000	2
		M	29	Fishing	Elementary	900	3
		M	30	Fishing	High School	1000	4
		M	29	Fishing	College	2000	5
		M	21	Fishing	Elementary	1000	6
		M	42	Fishing	Elementary	2000	7
BFG2	Fisher	M	55	Habal Habal	Elementary	3000	1
		M	61	Store	High School	3000	2
		M	21	Fishing	High School	300	3
		M	36	Carpentry	High School	5000	4
BFG3	Fisher	M	64	Electrician	Elementary	500	1
		M	44	Fish Seller	High School	2000	2
		M	28	Fish Seller	Elementary	4000	3
		M	24	Fishing	Elementary	3000	4
		M	36	Carpentry	Elementary	2000	5
		M	39	Fishing	Elementary	2000	6
BFG4	Fisher Wives	F	24	Housewife	Elementary	3000	1
		F	63	Housewife	Elementary	5000	2
		F	36	Housewife	Elementary	2000	3
		F	39	Housewife	Elementary	3000	4
		F	66	Housewife	High School	3000	5
BFG5	Fisher Wives	F	38	Housewife	Elementary	3000	1
		F	40	Housewife	High School	4000	2
		F	36	Housewife	Elementary	2000	3
		F	42	Housewife	Elementary	5000	4
		F	45	Housewife	Elementary	6000	5
		F	30	Housewife	Elementary	3000	6
BFG6	Fisher	M	55	Farming	Elementary	4000	1
		M	60	Fishing	Elementary	1500	2
		M	50	Carpentry	High School	2000	3
		M	56	Farming	Elementary	1000	4
		M	53	Carpentry	High School	2000	5
		M	47	Farming	Elementary	5000	6
BFG7	Fisher	M	49	Fishing	Elementary	4000	1
		M	45	Carpentry	High School	3000	2
		M	56	Fishing	High School	5000	3
		M	25	Fishing	Elementary	3000	4
		M	37	Farming	High School	3000	5
BFG8	MPA involved	M		FA President			1
		M		Barangay Official			2
		M		Barangay Captain			3
		F		Ex- Captain			4

3. Description of Candaping B Focus groups

Focus Group Code	Focus Group Type	M/F	Age	Occupation	Education	Monthly Income PHP	Number
CFG1	Fisher	M	39	Fishing	Elementary	2000	1
		M	44	Farming	Elementary	3000	2
		M	39	Resort	High School	3000	3
		M	59	Resort	Elementary	2000	4
		M	50	Farming	Elementary	2000	5
		M	30	Farming	High School	3000	6
CFG2	Fisher	M	39	Farming	High School	2000	1
		M	21	Student	High School	3000	2
		M	53	Farming	Elementary	2000	3
		M	29	Farming	Elementary	2000	4
		M	33	Fishing	Elementary	5000	5
CFG3	Fisher	M	41	Farming	Elementary	2500	1
		M	65	Farming	Elementary	3000	2
		M	68	Farming	Elementary	1500	3
		M	49	Farming	Elementary	1500	4
		M	47	Farming	Elementary	1000	5
CFG4	Fisher	M	38	Resort	High School	5000	1
		M	41	Farming	High School	2000	2
		M	26	Fishing	Elementary	500	3
		M	36	Fishing	Elementary	3000	4
		M	17	Student	High School	1000	5
		M	35	Farming	High School	5000	6
CFG5	Fisher	M	69	Bantay Dagat	Elementary	3000	1
		M	48	Fishing	Elementary	1000	2
		M	77	Ex-Captain	Elementary	5000	3
		M	43	Barangay Councillor	High School	5000	4
		M	37	Barangay Councillor	High School	5000	5
CFG6	Fisher Wives	F	47	Housewife	Elementary	5000	1
		F	65	Housewife	Elementary	3000	2
		F	33	Housewife	High School	2000	3
		F	30	Housewife	High School	3000	4
		F	32	Housewife	High School	3000	5
		F	37	Housewife	High School	9000	6
CFG7	Fisher Wives	F	42	Housewife	Elementary	2000	1
		F	49	Housewife	Elementary	4000	2
		F	44	Housewife	High School	3000	3
		F	43	Housewife	Elementary	3000	4
		F	42	Housewife	Elementary	2000	5

