Fins, gills and fishermen
The socio-economic impacts of marine conservation in southern Indonesia

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1. Introduction ......................................................................................................................... 1
   1.1 Asian demand for sharks and manta rays leads to overfishing ........................................ 1
   1.2 Government conservation efforts ..................................................................................... 1
      1.2.1 Protecting sharks and manta rays under law .............................................................. 1
      1.2.2 Marine Protected Areas ............................................................................................. 1
   1.3 Eco-tourism benefits from marine conservation ............................................................ 2
   1.4 Need for studying socio-economic impacts of conservation efforts ............................. 3
2. Thesis description .................................................................................................................. 3
   2.1 Aim of the thesis .............................................................................................................. 3
3. Conceptual framework ......................................................................................................... 5
   3.1 Economic concerns for stakeholders in marine conservation ........................................ 6
   3.2 Stakeholder participation in environmental decision-making ........................................ 6
   3.3 Stakeholder perception in marine conservation .............................................................. 7
   3.4 Summary: Expected trends among fishing communities ................................................ 7
      3.4.1 Expected trends in stakeholder economy ................................................................. 7
      3.4.2 Expected trends in stakeholder participation ........................................................... 8
      3.4.3 Expected trends in stakeholder perception .............................................................. 8
4. Methods ............................................................................................................................... 9
   4.1 Selection of cases ............................................................................................................ 9
      4.1.1 Komodo National Park, Flores .................................................................................. 10
      4.1.2 Nusa Penida, Bali .................................................................................................... 11
      4.1.3 Tanjung Luar, Lombok .............................................................................................. 12
      4.1.4 Defining stakeholders in cases ................................................................................ 13
   4.2 Methodology ................................................................................................................... 14
      4.2.1 Research design ....................................................................................................... 14
      4.2.2 Interviews .............................................................................................................. 14
         4.2.2.1 Gender considerations ...................................................................................... 15
      4.2.3 Interview design ..................................................................................................... 15
      4.2.4 Methodological challenges .................................................................................... 15
      4.4.3 Interview analysis ................................................................................................ 16
5. Results .................................................................................................................................. 17
   5.1 Komodo National Park .................................................................................................... 17
      5.1.1 Stakeholder economy, Komodo National Park ........................................................ 17
      5.1.2 Stakeholder participation, Komodo National Park .................................................. 19
5.1.3 Stakeholder perception, Komodo National Park .......................................................... 21
5.2 Nusa Penida .................................................................................................................. 22
  5.2.1 Stakeholder economy, Nusa Penida ........................................................................ 22
  5.2.2 Stakeholder participation, Nusa Penida ................................................................ 24
  5.2.3 Stakeholder perception, Nusa Penida .................................................................... 25
5.3 Tanjung Luar .................................................................................................................. 27
  5.3.1 Stakeholder economy, Tanjung Luar ..................................................................... 27
  5.3.2 Stakeholder participation, Tanjung Luar ................................................................. 29
  5.3.3 Stakeholder perception, Tanjung Luar .................................................................... 32
6. Discussion ....................................................................................................................... 33
  6.1 Stakeholder economy ................................................................................................. 33
  6.2 Stakeholder participation ........................................................................................... 34
  6.3 Stakeholder perception ............................................................................................... 36
  6.4 Conclusion .................................................................................................................. 37
7. Summary ......................................................................................................................... 38
8. Acknowledgements ......................................................................................................... 39
9. References ....................................................................................................................... 40
  9.1 Published sources ........................................................................................................ 40
  9.2 Electronic sources ....................................................................................................... 43
10. Appendix ....................................................................................................................... 44
  10.1 Interviewees, Komodo National Park ...................................................................... 44
  10.2 Interviewees, Nusa Penida ....................................................................................... 45
  10.3 Interviewees, Tanjung Luar ..................................................................................... 45
  10.4 Interview guide .......................................................................................................... 46
  10.5 Analysis checklist ...................................................................................................... 47
## List of Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTC</td>
<td>Coral Triangle Center</td>
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<tr>
<td>IUCN</td>
<td>International Union for Conservation of Nature</td>
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<tr>
<td>KNP</td>
<td>Komodo National Park</td>
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<tr>
<td>MPA</td>
<td>Marine Protected Area</td>
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<tr>
<td>NGO</td>
<td>Non-Governmental Organization</td>
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<td>UNEP</td>
<td>United Nations Environmental Programme</td>
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Fins, gills and fishermen

BJÖRN ERIKSSON

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Abstract: Sharks and manta rays are being heavily fished in Indonesia due to Asian demand for shark fins and manta gill rakers. The Indonesian government passed legislation in February 2014 to protect the two species of manta rays. A number of shark species have also been protected or banned from export. A major factor in this decision was the proven economic benefits from eco-tourism compared to the economic benefits from the shark finning and manta gill industry. However, previous research on marine conservation underlines that there is a lack of social scientific studies on the socio-economic impacts that marine conservation have on stakeholder fishing communities. In an attempt to start filling this gap of knowledge, the purpose of this thesis was to investigate how the shark and manta ray conservation efforts affect the socio-economic situation of different stakeholder fishing communities in Indonesia. Fieldwork was done in fishing communities in the Komodo and Nusa Penida regions, together with the fishing village Tanjung Luar in Lombok, where people in fishing communities were interviewed about their livelihood situation. The study found that the impacts of marine conservation on the economic situation for stakeholder fishermen affects their attitude towards and compliance with marine conservation efforts. If no profitable economic alternatives are given to fishing, fishing communities have a lower degree of compliance with conservation efforts.

Keywords: Sustainable development, fisheries management, marine conservation, development, stakeholder participation, tourism, Indonesia

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Summary: Due to Asian demand for sharkfin soup and traditional medicine, sharks and manta rays are being heavily fished all over the world for their fins and gills. Indonesia is the biggest exporting country of these wares, and the country is now taking efforts to halt this trade. A number of shark species have been protected or banned from export, and the Indonesian government passed legislation in February 2014 to protect the two species of manta rays. A major factor in this decision was the proven economic benefits that stem from eco-tourism depending on these species, such as scuba diving activities, compared to the economic benefits from the shark finning and manta gill industry. However, previous research on marine conservation has stated that there is a lack of social scientific studies on the impacts that marine conservation have on the socio-economic situation for stakeholder fishing communities, that may depend on fishing these animals for a living. In an attempt to fill this gap of knowledge, the purpose of this thesis was to investigate how the efforts to protect sharks and manta rays affect the socio-economic situation of different stakeholder fishing communities in Indonesia. To obtain this knowledge, fieldwork was done in Komodo, Nusa Penida and Tanjung Luar, where people in fishing communities were interviewed about their livelihood situation. The study found that the effect that marine conservation had on the economic situation for stakeholder fishermen affects their attitude towards, and compliance with, marine conservation efforts. If they are not given profitable economic alternatives to fishing, these communities are less likely to comply with conservation efforts.

Keywords: Sustainable development, fisheries management, marine conservation, development, stakeholder participation, tourism, Indonesia

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1. Introduction

1.1 Asian demand for sharks and manta rays leads to overfishing

The waters of the Indonesian archipelago have a high diversity of shark species. At least 118 species have been found throughout the vast region (Blaber et al., 2009). Indonesia however also has the highest number of annual shark landings, meaning sharks fished and brought to land. The country is one of the largest exporters of shark fins in the world, putting nearly all shark species of high economic value in the region at risk of being overexploited (Ibid). Since sharks are slow to grow and mature at a late age, they are particularly vulnerable to the increased fishing pressure. This situation is of international concern (Dharmadi et al., 2015) and continued intensive shark fishing is likely to lead to a depletion of shark populations in Indonesia (Ibid). While the majority of sharks are taken as bycatch, they are also targeted in several regions of eastern and southern Indonesia, where they are the main source of livelihood for many fisheries (Ibid). While trade in sharks covers live specimens as well as different parts of their bodies, the fins are the most valuable parts and represent by far the largest proportion of parts and products that are traded. While it has not been determined if the current catch rates are sustainable, declining numbers and sizes of caught sharks suggest that they are not (Ibid).

The Indonesian waters also have a high abundance of ray species, among them the two species of manta ray. Due to overfishing in many countries, among them Indonesia, manta rays have had their populations reduced considerably over the past decades, to the point where they are threatened with local extinction in some areas (O'Malley et al., 2013). The meat of manta rays is of poor quality, but the gill plates have become highly sought after in Asian markets, where they are marketed as treatment for a wide variety of conditions (Ibid). Indonesia has some of the most aggressive targeted fisheries for manta rays. While regulations will help curb fishing related threats, sound conservation strategies are also needed to protect decreasing populations (Germanov & Marshall, 2014). Fishermen have witnessed about declining numbers and sizes of caught specimen for manta rays (Lewis et al., 2015).

1.2 Government conservation efforts

1.2.1 Protecting sharks and manta rays under law

To try to stem the threat of overfishing, the Indonesian government declared both species of manta rays, the reef *Manta alfredi* and the oceanic *M. birostris*, as protected in 2014, and they were listed as a CITES endangered species in 2013 (Germanov & Marshall, 2014). Whale sharks, *Rhincodon typus*, gained protection status in Indonesia in 2014 and export was prohibited on Oceanic Whitetip sharks, *Carcharhinus longimanus*, together with four species of Hammerhead shark in the same year (Dharmadi et al., 2015).

1.2.2 Marine Protected Areas

A Marine Protected Area (MPA), is "a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values" (IUCN, 2008). As overexploitation and habitat degradation cause increasing stress to ocean ecosystems and associated human communities, implementing MPAs has commonly been offered as a useful management intervention. They have been particularly popular for addressing issues within coral reef systems such as overfishing, and also to foster alternative livelihoods within the region (Christie and White, 2007). According to a report from the United Nations Environment Programme (UNEP), MPAs tend to be governed using a variety of top-down, bottom-up, and market incentive-based
approaches. There is a growing recognition in governance debates that elements of all three are necessary for successful conservation and that co-management is the way forward, but the interpretations of its application vary between different MPAs and their regional contexts (Jones et al., 2011).

Prior to protecting the species by law, manta ray sanctuaries were established in Indonesia in the waters of Raja Ampat 2012, Komodo National Park 2013, and Nusa Penida 2013, as a tool to facilitate conservation of the species (Germanov & Marshall, 2014; Mantawatch, 2014). Raja Ampat was also declared as a shark sanctuary in 2013 (The Nature Conservancy, 2013). However, in the case of sharks, designing MPAs to benefit such mobile species has proven to be particularly challenging, and requiring extensive knowledge of their biology and behavior. Sharks have a broad geographic distribution and a migratory nature, making an effective conservation strategy difficult to define. The probability of fish captures outside of MPAs is a crucial factor. A study on two coastal shark species in two MPA regions in the Great Barrier Reef in Australia did however show that, while shark behavior and movement patterns vary between species and life stages, established MPAs may have “significant benefits for conservation and fisheries management” (Knip et al., 2014).

1.3 Eco-tourism benefits from marine conservation
Sharks have important functions in ecosystems as they often have the role of top carnivore, which plays a major role in structuring the ecosystems from above (Mooney et al., 2009). However, arguments for shark conservation based on their role as top predators have failed to halt the overfishing and subsequent worldwide decline in populations (Vianna et al., 2012). Meanwhile eco-tourism, which can be defined as “non-consumptive travel with minimal negative impact that results in increased conservation and sustainability of natural and sociocultural resources and contributes to the well-being of local people” (Sirakaya et al., 1999), has been successful in promoting marine conservation. It has also been shown to contribute to more sustainable livelihoods in places throughout the world (O’Malley et al., 2013). A study done on Andros island, Bahamas (Hayes et al., 2015) found that 79% of their interviewees agreed that tourism had helped enhance the quality of life for their family, and that 59% of respondents were in favor of additional protection of marine species if tourism would continue growing on the island. Vianna et al. (2012) found that shark diving in Palau, where a nation-wide shark sanctuary is in place since 2009, was responsible for the disbursement of US$ 1.2 million in salaries to the local community annually, and that it generated US $1.5 million in taxes to the government. The economic value generated from shark fishing alone accounts for more than 8% of Palau's GDP. Eco-tourism has also generated jobs for local residents in the diving industry, as well in other tourism-related sectors such as hotels, restaurants and souvenir shops. Comparing these numbers to the economic profits of shark fishing show a large difference, since the value of 100 sharks to shark fishermen amounts to US$ 10 800 at most (Ibid).

