Coral reefs in Wakatobi National Park Indonesia: Insights from Actor-Network Theory

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Foreword

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Summary

This thesis provides insights of ANT (Actor-Network Theory) in how the Wakatobi National Park coral reefs (Southeast Sulawesi, Indonesia) are used and discussed by different actors. Main goal of this thesis is: to describe and connect different enacted realities of the Wakatobi National Park coral reefs. The relationships, associations and connections between different reef-users are central throughout this research. ANT is used because it can reveal these connections by following the actor. Multi-sited ethnography in combination with ANT is chosen as the main method, because it provides clear tools such as (participant) observation combined with in-depth interviews, note-making and semi-structured interviews to follow an actor at different sites. The following actors are observed and or interviewed: fishermen (bubu (trap-fishing), menyulu (spearfishing) and bomb-fishing), coral miners, conservation organizations (TNC-WWF (The Nature Conservancy and World Wildlife Fund), TN (Taman Nasional), COREMAP (Coral Reef Rehabilitation and Management Program), Sara, FORKANI (local conservation organizations), government (planning, tourism and fisheries (DKP) department), tourists, local and outsider tourism facilitators and finally sellers of fishing-equipment and coral mining equipment. Direct reef-users such as fishermen, coral miners and tourists were selected first after which other actors were selected based on how important they are in the actor-network formed around the reefs. The results show three different realities of the coral reefs, namely 'Reefs for making a living' in which reefs are domestically used or marketed. Coral miners and fishermen are the main actors enacting this reality, and they depend on the reefs for food and money. 'Reefs for tourism' is distinguished because tourists and tourism facilitators see the reefs as an attraction to be enjoyed and protected. Finally 'Reefs for conservation' shows different conservation organizations and the government who all argue and (mostly) act in favor of reef-protection. Research, monitoring, patrolling and education are some of the key activities they perform. The distinguished realities only show small pieces of the complexity and multiplicity which is present for the actor-networks surrounding the reefs. The most outstanding clashes and coalitions between and within these networks are as follows: TNC-WWF together with TN form a strong coalition. TNC-WWF is the most powerful actor present in the conservation-network, with as main task to support TN. They are connected to every conservation organization, and they educate the majority of the conservation-network based on research and monitoring results. Their discourse and advise are quickly spread and accepted by the other conservation organizations and by local people. TNC-WWF tries to align and pressure the conservation organizations and the government to form a strong coalition in favor of reef-protection. The government has a double role in conservation in two cases: how they deal with coral mining and with bomb-fishing. Discursively the government supports the conservation organizations in their arguments against bomb-fishing and coral mining, whereas practically they are the largest buyer of mined coral, and they are bribed by bomb-fishermen who import bomb-materials. This also causes clashes between government and other conservation organizations, and it leads to different patrolling practices. Finally the conservation organizations agree that the reefs are insufficiently patrolled and monitored because of a lack of funding and because of insufficient information sharing between the conservation organizations and the government. Other conflicts are between tourists and bomb-fishermen and between tourists and bubu-fishermen. It is too dangerous for divers underwater when bombs go off at the same time, and bubus are seen as harmful and are therefore sabotaged or relocated by tourists. Both bomb-fishermen and bubu-fishermen are unaware of the tourists' ideas about their reef-practices. Tourists also have clashes with the government, since the government spreads nice reef-pictures and stories about the Wakatobi reefs, while the encountered reefs do not live up to the created expectations of

a beautiful well-protected reef. The fishermen and coral miners do not form a joint coalition against restrictions from government or conservation organizations, instead they act individually. The most prominent conflict coral miners have is with government and conservation organizations about mining restrictions. Another conflict is between bomb-fishermen and the conservation-network, because the conservation-network tries to restrict bomb-fishing by enforcing strict rules. The coral reefs can thus be seen as multiple and complex, because the reefs are indeed enacted in different versions at the same time, that sometimes oppose but also overlap each other in discourses and / or practices which sometimes leads to conflicts or coalitions. By connecting different entities such as human and nonhuman actors with the coral reefs shows shifting connections between a coral reef, new developments such as tourism and reef-protection and reef-practices that have been present for a long time already (bubu, menyulu, bomb-fishing and coral mining). This underlines the usefulness of ANT, because by viewing the reefs from a broader ANT perspective could lead to finding new solutions for complex problems surrounding the coral reefs.

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1. Introduction: the what, how and why of this thesis

This thesis deals with coral reefs from an Actor-Network Theory (ANT) perspective. First I discuss Wakatobi and some reef-practices to get a feel for the field. After this background information, I discuss ANT itself and (multi-sited) ethnography and what they can offer each other when they are combined as is done in this thesis. Finally I discuss the practical application of multi-sited ethnography and the contribution of this thesis in a practical and theoretical way.

1.1 Background information on Wakatobi

Wakatobi consists of four larger islands (Wangi-Wangi, Kaledupa, Tomia and Binongko), as well as smaller islands located at the southeast of Sulawesi, Indonesia. Wakatobi includes 25 groups of coral reefs, amongst others barrier reefs, atolls and fringing reefs. The reefs have been ecologically degraded because of the following occurrences (Caras and Pasternak, 2009; Elliott *et al.*, 2001): 1) high population pressure which intensifies pressure on near shore resources; 2) coral mining for lime (construction material, similar to concrete): it decreases abundance and richness of the corals and fish, increases land retreat and sedimentation, and it decreases shoreline protection against tsunami waves; 3) fishing-practices such as bomb-fishing with fertilizer bombs; covering fishing traps with live coral; and poison-fishing with potassium cyanide; 4) indiscriminate anchor/trap laying and sea bottom dredging are threats to coral reefs; finally 5) pelagic fishing and larger-scale fishing can be a threat, because overfishing could occur. The economic costs estimated for "*mismanaging or destroying one square kilometer of reef results in losses of up to US $6.6 million*" (Öhman and Cesar, 2001 cited in Caras and Pasternak, 2009: 539).

If bombs are used for fishing, the coral skeletons die quickly after the blast and there are no possibilities that they can recover after several blasts. The blasts leaves rubble on the seafloor, and this is moving upon every wave and thus not suitable for coral larvae who need a solid substrate to settle (Fox and Caldwell, 2006). The building up of coral takes hundreds of years, so it is a long period before the coral in the bombed spot is at the same level before bomb-fishing (if the larvae could settle). Besides the dead coral, all fish present die quickly, so besides mature target fish, also juveniles and other species die.

Because of these ecological threats to the reefs, Wakatobi was designated as a Marine National Park since 1996 and as a Marine Protected Area since 2002 (Caras and Pasternak, 2009). Since 2005 it has been listed as a tentative World Heritage site. This could encourage tourism, since World Heritage sites appear to be more often visited by tourists than other destinations (Jimura, 2011; Buckley, 2004).

After the designation as a National Park, Management Plans were created and implemented to protect the coral reefs. These Management Plans were not very effective at first because the ecological threats to the reefs were the only aspect taken into account, without informing or asking local people, while coral reefs have a central position in their livelihood (Elliott *et al.*, 2001). Local people are poor, and lime is freely available as a building material and fish are freely available for food. This local context was not taken into account and community participation was missing in the creation and implementation of Management Plans for the coral reefs. In other words, the focus of Management Plans did not address the needs and interests of local people. Therefore the plans were not effective and average hard coral cover declined by half between 2002-2007 (Caras and Pasternak, 2009).