Appendix 5. Semi Structured interview Template

    I.   **DEMOGRAPHIC INFORMATION**
1. *Age*
2. *Gender M/F*
3. *Job(s)/Livelihood*
4. *Members of any association?*

   II.   **KNOWLEDGE AND AWARENESS**

Knowledge of Objectives
5. *What are the reasons for having an MPA ?(Is the individual knowledgeable about the MPA)*

Knowledge of Relevant Laws
6. *Awareness of community towards MPA (is everyone aware ?why ? why not ? meetings ?)*
7. *Awareness of individual towards rules/fines/sanctions (is everyone aware ?why ?why not ? meetings ?)*
8. *Awareness of community towards rules/fines/sanctions (is everyone aware ?why ?why not ? meetings ?)*

  III.   **COMMUNITY SUPPORT :ATTITUDE**

9. *Personal Attitude Towards MPA (Why ?)(Has it Changed over Time ?)*
10. *Overall Community Attitude Towards MPA (Why ?)(Has it Changed over Time ?)*
11. *Why the Similarities or Differences in Opinions ?*

  IV.   **COMMUNITY SUPPORT :ACTION**

12. *What is done to ensure that no illegal activity such as encroachment or illegal fishing is occurring in the MPA ?*

Monitoring *:*
13. *Who detects whether an individual is encroaching or not ? (Do you ? Does the community ? Do many or few people monitor ?)*
14. *Why do they spend time monitoring ? Why do others NOT spend time monitoring (what are the benefits ?)*

Enforcement :
15. *What happens if someone spots an encroacher ?(Who do you go to ?Who decides if they are fined/emprisoned or not etc..)*
16. *Do all people do this if they spot an encroacher ? (Why ?Why not ?Are people scared ?)*
17. *Do some people get away without paying fines ? (Who ?Why ?Why not ?)*

Compliance
18. *How much illegal MPA activity/encroachment do you think is occurring ?*

   V.   **RELATIONSHIP BETWEEN ACTION AND ATTITUDE**

19. *Can you categorise the type of person that encroaches the MPA ?(poor/rich/mean/powerful/weak/cares for family/loner/foreigner ?)*
20. *Why do you think certain people encroach the MPA ?*
21. *Despite their encroachment do you think they are still in favour of the MPA ? (Why/Why not ?)*

VI.   HISTORY OF MPA AND POLITICAL STABILITY

22. *Have there been any changes in the effectivness of the MPA or the way it has been managed ? (Describe ?Why ?)*
23. *Do you think the success of the MPA may be altered if a new captain has been elected ? (Why ? Even despite the support of the community ?Support of FA ?)*
24. *What if a new mayor or new president is elected ? Why ?*

VII.   EMPOWERMENT
Participation
25. *Do you think that the community has participated in decision making surrounding the MPA ?(How ?Why ?)*
26. *Why do you think some participate and others don't ?*
Influence
27. *Do you think that the community has the power to influence decisions surrounding the MPA?(How ?Why ?)*
28. *Can all individuals influence decision making ? Why/Why not ?*

VIII.   SOLIDARITY
Trust
29. *Do individuals within the community trust each other ?*
30. *Why ?*
31. *Has the implementation of the MPA affected trust between individuals ?*
32. *Do certain individuals specifically distrust each other ?*
Cooperation
33. *Do individuals within the community cooperate with each other ?*
34. *How and Why ?*
35. *Has the implementation of the MPA affected the cooperation between individuals ?*
Similarity
36. *How similar do you feel opinions towards the MPA are within the community ?*
37. *Why ? Do certain groups or individuals differ in their views significantly ?*

IX.   FISHERMAN'S ASSOCIATION

38. *What is the fisherman's associations role ?*
39. *Can all individuals join the association ?*
40. *Why do you think certain individuals join the fisherman's association ?*
41. *Why do you think certain individuals refuse to join the fisherman's association ?*

X.   MONEY GENERATION

42. *Does the MPA generate money ?*
43. *What happens to it ?*

XI.   FOREIGNERS

293

44. Do you feel that foreigners have had an impact on the MPA ? How ?
45. Are there any differences between Sitios ?

Appendix 6. Application for Ethical Approval at the University of East Anglia

PART A – to be completed by the applicant(s)

ALL QUESTIONS IN **PART A** MUST BE ANSWERED.