In Raja Ampat, West Papua Province, Indonesia, manta rays and sharks are among the top attractions for tourists. A 1220 square kilometer conservation zone has been established in the region and local people, some of whom used to be engaged in shark finning, are hired as park rangers. A tourist resort is built on an island that was previously used as a shark finning camp (O’Malley et al., 2013). Over its lifetime, a single manta ray can generate benefits of up to 1.9 million US dollars as an asset to the tourism sector, whereas the value of its meat and gill plates is between 40 to 200 US dollars for a single fisherman (Ibid).
1.4 Need for studying socio-economic impacts of conservation efforts

While there is evidence that shark and manta ray eco-tourism is more beneficial economically compared to fishing these species, obtaining a better understanding of the socio-economics of manta fishing communities has been identified as critical to ensure sustainable conservation and management (Lewis et al., 2015). According to Mascia (2003), there appears to be a need for social science studies on how the efforts to protect sharks and manta rays have affected the socio-economic situation for the local communities. Pelser et al. (2013) state that conservation as well as poverty alleviation has been a key part of conservation philosophy and practice in most developing countries for the last decades, but that the majority of evaluations done on protected areas have still focused on the biological domain and neglected the social impacts. Gurney et al. (2014) mention that studies of the economic impacts of protected areas have found both positive and negative outcomes, but there are too few case studies done to be able to make any generalizations. Few evaluations have also had the necessary data to assess any causal effects of the protected areas. O'Malley et al. (2013) argues that while there is a clear economic argument in favor of manta ray-watching tourism compared to manta ray fishing, the socio-economic consequences for manta fishermen needs to be taken into account. Successful management of shark fisheries requires mutual understanding and cooperation between the relevant institutions, environmental NGOs fisheries associations, and fishing communities (Dharmadi et al., 2015).

MPAs are in most cases designed and evaluated from a biological perspective. They are often a successful short-term conservation tool (Christie et al., 2003). However, without addressing related social issues these short-term gains will likely disappear in the long-term, and social science research is generally conducted too late in the conservation design process to influence policy (Ibid). Christie (2004) also mentions that there has been a lack of social science research on the implications of MPAs which has led to, at least, two unfortunate conditions. First, an incomplete understanding of how the MPA management tool can be utilized most effectively, and second, a lack of knowledge on human responses to MPA implementations. In the tropics, this has led to conflict since artisanal fisheries have sometimes been marginalized by other activities which benefit from the MPAs, such as eco-tourism businesses. For the MPAs to be successful in the long term, the receptivity of fishing communities needs to be carefully considered (Christie, 2004). To conserve sharks and manta rays effectively through MPAs, support and commitment from stakeholders such as local governments, fishermen, civil society and local communities is necessary, in order for the protection from fishing to be successful. Fishing communities who depend on shark and manta ray fishing for their livelihood need to prompt the government to devise innovative solutions that will ensure long-term protection of sharks and manta rays, while also considering the impacts of these regulations on industries and fishermen (Dharmadi et al., 2015). As Valentine (1992) states, if local people lack the necessary qualifications to supply the services required by the tourism industry, their access to the economic benefits of tourism may be limited.

2. Thesis description
2.1 Aim of the thesis

The purpose of the thesis was to investigate the conflict of interest that occurs when marine conservation efforts, specifically shark and manta ray conservation, share environmental resources with fishing communities who may utilize them in different ways. In this study these environmental resources were of two categories. The first category is the species of sharks and manta rays that are protected by legislation, and the second category is the marine regions where reef manta rays and certain shark species had been proven to frequent and which are declared as MPAs by the
government. The study was focused on Indonesia which, as mentioned in the Introduction, has implemented marine protected areas (MPAs) and declared endangered shark and manta ray species as protected under law, while still remaining the world's largest exporter of shark fin and a leading exporter of manta gill rakers. Using the concept of stakeholder participation as a conceptual framework, fishing communities were viewed as stakeholders in the conservation efforts as they too depend on the marine resources. These communities are potentially having their economic resource pool, in the form of fishing grounds or targeted species, limited by marine conservation efforts being enforced in the region by the government or local NGOs.

The study aims to examine this conflict of interest by looking at how fishing communities are affected socio-economically by shark and manta ray conservation efforts. The research was based on interviews with people living in local fishing communities having the majority of interviewees being dependent on fishing for their main livelihood. Communities were chosen based on their location in relation to marine protected areas, and the extent of their activity in terms of targeted shark and manta ray fishing. The focus of the interviews were these people's opinions of, and experiences from, the marine conservation efforts that are or had been taking place in the area.

The set of questions used covered how marine conservation efforts affected their livelihoods, whether they felt that they had been involved in the process(es) by for example getting access to alternative livelihoods, and if they thought they had been better or worse off economically as a consequence (see interview guide in Appendix 10.4). The results from the interviews conducted in the different regions will be compared in the discussion part (section 6), in order to find potential similarities or differences in conservation effects on the fishermen’s income and attitudes. The ambition is to reach a conclusion on whether a high or low degree of stakeholder participation has had an effect on fishermen livelihoods, via for example access to alternative livelihoods, and if this in turn affected their attitudes towards marine conservation. This issue and the subsequent research question for this study is visualized in figure 1 below.
Figure 1. Problem and research question. Fishing communities choosing to comply with shark and manta ray conservation lose access to their income source. If participation is high, they have gained access to other economic options like tourism instead and can get socio-economic benefits. If participation is low they have not gained this access and their socio-economic situation can have worsened, which could cause them to go back to fishing the protected species.

3. Conceptual framework

Concepts, meaning ideas expressed in symbols or words, are the building blocks of theory (Mikkelsen, 2005). This study will use the concept of stakeholder participation in evaluating the socio-economic impacts of marine conservation. In order to explain this concept and its use for the research question, this section will map out some of the literature and empirical findings on stakeholder participation, with emphasis on three topics of concern to stakeholders in marine conservation:

- Economic consequences
- Participation in conservation
- Personal perception

Literature and empirical findings related to these topics will be described in sections 3.1, 3.2 and 3.3 below. Based on the literature and empirical findings a summary will be done on each of these three topics, together with a Figure which explains the trends expected to be seen in the analysis.

For the purposes of this study, socio-economic status will be defined as an individual's access to financial, social, cultural, and human capital resources (National Forum on Education Statistics, 2015). As has been shown in section 1.4, there is an expressed need for studies of the socio-economic consequences that marine protection efforts have on local populations, in particular fishing communities. Stakeholders can be identified as those who are affected by, or can affect, a
decision (Freeman, 1984) or as individual persons, groups and institutions with vested interests in an intervention. Primary stakeholders are those who will be directly affected by an intervention, positively or negatively (Mikkelsen, 2005) which in the case of this study is the fishermen sharing their marine resources with stakeholders in marine conservation, such as NGOs and the Indonesian government. Participation can in turn be defined as a process where individuals, groups or larger organizations affected by certain decisions, take an active role in forming them (Rowe et al., 2004). MPAs have faced a lot of problems globally, such as limited management capacity, poor or ineffective governance and a lack of stakeholder participation (Kusumawati & Huang, 2014).

3.1 Economic concerns for stakeholders in marine conservation
Previous research shows that conservation efforts which include local residents in economic activities related to them also have been successful in their environmental targets (Hayes et al., 2015; O'Malley et al., 2013). Gurney et al. (2014) investigated the success of an MPA designed to provide fishermen with economically beneficial activities in North Sulawesi, Indonesia. The results indicated that the MPA had a significant effect on poverty, and that dependency on fishing for livelihood was initially reduced (Ibid). Von Essen et al. (2013) assessed how communities in North Sulawesi reacted to the adoption of mariculture, meaning activities such as seaweed farming, as an alternative to fisheries. The study found that alternative livelihoods need to be accepted by coastal communities when conservation efforts are introduced, for them to be successful. Fishermen unwilling to drop fishing entirely listed economic profits as one of the major factors. The study concludes that careful consideration of local socio-economic factors is required, as failure of doing so has negatively impacted mariculture projects in the past (Ibid).

3.2 Stakeholder participation in environmental decision-making
On local as well as international level, stakeholder participation is increasingly being seen as an important component of environmental decision-making processes. It is argued that involving stakeholders will better the quality and durability of decisions being made (Reed 2008; Luyet et al. 2012). Richards et al. (2004) also claim that it can increase the likelihood that environmental decisions are perceived as holistic and fair and that they recognize the complexity of human-environmental interactions. For MPA planning specifically, public participation is seen as vital to achieving conservation goals. The IUCN points out that MPA management should involve local fishermen in its establishment and zoning, and they should also contribute to control and surveillance (Korting, 2016).

Political theorists and social scientists tend to argue that concepts related to public acceptance, such as fairness, are of greatest importance in policy setting, while economic and scientific arguments tend to focus on the importance of a quality decision and process (Rowe et al., 2004). Rowe and Frewer (2000) argue that environmental conservation which has good process but poor acceptance among stakeholders is likely to be met with skepticism, dispute, boycott and similar attitudes. Stakeholder participation has also been argued to have democratic benefits, as it reduces the likelihood of marginalizing those in the periphery of a decision-making process, allowing for more relevant stakeholders to be involved in the process and promoting active citizenship (Martin and Sherington, 1997). If participatory processes are perceived to be transparent and take conflicting claims and views into consideration, they can also increase public trust in civil society (Richards et al., 2004). Furthermore it can function to empower stakeholders through the co-generation of knowledge with researchers and the resulting increased capacity to use this knowledge (Wallerstein, 1999).
Certain concerns are also brought up about stakeholder participation not living up to many of the claims that are being made, or that it can have unexpected negative consequences. If the processes that stakeholders participate in are not well run, they can develop consultation fatigue as they perceive that their involvement generates little reward or influence on decision making (Burton et al., 2004). Brody (2003) also finds that while involving stakeholders in a planning process for environmental conservation may facilitate implementation of the plan, contrary to theoretical support it is not a significant factor in producing a high-quality outcome in terms of ecosystem or environmental planning. It does not guarantee the adoption of a strong plan. Empowerment of previously marginalized groups can shake existing local power structures and lead to potentially negative interactions between groups (Kothari, 2001). On the other hand, it can also reinforce existing privileges and discourage minorities from expressing their perspectives (Nelson and Wright, 1995).

3.3 Stakeholder perception in marine conservation

According to Hutchison et al. (2015), it is important to note that people's actions are based on what they think, rather than on what is necessarily true. An example of how this can present itself among stakeholders was found in Kusumawati & Huang (2014) study. They compared two MPAs in Aceh, Indonesia and found that in the MPA where the central government was the implementing agency and responsible for management of the area, communication with local communities was found to be poor and authorities mentioned having problems with illegal fishing in the MPA. At the same time local fishermen considered their participation to be low and they had low trust in the government. In the other MPA fishermen received more benefits from the MPA and subsequently had higher trust in the government. According to the researchers, decentralized decision making played a key role (Kusumawati & Huang, 2014).

3.4 Summary: Expected trends among fishing communities

A theory can appear in a research study as an argument or rationale which helps explain or predict phenomena that occur in the world. In qualitative research, patterns are found by building categories and themes from the bottom up (Creswell, 2009). An inductive approach is generally used, as the data is organized into abstract units of information from which general principles can be drawn (Copi, 2007). Here, the empirical findings and literature described above will be used inductively, in order to identify and predict potential trends in living situations and attitudes that may be found among stakeholders during data collection. Based on these predictions, a figure for each of the three topics (economy, participation, perception) will be designed to enable explanation and comparison of the field survey findings in the analysis. These will be designed using an input-process-output model as per Bhattacharjee's (2012) recommendation.

3.4.1 Expected trends in stakeholder economy

From the review on economic impacts of marine conservation, and with previous research pointing out economic advantages as a key factor when fishing communities decide to switch to other livelihoods, we can argue that a high degree of involvement in conservation efforts, via access to alternative livelihoods such as the tourism sector, should have generated economic benefits for stakeholder fishing communities. At the same time, findings of negative economic impacts for fishing communities should hint at a low degree of involvement, as they would have less income from fishing and no alternative sources of income. An important factor to consider here is the actual possibilities for fishing communities, as stakeholders, to partake in other economic activities than the ones conflicting with marine conservation efforts – a high degree of possibility to switch should be visible in the economic status of individual fishermen and their perception of conservation.
efforts. This trend is described in Figure 2 below.

**Figure 2.** Stakeholder economy impacts from marine conservation.

### 3.4.2 Expected trends in stakeholder participation

The literature review on stakeholder participation tells us that a high degree of participation should increase the quality and durability of decisions, and generate a perception of the decision as holistic and fair among stakeholders. Trust in government should be high. If the opposite is found during data analysis, that government trust is low and the decision (being the marine conservation efforts in question) is perceived as unfair and failing to take fishermen's interests into consideration, we should be able to argue that stakeholder participation in the particular case has been low. This trend is described in Figure 3 below.