In 2007, a new protection system was implemented, which "*comprises various no-take and no-entry zones, tourism zones, and a zone where traditional pelagic fishing is allowed. Enforcement of*

these rules is performed by park rangers, local police, local community, local district fisheries, the Wakatobi Marine & Fisheries Agency and the Indonesian navy" (Caras and Pasternak, 2009: 543). Local communities and other parties using the coral reefs, as well as local and central government were involved in the creation of this new system (WNF, 2011). In other words, a lot of different actors are involved in using as well as protecting the coral reefs by rules and rule enforcement.

Even though a special area of the coral reefs is assigned for tourists, tourism is not widespread in Wakatobi. Two forms of tourism are practiced, and both forms are occurring because of the presence of coral reefs: 1) tourism aimed at diving and snorkeling with as main goal enjoying the underwater scenery, especially aimed at rich people; and 2) because of research concerning the reefs (performed by students from the UK and other western countries for their Master thesis, also called Operation Wallacea: see Eagles and McCool, 2002). Neither form of tourism is widespread, and the tourists that are present do not have a lot of contact with the local communities.

The coral reefs of Wakatobi National Park are used in multiple ways, as can already be seen from the reviewed literature on Wakatobi above. The reefs are a fairly new tourist attraction, and at the same time they are used by local people for food and other resources. The coral reefs of Wakatobi National Park are the central object of investigation of this thesis. The thesis is aimed at revealing several (sometimes conflicting) realities of the coral reefs, like as a tourist destination, or as a resource for food or other products. A broad approach is needed to understand the different, perhaps clashing, realities of the coral reefs. Actor-Network Theory (ANT) is used throughout this thesis, because it can reveal these different realities. In the next paragraph, the decision to use ANT, and ANT itself is further elaborated upon. Since ANT is not a theory but an approach (Law, 2009), it is not taken up in a 'theoretical framework' but discussed in the methodology section instead.

The main goal of this thesis is: *to describe and connect different enacted realities of the Wakatobi National Park coral reefs in actor-networks formed around these reefs*. With the following main questions: *Which different enacted realities co-exist of the Wakatobi National Park coral reefs?* The starting point of this thesis are direct reef users, and the actor-networks in which they are active concerning the coral reefs. After this short introduction about the Wakatobi coral reefs, the next paragraph goes in depth about the ANT approach, how this research is conducted using multi-sited ethnography, and finally how this thesis contributes theoretically and practically. The results are discussed in Chapter 2 in which the first reality: 'Reefs for making a living' is presented. Chapter 3 goes further in depth about the two other realities: 'Reefs for tourism' and 'Reefs for conservation'. Then Chapter 4 deals with these realities by distinguishing the main actors, discourses, practices, coalitions and conflicts. Finally the thesis ends with a discussion and a conclusion in Chapter 5.

1.2 Methodology: ANT and (multi-sited) ethnography

This paragraph deals with the theoretical notions of ANT, and how these are revealed through the combination of multi-sited ethnography and ANT. First I explain ANT, followed by a short paragraph on ethnography on which multi-sited ethnography is based. Then I explain multi-sited ethnography and finally how and why multi-sited ethnography is used in this thesis.

1.2.1 ANT and its concepts

The coral reefs are central in this thesis and ANT is used because it shows how the reefs are "*constructed, reproduced and reinforced in and through materiality and performance, simultaneously displaying it as an opportunity as well as a repertoire of constraints*" (Ren, 2011: 5). In other words, ANT acknowledges cooperation between different actors in which the network is constraining and

enabling at the same time. This is important, because how the reefs are used is different for each actor-network in which different actors reproduce and construct their way of using the reefs very differently. The following elements of ANT are used in this thesis, based on the work of Van der Duim (2005), namely: 1) the principle of symmetry; 2) its focus on actor-networks and 3) the process of translation. These are chosen because they are considered especially relevant to get a better understanding of the different enacted realities that co-exist of coral reefs. A further explanation of 'enacted reality' is given in the part on the principle of symmetry.

Before explaining these different elements of ANT, first the concept of actor is explained. In this thesis an actor can be human or nonhuman (Van der Duim, 2005; Ren, 2011; Whatmore and Thorne, 2000; Callon, 1986). More specifically actors can be *human* such as a tourist or fisherman, or an *object* such as coral reefs or fishing equipment, and finally it can be *information and media*, such as newspapers, images, and travel guides (Van der Duim, 2005). Because it is the object of coral reefs which attracts tourists and other direct reef users, the coral reefs are given a central position in this thesis without falling into the trap of only looking at ecological aspects of the coral reefs, as was done in the first management plan where only ecological realities were taken into account. Therefore I will look at humans in this thesis, as well as at nonhumans.

The principle of symmetry between humans and nonhumans is central in the concept of actor in this thesis. This principle is needed, because in describing connections and relations between actors you have to treat each actor in a similar manner. This "*erodes distinctions … that are said to reside in the nature of things, and instead asks how it is that they got to be that way as a product or effect of processes of ordering*" (Law, 1994 cited in Van der Duim, 2005: 86). In other words: "*ANT transcends the analytical distinctions between the human and nonhuman, nature and culture, micro and macro*" (Latour and Callon, 1981 cited in Ren, 2011: 4).

This principle represents the ontological perspective, because reality is viewed as '*enacted into being*' and objects are not exempt from this (Ren, 2011: 6; Law and Singleton, 2005). The main argument is that, instead of thinking about multiple interpretations of the same object, you think about coral reefs as multiple objects themselves (Law and Singleton, 2005). A coral reef can thus be very different or multiple '*as it is enacted in different versions*' (Ren, 2011: 6). Law and Singleton (2005) give a good example of the different versions of the object liver cirrhosis. Even though the disease liver cirrhosis is exactly the same, different actors (e.g. patients, general practitioners) enact the disease very differently, instead of as what was first thought to be a singular object in one person (also see Mol, 2002). The different realities of an object can be incompatible or conflicting, and in this thesis the coral reefs are viewed as messy objects that are partially connected and multiple, and the ontological approach can deal with these different (even conflicting) realities of the reefs in actor-networks (Ren, 2011; Law and Singleton, 2005).

The step from the principle of symmetry towards an actor-network is not that large. An actor-network consists of people and things, and it: "*is an emergent effect created by the interaction of the heterogeneous parts that make it up*" (Verschoor, 1997; Callon and Law, 1995 cited in Van der Duim, 2005: 92). In the late 1990s this was referred to as 'collectif'. Thus relations and their heterogeneity are important and not the things in themselves. These relations change the network, but they are also changed by the network. Actors can also align their activities so that they are compatible with the activities of other actors from the same network, this is what Verschoor (1997) calls convergence. In short: the continuation of an actor-network depends on many different actors and their relationships have to be performed continuously in order to sustain the network.