Name of applicant:	Tomas Chaigneau				
Student ID no. (if applicable)	4495136		Sex (✓)	M ✓	F
Project Title:	What factors influence community support towards Marine Protected Areas (MPAs) in the Philippines?				
Project Funder*:	NERC/ESRC				
Submitted by (✓)*	SSF	✓	ODG		
Date of submission of application:		08/07/2010			

Name(s) of all person(s) submitting research proposal (including main applicant)	Status (BA/BSc/MA/MSc/MRes/ MPhil/PhD/research associate/faculty etc.) **<u>Students please specify your course</u>**	Department/Group/ Institute/Centre
Tomas Chaigneau	PhD	School of International Development
Address for correspondence relating to this submission:		
Tomas Chaigneau c/o School of International Development University of East Anglia Norwich NR4 7TJ		

In the case of undergraduate and postgraduate research please give details of supervisor(s):	
Name	**Position held**
(1) Tim Daw	Lecturer in Development Studies
(2) William Cheung	Lecturer in Marine Ecosystem Services
	Professor of Development Studies
(3) Katrina Brown	

1. OVERVIEW OF THE STUDY: Describe the purposes of the research proposed. <u>Detail the methods to be used and the research questions.</u> Provide any other relevant background which will allow the reviewers to contextualise your research (approx. 400 words).

Research Question: What factors influence community support towards Marine Protected Areas (MPAs) in the Philippines?

Objective: Most conventional fisheries management techniques have failed. Given the potential repercussions, especially in developing countries, of a continuing decline in fish catch, developing effective management strategies have become one of the most important challenges confronting natural resource and conservation scientists. There has been a shift from a purely biological approach to a more interdisciplinary one which understands the links between social and ecological systems. Resource users are now increasingly seen as the solution and not part of the problem. Whilst MPAs are often hailed as the solution to this fishery crisis, it is becoming apparent that many are failing their social and biological objectives.

The proposed research will seek to integrate social and natural science data and theory to understand what influences community support towards MPAs in the Philippines. It may then become possible to prioritise areas that are more welcoming of these conservation strategies and help determine if MPAs are appropriate for a given area.

Theoretical Background: To both define and determine the importance of community support towards MPAs. I draw from a number of broad overarching theories. Both the study of Socio-Ecological Systems and work on Common Pool Resources and Collective Action have been vital in highlighting the importance community support may have towards MPAs. Furthermore, behavior theories were essential to help define "community support" and help conceptualise the link between the attitude of individuals and their relevant pro-environmental behavior/action towards the MPA. These overarching theories together with other empirical work also helped me determine which factors may influence community

support.

Research Site: Philippines. One site in Siquijor, One site in Eastern Samar, and One site in Negros Oriental, all these villages will be within the visayas regions of the Philippines.

Sub-questions:

1. What factors influence positive and negative attitudes towards MPAs?

2. Are attitudes related to pro environmental action?

3. If so, are there barriers preventing positive attitudes turning into environmental action?

Methods: A Q2 method will be adopted and a mixture of quantitative questionnaires, semi-quantitative interviews and more in depth interviews as well as focus groups will be carried out to infer the level of individual and community support towards MPAs. Furthermore, ecological and fishery data will be obtained from various NGOs to determine if the MPA is providing fishery benefits or not, and to determine the state of the adjacent reefs.

2. SOURCES OF FUNDING: The organisation, individual or group providing finance for the study.

NERC/ESRC

3. RISKS TO PARTICIPANTS: What risks to the subject are entailed in involvement in the research? Are there any potential physical, psychological or disclosure dangers that can be anticipated? What is the possible benefit or harm to the subject or society from their participation or from the project as a whole? What procedures have been established for the care and protection of participants (e.g. insurance, medical cover) and the control of any information gained from them or about them?

A series of procedures will be put in place to minimise the possibility of risk to participants in the research.

1. The regional, provincial and municipal government will be contacted before entry to the relevant villages. This will be to ensure that they are aware and happy for me to do my research within these sites. If there are any issues, my research design is flexible enough to allow me to carry out my research within different sites in the visayas.

2. Entry the barangay (village) will be negotiated with the barangay captains and research will only be carried out if their permission is granted. During these negotiations I will briefly explain what my research is about, how I will carry it out and the purposes of my research.

3. All individuals interviewed will be made aware of my research and will have the opportunity to opt out of the interview at any point. All information obtained will be confidential until publication where data will be made available to villages and the government in which case all individuals names will be made confidential. With strict attention paid to sensitive information and key informants within organisations.

4. There are likely to be times when some community members say one thing while others say another. In these cases it is important not to reveal what others have said but rather I will note down these discrepancies as a point of research in themselves. In these cases it is very important to maintain with participants that there are no right or wrong answers but rather that I am interested in their own views. Participants are likely to feel more able to talk if they are offered absolute confidentiality.