**Figure 3.** Stakeholder participation in marine conservation.

### 3.4.3 Expected trends in stakeholder perception

As shown in section 3, it has been stated that people's actions are based on their opinions rather what is necessarily true. As perception of the decision in question is shown to have an impact on stakeholder attitudes, and stakeholder trust is described as an important factor for marine conservation, we should be able to find that a positive perception and expressions of trust towards marine conservation efforts correlates with a high degree of complying with them (meaning, for example, a low degree of unauthorized fishing). In the same way, expressions of bad perception and distrust of marine conservation efforts should correlate with a low degree of compliance (a high degree of unauthorized fishing). This trend is described in Figure 4 below.
Figure 4. Stakeholder perception on marine conservation.

The empirical data for this research was collected during a field study carried out at sites in three different regions in Indonesia during nine weeks in the spring of 2016. Section 4.1 below will motivate the choice of gathering data in different regions by explaining how these sites are connected. This section will explain how the study was conducted in terms of methodology.

4. Methods
4.1 Selection of cases
Three sites in Indonesia were chosen for the field study (Figure 5), which took place over nine weeks in February-March 2016. Two of the sites selected were chosen based on the fact that they are MPAs and also manta ray and shark sanctuaries. These are Komodo National Park which is located in the West Manggarai province of Flores, and Nusa Penida which is located southeast of Bali and is part of its province. Through large-scale photo identification, it has been proven that some manta rays migrate between these two MPAs (Germanov & Marshall, 2014) which implies that they share a population of the species and, for the purpose of this study, that marine conservation stakeholders in the two regions share the same resource pool. In addition, a third site was chosen because of its history of shark and manta ray fishing: Tanjung Luar on southeast Lombok, Nusa Tenggara is the biggest shark fishery in Indonesia and is also one of the most productive manta ray landing ports (Dharmadi et al., 2015). As its geographic location is in between West Manggarai/Komodo and Nusa Penida, it poses a threat to the manta rays moving between the two MPAs (Germanov & Marshall, 2014).
Figure 5. A section of southern Indonesia where chosen case sites are located. The upper map shows the geographical relation between the sites. The lower left map (A.1) show Lombok and Nusa Penida on a smaller scale: 1.1), 1.2), and 1.3) are manta ray monitoring sites around Nusa Penida. 2) is Gili islands. 3) is Tanjung Luar village. The lower right map (A.2) shows Komodo National Park, where points 4.1)-4.7) are manta ray monitoring sites. Source: Germanov & Marshall (2014).

4.1.1 Komodo National Park, Flores

Komodo National Park is a marine and terrestrial park (Wiadnya et al., 2011) that was established in 1980. It was declared as a Man and Biosphere reserve in 1986 by UNESCO, initially established as a reserve for the unique Komodo Dragon, *Varanus komodoensis*. In 1990 it was declared as a World Heritage Site. The national park includes three major islands, Komodo, Rinca and Padar, and numerous smaller islands. It has one of the world's richest marine environments (Subijanto, 2002). As of 2002, there were 4000 inhabitants living within the national park, spread out over four settlements on the islands of Komodo, Papagaran, Rinca and Kerora (Ibid). Regular marine patrols started in the park in May 1996. Its main objective was to combat destructive fishing practices, such as fishing with dynamite and potassium cyanide. This has since been the main focus area of the marine patrols, which has led to less enforcement being done on zoning areas where artisanal fishing is prohibited. This has led to fishermen continuing to fish inside these zones, over-exploiting them in the process (Wiadnya et al., 2011). The Komodo MPA is managed by the Indonesian Ministry of Forestry. According to Wiadnya et al. (2011) the MPAs managed in this way are considered very centralistic, with most decisions coming from the central institutions in Jakarta, the capital of Indonesia, and local authority acting more as an implementing agency.

In august 2013, the 7000 square kilometer zone that makes up Komodo National Park was declared as a manta ray and shark sanctuary by the district governor of West Manggarai and Komodo (Mantawatch, 2013). One of the main drivers was to protect the manta ray tourism economy (Germanov & Marshall, 2014).
Figure 6. Zoning of the Komodo National Park. The fishing communities interviewed for this field study are located at the Settlement areas marked in red and pink: Rinca, Komodo and Papagaran. Source: www.komodoisland.co.

4.1.2 Nusa Penida, Bali

The district of Nusa Penida consists of three islands, Nusa Penida itself together with Nusa Lembongan and Nusa Ceningan. The islands are located a few km southeast of Bali. The coastal areas of Nusa Penida are intensively used for many of the main economic activities such as seaweed farming, marine tourism and fisheries, including shark fishing. About 850 residents have fishing as their main livelihood, and the vast majority of the 46,000 residents depend on the marine biodiversity of the region for its daily survival (Sanjaya, 2009). A Marine Protected Area surrounding the three islands was declared in November 2010. The MPA was established with three objectives in mind: Protecting marine biodiversity, sustainable fisheries, and sustainable marine tourism. This was done in order to protect the high level of marine biodiversity, in particular megafauna like the manta rays. These objectives were also meant to guarantee the livelihoods of the local communities who depend on these resources for their livelihood. Threats to local biodiversity include destructive fishing methods, such as dynamite fishing and use of poison, and over-exploitation (Ruchimat et al., 2013). Nusa Penida has since been declared as one of three manta ray sanctuaries in Indonesia. The sanctuary spans over 200 square kilometers (Germanov & Marshall, 2014).

The establishment process of the Nusa Penida MPA included gathering of scientific evidence as well as public consultation with key stakeholders such as fishermen, marine tourism operators, and district government officials. Based on the gathered ecological and socioeconomic baseline data, a zoning system was decided upon which catered to the different interests of the stakeholders (Ruchimat et al., 2013).
Figure 7. Zoning of the Nusa Penida MPA. The area consists of three islands (marked in grey). From the left Nusa Lembongan, Nusa Ceningan and Nusa Penida. Source: Weeks et al. (2014).

4.1.3 Tanjung Luar, Lombok

Tanjung Luar, a village located of the island of Lombok in West Nusa Tenggara, is one of the current central ports for shark and ray fishing (Christensen & Tull, 2014) and has been identified as the largest shark and manta ray landing site in Indonesia (Lewis el al., 2015; Dharmadi et al., 2015). Sharks and manta ray are also the most important groups of fish landed in the area (Blaber et al., 2009). As Lombok is situated between two of Indonesia’s most economically important manta ray tourism destinations, Nusa Penida (Bali) and Komodo (West Manggarai, Flores), the fisheries could pose a threat to these operations (Lewis el al., 2015; Germanov & Marshall, 2014).

Since small scale fishing communities such as Tanjung Luar have a low level of income, any restrictions on shark and ray catches can have potentially serious impacts on the incomes and wellbeing of the local fishers and their families (Christensen & Tull, 2014). Catch restrictions can create ripple effects on the local economy by reducing downstream processing of shark products. This is an important source of employment, especially for females. Most of the catch is processed locally. The meat is salted and the skins are commonly used for fashion accessories. Fins are not normally processed before export, as importers prefer to do the processing themselves, but are dried or frozen on location (Ibid). Shark fishing boats use a variety of equipments for fishing. The main equipment for Tanjung Luar is surface longlines which is used to catch pelagic sharks. This type of longline is usually at least 3,000 m in length and has 300-500 hooks. Common time spent on a shark fishing trip is 15 days (Ibid). Capacity controls such as licensing and gear restrictions have been suggested as possible restriction methods (Blaber et al., 2009). The main beneficiaries of the shark fin trade have been the boat owners and traders, rather than fishermen and their families. The proceeds of the
catch are distributed on a share basis, after operating expenses have been deducted (Christensen & Tull, 2014).

Figure 8. Map of the island of Lombok. The village Tanjung Luar is located on the southeast part of the island. Source: www.travelindo.com.

4.1.4 Defining stakeholders in cases

Using Mikkelsens (2005) checklist on how to identify main stakeholders of an intervention, based on previous research and theoretical concepts, four groups of human stakeholders can be identified in the cases chosen for the study:

- Conservation implementers: government authorities responsible for implementing protection law in Tanjung Luar and authorities/NGOs involved in conservation in Komodo National Park and Nusa Penida MPA
- Eco-tourism operators benefitting from shark and manta ray tourism
- Fishing communities living within the two MPAs of Komodo National Park and Nusa Penida
- Shark and manta ray fishermen in fishing community in Tanjung Luar

Since the focus of this study lies on the socio-economic consequences for fishing communities, the interests of people and organizations involved in marine conservation and eco-tourism are outside the scope of this study.
4.2 Methodology
4.2.1 Research design
A multiple case design was chosen to allow for in-depth investigation of the study topic in the required number of case settings. Case research is appropriate for studies where the experiences of actors and the context of actions are critical (Bhattacherjee, 2012). As the study will use stakeholder participation as a conceptual framework for investigating the socio-economic situation for fishing communities, by looking into their economic situation and their perception of marine conservation efforts, the research has overarching characteristics of having a relativist orientation, which recognizes that multiple perceived realities exist among individuals (Yin, 2011). The relativist approach springs from what Creswell (2009) calls the philosophical worldview of social constructivism. This position assumes that the views and realities of participants have been formed through interaction with others as well as cultural and social norms. Researchers using this approach are interested in the participant's subjective view of a situation being studied (Ibid). The study was conducted by doing a field survey. Field studies are non-experimental study designs that are used to capture snapshots of practices or situations from a sample of subjects, from a survey questionnaire or a structured interview. In this study the sample and practice are people in fishing villages practicing legal or illegal fishing. Field surveys do not involve controlling for or manipulating independent variables or treatments (Bhattacherjee, 2012), which for the case of this study would be the impact on marine conservation.

Qualitative research is an approach used for building an in-depth picture of a situation, community or other similar social phenomena. It often combines a variety of methods such as observation, discussion and semi-structured interviews (Mikkelsen, 2005). It stands out from other approaches in its ability to capture and represent the views and perspective of participants in a study (Yin, 2003). A major characteristic of qualitative research is collecting data in the natural setting of participants, where they experience the issue under study (Creswell, 2009). This fact hints that a qualitative approach to the issue under study is more likely to yield the intended results.

4.2.2 Interviews
In the present study, qualitative face-to-face interviews were chosen as the method to collect data. Target interviewees were people identified as stakeholders in marine conservation in the cases chosen for the study. Compared to questionnaires, which are commonly used for gathering quantitative data, interviews are a more personalized form of data collection which allows the researcher to clarify any issues with the questions or ask probing follow-up questions (Mikkelsen, 2005). Generally, when doing qualitative interviews, participants are few in number and intended to elicit views and opinions from the participants (Creswell, 2009). However, for this study the ambition was to have a high number of participants, in order to gain a more holistic view of the situation for fishing communities.
4.2.2.1 Gender considerations
Researchers should be sure to include participants who play different roles within households such as women, children, spouses, parents, and female heads of households. Household members may have diverse responsibilities, perform different activities, and have different workloads and access to resources (Mikkelsen, 2005). For this reason, the ambition for the field study was to have up to a third of interviewees being female.

4.2.3 Interview design
A semi-structured design was chosen for the set of interview questions. In this type of interview, questions are open-ended and unexpected, and relevant answers can be followed up with further questions or probing. When doing this type of interviews, common interviewees are key individuals. These are people anticipated to have particular insight into, or opinions about, the topic under study. Field surveys imply that the study is set among the people who are the subject of the study (Mikkelsen, 2005). During the field study, a number of methods were used to find the target interviewees. Local fishermen and other individuals in the chosen fishing communities were identified as primary stakeholders, who in turn were deemed to be key informants for the purposes of this study (Ibid). Subsequently, some interviewees were chosen on the basis of their profession being related to fishing. A number of interviewees were also chosen using snowball sampling, meaning that interviewees helped finding new interviewees (Esaiasson et al., 2012). In the analysis in section 5, Interviewees will be presented as anonymous persons with only their professions being described. List of interviewees can be found in Appendixes 10.1 (Komodo National Park, 10.2 (Nusa Penida) and 10.3 (Tanjung Luar).

When designing interview instrumentation an interview guide approach was taken. In such approach topics and issues to be covered are specified in advance and the interviewer decides the sequence and wording of questions in the course of the interview (Mikkelsen, 2005). Based on the expected trends formulated in section 3.5, the interview guide was designed to contain 4-7 supporting questions for each of the three discussion topics: economy, participation and perception. Questions were designed with both informative (for example, such as income) and descriptive (for example, opinion-based) answers in mind. The interview guide can be found in Appendix 10.4.