Three principles taken from Callon (1986: 196) are used as the starting point for the process of translation: 1) agnosticism, which means that each actor is treated in the same way without taking sides. The actors will not be described in terms of doing/being right or wrong; 2) generalized symmetry, meaning that conflicting viewpoints are explained in the same terms, for example the viewpoint of a coral miner will be described in the same manner as the viewpoint of a conservation organization, and finally; 3) free association, which means that all distinctions between the natural and social world are abandoned. The natural and social world are thus described in the same terms, meaning that a technology or an object is approached similar to a human actor and the same words are used to describe them. These principles will be used throughout this thesis, actors will not be written about in terms of right or wrong and the same terms will be used for analyzing different viewpoints and the distinction between the natural and social is abandoned in the analysis (also see the principle of symmetry between human and nonhuman actors).

Building on these principles, the process of translation can be seen as displacement, as a process and as occurring at several moments in time (Callon, 1986). Displacement is present in every moment of translation, and it refers to changes in goals and interests as well as physical displacements. '*To translate is to displace*' (*ibid*.: 214), and it is '*a process before it is a result*' (*ibid*.: 215). Therefore different moments of translation can be seen, sometimes occurring simultaneously. For example a change in viewpoint from a coral reef as a resource for food towards a coral reef as a resource for enjoyment, or a physical displacement like fishermen avoiding the use of certain reefs after the law and conservation organizations enforce them to do so.

The process of translation is also about power relationships within and between actor-networks in which both the social and the natural worlds come together. The result of this is that '*certain entities control others*' (*ibid*., 1986: 215). The main question here is how are actors '*defined, associated and … obliged to remain faithful to their alliances*'? (*ibid*., 1986: 215). This could be done by actors pressuring other actors (politically, financially, materially) in the same network to act conform network requirements. Callon (1986) places the issue of representation central here, because the representative who expresses for silent actors has a lot of power. The representative has obtained this power by translating the problem or issue at stake in a certain way in which he/she/it cannot be circumvented for a proper solution (like an '*obligatory passage point*' see Callon, 1986: 202). For example a conservation organization using scientific knowledge to empower their arguments against certain fishing-techniques (so they cannot be circumvented), while representing actors that face negative consequences of these fishing-techniques such as fish, or other fishermen (according to science). The power of an actor thus depends on the '*capability to engage with a network*' (Ren, 2011: 4). The power to act is here neither strictly intentional, nor only possible for human actors. To act is thus seen in this thesis as '*a relational capacity created through and distributed in an actor-network*' (Ren, 2011: 4).

It must be said that neither the position of the representative, nor that of silent actors is fixed and this position may change, or in Callons' words (1986: 196) '*translation is a process,… and it may fail*', like in his example of scallops in St. Brieuc Bay. Dissidence refers to such a failure, in that previous silent actors refuse or challenge displacements to divert away from the former obligatory passage point (*ibid*., 1986) (like fish not facing negative consequences of a fishing-technique after all, leading to fishermen to continue their formerly framed bad fishing-technique). New displacements can take the place of old ones, and new representatives can take the place of the old.

In short the process of translation is: the method by which actors form associations with other actors and actor-networks which are already established and stabilized (Van der Duim, 2005).

In other words it "*is the process in which (actors) attempt to constitute themselves as collectifs*" (actor-networks) (Steins *et al.* 2000; Law, 1994 both cited in Van der Duim, 2005: 94). It refers to "*processes of negotiation, representation and displacement between actors, entities and places. It involves the redefinition of these phenomena so that they are persuaded to behave in accordance with network requirements, and these redefinitions are frequently inscribed in the heterogeneous materials which act to consolidate networks*" (Murdoch, 1998 cited in Van der Duim, 2005: 94-95). Translation could lead to convergence or divergence, and in all cases '*network conformity or nonconformity … is an effect of processes of ordering*' (Murdoch, 1998 cited in Van der Duim, 2005: 96).

1.2.2 Ethnography

For this thesis multi-sited ethnography is chosen as the main method. The main differences are mentioned between ethnography and multi-sited ethnography, because multi-sited ethnography is a response to shortcomings of ethnography in studying connections. Therefore first a short introduction to ethnography is given, after which multi-sited ethnography is introduced and finally the motivation to use multi-sited ethnography for this thesis is elaborated upon.

Discovering new cultures and being able to understand these cultures used to be a central theme in anthropology and in ethnographies. In early anthropology it was believed necessary to immerse yourself completely in the 'other' culture to reach a proper understanding of this culture. The image of a lonely anthropologist staying with indigenous people for an extended period of time is coming to mind immediately. An ethnography in that sense is about the 'other' who is very different from yourself, and often exotic cultures were at the center of investigation. This exotic and narrow view of ethnography is changing and not completely correct anymore (Marcus, 1998).

In an ethnography the researcher should assume a learning role, because "*in order to understand the world 'firsthand' you must participate yourself rather than observe people at a distance*" (Silverman, 2009: 68). Participant observation was thus the regular way to investigate 'the other', and the observations were often done within a walking distance (Marcus, 1998). This early view of ethnography implies that participant observation is the only way to do a proper ethnography. An example of this is Brewers' (2000 cited in Silverman, 2009: 67) definition of an ethnography: "*a study of people in naturally occurring settings or 'field' by methods of data collection which capture their social meanings and ordinary activities, involving the researcher participating directly in the setting, if not also the activities, in order to collect data in a systematic manner*".

The definition of ethnography given above can be seen as providing a contextually rich or 'thick' description of daily interactions in a certain field (Falzon, 2009). The underlying idea is staying in a certain field site of choice where the researcher studies social relations in depth. The research is based on relations of trust with the people studied, and the obtained information of these social relations could be compared with ethnographies done elsewhere. The focus of an ethnography is often on a single site (Falzon, 2009).

The view of an ethnography mentioned above is useful, and it can be used to get a good feel for the field before moving on to other sites. For me, together with Silverman (2009) an ethnography is broader than just doing (participatory) observation, and I believe that focusing on more sites can provide different in-depth information than focusing on a single site (see next section). Besides that I agree with Falzon (2009) and Silverman (2009) that different field-techniques can be used in an ethnography, such as: note-making, interviews, observations, and reading indigenous literature next to, or apart from, participant observation.

1.2.3 Multi-sited ethnography

The narrow view of ethnography has been questioned since the early 1980s (Shore, 1999; Horst, 2009), in which a physical boundary in terms of space and people is not tenable anymore. Or in Shore's (1999: 44-45) words: "*the traditional idea of a clearly bounded space or people has become increasingly problematic: 'the field' proper is a fluid, loosely connected set of relations, sites, events, actors, agents and experiences from which, and onto which, anthropologists try to impose some kind of conceptual order*". By imposing physical boundaries like this, the messiness and complexity of the field is not properly recognized. ANT is exactly dealing with complexity and messiness, and to be able to reveal different enacted realities of coral reefs the messiness and complexity of the field should be taken into account.

Other problems with the ethnography described above is that connections, relations and associations with other people at different locations cannot be researched. And that is exactly the main theme in this thesis, because as mentioned earlier, in actor-networks connections, relations and associations are key concepts. Therefore this needs attention before ethnography can be used for this thesis, because as mentioned earlier it is the connections, relationships and associations between actors which is placed at the center of this thesis.