5. In order to put participants at ease, an interview will be offered wherever they feel most comfortable, such as in the family home or in a private or public space. Although the offer of a public space may make the respondent feel more comfortable and therefore is important to be offered, this could well affect the nature of the information given. As such, who is present at interviews will be noted and this can be cross-referenced to repeat interviews where the same people may not be present.

6. There is a possibility for community conflict, where members of the community are either concerned because of an individual's involvement with my research or where they are jealous or upset that they themselves are not included in the study. In order to overcome this I must be upfront all the time about the ways that I am carrying out research. Respondents must feel able to pull out if they feel under pressure because of their involvement and will be made aware of that. Any issues must be addressed clearly and comprehensively such as the criteria for selection and the purposes of the research.

7. Any sensitive information relevant to my project that I may have observed and not collected via interviews will be noted and kept confidential.

4. RECRUITMENT/SELECTION PROCEDURES: How will study participants be selected? Is there any sense in which participants might be 'obliged' to participate – as in the case of students, prisoners or patients – or are volunteers being recruited? If participation is compulsory, the potential consequences of non-compliance must be indicated to participants; if voluntary, entitlement to withdraw consent must be indicated and when that entitlement lapses.

For the questionnaire where fisherfolk will be interviewed, they will initially be selected opportunistically at fishery landing sites while they repair fishing traps and nets during non fishing days or at their homes. Given the very small population sizes of each sites (approx

300 individuals), snowball sampling may also occur and I believe the majority of fisherfolk can be approached for interview. More in depth interviews will also be carried out, and here consent will be seeked out for experienced fishers, local government representatives, relevant NGO representatives and other key informants to ensure that a range of individuals representing the community are interviewed,

Interviews will be conducted in private and in each case participation will be entirely voluntary and from the outset participants will be made aware of their right to pull out of the research at any point and to withdraw their interview up to 14 days after it has been conducted.

5. PARTICIPANTS IN DEPENDENT RELATIONSHIPS: Specify whether participants will include students or others in a dependent relationship (this could affect their ability to decline to participate). If such participants will be included what will you do to ensure that their participation is voluntary etc.?

For the purposes of this research, I do not intend to include any participants in dependent relationships. If this is likely to change at any point in the research ethical clearance will be re-sought.

6. VULNERABLE INDIVIDUALS: Specify whether the research will include children or people with mental illness. If so, please explain the necessity of involving these individuals as research participants and what will be done to facilitate their participation, or the participation of people with physical disabilities.

The research is not specifically considering children or vulnerable adults but it may be that teenagers or even children are included in data collection. In this case permission will be sought from parents or whoever is in charge of the children.

7. PAYMENTS AND INCENTIVES: Will payment or any other incentive, such as a gift or free services, be made to any research subject? If so, please specify and state the level of payment to be made and/or the source of the funds/gift/free service to be used. Please explain the justification for offering payment or other incentive.

No payment will be offered as an incentive for taking part in the study. However, especially in the case of repeat interviews it may be appropriate to take a small culturally relevant gift to individuals that are participating such as something for the home, some rice or some oil or in most cases Filipino "snacks" (I will try to opt for the healthiest option). In these cases it will be made clear that this is not payment for what I am being told but rather a gift which will fit in with the cultural traditions of the area. This is thought to be especially important if I am being invited into people's homes. In some cases it may also be appropriate to buy a respondent some refreshment such as a soda. Again it will be made clear that this is brought

out of custom and friendship rather than as payment for research.

8. CONSENT: Please give details of how consent is to be obtained. A copy of the proposed consent form, along with a separate information sheet, written in simple, non-technical language MUST accompany this proposal form (do not include the text of the form in this space, attach with your submission as a separate document).

A consent from will be made up (see attached). Translated into local language and then back translated to ensure accuracy. This will be written in simple language and will not use academic jargon.

However, it is predicted that consent will usually be obtained verbally as written consent can make an interview appear very formal and can make participants feel uncomfortable. In these cases the same information will be given as on the consent sheet and will be translated verbally into local language by the research assistant/ translator

9. CULTURAL, SOCIAL, GENDER-BASED CHARACTERISTICS: Comment on any cultural, social or gender-based characteristics of the research participants which have affected the design of the project or which may affect its conduct.