4.2.4 Methodological challenges
Since this study is a field survey, it is important to consider potential challenges with internal validity or causality. This means considering whether the result of an observed change is indeed caused by the hypothesized circumstances or if it is caused by factors outside of the context of the study (Bhattacherjee, 2012). For example, changes in livelihood standards for the fishermen being interviewed could be caused by market fluctuations or economic inflation, or their perception of marine conservation efforts could be influenced by cultural contexts and/or respondent bias. However, as this study includes multiple (three) cases, it has higher degrees of both internal and external validity compared to a single case study (Ibid). To strive further for high validity in the results in the study, Maxwell’s (2009) list on strategies to process threats to validity was consulted. In order to obtain comparable results from different settings, cases were chosen partly on the basis of being different in conservation issue, geographic size and characteristic of stakeholders. The ambition was also to have a high number of interviewees in order to have a rich amount of data from the case sites. When doing interviews in the field, interviewees were continually asked to verify answers that appeared vague, in order to decrease the possibility of a misinterpretation. Employing these strategies served to strengthen the validity of the study. However, field sites were not visited long-term and data was not triangulated during analysis, which may potentially decrease
the validity of the study (Ibid).

As interviewees were not knowledgeable in English, a translator was used for conducting interviews. For some interviews in the Komodo National Park an additional translator was needed due to the interviewees not being knowledgeable in Bahasa Indonesia, the official language of Indonesia. This means that some intentions with the questions asked such as avoiding personal bias in their formulation, and even the basic understanding of the question posed by the interviewees, may have been modified in the course of translation and therefore affecting their given answers.

Semi-structured interviews with an interview guide can increase the comprehensiveness of the data gathered and make data collection more systematic. Interviews are more conversational and situational. On the other hand, important topics may be omitted by mistake and responses given may be different if they come from a different anterior question than previous interviews, which can complicate comparability between interviews (Creswell, 2009).

4.4.3 Interview analysis

A total of 59 interviews were carried out in the three field sites chosen. Interviews were recorded and transcribed to facilitate the analysis (see Appendix 10.1, 10.2 and 10.3) which was done once back from the field. Categorization was done in order to get initial oversight of the interviews. Seven tables were added for each case, and each table was used to categorize different aspects of the interviews, based on the conceptual framework (Esaiasson et al., 2012). The interviews were then analyzed qualitatively to find trends responding to the conceptual framework (see Figures 2, 3 and 4 in section 3.5). The qualitative analysis was done using a pre-designed checklist, following Esaiasson et al. (2012) recommendation for qualitative analysis. The checklist can be found in Appendix 10.5. Based on the trends observed in the tables and the qualitative analysis, conclusions were then drawn in relation to the research question.
5. Results

In this section, the cases will be presented one by one, including design of data gathering and potential issues that arose during or before interviews. Reference to particular interviewees that expressed particular opinions/perceptions is given in the brackets (Interviewee lists can be found in Appendixes 10.1, 10.2, and 10.3)

5.1 Komodo National Park

5.1.1 Stakeholder economy, Komodo National Park

Table 1. Access to alternative livelihoods, Komodo National Park

<table>
<thead>
<tr>
<th>Access</th>
<th>Rinca</th>
<th>Komodo</th>
<th>Papagaran</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>No</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>Not consider</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>No answer</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>30</td>
</tr>
</tbody>
</table>

Source: Appendix 10.1

Table 1.1 Known obstacles to alternative livelihoods, Komodo National Park

<table>
<thead>
<tr>
<th>Known obstacles</th>
<th>Rinca</th>
<th>Komodo</th>
<th>Papagaran</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>5</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>No answer</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>30</td>
</tr>
</tbody>
</table>

Source: Appendix 10.1

Results showed that 7 out of the 30 interviewees had access to livelihoods not related to fishing, such as tourism (Table 1). In addition, 4 out of 30 interviewees answered that capital was the main obstacle for them or for someone they knew (Table 1.1). Efforts seem to have been done by the national park office in Komodo to give locals access to the tourism economy. According to one of the interviewees who works as a carver and does part-time fishing, 180 people in the village had been trained to become carvers, but less than 20 were still active (Interviewee 20a, Komodo, 2016). One fish boat owner stated that there were "lots of options" for livelihoods now, such as souvenir trading, naturalist guide, park ranger, and to drive tourists with their boats (Interviewee 19a, Komodo, 2016). Another interviewee who worked as a ranger in the natural park said he was actively involved in the park and was economically better off because of that (Interviewee 6a, Rinca, 2016).
A former fisherman had changed to start a handicraft business, after having been given training from an NGO involved in the national park, and now sells the souvenirs to tourists. He mentioned being better off economically because of it (Interviewee 4a, Rinca, 2016). There were, however, also some critical voices, e.g. pointing out that only 20 people out of the 1000 village inhabitants in Komodo had been recruited for being employed in the national park and that they were not transparent with the allocation of the income from the park (Interviewee 13a, Komodo, 2016), which suggests that potentially more money could be accessible to the villagers. One interviewee whose son was working for the national park as a ranger, also pointed out that his livelihood was very dependent on the number of visitors (Interviewee 26a, Papagaran, 2016).

Most livelihood options in the region still seem to evolve around fishing in the region. According to one interviewee from Rinca, fishermen change to become boat owners or fish traders, presumably at a later stage in life when the economic conditions might have improved (Interviewee 5a, Rinca, 2016). Other interviewees also said that fishing was the only way to make a living in the area (e.g. Interviewee 3a, Rinca, 2016). It was also considered to be a more stable income than tourism (Interviewee 20a; Interviewee 18a, Komodo, 2016). The people of Papagaran island seem to have been worse off than Komodo and Rinca from the conservation. One of the interviewees, for example, commented that the only ways to make a living on the island are fishing and seine, a form of fishing net, and the latter had just been forbidden (Interviewee 30a, Papagaran, 2016). Another fisherman also said that, unlike Komodo island, they do not have access to tourism or handicraft business (Interviewee 21a, Papagaran, 2016).

Table 2. Income effect, Komodo National Park

<table>
<thead>
<tr>
<th>Income</th>
<th>Rinca</th>
<th>Komodo</th>
<th>Papagaran</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Decrease</td>
<td>5</td>
<td>6</td>
<td>8</td>
<td>19</td>
</tr>
<tr>
<td>No change</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>No answer</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10</strong></td>
<td><strong>10</strong></td>
<td><strong>10</strong></td>
<td><strong>30</strong></td>
</tr>
</tbody>
</table>

Source: Appendix 10.1

Nineteen out of 30 interviewees answered that their income had decreased since the conservation efforts started, and 3 out of 30 said they had seen an increase (Table 2). For example, one of the interviewees stated that they "of course" need more sources of income since the conservation efforts started. She attributed their decrease in income to an increased number of fishermen, and that the size of the fishing zone was unfair to the point that they felt squeezed in terms of the areas available for fishing (Interviewee 3a, Rinca, 2016). The word squeezed was also used to describe the zoning by other interviewees (Interviewee 30a, Papagaran, 2016; Interviewee 16a, Komodo, 2016). One of them also added that her household income had decreased by 70% because of this (Interviewee 16a, Komodo, 2016). The fishing zone issue was a recurring topic among interviewees. For example, there were comments about them being better before (Interviewee 8a, Rinca, 2016), having become smaller (Interviewee 10a, Rinca, 2016) or pressed and limited (Interviewee 28a, Papagaran, 2016). For some fishermen the changes in fishing zones had also led to them being further away compared
to before (Interviewee 3a, Rinca, 2016), which led to using more gas to get there. Another wife of a fisherman said that now sometimes the income from fishing barely covered the operation costs (Interviewee 18a, Komodo, 2016).

Fishermen had also had some of their equipment prohibited from use. Certain sizes of net or trawling were forbidden while dragnet was the equipment still allowed (Interviewee 4a, Rinca, 2016). One of the fishermen said that his 'life changed' when his fishing equipment, a form of fishcage, became prohibited from use inside the MPA (Interviewee 5a, Rinca, 2016). People from Rinca had suggested to park authorities that the villagers should be given legal nets as compensation, but no response had been given so far (Interviewee 8a, Rinca, 2016). However, it was mentioned that fishing boats having been donated to the village from authorities, which likely means representatives from the national park (Interviewee 9a, Rinca, 2016).

5.1.2 Stakeholder participation, Komodo National Park

Table 3. Knowledge of conservation, Komodo National Park

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Rinca</th>
<th>Komodo</th>
<th>Papagaran</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>5</td>
<td>6</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>Low</td>
<td>3</td>
<td>3</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>No answer</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>30</td>
</tr>
</tbody>
</table>

Source: Appendix 10.1

Fourteen 14 out of the 30 interviewees gave answers that revealed a high degree of knowledge of local conservation (Table 3). For example, one fisherman said he did not know about involvement of local authorities. He did, however, knew the zonation area and the ban to fish outside of it, and that the mooring line meant they were not allowed to fish, which hints at good knowledge of the conservation rules (Interviewee 1a, Rinca, 2016). At the same time, there seemed to be "no communication between the local authorities with the government about conservation" (Interviewee 15a, Komodo, 2016). Also, outright wishes for more communication from the park management were uttered (Interviewee 4a, Rinca, 2016). For example, one interviewee expressed her belief that knowledge was poor on local conservation efforts in their community because there was no transparency. When asked about the importance of communication, she requested that authorities have a dialogue with the fishermen before they make new regulations or change the zoning. She said that so far there had been no socialization, just sudden changes (Interviewee 3a, Rinca, 2016), which could potentially obstruct knowledge spreading on the marine conservation efforts in the region.
Table 4. Compliance with conservation, Komodo National Park

<table>
<thead>
<tr>
<th>Compliance</th>
<th>Rinca</th>
<th>Komodo</th>
<th>Papagaran</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Low</td>
<td>0</td>
<td>3</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>No answer</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>30</td>
</tr>
</tbody>
</table>

Source: Appendix 10.1

Nine out of 30 interviewees gave answers that spoke of a high degree of compliance with the conservation efforts, and seven of them gave answers that indicated a low degree (Table 4). For example, one interviewee, a wife of a Rinca fisherman, mentioned that her husband had to sail to Komodo island to fish, because otherwise they would not get any fish (Interviewee 3a, Rinca, 2016). While it was not clear during the interview whether he was allowed to fish there, being a fisherman from Rinca it can be guessed that he was not. In that case this hints at low compliance with the zoning rules, which are part of the conservation efforts. One interviewee also mentioned previous conflicts on fishing zones where the communities had not been involved (Interviewee 4a, Komodo, 2016) and another fisherman said that they were "always in confrontation" with the national park regarding the zoning and that he had more income now because he "do not care with their core zone or whatever" (Interviewee 13a, Komodo, 2016).

When asked about how he perceived actions of park authorities, one interviewee from Papagaran gave the following anecdote:

"They have no respect. They spit on our face. We were 20 that time. We install the seine. They came along, took our nets, and spit in our face. [...] Saleh [National Park officer] put the gun on our face. They ask for our fish, we don’t give them. [...] We call Basir [village secretary] he call his contact and we do demonstration after" (Interviewee 30a, Papagaran, 2016)

This quote tells of both a poor perception and low compliance towards the marine park and its management among the Papagaran villagers. It was explained in the same interview that *seine* is a forbidden activity, and the fact that they were doing it anyway hints at either low compliance or poor knowledge of the law. The responses from the park rangers (spit in their face and threaten them with gun violence) had probably been perceived as both disrespectful and threatening and the reaction of the village after this event led to a demonstration against being treated like this. Another fisherman also mentioned that stones had been thrown at the national park office during this protest (Interviewee 21a, Papagaran, 2016). This also indicates poor relations between the park management and the village.
5.1.3 Stakeholder perception, Komodo National Park

Table 5. Perceived transparency and fairness in decision making, Komodo National Park

<table>
<thead>
<tr>
<th>Perception</th>
<th>Rinca</th>
<th>Komodo</th>
<th>Papagaran</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>No</td>
<td>5</td>
<td>9</td>
<td>10</td>
<td>24</td>
</tr>
<tr>
<td>No answer</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>30</td>
</tr>
</tbody>
</table>

Source: Appendix 10.1

Five out of 30 interviewees viewed decision making as fair and transparent, while 24 perceived the decision making of the conservation efforts as unfair and non-transparent (Table 5). When discussing the perception of the national park, interactions with park rangers and other officials were a recurring topic among the interviewees. For example, one interviewee from Komodo mentioned being thankful about the conservation of the area, as fishermen from outside the Komodo region with access to modern fishing gear were not allowed inside the park. He himself only had access to traditional fishing gear and therefore might have had problems competing with fishermen for the catch. On the other hand, he also mentioned they had been farmers before but had been chased from their land when the national park was being created (Interviewee 12a, Komodo, 2016).

An interviewed married couple said that they understood that Komodo had to stay a conservation area due to the threats of outside fishing, but they also said that the national park authorities "should know that the park will not exist without the support of the community" and that they had to "be nice" to them, as they could destroy the region in one or two months if they wanted to (Interviewees 19a, Komodo, 2016), hinting that they perceived the park authorities as unfair and disrespectful. Similarly, an interviewee from Komodo said that they were feeling threatened by the park authority, that there was "no freedom" and that follow-up on dialogue was poor (Interviewee 11a, Komodo, 2016).