Mostly exotic cultures were at the center of investigation in ethnographic research. Nowadays most exotic cultures have been discovered. So why still conduct ethnographic research? Ethnographic research should still be considered as a useful way of doing research, even though the exotic is 'in eclipse' (Marcus, 1998: 21). Since: "*the sense of discovery in ethnographic research is still important and a key to why scholars engage in it*" (*ibid.*, 1998: 21).

Alternative options for ethnography in the future are acknowledged by several authors (Marcus, 1998; Falzon, 2009; Horst, 2009; Hannerz, 1998), and Marcus (1998: 21) recognizes the importance of ethnographic research in a multi-sited way as follows: "*If it is the 'making strange' or the act of defamiliarization that has given discovery its form in ethnography, then in a multi-sited imaginary of fieldwork, this operation is sustained in developing knowledge of the relationships and connections that extent beyond frames that have held the traditional act of fieldwork in place*". He views this as the contribution of multi-sited ethnography in a new form, and able to deal with '*new interests and conditions of work*' (*ibid.*, 1998: 21).

Another important reason to keep on doing ethnography is according to Marcus (1998) the detailed descriptions, and interconnectedness of people. In the first place, ethnography is often descriptive while its arguments and significance should be produced '*within the frame of ethnographic work itself*' (Marcus, 1998: 12). "*Within a multi-sited research imaginary, tracing and describing the connections and relationships among sites previously thought incommensurate is ethnography's way of making arguments and providing its own contexts of significance*" (Marcus, 1998: 14). In other words, by tracing and following connections and relationships at several sites (either at the same time or not) provides a good description of these connections and relations and this provides its significance and context.

Two spatial arguments are provided by Marcus (1998) and Falzon (2009) for multi-sited ethnography, while Horst (2009) gives a more practical reason. Firstly multi-sited ethnography breaks with the idea of focusing on a single field site, and its objective is to study '*social phenomena that cannot be accounted for by focusing on a single site*' (Marcus, 1995 in Falzon, 2009: 1). For example Hannerz' (2009) study on transnationalism, or Horsts' (2009) study on contacts between migrants in developed countries and their families in Somalia. According to Marcus (1995, cited in Horst, 2009:

120) there are six examples of multi-sited ethnography: "*to follow people, things (or objects), metaphors, plots, stories/allegories, lives/biography or the conflict*". In other words '*the essence of multi-sited ethnography is to follow people, connections, associations and relationships across space*' (Falzon, 2009: 1-2). Multi-sited ethnography thus looks at different spaces, and it '*implies some form of (geographical) spatial de-centeredness*' (Falzon, 2009: 2).

The notion of space in multi-sited ethnography is different from the notion of space in ethnography. In multi-sited ethnography space is seen as socially produced (constituted through interactions between people and/or objects), and in this way room is given for multiplicity (like conflicting realities) in which distinct trajectories co-exist (heterogeneity) (Massey, 2005 cited in Falzon, 2009). Space should also be seen as dynamic and always under construction, it is never fixed. These spatial reasons are also called the '*spatial turn*' (Falzon, 2009: 4), because if space is produced, why should the single space of ethnography be exempt?

The second spatial reason deals with globalization. Globalization connects people with each other who were not connected before. Completely estranged or isolated peoples are therefore hard to find in the present world of connection. In a classical ethnography the object of study is already bounded in a single space '*before the ethnography begins*' (Marcus, 1998: 16). If ethnography can still discover new things, "*it is relationships, connections and indeed cultures of connection, association and circulation that are completely missed through the use and naming of the object of study in terms of categories "natural" to subjects' pre-existing discourses about them*" (Marcus, 1998: 16). In other words contemporary societies are not cut-off from other, even very distant societies. They are interconnected in different ways in which '*people, ideas, and goods are in a constant state of displacement*' (Falzon, 2009: 5). The embeddedness of social relations in particular communities and places can thus be questioned, because '*paradigms of globalization and transnationalism posed a major 20th century challenge to ethnographic methods of inquiry and units of analysis*' (Falzon, 2009: 6). The notion of a bounded space is thus outdated, and not suitable anymore for contemporary society. In this thesis globalization is not a central theme, it is just mentioned to show that a notion of a bounded space is not correct anymore and that I am aware of possible complications this could have for my thesis. It shows that the networks I will study have to be cut at some point, because neither time nor money is available to follow global or international connections.

The practical reason to shift towards multi-sited ethnography is because there is a tendency for shorter periods of fieldwork and the fieldwork sites are also becoming larger. A large field site cannot be researched on foot, because not everything happens at a walking distance. Therefore a reformulation of methods is needed, and cooperation between scientists should not be underestimated as a partial solution to problems such as large fields or multiple sites (Horst, 2009). Nowadays a site is selected because of its '*relevance and convenience*' (Horst, 2009: 121). Convenience, because it has to fit into our lives. Often research is only one part of your life besides teaching and your personal circumstances, therefore fieldwork is often done '*in between*' our lives (Hannerz, 2003: 212-213) with shorter durations in the field.

The most important critique on multi-sited ethnography is that it does not provide a thick description anymore (Horst, 2009). On the one hand it does provide a thick description and on the other hand it does not. It does give a thick description of the network studied, of the connections relations and associations between different actors. But it does not provide a thick description of individual nodes. The description of a network is partial since the sites selected are only one part of the total network and flows within it (Horst, 2009). Single-sited fieldwork is thus as partial as multi-

sited fieldwork, since single-sited fieldwork fails to analyze connectedness. The purpose of multi-sited fieldwork is not a full located understanding of culture or social interactions, but rather one which targets (transnational) networks and flows, it thus provides a thick description of the network, its dynamics and the interplay of relations between people, things, activities and meaning (Horst, 2009).

Of course some methodological challenges to multi-sited research remain: how to capture the linkages between the different locations and how to understand the simultaneity of the flows with which these linkages are created and maintained. Other questions come to mind as well: when to follow an actor or linkage? When do you have sufficient information? For how long to follow the actor or linkage and until which 'level' should you follow it? In the next paragraph I will deal with these methodological challenges.

1.2.4 How and why of multi-sited ethnography

Multi-sited ethnography is chosen for this thesis, because it can give detailed descriptions of how different realities of the coral reefs of Wakatobi National Park are enacted upon in actor-networks formed around these reefs. Since multi-sited ethnography is able to deal with networks (see Ren, 2011; Horst, 2009; Hannerz, 2003; 2009), it is suitable for the main research objective in this thesis. For this thesis I will first look at direct users of the reefs such as fishermen, coral miners, tourists, researchers, conservation organizations and the government. These actors are my starting point. This research starts at the largest island Wangi-Wangi, because this is the main entry point of the national park, and it is the only island with an airport which makes it better accessible than the other islands. Because it is the largest island I expect that this island has a lot of fishermen and that it is the place where tourists can stay and rent equipment for diving and snorkeling. Transport to the other islands is done by public transport in the form of the regular slow boats or speedboats.

For this thesis the following field-techniques are chosen: (participant) observation, note-making, in-depth (open-ended) and semi-structured interviews. First trust has to be built, and (participant) observation could help with this (volunteering to help fishermen). At the second stage I have done semi-structured interviews based on the observations, notes and in-depth interviews done before.