I will be looking at how a number of social and cultural characteristics of participants may influence their attitudes, perceptions and behaviour towards the adjacent marine reserves. And therefore cultural, social or gender based characteristics of the research participants may influence the data collected. However most of the information gathered via questionnaires will not be sensitive in anyway and questions have been designed so that all participants may happily answer all questions.

The questionnaires will also only be administered to fishertfolk.

In depth interviews will also be carried out however, these may include more sensitive topics and elicit attitudes towards the rest of the community and their relationship with the MPA. Depending on the individual, these interviews may be conducted differently depending on their attributes. Indeed a great deal of flexibility and reflexivity will be important to ensure that I remain aware and to any cultural, social or gender based issues and carry out the interview in a sensitive manner.

10. ENVIRONMENTAL IMPACT: Identify any environmental impacts arising from your research and the measures you will take to minimise risk of impact.

At each site I will be living and working in, it will be imperative to be respectful to the local practices of environmental protection. I come from a different background to most research participants and it will be important to be aware of the ways that they take care of the land and coral reefs, which is their main source of livelihood.

My main environmental impact will be the flights taken to and from the Philippines and any internal flights. Although, this is unavoidable, wherever possible I will attempt to replace flying with the use of boats within the Philippines. It may be that there are ways to minimise this environmental impact and I will look into the possibility of offsetting my carbon footprint.

Locally I will try and travel by foot or any form of public transport as much as possible and will respect the land. I however, will try not to inflict my own ideas of environmental protection on another culture.

11. CONFIDENTIALITY: Please state who will have access to the data and what measures which will be adopted to maintain the confidentiality of the research subject and to comply with data protection requirements e.g. will the data be anonymised?

I will be carrying out my research with a translator/ research assistant, as such they are also privy to the data as it is collected. This is obvious to the participant and if this prevents the wish to participate then the individual's wishes will be respected.

Once the data has been collected it will be anonymised by labelling each participant with a letter and then re-naming them with a name beginning with this letter. The list of participants will be held only by the researcher and will be kept in a password protected file on the researchers lap top. Any written notes will not include the name of the participant

Where tapes are given to someone else to transcribe this will not be a local person who may be able to identify any of the participants and nothing identifying the name of the participants will be on the transcription.

Once written up any paper notes will be kept securely away from the village where they can be read by people who may be able to identify the respondent. Nowhere on the written notes will the person's name be written.

12. THIRD PARTY DATA: Will you require access to data on research participants held by a third party? In cases where participants will be identified from information held by another party (for example, a doctor or school) describe the arrangements you intend to make to gain access to this information.

No access is required to third party data for the purposes of this research. However if government records show the name of individuals that may have encroached the adjacent MPA illegally, this individual may be interviewed. However only if gives me permission to do

so.

13. PROTECTION OF RESEARCHER (Applicant): Please state briefly any precautions being taken to protect your health and safety. Have you taken out travel and health insurance for the full period of the research? If not, why not. Have you read and acted upon FCO travel advice (website)? If acted upon, how?
As the researcher I will be considering the precautions I need to undertake to protect my own health and safety. Coming from the UK I will be making sure that all my vaccinations are up to date, that I have health insurance in place and that any medications is taken out with me to save reliance on possibly less reliable medicines brought out there. Having read the FCO travel advice, I am not travelling to any high risk areas. Care will also be taken with valuables and data which will be locked when out in the field. I will have assistance and regular contact with organisations with internet access to alert me of any prevalence of typhoons in the region. My Filipino mobile number will be given to a number of individuals and vive versa. Addresses will be kept for myself and my research assistant with the UEA along with contact details and next of kin. These can be used by the UEA if the need occurs. Regular breaks will be taken from the research site in order to step back and get some perspective as well as to give time to recuperate when necessary. It is recognised that I will always be under scrutiny in the research site and therefore time out is likely to be necessary.

14. PROTECTION OF OTHER RESEARCHERS: Please state briefly any precautions being taken to protect the health and safety of other researchers and others associated with the project (as distinct from the research participants or the applicant).
My interpreter will be relatively local and will know the area well. However, we will be in regular contact when not together via mobile phones. Participants and government officials will be alerted as to the interpreter's role. I will be held accountable for any issues arising from the project. We will also spend a great deal of time apart during weekends or during non questionnaire work. In these situations, the interpreter will be free to do as he pleases as long as it does not interfere significantly with the research project. The interpreter will be mostly involved in the questionnaires as most key informants, government officials and participants involved in NGOs will have a good level of English. This will greatly reduce any potential conflict that may arise as no sensitive issues are explored in the questionnaire.