Table 6. Attitude towards conservation, Komodo National Park

<table>
<thead>
<tr>
<th>Attitude</th>
<th>Rinca</th>
<th>Komodo</th>
<th>Papagaran</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
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<td>1</td>
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<td>7</td>
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<tr>
<td>Negative</td>
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<tr>
<td>Total</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>30</td>
</tr>
</tbody>
</table>

Source: Appendix 10.1
Seven out of 30 interviewees expressed a positive attitude towards the conservation efforts, and 19 expressed a negative attitude (Table 6). For example, a fisherman who had had interactions with the national park patrol in the fishing zone mentioned that they had been acting polite towards him (Interviewee 1a, Rinca, 2016), while another interviewee from Komodo said that the zoning rules were tight and that fishermen were chased out if they entered the wrong zone. He wished that enforcement was less strict on local fishermen (Interviewee 12a, Komodo, 2016). Likewise, an interviewee from Papagaran said that they felt threatened by the marine park officers (Interviewee 30a, Papagaran, 2016).

Another fisherman expressed frustration over the paperwork needed to fish in the region and to visit other islands, which according to him was complicated to get. He also mentioned wanting to be free to fish and visit other villages "like before they operated here" (Interviewee 2a, Rinca, 2016), which hints at him perceiving the conservation efforts as unfair. A woman from Papagaran also mentioned wanting the procedure of getting the paperwork to be shorter. She said that the park management was acting repressively and that they 'wanted their lives back' (Interviewee 26a, Papagaran, 2016). Another interviewee from the same village even said that he felt like a thief fishing in the region now (Interviewee 26a, Papagaran, 2016).

5.2 Nusa Penida

5.2.1 Stakeholder economy, Nusa Penida

Table 7. Access to alternative livelihoods, Nusa Penida

<table>
<thead>
<tr>
<th>Access</th>
<th>Nusa Penida</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>8</td>
</tr>
<tr>
<td>No</td>
<td>0</td>
</tr>
<tr>
<td>Not consider</td>
<td>6</td>
</tr>
<tr>
<td>No answer</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
</tr>
</tbody>
</table>

Source: Appendix 10.2

Eight out of 14, i.e. more than half of interviewees, answered that they had access to alternative, non-fishing livelihoods, and none of the interviewees mentioned having any obstacles to change livelihoods themselves (Table 7). The driver behind the access to alternative livelihoods seems the growing marine-related tourism on the islands, which in turn correlates with the implementation of the Marine Protected Area. According to one interviewee, island inhabitants had been given education on tourism from the NGO responsible for marine conservation, Coral Triangle Center (CTC), and many people had quit fishing in favor of tourism-related business (Interviewee 1b, Nusa Penida, 2016).

The dependency on low and high tourist season is still affecting the income for businesses like restaurants, so there is still a dependency on fishing for some people working in the tourism business (Interviewee 2b, Nusa Penida, 2016). Many fishermen also use their boats to drive tourists to snorkeling or diving sites (Interviewee 5b; Interviewee 6b; Interviewee 7b; Interviewee 8b, Nusa
The younger generation also seems less interested in fishing compared to tourism. One fisherman mentioned that the percentage of fishermen had gone from 10% to 5% during the last five years, because of the growth of the tourism industry (Interviewee 10b, Nusa Penida, 2016).

Table 7.1. Known obstacles to alternative livelihoods, Nusa Penida

<table>
<thead>
<tr>
<th>Known obstacles</th>
<th>Nusa Penida</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
</tr>
<tr>
<td>No answer</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
</tr>
</tbody>
</table>

Source: Appendix 10.2

Interestingly and in accordance with Table 7, 11 out of 14 interviewees argued that no known obstacles, such as lack of access to capital, existed for them to change livelihoods (Table 7.1). One fisherman who sometimes bring snorkeling tourists on his boat, mentioned that there sometimes is a language barrier (Interviewee 8b, Nusa Penida, 2016). Another fisherman and restaurant owner also pointed out that as Nusa Penida is an island, it is dependent on resources like water and food from the outside (Interviewee 2b, Nusa Penida, 2016).

Table 8. Income effect, Nusa Penida

<table>
<thead>
<tr>
<th>Income</th>
<th>Nusa Penida</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase</td>
<td>6</td>
</tr>
<tr>
<td>Decrease</td>
<td>0</td>
</tr>
<tr>
<td>No change</td>
<td>6</td>
</tr>
<tr>
<td>No answer</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
</tr>
</tbody>
</table>

Source: Appendix 10.2

Six out of 14 interviewees had not experienced any change in their income from the conservation efforts, while 6 of them had experienced an increase in their income, and no one had experienced a decrease in income (Table 8). As the MPA patrols protect the area from outside fishermen using destructive fishing gear like dynamite and compressors, local fishermen who use fishing gear like nets also gain more catch since there is less competition (Interviewee 4b; Interviewee 6b; Interviewee 10b, Nusa Penida, 2016). Snorkeling tourists also generate an increase in income for fishermen (Interviewee 9b, Nusa Penida, 2016). Interestingly, one restaurant owner complained about how increased tourism led to increased competition among restaurants for the labour, which pushed their wages up (Interviewee 2b, Nusa Penida, 2016).
5.2.2 Stakeholder participation, Nusa Penida

Table 9 Knowledge of conservation, Nusa Penida

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Nusa Penida</th>
</tr>
</thead>
<tbody>
<tr>
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<td>9</td>
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<tr>
<td>Low</td>
<td>3</td>
</tr>
<tr>
<td>No answer</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
</tr>
</tbody>
</table>

Source: Appendix 10.2

Nine of 14 interviewees gave answers hinting at a high degree of knowledge of the conservation efforts in Nusa Penida among them (Table 9). Some gave detailed answers on the planning of the MPA and its implementation. Moreover, the incitement to create the MPA around Nusa Penida came from a group of environmentally concerned locals, who approached the CTC, which in turn approached the government in Bali about it (Interviewee 4b, Nusa Penida, 2016). Then during the later planning and implementation of the MPA, CTC had been hosting meetings with stakeholders like the seaweed group and the fishermen group, as well as tourism operators, during the planning and implementation (Interviewee 1b; Interviewee 2b, Nusa Penida, 2016). Interviews confirmed that the fishermen participated in the making of the MPA, were often invited to the meetings (Interviewee 5b; Interviewee 6b, Nusa Penida, 2016) and there were efforts to synchronize between fishermen and tourism operators (Interviewee 13b, Nusa Penida, 2016).

One interviewee explained that there is a zoning system around the islands, with separate zones for fishing, tourism and other activities (Interviewee 2b, Nusa Penida, 2016). A retired fisherman also mentioned that the CTC had said that the zoning was done to keep the sustainability of the marine ecosystem intact and that it can be a long term solution (Interviewee 3b, Nusa Penida, 2016). However, there were also individuals who expressed poor knowledge of the MPA, for example, one interviewee said that he did not know about the zoning rules (Interviewee 12b, Nusa Penida, 2016).

Table 10. Compliance with conservation, Nusa Penida

<table>
<thead>
<tr>
<th>Compliance</th>
<th>Nusa Penida</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>12</td>
</tr>
<tr>
<td>Low</td>
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<tr>
<td>No answer</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
</tr>
</tbody>
</table>

Source: Appendix 10.2

Twelve out of 14 interviewees gave answers that indicated high compliance with the conservation efforts, and none of the persons interviewed showed any hint of low compliance (Table 10). Since analysis on stakeholder economy (Table 7 and 8) show that a majority of interviewees benefit from
the MPA and that conservation knowledge among them is high (Table 9), it is reasonable to assume that their compliance is also high. The interviews confirmed that the fishermen work in line with the MPA, and that there are no problems with it (e.g. Interviewee 3b, Nusa Penida, 2016) and that fishermen around Nusa Penida know what fish are allowed to catch and which ones are not (e.g. Interviewee 5b, Nusa Penida, 2016).

Some interviewees (e.g. Interviewee 2b and Interviewee 6b, Nusa Penida, 2016) expressed concern over how a kind of pontoon boat which was hosting tourists was damaging the corals in the MPA, which also suggests a high knowledge of the reason behind the MPA implementation and a high compliance with the rules. Some interviewees also hoped that the government in Bali is "really, really concerned" about the Nusa Penida MPA (Interviewee 7b, Nusa Penida, 2016) and that the MPA management patrols around Nusa Penida every day to keep the fishermen using illegal equipment away from the area (Interviewee 10b, Nusa Penida, 2016). Another fisherman agreed and hoped that the government will do more to stop fishermen from other islands (Interviewee 12b, Nusa Penida, 2016). It was also underlined that the MPA is "really, really helping the fishermen" (Interviewee 4b, Nusa Penida, 2016). These answers from the interviewees, including respect for rules, expressions of concern over damaged corals, and wishes for strong enforcement of the rules, suggest a strong loyalty and compliance among stakeholders towards the MPA.

One fisherman said that he and 15 to 30 others go outside of the MPA to catch thresher sharks, \(Alopias\), when the season is right (Interviewee 10b, Nusa Penida, 2016). This species is listed as Vulnerable on the IUCN red list of threatened species since 2007 (IUCN, 2007). However, as the fishing was taking place outside of the MPA, for the purpose of this thesis this activity is not interpreted as low compliance.

5.2.3 Stakeholder perception, Nusa Penida

Table 11. Perceived transparency and fairness in decision making, Nusa Penida

<table>
<thead>
<tr>
<th>Perception</th>
<th>Nusa Penida</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>12</td>
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<tr>
<td>No</td>
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<tr>
<td>No answer</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
</tr>
</tbody>
</table>

Source: Appendix 10.2

Twelve out of 14, a clear majority of the interviewees, perceived the implementation and enforcement of the MPA in Nusa Penida as fair and transparent (Table 11). For example, one interviewee said that the regulation and zoning system is clear (Interviewee 1b, Nusa Penida, 2016), while other mentioned that the creating of the zoning system had been good for them (Interviewee 10b, Nusa Penida, 2016). According to another interviewee, the fishermen had participated in creating the MPA, which he had found positive (Interviewee 5b, Nusa Penida, 2016).

It was also said that the MPA management cared for the corals, that they had shown a friendly and respectful attitude and provided education to the fishermen, and that communication and good dialogue had been good during the planning and implementation (Interviewee 2b, Nusa Penida, 2016; Interviewee 3b, Nusa Penida, 2016; Interviewee 4b, Nusa Penida, 2016). Also, the
management protected the local fishermen from outside illegal fishermen (Interviewee 3b, Nusa Penida, 2016). However, one fisherman wished for a little more socialization from the MPA management, as some people in his area had poor knowledge of the zoning system (Interviewee 6b, Nusa Penida, 2016). Some frustration was also expressed from a fisherman and tourist guide who said that the MPA patrols had approached him when he was at sea and asked questions, for example like the number of snorkeling guests on the boat (Interviewee 8b, Nusa Penida, 2016).

Table 12. Attitude towards conservation, Nusa Penida

<table>
<thead>
<tr>
<th>Attitude</th>
<th>Nusa Penida</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>13</td>
</tr>
<tr>
<td>Negative</td>
<td>0</td>
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<tr>
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<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
</tr>
</tbody>
</table>

Source: Appendix 10.2

Table 12 shows that, similarly to the results seen in table 10 and 11, a clear majority of interviewees displayed a positive attitude toward the MPA in their answers. Some believed that the MPA and the zoning system is good (Interviewee 1b and 3b); however, one also said that he hoped that the government would do more to protect the island (Interviewee 1b; Interviewee 3b, Nusa Penida, 2016). MPA was seen as something "really, really good for Nusa Penida" (Interviewee 4b, Nusa Penida, 2016), and "really, really helping the fishermen" (Interviewee 11b, Nusa Penida, 2016).