In the first stage of the fieldwork (first month) I did participant observation (note-making) and in-depth interviews with direct reef-users to get an impression of the field. For this thesis the most important actors are selected, based on their prominence in the field and on their reality. Participant observation is done to find out what the people are doing with the reefs and the open-ended interviews are done to get an idea what the motives behind their reef use are. By doing open-ended interviews with local government officials I learned more about laws, rules and regulations for reef-use. By interviewing conservation organizations their agenda for Wakatobi was revealed, as well as their main practices and relationships with other actors in the same or other networks. Broad lines of the power relations, actor-networks, and relationships between different actors also became apparent in the in-depth interviews.

In this first stage the focus for the observations and interviews with fishermen was on how they fish, which objects they use and how they use them, which legal rules and regulations they should follow and how they describe their relation with the reefs, as well as their relations with other reef-users and institutions such as fishermen's organizations. Different fishermen were approached, namely fishermen using legally allowed fishing-techniques (2 menyulu- and 2 bubu-fishermen) and fishermen using illegal fishing-techniques (2 former bomb-fishermen). Other actors followed were 5

coral miners, 5 tourists, 2 tourism facilitators, equipment for fishing, mining and diving (2 bubu-makers/sellers, 2 blacksmiths). With these actors (participant) observations, note making, and in-depth (open-ended) interviews were conducted. Besides working with the initially selected respondents mentioned here, the connections they mentioned with other actors or actor-networks were also investigated. In this case it led to conservation organizations, government (5 TNC-WWF (The Nature Conservancy-World Wide Fund for nature), 3 TN (Taman Nasional), 2 COREMAP (Coral Reef Rehabilitation and Management Program), 4 government representatives, and 2 local organizations representatives) and objects used for their reef-practice. All numbers indicated here represent the number of respondents for an organization or object. The interviews were conducted with a translator. The reason for the low amount of fishermen interviewed and observed is that the season changed from dry to wet during the fieldwork period, and menyulu and bubu are only conducted during the dry season, which made it challenging to find respondents. Since bomb-fishing is an illegal practice, not many fishermen wanted to be interviewed. Therefore former bomb-fishermen were interviewed instead. Even though only three different fishing-techniques were selected, at least 20 others are used on the reefs. These techniques were selected because they are used by different people (land- or Bajonese people) on different reefs (remote or local reefs), and because of the high dependence of these techniques on the reefs.

For tourists the focus was on how they use the reefs, what their main reef-related activities are and how they describe their relations with the reefs. For coral miners observation entailed to rent a boat and observe how miners mine the corals to see how this practice is performed. By looking at how these different actors describe the coral reefs in combination with the observations, different realities of the coral reefs can be distinguished. Conservation organizations are also observed and interviewed about their actions related to the reefs, such as patrolling and monitoring, and their motivations behind this. The descriptions of the reefs and the actors' motivations to use the reefs were obtained through in-depth interviews, and how the reefs are used was revealed by observations.

In the second stage of this research semi-structured interviews were conducted, based on the information obtained in the first stage of the research. In these interviews a clear focus is present on a couple of aspects revealed in the in-depth interviews and observations. In this stage of the research I decided on which realities of the coral reefs my focus is, depending on the information obtained from participatory observation and the in-depth interviews. The decision also depended on access to information, willingness of respondents to cooperate, travel time between the islands, availability of translators and on the realities that the actors have of the coral reefs. By doing semi-structured interviews, the actor-networks, processes of translation and realities were revealed more clearly. Through the observations and in-depth interviews an idea of these three concepts was obtained, and by going into depth in semi-structured interviews a more clear picture of the enacted realities was obtained.

Finally the questions of when to follow an actor, when to stop following and until which level to follow actors remain open. In this thesis I have followed actors until no new information was revealed. So several fishermen of the same group were interviewed and observed and if no new information was present these actors were not followed anymore. If an actor, connection or linkage was out of reach it was also not followed. This means that if the actor is not present in Wakatobi National Park he/she/it was not followed. The level to follow a network depended on the situation present such as cooperation of respondents, language and cultural barriers and on time. At one point

the network has to be cut, since it is impossible to reveal a complete network, and a network can change over time or even disappear.

1.3 Contribution of this thesis

The scientific contribution of this thesis is twofold: 1) viewing a coral reef as an object in terms of ANT has not been done before and this will lead to new perspectives of coral reefs and of the actors using the reefs; 2) ANT is not often used in literature concerning natural resources, while this approach could provide new insights. ANT is already introduced to several fields such as tourism (Ren, 2011; Van der Duim, 2005, 2007), medicine (Law and Singleton, 2005) and geography (Kortelainen, 2010; Allen, 2011) where it in all cases provided new insights for the topic under investigation. The argument here is that ANT should be explored more firmly for natural resources, of which different realities often co-exist. Therefore I argue that ANT also has potential for natural resources such as coral reefs, because different enacted realities can be explored with it. Kortelainen (2010) shows in his work that by viewing old forests as objects provides a very useful and new way of approaching a natural resource, leading to new insights. This thesis has a similar ambition, with as main difference that this thesis is aimed at enacted realities instead of enacted spaces. This thesis provides new realities of coral reefs by approaching the reefs as the central object of investigation.

This thesis practically contributes because a static reality of coral reefs is confronted. This confrontation helps, because it reveals different realities and also different solutions or strategies to deal with a complex and messy object like coral reefs. The problems surrounding the coral reefs can then be viewed in a different way as well. Different solutions are considered when different realities of the reefs are taken into account. Acknowledging these different realities could be a first step for looking at different solutions than before, because there is no such thing as a static reality which is real for every actor. By revealing diversity in enacted realities, this thesis practically contributes to new directions of solutions to complex problems surrounding coral reefs.

2. Reefs for making a living

This chapter reveals the first reality of this thesis, namely 'Reefs for making a living' in which fishermen (bubu, menyulu and bomb-fishermen) and coral miners are present. The second reality discussed in the next chapter is 'Reefs for tourism', which is mainly used by tourists and people working in tourism. Then the final reality which is also discussed in the next chapter is 'Reefs for conservation' in which research, monitoring, and patrolling are discussed. It must be said, that even though these different realities are distinguished, many more can be present even within one group of respondents. In Wakatobi alone more than 20 different reef fishing-techniques exist to catch species such as fish, crabs, lobster, squid, sea-cucumber and octopus, to name only a few. They can all have different enacted realities about the reefs and for different reasons. They can be connected to each other and to other groups involved in the reefs in different ways, so it is impossible to provide a complete picture of 'the' actual present realities of the coral reefs at one point in time. Furthermore the distinguished realities are my way of ordering the reefs and the reef-practices, which is neither neutral nor objective. Because attempting to reveal different realities or actor-networks also means to engage with their realities and networks, which can change them as well. This should be kept in mind while reading through the results.

For this research I have chosen the fishing-techniques bubu, menyulu, and bomb-fishing. Bubu is chosen because it entails placing traps on top of or near the reefs, and covering these traps with live coral. The reefs are thus intensively used by 'orang darat' (land people, meaning people living on the islands) only. Menyulu is chosen, because it is a spearfishing-technique used by Bajo people only and because it can be practiced on the reefs only. Bomb-fishing is chosen because of its illegal status, and because it is used on the reefs exclusively. Besides that I quickly found out that this technique is not appreciated by other reef-users, and that it is high on the list of 'activities to eliminate from the park' by conservation organizations and tourists. Coral mining is chosen because it is also an illegal reef-practice, while it still happens at a large scale. All the interviews and observations are done during the fieldwork period in October and November 2011.