15. RESEARCH PERMISSIONS (INCLUDING ETHICAL CLEARANCE) IN HOST COUNTRY AND/OR ORGANISATION: The School's staff and students will seek to comply with travel and research guidance provided by the British Government and the Governments (and Embassies) of host countries. This pertains to research permission, in-country ethical clearance, visas, health and safety information, and other travel advisory notices where applicable. If this research project is being undertaken outside the UK, has formal permission/a research permit been sought to conduct this research? Please describe the action you have taken and if a formal permit has not been sought please explain why this is not necessary/appropriate (for very short studies it is not always appropriate to apply for formal clearance, for example).

Permission will be sought with officials at a village, municipal and provincial level.

A student visa will be acquired from the Filipino embassy in London before departure. All other health and safety information has been acquired from the FCO website and will be checked regularly.

A formal research permit may not be required for my project, however, local NGOs, notably CCEF who I am in contact with will be able to keep me informed as to the best ways to conduct my research and to ensure that everyone that needs to be informed of my research is contacted.

16. MONITORING OF RESEARCH: What procedures are in place for monitoring the research (by funding agency, supervisor, community, self etc.)

The research will be largely self monitored with a requirement to produce an analysis paper within the first three months of research as an incentive to keep on track. Research diaries will be kept daily and will be used as a measure of progress. After 4 months I will return to UEA to reflect and analyse upon my findings.

Regular updates will be organised with my supervisors in order for them to monitor my progress. During my time back in the UK a number of meetings will be held to discuss work to date and future plans.

17. ANTICIPATED USE OF RESEARCH DATA ETC: What is the anticipated use of the data, forms of publication and dissemination of findings etc.?

The data collected will primarily be used for the creation of my PhD thesis. It may also be used as data for academic publications

18. FEEDBACK TO PARTICIPANTS: Will the data or findings of this research be made available to participants? If so, specify the form and timescale for feedback. What commitments will be made to participants regarding feedback. How will these obligations be

verified?

Participants will be made aware of what I hope to use the data for. They will know that I am a student and the length of time it takes to analyse and write up the information will be given as accurately as possible. A full copy of my thesis will be supplied to the local government but a summary will also be written and translated through the same process as the consent forms. This can be distributed to anyone who was interested in having a copy of my research findings. Any publications made from my research will be publically available and I will attempt to disseminate the information that the work is available via members of the community that have e-mail. This way, individuals will be able to view any publications if they desire to. Any local NGOs who register their interest will also get a copy of the final PHD or a summary of the findings.

19. DURATION OF PROJECT	
START DATE	05/08/10
END DATE	05/12/10

20. PROJECT LOCATION(S): Please state location(s) where the research will be carried out.
1) Suba Barangay-Municipality of Anda-Bohol Province-Visayas-Philippines 2) Tambobo Barangay-Municipality of Siaton-Negros Oriental Province-Visayas-Philippines 3) Candaping B Barangay-Municipality of Maria-Siquijor Province-Visayas Philippines

Signature (Proposer of research)	Date
Tomas Chaigneau	07/08/10

List of Acronyms

AIC: Aikeke Information Criterion

ANOVA: Analysis of Variance

BFAR: Bureau of Fisheries and Aquatic Resources

CBD: Convention on Biological Diversity

CB-NRM: Community Based Natural Resource Management

CCEF: Coastal Conservation Education Foundation

CEMRINO: Centre for the Establishment of Marine Reserves in Negros Oriental

CPR: Common Pool Resource

CPUE: Catch Per Unit Effort

CRM: Coastal Resource Management

DA: Department of Agriculture

FA: Fisherman's Association

FAO: Food and Agriculture Organization

FARMC: Fisheries and Aquatic Resource Management Council

FG: Focus Group

GO: Government Organisation

ICM: Integrated Coastal Management

IDI: In Depth Interview

IFAD: International Fund for Agricultural Development

IUCN: International Union for Conservation of Nature

KI: Key Informant

LGC: Local Government Code

MPA: Marine Protected Area

NGO: Non-Governmental Organisation

NRM: Natural Resource Management

NS: Non-Significant

NSCB: Philippine National Statistical Coordination Board

PEB: Pro-Environmental Behaviour

SD: Standard Deviation

SES: Social-Ecological Systems

SSI : Semi-Structured Interview

TEV: Total Economic Value

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311

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