One of the interviewees said that he believed that the MPA is good for the local people, and that he was glad for the protection from outside fishermen with illegal fishing methods. He hoped it would mean that the corals and fish would still be there for his son and grandson (Interviewee 2b, Nusa Penida, 2016). This last sentence tells of a positive attitude towards the conservation efforts. Similarly, another interviewee said he felt really good when the MPA started, because it would mean that no one would come and destroy the corals with illegal fishing methods. Previously, nobody had stopped them (Interviewee 6b, Nusa Penida, 2016). There was also an expressed hope that the MPA would grow "better and better" (Interviewee 5b, Nusa Penida, 2016).
### 5.3 Tanjung Luar

#### 5.3.1 Stakeholder economy, Tanjung Luar

**Table 13. Access to alternative livelihoods, Tanjung Luar**

<table>
<thead>
<tr>
<th>Access</th>
<th>Tanjung Luar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>7</td>
</tr>
<tr>
<td>No</td>
<td>1</td>
</tr>
<tr>
<td>Not consider</td>
<td>2</td>
</tr>
<tr>
<td>No answer</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>

Source: Appendix 10.3

Seven out of the 15 interviewees had access to alternative livelihood (Table 13). However, a factor contributing to this is that a number of the interviewees were former shark fishermen who had started other livelihoods in the village, for example having a small shop or restaurant. One of the interviewees had tourism as his current livelihood (Interviewee 1c, Tanjung Luar, 2016). According to a person who works in the fisheries office, 85% of the population in Tanjung Luar has fishing as their livelihood, and 20% has shark fishing specifically as their main income (Interviewee 3c, Tanjung Luar, 2016). Since the conservation efforts started, some fishermen have changed to other types of fishing (Interviewee 6c, Tanjung Luar, 2016). A former shark fisherman who now works as a tourist said that tourism was increasing in the area, and that he was happy about it (Interviewee 1c, Tanjung Luar, 2016). However, he was the only of the interviewees who had tourism as a livelihood.

**Table 13.1. Known obstacles to alternative livelihoods, Tanjung Luar**

<table>
<thead>
<tr>
<th>Known obstacles</th>
<th>Tanjung Luar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital</td>
<td>4</td>
</tr>
<tr>
<td>Other</td>
<td>6</td>
</tr>
<tr>
<td>No answer</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>

Source: Appendix 10.3

Four interviewees mentioned capital as an obstacle to change livelihoods and 6 interviewees mentioned other obstacles (Table 13.1). Judging from the interviews, shark fishing seems to be an important economic factor for the community. The interviewees who had started alternative livelihoods were not necessarily better off. A woman whose husband used to buy and sell sharks at the auction place explained that they had stopped this trade because of the conservation efforts. Instead they had started both growing chickens and trading other fish, since neither of the two income sources could support them economically on its own, compared to shark trading
The person who was working in tourism said that his income was dependent on the season (Interviewee 1c, Tanjung Luar, 2016). However, the same was also said about shark fishing. A shark fisherman said that he went shark fishing for two months per year and worked in his shop during the rest of the year to support the livelihood (Interviewee 2c, Tanjung Luar, 2016).

Some interviewees also witnessed about lack of outside investment as an obstacle. A woman married to a shark fisherman mentioned that lack of access to capital was an obstacle to alternative livelihoods. According to her, getting a loan is difficult for people in the area since they often lack apartment certificates or land, which are necessary as insurance (Interviewee 8c, Tanjung Luar, 2016). One person who was a former manta ray trader explained that he had plans to start a tourism business in the area which would generate jobs for local people, but that he had difficulties in finding capital investors (Interviewee 14c, Tanjung Luar, 2016). Another person said that the lack of government support was an obstacle for fishermen to change livelihoods (Interviewee 15c, Tanjung Luar, 2016). One of the interviewees, an owner of two shark boats, explained that fishing had been his profession since a long time and that he didn’t have knowledge to start any other business. He said that the government should give loans to fishermen to help them start new businesses, but according to him no such support had been given yet (Interviewee 10c, Tanjung Luar, 2016).

<table>
<thead>
<tr>
<th>Income</th>
<th>Tanjung Luar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase</td>
<td>1</td>
</tr>
<tr>
<td>Decrease</td>
<td>8</td>
</tr>
<tr>
<td>No change</td>
<td>1</td>
</tr>
<tr>
<td>No answer</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
</tr>
</tbody>
</table>

Source: Appendix 10.3

Eight out of the 15 interviewees witnessed a decrease in their income since the start of the conservation efforts (Table 14). Some information was given on the economic situation for shark fishermen. A street kitchen owner and former shark fisherman explained that the time period for a shark fishing trip usually is between ten days and up to a month. The catch is sold via auction, and the net profit is then divided into three shares. The financier and the boat owner take one share each, and the last share is split between the boat crew, who usually consists of five persons. He had stopped doing shark fishing because of the sharing system and said that his economic situation had improved since he started the street kitchen (Interviewee 4c, Tanjung Luar, 2016).

One shark fisherman explained that different shark species need specific equipment, and that the protection of some species meant that equipment used to fish them became useless. Subsequently, fishermen also had to invest in new equipment to fish the legal species (Interviewee 2c, Tanjung Luar, 2016). Another person who was a former shark fisherman and shark trader explained how the prices for shark fins differ depending on the species. Species that are protected become more
valuable due to their increased exclusivity. Species that are still legal to catch are considered to be of less value by the fishermen, meaning that they experience negative economic consequences from the conservation efforts (Interviewee 5c, Tanjung Luar, 2016). This had also been observed by another interviewee who said that demand for the shark species that are still legal to catch had gone down (Interviewee 15c, Tanjung Luar, 2016).

Due to the variations in price in the auction house, an average monthly income for a shark fisherman ranges from 60 to 200 US dollars, depending on if it's high or low season for shark fishing (Interviewee 3c, Tanjung Luar, 2016). The changes in demand from Asian buyers also affect the prices. This speculative aspect of the profits of shark fishing is what makes it attractive to fishermen. Other types of fishing, like squid or tuna fishing have a standard price which does not fluctuate (Interviewee 4c, Tanjung Luar, 2016). The government regulations have made the auction prices more unstable compared to before, according to one of the shark buyers (Interviewee 9c, Tanjung Luar, 2016). A shark boat owner stated that shark prices had gone down because of the government regulations, and that export had gotten more difficult (Interviewee 10c, Tanjung Luar, 2016).

One person who was a former manta ray fisherman explained that the conservation efforts had led to fewer fishermen, less buyers at the marketplace, and less visitors to the restaurants (Interviewee 14c, Tanjung Luar, 2016). The conservation efforts of sharks had led to a decrease in catch for the fishermen, which had led to some fishermen changing to other types of fishing (Interviewee 6c, Tanjung Luar, 2016). One interviewee stated that conservation affected the local economy negatively, that jobs became fewer and that people had moved to look for new jobs (Interviewee 10c, Tanjung Luar, 2016). A shark boat owner stated that his boat had seen less activity since the conservation efforts started. The decrease in potential income from the auction had lessened incentives for fishermen to go fishing if weather conditions were bad (Interviewee 15c, Tanjung Luar, 2016).

### 5.3.2 Stakeholder participation, Tanjung Luar

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Tanjung Luar</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>13</td>
</tr>
<tr>
<td>Low</td>
<td>1</td>
</tr>
<tr>
<td>No answer</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
</tr>
</tbody>
</table>

Source: Appendix 10.3

Thirteen out of 15 interviewees showed a high degree of knowledge on the conservation efforts (Table 15). This suggests that it has been an important issue for the area, likely because shark and manta ray fishing are important parts of the local economy. According to one person, the government had visited the village before to speak to them about the conservation efforts (Interviewee 15c, Tanjung Luar, 2016). Knowledge on the conservation efforts was generally high.
in the village, and knowledge was good among fishermen on which shark species are protected and which are not. He also explained that Hammerhead sharks are forbidden to export but are still ok to fish for domestic consumption, which speaks of detailed knowledge on the legislation (Interviewee 2c, Tanjung Luar, 2016). The fishery office also continually worked on reminding fishermen about what species are protected (Interviewee 3c, Tanjung Luar, 2016). Another interviewee said that all fishermen had visited an information event hosted by the government (Interviewee 5c, Tanjung Luar, 2016).

Fishermen coming from outside the village, however, sometimes lacked knowledge on which species were protected and caught them. This had created conflicts when they brought them to the market later (Interviewee 5c, Tanjung Luar, 2016). A worker at the shark marketplace said that he hoped that fishermen would not bring protected species into the market, as knowledge of protected species was poor among the workers, and they risked getting a punishment as well if it was reported (Interviewee 11c, Tanjung Luar, 2016). One interviewee also said that “we”, presumably meaning the majority of villagers, were involved in the conservation efforts and that shark traders as well as coffee sellers kept watch for protected species on the market (Interviewee 12c, Tanjung Luar, 2016). Apparently, some fishermen did not agree with the motivation behind the conservation efforts, that sharks were getting less. According to them there were still many sharks in the oceans when they were out fishing. Instead they attributed the decrease in shark quantity on the market to the decrease in investment from the financiers, which meant that fewer fishermen could go catch them (Interviewee 15c, Tanjung Luar, 2016).

Table 16. Compliance with conservation, Tanjung Luar

<table>
<thead>
<tr>
<th>Compliance</th>
<th>Tanjung Luar</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>5</td>
</tr>
<tr>
<td>Low</td>
<td>5</td>
</tr>
<tr>
<td>No answer</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
</tr>
</tbody>
</table>

Source: Appendix 10.3

Five out of 15 interviewees gave answers that hinted at a high degree of compliance with the conservation efforts, and 5 of them also showed signs of a low degree of compliance (Table 16). One interviewee said that the fishermen understood why the conservation efforts were being taken on sharks and manta rays, but that they found it very hard to agree with the implementation due to their dependence on fishing them for their livelihood. Because of this, fishermen did “not really care yet” about the legislation: Since there is still demand on sharks from Asian countries, fishermen would continue fishing for them (Interviewee 3c, Tanjung Luar, 2016). A former shark fisherman also stated that as long as there is demand for sharks, people from the village will continue to fish for them. If there is no buyer, he believed that fishing would stop (Interviewee 1c, Tanjung Luar, 2016). Manta rays were not targeted anymore (Interviewee 3c, Tanjung Luar, 2016), although they are still accidentally caught in nets (Interviewee 6c, Tanjung Luar, 2016). Some protected shark species are still caught accidentally (Interviewee 1c; Interviewee 2c, Tanjung Luar, 2016), but many fishermen release the shark when they see that that it is a protected species (Interviewee 5c, Tanjung Luar, 2016).
One person described how if a protected species was brought to the market, the fishermen responsible were given a warning. If the same fisherman brought protected species there again, they would be arrested and given punishment. When this had happened in the past, he said that other fishermen were happy that the government set an example (Interviewee 7c, Tanjung Luar, 2016). Some shark buyers report to the government authorities if they see protected species on the market (Interviewee 15c, Tanjung Luar, 2016).

Apparently however, if a protected shark is caught, some fishermen cut its fins off and hide them on the boat. The rest of the shark is left in the water, as bringing it to land could mean that the fishermen risk facing legal charges (Interviewee 6c, Tanjung Luar, 2016). A shark fisherman witnessed about this phenomenon, explaining that he had cut fins off protected shark species in the past (Interviewee 7c, Tanjung Luar, 2016). A woman whose husband used to own shark boats said that fishermen told government authorities that they do not catch the protected species, but that protected species were still caught and brought to land, and hidden when authorities were present (Interviewee 12c, Tanjung Luar, 2016). Interestingly, as explained above, she also said that village inhabitants also make efforts to monitor and stop this phenomenon, suggesting difficulties or inconsistency in the efforts of doing so. Another interviewee also described how fishermen promised compliance to government authorities but “do sneaky”, which hints at him talking about secretly continued trade with protected species (Interviewee 14c, Tanjung Luar, 2016). A shark boat owner also witnessed that his boat crew sometimes caught protected species and sold it somewhere else, and then came back to the marketplace in Tanjung Luar without it. He said that because of the strict protection, one has to act smart on how to sell the protected species; otherwise they would get in trouble (Interviewee 15c, Tanjung Luar, 2016).

According to a shark buyer, fishermen had tried to contact government authorities to discuss the legislation in the past, but felt that the government had not prioritized this request. This had led to some shark buyers finding alternative ways, including bribing, to continue trading protected species. This had in turn increased the difficulty of arranging a meeting with government authorities (Interviewee 9c, Tanjung Luar, 2016).

Knowledge seems to be high among fishermen and the rest of the community on the shark and manta ray conservation efforts. Taking the economic consequences into consideration, it is apparent that the shark and manta ray protection has had a considerable impact on the community, which can explain the high degree of knowledge as well as the medium level degree of compliance. With shark fishing being the livelihood for 20% of the population, protected shark species becoming more valuable, and the fishermen experiencing a lack of support from the government, incentives for fishing the protected species are likely to have risen. 
5.3.3 Stakeholder perception, Tanjung Luar

Table 17. Perceived transparency and fairness in decision making, Tanjung Luar

<table>
<thead>
<tr>
<th>Perception</th>
<th>Tanjung Luar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>2</td>
</tr>
<tr>
<td>No</td>
<td>12</td>
</tr>
<tr>
<td>No answer</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
</tr>
</tbody>
</table>

Source: Appendix 10.3

Twelve out of 15 interviewees gave answers that indicated that they perceived the conservation efforts as unfair and lacking in transparency (Table 1). The conservation efforts had apparently become stricter when the new president came to power. One person described the relationship between the government and the fishermen as being like “stone and egg”, leaving them no choice but to follow the new legislation. Under the former president, they had not had any problems with catching sharks or manta rays (Interviewee 10c, Tanjung Luar, 2016).