The coral reefs are used in multiple ways and by multiple people and also for multiple purposes. Reefs for making a living deals with how and why the reefs are used by coral miners and by fishermen (menyulu, bomb-fishing and bubu). The commonality for all these reef uses is making a living. In other words: catching fish for food, sell it at the market for income or a combination of this both. In case of coral mining, the corals are mined for domestic use or to sell it for income.

2.1 Bubu

The people using bubus/traps are 'orang darat' (people living on the islands), Bajo people do not use bubus. For interviews and observations of two bubu fishermen I went to Waha, where one took place in October with Amar, and the other in November with Yansen. In Waha around 10 fishermen / women are working with bubus[1]. For both observed fishermen, bubu is the only technique they use to catch fish. Bubu trapping is a very old way of fishing in Waha and the fishermen could not give me a period in which this fishing-technique was invented or tried for the first time. The use of bubus occurs only during the dry season, because during the rainy season waves are high and it is too

[1] It was difficult to get an accurate number of how many people were using bubus, because they are only entering the water for a short period of time to (re)place, check or empty the traps. Besides that, the bubu users often do not know each other.

dangerous to set the traps. The bubus also break when the current is strong or when the waves are high. During a walk at the beach near Waha broken bubus of different sizes were present on the beach and in trees near the beach.

The bubu selected for this research is a squared small one (approximately 70cm long, 35cm wide and 10cm high) made of bamboo with a tapered entrance and it is used to catch 'ikan napoleon', 'ikan kalibomba' or 'ikan baronang', all are reef fish[2]. This type of trap is placed in shallow water near the shore (placed maximum 1 meter deep), and no bait is used. There are also large square bubus available and these are placed at greater depths on the reefs. Circle-shaped traps are also available and in these traps bait is used. This trap is not placed on the reef, but placed near the reef-edge attached to a buoy (Amar). The biggest difference with the other traps is that for the selected trap living coral is used to camouflage it, and for kalibomba the trap is placed directly on the reef. Since the coral reefs are my main point of interest, I selected the small square bubu for which the coral is directly used.

The following descriptions of bubu-use are obtained from Amar: "*I met 2 fishermen at 7:30 in the morning when it was still low tide. The traps can only be placed when it's low tide, because otherwise the water-level is too high to place the trap in a good spot. In this case both fishermen went in the water together (one bubu per fisherman), but they placed their trap individually. Their trap was aimed at kalibomba*". Kalibomba is caught for domestic use only, they are very small (maximum of 9cm) and therefore not sold at the market. Sometimes also other fish species enter the trap, these are also caught depending on their size.

The trap was placed near his house. With low tide he walked on the reefs to find a good bubu spot using his goggles, namely a place where he saw a lot of fish. When a good spot is found, the trap is placed with its entrance facing the shore, after which it is covered completely with coral. When I asked why he used living coral to cover his trap he told me: "*The fish are just too smart. First we used dead rocks only, but then the fish found out that shelters made of these rocks are often a trap so they started to avoid the traps. The dead rocks are white, so they stand out too much from the colorful corals. That's when we decided to use living coral rocks, then the trap is just better camouflaged*" (Amar). Just before we left the trap, the fisherman checked the camouflage of the bubu by looking at it from different sides to check if he could still see the bamboo. He was satisfied when the bamboo was completely covered.

Another activity the fisherman did while placing the trap was taking a piece of coral and tying it with rope to the trap. Because the trap is made of bamboo, it floats just like wood. To get it to the bottom, a piece of coral is attached to the trap. That is also a reason for covering the trap with coral, to make sure the trap remains in the position it is placed in, next to the camouflage function. The whole process from entering the water to find a place for the bubu until leaving the water after placing the trap took about one hour in total. The trap was placed around 100 meter from the shore and then checked the next morning at the same time during low tide again. The trap placed by the other fisherman was placed around 25 meter from the first trap and a bit further from the shore. He used similar methods as the fisherman we joined. They told me that one bubu can be used for around 4-5 months before it needs reparation, and on average after seven months a small bubu needs replacement.

[2] Kalibomba, baronang and napoleon are all local fish name, so several different fish species are meant when one of these terms is used. For example with baronang rabbit-fish species are meant and with napoleon several wrasse species are meant.

The second day, we entered the water again with line and hook and we walked to the trap. Even though the fisherman did not mark the place where he put the trap, he knew exactly where the trap was placed. He used his goggles when we were near the place to find out the exact location of the trap. When he found it, he checked the trap with his goggles to see how many fish were caught. He said it was not much this time, and that there were only three fish in the trap with one kalibomba of a reasonable size (more than 5cm). Before he uncovered the trap he closed the entrance with a small piece of coral. Then he shook the trap until the kalibomba was in front of the entrance and he took the fish in his hand. He hooked the fish in its lower lip and he placed it back in the water while holding onto the line to which the fish was now attached. He shook the other two fish out of the trap and he released them, because they were too small to eat (smaller than 5cm). He told me that a good catch is ten fish of a reasonable size, therefore the trap was completely uncovered and relocated. The same method for finding a good spot and placing the trap was used as described before.

The other trap had a higher catch with six small fish. There only one fish was released because of its size. They took the fish in a bucket with some sea water in it. Different fish species were present in this trap. Also this trap was relocated after the fish were taken. The whole process of checking the traps and relocating them took about an hour and a half. This time a small boat was used to bring the fish back to the shore. With a bamboo stick the boat was maneuvered over the reefs, sometimes hitting the reefs, until the shore was reached. There the fishermen split the catch between them and they took the fish home.

Yansen, another bubu fisherman used exactly the same bubu as Amar. He owned three traps, but he only placed one in the water. The other bubus were left to dry at the beach so that algae and mosses die that attach to the bubu when it is underwater. Yansen told me that fish do not like the smell of algae and mosses, so they do not enter if the trap is covered with it. Amar agreed with him about this point, he also owned three traps, but he placed only two and he left one to dry on the beach.

Yansen used the trap to catch baronang and napoleon, at another location and with another strategy of camouflaging the trap. Both are also reef fish, but the bubus are not placed on the reefs in this case. Instead the traps are placed in front of the reefs (approximately 20-30m from the shore and at the same distance from the reefs). There were a lot of small fish present who could easily swim in and out of the trap through its holes. Yansen told me that: "*During high tide these fish come closer to the shore, and when low tide starts the fish tend to swim with the current back into the deep water*". That is also the reason why the trap always has its entrance faced towards the shore. Because when low tide starts the fish want to swim towards deep water, and when the trap is checked at low tide the fish will still be in the trap because they cannot follow the current for high tide yet.

Another difference with this trap is how it is camouflaged. Only the sides of this trap are covered with coral, not the complete trap. Yansen told me the following about this set-up for the trap: "*The napoleon or baronang would not enter if the trap is completely covered, and I would risk sea-snakes to enter the trap. When a sea snake enters, the trap is often destroyed. Sea-snakes like to rest or look for prey in coral shelters, so if the trap is completely covered with coral you have a big chance of catching a sea-snake. And the baronang and napoleon are then less likely to be caught, also because the sea-snake will have eaten them*".