According to the man working at the local fisheries office, the fishermen did not understand the reasoning behind the protecting of the shark and manta ray species (Interviewee 3c, Tanjung Luar, 2016). Government authorities had come to Tanjung Luar from Java and Jakarta several times, and informed about the protection of marine species that were being fished by the community. This included non-shark species. This had led to frustration among fishermen as no alternative solutions had been offered to them (Interviewee 5c, Tanjung Luar, 2016). One interviewee predicted that more species would become protected by the government in the future, which would lead to less work for him (Interviewee 13c, Tanjung Luar, 2016).

One interviewee voiced frustration over that the government authorities did not provide any solution for the fishermen, in exchange for the ban of shark and manta ray fishing (Interviewee 1c, Tanjung Luar, 2016). This was a recurring perception among the interviewees. Similar worries were expressed by another person, who said that the government authorities needed to offer alternative livelihoods to the fishermen, which he was convinced they were able to provide (Interviewee 6c, Tanjung Luar, 2016). It was also stated that the shark and manta ray fishermen needed a form of support to start other kinds of fishing to balance for the economic loss they had faced (Interviewee 14c, Tanjung Luar, 2016), and that the government must provide an alternative source of income for them. People in the village had been fishing for generations and did not necessarily possess the knowledge to change livelihoods (Interviewee 2c, Tanjung Luar, 2016). The latter concern was also voiced by a man who explained that he had been fishing as a livelihood since 1970, and did not have knowledge for any other kind of business (Interviewee 10c, Tanjung Luar, 2016). Apparently, many efforts had been done to discuss with the government authorities about getting help to find alternative livelihoods, but they had been rejected many times due to economic reasons. This was perceived to be because of a lack of prioritization (Interviewee 15c, Tanjung Luar, 2016).
Eight out of 15 interviewees showed a negative attitude towards the conservation efforts (Table 18).

<table>
<thead>
<tr>
<th>Attitude</th>
<th>Tanjung Luar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>4</td>
</tr>
<tr>
<td>Negative</td>
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<tr>
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<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
</tr>
</tbody>
</table>

Source: Appendix 10.3

Eight out of 15 interviewees showed a negative attitude towards the conservation efforts (Table 18). Some contrasting replies were given by the interviewees. One person who had previously explained that he sometimes caught the protected shark species, said he thought the conservation efforts were good and that people and fishermen were happy about them being enforced (Interviewee 7c, Tanjung Luar, 2016). His wife expressed fear over the possibility of him being put in jail, although she showed a positive attitude towards the conservation efforts (Interviewee 8c, Tanjung Luar, 2016). A woman whose husband was also formerly involved in shark fishing, also said she was happy about the conservation efforts. However a shark boat owner explained that he was angry when the conservation efforts started since it would mean negative consequences for his livelihood (Interviewee 15c, Tanjung Luar, 2016). Another interviewee involved in shark fishing expressed similar thoughts, saying that he was “not happy” when the conservation efforts started, since it affected his whole business (Interviewee 14c, Tanjung Luar, 2016).

It was explained by two interviewees that a large majority of the shark fishermen were unhappy with the conservation efforts (Interviewee 2c; Interviewee 3c, Tanjung Luar, 2016). Another person had similar views, explaining that there had been complaints from the fishermen about the protection of species (Interviewee 10c, Tanjung Luar, 2016). Frustration was also expressed over the perceived lack of communication from government authorities on the protection issue (Interviewee 9c, Tanjung Luar, 2016).

Many of the interviewees expressed an understanding of the motivation behind the conservation efforts, that sharks and manta ray population were decreasing, but the perceived lack of compensation from the government has meant that a majority of the interviewees have taken a negative stance to the conservation effort and perceive them as unfair. They experience that they have nothing to gain from complying with the legislation.

6. Discussion

6.1 Stakeholder economy

In recent years the Indonesian government has passed legislation for the protection of manta rays and shark species. This might have had an effect on the economic circumstances for people fishing these species for their livelihood. When looking at the economic consequences for the different fishermen stakeholders, the study found varying results between the three cases. In Komodo National Park, fishing communities had experienced a decrease in their income since the conservation efforts started. However, it is unclear whether this was because of the manta ray sanctuary being imposed, or previous conservation efforts. The main reason was a ban of certain
fishing methods (use of gear), and fishing zones being smaller or moved further away. This seems to have resulted in smaller and more expensive catches for the fishermen. In addition, only few of the interviewees had access to alternative livelihoods in tourism or other income sectors. Lack of access to capital was given as the main obstacle to start new businesses. Some efforts had been taken by the national park to involve villagers in tourism, for example by educating them in souvenir handicraft or training them as park guides, but according to interviewees the net effect on livelihoods in the village seemed to have been minimal.

On the contrary, in the Nusa Penida region, the majority of fishermen had many possibilities to engage in tourism business and therefore their economic situation has improved since the implementation of the MPA. Fishing as a livelihood was in steady decline, especially among the younger generations, because of the economic benefits of tourism. Interviewees claimed that the economic wellbeing was due to the implementation of the MPA, and the education on tourism that had been given to them by the NGO responsible. These results are similar to the study on shark tourism in Palau done by Vianna et al. (2012), which found that eco-tourism had generated income for restaurant and hotel businesses. They are also similar to what Hayes et al. (2015) found in Bahamas where a majority of interviewees said they were in favor of marine protection if tourism would continue to grow.

In the village Tanjung Luar, not just fishermen but the whole local economy seemed affected by the protection of sharks and manta rays, according to the findings of this study. Whether the reason for a decrease in shark landings is because of government legislation or because of overfishing is outside of the scope for this thesis. The personal experiences of the fishermen seem to steer their subsequent attitudes towards conservation regardless. The Tanjung Luar fishermen had some access to alternative livelihoods, but these alternatives did not seem to offer the same economic benefits as tourism in Nusa Penida, and they were generally not more profitable than shark fishing. A majority of the interviewees wanted alternative livelihoods in tourism, and although it was said to be growing, access was still poor in the region and little seemed to be done by the government to help, according to the fishermen. These actions seem to be in line with Dharmadi et al. (2015) conclusion that the fishermen need to prompt the government to include their interests in conservation plans. Interviewees who had quit shark or fishing did so because of unfair profit sharing and because of the tough life conditions at sea, not because they were offered something else.

Looking at the empirical motivation to investigate the economic consequences for stakeholders, the results from Nusa Penida are in line with the previous research of O’Malley et al. (2013), which suggests that involving local residents in economic activities related to the conservation efforts yield successful environmental conservation. Interviewees in Komodo National Park and Tanjung Luar witnessed about poor access to tourism livelihoods and lack of help from conservation authorities to facilitate such activities, and gave subsequent anecdotes on illegal fishing. This reinforces the results from mentioned research. Similar to what von Essen (2013) found in North Sulawesi, economic profits seem to be the main reason for why fishermen were unwilling to drop illegal fishing entirely. This was more evident in Tanjung Luar than Komodo National Park. O’Malley et al. (2013) also states that the socio-economic consequences for fishermen needs to be taken into account, which in the case of Tanjung Luar and Komodo National Park, does not seem to have been done yet.

6.2 Stakeholder participation

In Komodo, according to interviewees, communication between the national park and the fishing communities was poor. Half the interviewees had some knowledge on the marine park and the
fishing zones, but many stated that one of the big problems with the park was the unclear rules on zoning and that the areas were fishing was permitted got moved without their knowledge. This can be the reason why less than a third of interviewees showed high degrees of compliance with the regulations. This is in line with Christie's (2004) argument that failure to address social aspects of MPA management can lead to marginalization of fisheries, with conflict as a consequence. When comparing the results to those of Nusa Penida, where the compliance was high, there are also geographical aspects that need to be taken into account. As explained in section 4.1.1, Komodo National Park is 7000 square kilometers while Nusa Penida MPA is 200 square km and next to Bali, meaning that communication between islands in Komodo (which have limited access to electricity to begin with) and access to tourists is likely to be more difficult.

Subsequent differences in education levels may also have been a factor in this as, like Valentine (1992) proposes, local people without the qualifications to meet tourism sectors demands may have limited access to it. Fishing communities in Komodo might have lacked the necessary qualifications work in tourism. The marine parks also differ in design. Komodo National Park has a centralistic, top-down design (Wiadnya et al., 2011), perhaps springing from another political era in Indonesia. The Nusa Penida MPA, on the other hand, being established in 2010 (Ruchimat et al., 2013), looks to have been designed with a more inclusive bottom-up design. Efforts by the MPA management to have meetings with local stakeholders like fishermen and tourist operators, as was witnessed of by interviewees, hint at this.

Contrary to Komodo National Park, interviewees in Nusa Penida showed a high degree of knowledge on the MPA and its implementation. Details had been given on meetings with the NGO responsible, prior and during the implementation. Different stakeholders, such as tourist operators and fishermen had meetings and dialogues where issues such as zoning areas were discussed, and this likely contributed to the high degrees of both knowledge and compliance with the new laws. These efforts are in line with the IUCNs recommendation that MPA management should involve local fishermen (Korting, 2016) while, based on the results of this study, the management of Komodo National Park seems to have overlooked this. Stakeholders participating in MPA implementation can also have had a preventative effect, being one step ahead of potential conflicts between stakeholder groups like the ones in Komodo National Park, which Christie (2004) also warned about. Many interviewees in Nusa Penida expressed belief in the long-term protection of the MPA.

Compliance was also found to be high among interviewees in Nusa Penida. In addition to the high degree of knowledge being a contributing factor, the economic benefits from tourism for the island inhabitants is also likely to contribute. As seen in Komodo National Park, fishermen are less likely to comply with conservation if they are not able to partake in the economic benefits while in Nusa Penida fishermen were able to partake in the tourism economy and displayed a high level of compliance as a consequence. Both of these results are in line with Martin and Sheringtons (1997) argument that a high degree of stakeholder participation reduces the likelihood of marginalizing people in the periphery of decision making. Like Sirakaya et al. (1999) and O’Malley et al. (2013) propose, eco-tourism, when contributing to the well-being of local people, seems to be an effective tool in promoting marine conservation. Fishermen with access to the tourism economy comply with conservation efforts, which means that marine species are successfully protected, which in the long term reinforces the economic benefits from tourism, albeit indirectly.

In Tanjung Luar, knowledge on conservation efforts was high, which is not surprising considering the importance of the area (it being the largest shark market in Indonesia) and the focus it seems to
have been given by government authorities working to stop shark and manta ray fishing (Christensen & Tull, 2014; Blaber et al., 2009). However, while knowledge was high, the anecdotes and views of continued fishing of protected species and secret trading tell of a medium level of compliance. It is likely that this can be explained by the current economic situation for the fishermen. They are being told to stop fishing certain species, which are exclusive and thus valuable, but are not given any compensation in the form of alternative income sources. Protected species in turn become more valuable due to their increased exclusivity, increasing incentives for fishermen to catch them. Therefore the fishermen can have good knowledge, but poor compliance if economic concerns are not met. There can also be cultural aspects playing into this that are outside of the scope for this thesis. This study confirms Rowe and Frewers (2000) argument that environmental conservation efforts with good progress but poor acceptance among the public will be met with stakeholder skepticism. In further accordance with Richards et al. (2004), the perceived failure of government authorities to take the Tanjung Luar fishermen's livelihoods into consideration, was also reflected in their poor trust in government and civil society. These fishermen also showed signs of consultation fatigue, as warned by Burton et al. (2004).

6.3 Stakeholder perception

Relationships between fishing communities and national park management seem to have been strained in Komodo. The interviews showed that fishermen felt threatened by repressive park rangers and fishermen told how they felt marginalized by the zoning rules. The villages expressed threats of destroying the corals, if treatment from park authorities continued to be as poor as perceived by the interviewees. However, some interviewees also expressed thankfulness for the enforcement on outside illegal fishermen. Fishermen in Nusa Penida generally perceived the MPA rules as fair, clear, and beneficial to them. Attitudes from the NGO had been respectful and a good dialogue had been kept.

Many interviewees expressed thankfulness over the protection from outside fishermen using dynamite and other illegal fishing methods, which suggests that they know they have an interest in keeping the corals alive. The comparison of between these two cases on this issue shows that relationships between conservation management and fishing communities seems to have an effect on their perception of the conservation efforts. Fishermen in Komodo National Park spoke of illegal fishing and implicitly threatened to destroy the corals because of perceived poor treatment from park management, while on the other side of the spectrum, fishermen in Nusa Penida wish for more patrols in the area and hope that the corals remain protected. These results are, again, in line with Richards (2004) claim that stakeholder participation, in this case dialogue between fishermen and conservation management, leads to them perceiving conservation efforts as holistic and fair. Maintaining good relationships with fishing communities thus seems like an effective way of ensuring their compliance with conservation efforts.

In Tanjung Luar almost every interviewee perceived the conservation efforts as unfair. Transparency in decision making seems to have been good, since they had a high level of knowledge and understanding on the reasoning behind the protection of manta rays and certain shark species (i.e. population decreases), but there was consensus among the interviewees that the government authorities had to give access to an alternative income source as compensation. They felt that they had nothing to gain from complying with the legislation. This suggests that personal economic interests have an effect on perception of marine conservation. As seen above, economic issues also have a stronger effect on compliance among shark and manta ray fishing stakeholders than good knowledge and clear, transparent communication. Considering the income level of 60 to
200 US dollars for a shark fishing crewman, this is understandable. It is possible that a higher living standard among fishermen would lessen this impact.

This study found some support for the claim made by Hutchison et al. (2015) which said that people's actions are based on what they think rather what is necessarily true. It was quite evident when fishermen with good knowledge of conservation rules willingly ignored them if they perceived them to be unfair. In the three cases studied, low or high trust or perception of conservation authorities coincided with a low or high degree of acceptance of conservation efforts. The results from Komodo National Park and Nusa Penida are also interestingly similar to the results from the two MPAs studied by Kusumawati & Huang (2014) where a centralized conservation authority had low degrees of communication with stakeholders in an MPA, and the opposite trends were noted in another MPA with decentralized decision making as well. When implementing and enforcing conservation efforts, decentralized decision making may be better at taking local stakeholder interests into account.

6.4 Conclusion

It is important to note that the conservation efforts in Komodo National Park and Nusa Penida started before they were declared as shark and manta ray sanctuaries and shark and manta ray species received legal protection. These conservation efforts can therefore not be said to have had a direct effect on the socio-economic situation for the fishermen in these two areas, rather it is the initial conservation efforts implemented in the area that have had the observed effects. However, sharks and manta rays frequented these areas during that time as well, which makes them part of these conservation efforts too. As the results show, the trends seen in the three cases can likely be generalized to other areas where similar marine conservation is being implemented, making them an indicator of successful involvement of stakeholder fishing communities. Based on the findings of this study, a pattern on stakeholder compliance with marine conservation can be summarized as in Figure 9 below.

Figure 9. Flow chart showing how the effects that marine conservation has on the economic situation for fishing communities affects their perception of its fairness, and their degree of compliance. The perception of fairness will in turn also affect the degree of compliance. Knowledge of the marine conservation efforts can affect the perception, but it has no direct effect on compliance.
7. Summary
Due to Asian demand, shark and manta ray populations are threatened by overfishing in several parts of the world. Actions are being taken by governments and NGOs to protect them, such as giving them legal protection and implementing shark and manta ray sanctuaries in areas which they frequent. However, as the fishing activities is a significant source of income to fishing communities, not addressing the socio-economic aspects of these conservation efforts is claimed to be one of the biggest threats to successful conservation.

The purpose of this thesis was to attempt to address this knowledge gap by investigating the socio-economic impacts that marine conservation efforts, specifically manta ray and shark conservation, have on stakeholder fishing communities. To gather data, a field study was done in Indonesia, which is the world's biggest exporter of shark fins and a significant exporter of manta gills. Using a multiple-case approach, interviews were carried out in fishing communities in three different areas of southern Indonesia: Komodo National Park and Nusa Penida where manta rays and sharks are known to frequent, and Tanjung Luar, Lombok which is the biggest shark marketplace in Indonesia and one of the biggest manta ray markets.

In order to evaluate the findings in the interviews, the concept of stakeholder participation was used to develop a framework for the study, based on literature and empirical findings. The framework focused on three topics: 1) the economic consequences for stakeholders, 2) the degree of stakeholder participation, and 3) stakeholder perception of the conservation efforts. These three topics were the basis of discussion when doing interviews in the field.

The study found that economic drivers are a vital part for shaping fishermen attitudes and compliance with marine conservation efforts. Access to alternative livelihoods in tourism played a key role in their economic situation, which in turn shaped opinion on the conservation efforts being taken. Giving fishermen access to economically beneficial livelihoods had shaped their perception of marine conservation positively, which in turn seemed to affect their compliance with them. The findings of this study support previous research which has also found that economic consequences are highly prioritized by fishing communities faced with conservation efforts in their area. More social scientific research on these issues, qualitative as well as quantitative, is highly encouraged as it has potential to significantly contribute to the future success of marine conservation.
8. Acknowledgements
Throughout the planning and execution of the field survey that preceded the writing of this thesis, a number of people from all over the world have been involved, consulted or contributing in some way. First, I would like to thank my supervisor, Professor Frank Johansson who has given solid guidance from the start of this long project, and Dr. Malgorzata Blicharska who acted as my evaluator and gave vital input prior to the field survey. Researcher Vanessa Jaiteh from Murdoch University in Australia gave crucial advice initially as I was researching the possibilities of embarking on this project – I am not sure I would have done it without your initial enthusiasm. Thank you Dr. Eny Buchary for sharing your experiences from doing fieldwork among Indonesian fisheries. For my fieldwork in Nusa Penida, I would like to express my thanks to Mr. Permana Yudiarso from the Regional Office of Coastal Zone and Marine Management in Bali, who was of great help in facilitating my fieldwork. I would also like to thank Mr. Marthen Welly, Mr. Wira Sanjaya and Mr. Kobang Budiarta from the Coral Triangle Center, for your vital support with contacts and translation. For my fieldwork in Komodo, I would like to thank Mr. Johan Bratt and Mrs. Marta Muslin Tunis from Wicked Diving, for facilitating my stay there and for helping me with guiding and translating. For my fieldwork in Tanjung Luar I would like to thank Mrs. Kathy Xu and Mr. Agus Harianto from The Dorsal Effect, for making my stay there possible and for acting as my guide and translator. Finally, I would like to thank all the individuals whom I interviewed for their time and patience.
9. References

9.1 Published sources


### 9.2 Electronic sources

Figure 6. Map of Komodo National Park, accessed 17 May 2016.  

Figure 8. Map of Lombok and Tanjung Luar, accessed 17 May 2016.  
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The Nature Conservancy 2013, accessed 23 May 2016,  
http://www.nature.org/newsfeatures/pressreleases/raja-ampat-declares-shark-and-manta-ray-sanctuary.xml
10. Appendix

10.1 Interviewees, Komodo National Park

**Rinca village, interviews carried out on 2 March 2016**
- Interviewee 1a, fisherman
- Interviewee 2a, fisherman
- Interviewee 3a, female, wife of fisherman
- Interviewee 4a, souvernir shop owner, ex-fisherman
- Interviewee 5a, fisherman
- Interviewee 6a, national park ranger
- Interviewee 7a, fisherman
- Interviewee 8a, female, fisher
- Interviewee 9a, fisherman
- Interviewee 10a, female, fisher

**Komodo village, interviews carried out on 3 March 2016**
- Interviewee 11a, fisherman
- Interviewee 12a, fisherman
- Interviewee 13a, fisherman
- Interviewee 14a, fisherman
- Interviewee 15a, widow of dead fisherman
- Interviewee 16a, wife of fisherman
- Interviewee 17a, abalone farmer (mariculture)
- Interviewee 18a, wife of fisherman
- Interviewee 19a, couple, wife and fisherman
- Interviewee 20a, fisherman

**Papagaran village, interviews carried out on 4 March 2016**
- Interviewee 21a, fisherman
- Interviewee 22a, fisherman
- Interviewee 23a, fisherman
- Interviewee 24a, fisherman
- Interviewee 25a, fisherman
- Interviewee 26a, female, fisher
- Interviewee 27a, female, fisher, sea cucumber farmer (mariculture)
- Interviewee 28a, female, fisher
- Interviewee 29a, fish trader
- Interviewee 30a, fisherman
10.2 Interviewees, Nusa Penida

Interviews carried out on 2 April 2016
Interviewee 1b, fisherman, seaweed farmer
Interviewee 2b, fisherman, restaurant owner
Interviewee 3b, retired fisherman, boat maker
Interviewee 4b, fisherman
Interviewee 5b, fisherman, seaweed farmer

Interviews carried out on 3 April 2016
Interviewee 6b, fisherman
Interviewee 7b, fisherman, seaweed farmer
Interviewee 8b, fisherman
Interviewee 9b, fisherman
Interviewee 10b, fisherman, farmer

Interviews carried out on 4 April 2016
Interviewee 11b, fisherman
Interviewee 12b, fisherman
Interviewee 13b, fisherman
Interviewee 14b, fisherman

10.3 Interviewees, Tanjung Luar

Interviews carried out on 17 February 2016
Interviewee 1c, former shark fisherman, tourist operator
Interviewee 2c, shark fisherman

Interviews carried out on 18 February 2016
Interviewee 3c, fishery office management
Interviewee 4c, kitchen owner, former shark fisherman

Interviews carried out on 19 February 2016
Interviewee 5c, kitchen owner, former shark fisherman

Interviews carried out on 25 March 2016
Interviewee 6c, former shark fisherman
Interviewee 7c, shark fisherman
Interviewee 8c, wife of shark fisherman (interviewee 7c)

Interviews carried out on 26 March 2016
Interviewee 9c, shark trader
Interviewee 10c, shark boat owner
Interviewee 11c, worker at shark market

Interviews carried out on 27 March 2016
Interviewee 12c, wife of former shark boat owner
Interviewee 13c, shark fisherman, worker at shark market
Interviewee 14c, former manta ray trader
Interviewee 15c, shark boat owner
10.4 Interview guide

This interview guide was used as a basis for conducting the interviews. As the interviews were semi-structured, some questions were added or removed from the guide when talking to the interviewees.

1. Changes in the economic situation for the fishermen
   - How do you mainly support your livelihood?
   - How do you feel about the ongoing environmental conservation efforts that have started here?
     - Has your main livelihood changed since they started?
   - Do you have (need) more sources of income since the conservation efforts started?
   - Approximately, how much do you make per month from your main livelihood?
   - Has that amount increased or decreased since the conservation efforts started here?
     - Do you remember approximately how much?

2. Opportunities for fishermen to transition to alternative livelihoods
   - Have you considered doing something else as a livelihood?
   - What could it be?
   - Is it difficult to get started with that around here?
   - What obstacles do you know of or have experienced?

3. Personal perceptions of being included as stakeholders in local marine conservation efforts
   - What animals do they want to protect?
   - Why are these conservation efforts going on here?
   - Were local authorities involved in the conservation efforts?
   - Were other authorities, such as NGOs, involved in the conservation efforts?
   - How did you perceive that these other authorities acted towards you?
   - How did you experience this?
   - Did you feel involved in the process?
   - Did you feel that your interests and concerns were being considered?
10.5 Analysis checklist

This checklist was based on the example presented in Esaiasson (2012), chapter 14, page 270 on how to analyze interviews qualitatively.

**Expected trends: Economic impacts of marine conservation (Figure 2)**
To test the expected trends, the interviews were searched for answers on the following:
A. Income from livelihood
   1. What is their livelihood
   2. Increase or decrease after conservation
   3. Income per week or month
   4. What the (positive/negative) effect on income is attributed to
B. Access to alternative livelihood
   1. Yes or no
   2. Comments or anecdotes on the access to other livelihoods
   3. Mentions of obstacles to access other livelihoods
   4. Their explanations for the above

**Expected trends: Stakeholder participation in marine conservation (Figure 3)**
To test the expected trends, the interviews were searched for answers on the following:
A. Knowledge on marine conservation
   1. Information on marine conservation in the region, such as protected species
   2. Knowledge of rules related to the above that are relevant to the person
   3. Reflections on the personal degree of knowledge on relevant marine conservation
   4. Expressions of being/feeling involved or not in conservation efforts
B. Compliance with marine conservation
   1. Anecdotes on local conservation-related events
   2. Comments on personal degree of obedience with conservation rulings/legislation
   3. Mentions of any obstacles to comply with conservation

**Expected trends: Stakeholder perception in marine conservation (Figure 4)**
To test the expected trends, the interviews were searched for answers on the following:
A. Perception on transparency and fairness in decision making
   1. Comments on fairness of local implementation of conservation
   2. Perception of conservation management and legislation
   3. Reflections on personal consequences from conservation
B. Attitude towards marine conservation
   1. Expressions of emotion when discussing conservation-related events
   2. Labelling of conservation rulings as fair or unfair
   3. Reflections on personal relationship to conservation management