He places the trap always at the same spot, because that is the living space of the target fish. He explained a bit more about how the bubu works: "*The idea of the bubu is that you create a nice*

resting place for the fish, so that it will enter your trap. If you move the trap, the fish will not be caught anymore, because napoleon and baronang are very sedentary. So there is one place where the trap is placed, and when you catch these fish then you will place your trap at the same spot. Only if you do not catch fish anymore with your trap you will place it somewhere else to see if you have more luck there". Today the trap was empty, but Yansen decided to leave the trap at the same spot, because this spot usually brings four fish on average per day.

Interestingly enough, both fishermen I observed and interviewed agreed immediately on who is using bubus as a fishing method. Amar described it as follows: "*Usually older men and women fish like this, because only if you are old, handicapped or lazy you should fish in this way. Healthy able-bodied people should go for pelagic fish like tuna, which can be sold at the market, not for small reef fish*". The interviewed bubu-sellers confirmed that their clients are mostly older men (Didi; Bahral). Yansen added to this: "*You get very tired if you go to the deep sea and try to catch tuna or other species. This is very near, the bubu can be checked every day, it doesn't take a lot of time and you don't get very tired by doing so*". Besides being a bubu-fisherman, Amar owned a shop in his house and Yansen was a teacher at the school near his house to make money. The only fishermen I interviewed who occasionally make money from bubu-trapping are the bubu-sellers (Didi; Bahral) who use around ten traps at the same time.

Both Yansen and Amar said that they always buy bubus at the market from craftsmen or from sellers near Tindoi (place famous for bubu-makers and sellers). They never make bubus themselves, but they do repair them if they are broken. The bubu can be broken by sea-snakes or large fish who can bite their way out of the trap through the bamboo, and also by rough currents or waves. Reparations are done as follows: "*White rope is used to strengthen the bubu in places where the bamboo is broken. The rope is wrapped around the parts of bamboo that are still good, and then connected by crossing over the holes, so that they are partially covered*" (Yansen).

The bubu as an object was followed, because it is the most important equipment used to catch fish besides the goggles. There are several spots where bubus are sold. For example at the central market in Wanci, Waha or at the bubu-makers' home. Both interviewed bubu-makers work at home at the center of the island, where they have their own bamboo garden from which they harvest the bamboo needed to make a bubu. A bubu can be ordered directly from bubu-makers at their home in central Wangi-Wangi island but also at other islands such as Kapota. I went to Wunga (near Tindoi) and Kapota island to interview bubu-makers, because the sellers of bubu at the central market in Wanci told me that the bubu-makers live there.

The first things the bubu-sellers told me were that the bubus are made on request only. Both sellers do not have them in stock, and they make the bubu exactly how you like it (mesh size, thickness of bamboo, bubu-type and design). The price depends on the size of the bubu, a small bubu costs around 50.000IDR[3], whereas the largest costs around 300.000IDR. The small squared bubu is made within a day. The bubu-sellers told me they do not have regular customers, but different customers every time.

Besides making bubus, the sellers are also bubu-fishermen, with normally around ten bubus at sea per day. The sellers work in small groups of three people to set the bubus and to check them the next day. If the bubus are placed with a group of people the catch is always shared. The bubus they use are larger square ones, which they also cover with coral. They said that the larger the bubu,

[3] At the time I was in Indonesia the exchange rate was 1 euro/12.000 Indonesian rupiah.

the larger the coral parts used to cover the bubu, and the bigger the target fish. If the catch is good the bubu-sellers also go to the market to sell fish, and if the catch is bad they eat the fish themselves.

What both bubu fishermen and the sellers mentioned was the absence of rules or regulations about bubus: "*Government doesn't have rules about bubus, we can use whatever we like. I have never seen a boat checking the area for bubus, and I have never been checked on what kind of traps I use, make or what type of fish I catch. I just catch whatever enters my trap, and whatever enters is mine*" (Didi; also see Bahral; Yansen; Amar).

2.2 Menyulu

The people involved in menyulu are Bajo. It is a 'sea peoples' fishing-technique, land people do not use this technique. Only for equipment (the spear points) land people are involved as spear-point sellers. The people learn how to practice menyulu when they are still very young, this was clear when I saw many children joining the menyulu boats just before we left. This fishing-technique was introduced by their ancestors. Both interviewed and observed fishermen could not give me a time indication when menyulu was first practiced. Both men and women go spearfishing, but if a woman joins the boat other women join as well. This has to do with the Bajo belief that one woman on board means bad luck[4].

I joined Ridwan and three others around 19:00 o'clock, when it was already dark and low tide. We left at low tide because then less distance has to be covered by the spear, which makes it easier to fish. And it is also easier to move the boat forward with spears. In short: "*We went fishing for crab with objects that look like spears. The sticks are made of bamboo which they make themselves. The point is made of iron, it has 5 points and they are located similar to the number five on a dice. The points are approximately 5cm long and the middle point is a bit shorter, approximately 3cm long. The pins are approximately 2-3mm thick. The bamboo sticks are always held with the sharp points pointing downwards. The spear is used to move the boat forward, because the boat did not have a motor. Two spears were brought of which one is a spare one. The fisherman stood at the front of the boat where a small oil lamp was attached to shed light on the water and to be able to see the fish and crabs*". The five-point spear is only used in Mola, other Bajo villages use three-point spears.

We went to a location near the village. This was not a regular location. Often locations are switched to see if more fish (or crab or squid) is present there, especially when they have had a bad catch. When Ridwan goes for menyulu, he does have a certain target like crab, but he just caught whatever swam or walked on the sea bottom. From crabs, fish (all species he saw) to sea-cucumbers. Very small fish are not caught, because they are smaller than the distance between the spear-points.

Ridwan said it was a good time to fish crabs because it was full moon, then the crabs are more active and easily seen. The same goes for squid, they come to the surface when it is full moon which makes them an easy target to catch. We were going for crab, because the squid is living far away from the village. Ridwan explained further why fish was not the main target this evening: "*Fish are more difficult to catch with full moon, because they can see the spear reflect in the water which gives them a bigger chance to escape. Besides that, October and November are spawning months for fish, so many fish have moved to their breeding grounds away from the living reefs*".

During the whole trip Ridwan stood at the front of the boat searching the water for fish, crab and other targets to spear. Once in a while he had to pump the oil lamp to keep it burning. When he saw a fish or another target he used his right hand to hit the spear firmly in his target. When a fish

[4] Because I am a woman, always other women joined the boat for menyulu. This could have influenced their 'regular ways' of practicing menyulu.

was caught it was hit several times with a knife behind its head to make sure it was dead, because some fish have poison in their fins so they should be dead before they are placed in the box. The catch was always released in the boat in a box made of foam paper (which was immediately behind the fisherman), and a knife is used to release the catch from the spear. The small crabs are often released upside down in the box to make sure they are not moving, while big crabs were often hit on their head before their release. Crabs often survive after being speared so often they will start walking to reach the sea again. When a sea-cucumber was caught it was squeezed firmly before it was placed in the box. In this way water and organs were removed from the cucumber.

In total 8 crabs, 11 fish (varying between 5-20cm in length) and 2 cucumbers were caught during this trip. This is not a very good catch, partially because we had to leave early (21:00 o'clock) because of a quick change in weather. Ridwan said that sometimes they would go fishing all night if the catch is good. This was not the case today, because it was about to rain. When it is raining you cannot go for menyulu, because the visibility of the water decreases rapidly so you cannot see your targets very well which quickly decreases the chance to catch something. During the rainy season the wind also increases which causes higher waves and stronger currents, this also decreases visibility with the same consequences mentioned before. That is also the reason why menyulu is a dry seasons' activity when the sea is calm and the visibility good[5].

A lot of the corals below us were dead, while menyulu is a practice connected to living reefs. Ridwan felt ashamed of the dead corals near his village, and he told me that the corals died because of bomb-fishing and poisoning. He also told me that these reefs were once very good for menyulu, but now there are less fish, crabs and squid to catch (he already practiced menyulu for over 30 years). Today Bajo people have to go further away from the village to reach the living reefs. So the menyulu area has decreased together with the amount of fish caught.

The catch from this trip was used domestically. After we returned Ridwans' wife placed the catch in a plastic bag and brought it to the shore. There she cleaned the fish by removing the organs and gills. After this a traditional meal was prepared, namely 'ikan bakar' (barbecued fish), 'kepiting bakar' (barbecued crab), raw sea-cucumber and kasuami (traditional cassava extract). This was all served with sambal. If the catch is good, it is sold at the market. This evening the catch wasn't very good so it was eaten directly. Besides being a menyulu-fisherman Ridwan is also a sand-miner to make money for his family.

With Wawan I went to fishing grounds further away from Mola, namely 'karang Kapota' (Kapota reef). For menyulu he always goes to karang Kapota, because according to him that is the best fishing ground near Mola. Karang Kapota has a lot more living reefs than the spot fished with Ridwan near the village. Again we left at around 19:00 o'clock from Mola Selatan at low tide with four men and three women on board. The boat we took was a bit longer than Ridwans' boat and it had an engine which was used to reach karang Kapota. Again it was full moon, so a good evening to catch crab. When we reached the spot the engine was turned off and he said it was really bad weather with low visibility. The waves were higher than with Ridwan, which made it hard to see the fish and crabs. Exactly the same equipment was brought as Ridwan did, with one extra piece: a spear-gun. Because of the bad weather, Wawan said it is easier to dive into the water with a spear-gun (one point) and goggles to find the species you want to catch rather than to stare into the blurry water from above. Spear-gun fishing is called 'pana' by the Bajo people.

[5] I wanted to join more menyulu fishermen, but the weather changed quickly with hard wind and lots of rain. Therefore I only did two observations for menyulu.

The first half an hour was used for menyulu, but only a few fish and crabs were caught. So after a while menyulu stopped, and the pana fisherman took off his shirt, put on his goggles and he jumped in the water carrying his spear. This spear is a bit longer than one meter and it has a grip similar to a gun. The spear consists of two parts which can be separated from each other. The spear-point can be released from the grip. It also has a rubber / elastic strap which is tied to a small hook near the grip. It works like a bow and arrow, when the strap is released the spear point jumps out quickly to spear a fish or a crab. He looked underwater until he found a target, then he dived into the water to spear it. While the pana fisherman was in the water, Wawan steered the boat right behind him, and he made sure enough light was present by moving the oil-lamp in the direction of the pana fisherman. Menyulu and pana are never done at the same time, because it would be too dangerous for the pana fisherman (he could get speared by the menyulu fisherman). During both fishing techniques the engine of the boat was turned off, because it scares the fish away and the boat would go too fast and cause too much waves for the fishermen to work. After half an hour the pana fisherman caught four fish, two crabs and a sea urchin which he picked up from the bottom. Every time three fish or crabs were on the spear, the pana fisherman gave the spear-gun to Wawan to unlock the gun and place the fish or crab from the spear into a black plastic bucket with his knife. After half an hour, the pana fisherman climbed into the boat and menyulu continued.

When I asked Wawan why he preferred the five pointed spear, he said that it was easier to use. According to him, with less spear-points the fish could more easily escape once it is speared. That is also the reason why the pana is used exclusively underwater, otherwise the speared fish could escape easily from the one-point spear.

The fishermen are allowed to catch every fish, crab, sea-cucumber or ray at the fishing grounds. Wawan said: "*I catch anything I like, there are no restrictions about catch. There is only one area where we are not allowed to fish*". When we approached this forbidden area we went around it to avoid problems with the authorities. The area was not marked by buoys or other visible signs that it was forbidden to enter for conservation reasons. Wawan knew it from meetings with TNC-WWF, and also that he could face charges if they would find him fishing there. According to him TNC-WWF, TN and other organizations check the protected areas, also during the evening. He said he was never checked by the authorities, but that he heard about it from friends.

After we returned from menyulu at around 21:30 the catch was removed from the plastic bucket into a plastic bag and brought to the shore. Normally these fish were sold at the market or prepared for a big meal after the fishermen's return. Today the fish were left in the bag and given to me as a present. Besides being a menyulu-fisherman Wawan uses the pana, and he is a lobster fisherman for which he uses another type of spear. According to him the big money is in lobster fishing, not in menyulu.

When I asked if they faced any conflicts with other reef-users such as coral-miners, bomb-fishermen, tourists or people trying to protect the reefs, they said they did not experience any direct negative effects. Wawan: "*The coral miners and bomb-fishermen are active in other locations than us, so we don't have issues with them. Only if the bomb-fishing takes place near our fishing grounds we have a problem, because without reefs the fish cannot survive. Now we know about the protected zones near Mola after education, so we don't have any problems with the conservation organizations either. We are very happy about tourists who are interested in fishing, and we have recently created a group of which I am part, namely 'Nelayan Bakti'. We are a group of fishermen who can facilitate tourists and who can take them fishing if they want to. So we are trying to adapt ourselves to the tourists coming here*". The organized group of fishermen is new (10 people are part of this group),

and they have not introduced themselves yet to other organizations or the government as a representative of menyulu-fishermen and their focus on tourism.

The equipment used for menyulu is all made by Bajonese, except for the spear-points. They buy the spear-points from blacksmiths, a profession done by land people only (Ridwan; Wawan). The blacksmith told me that one menyulu spear-point costs around 25.000 IDR, and if they want the bamboo attached to it they have to pay extra (Laode; Wawan). Laode also mentioned that Bajo people often attach the bamboo themselves to the spears (also confirmed by Wawan and Ridwan). Both fishermen told me that the bamboo is usually broken after one or two years, then they locally buy new bamboo and attach it to the spear-point again.

2.3 Bomb-fishing

Bomb-fishing is described based on descriptions of two former bomb-fishermen, namely Budi who stopped in 1998 (after 10 years of bomb-fishing), and Tofa who stopped in 2007 (after 20 years of bomb-fishing). Since it was very difficult to find respondents who are still active in bomb-fishing, I decided to look for respondents who already stopped bomb-fishing and who were willing to talk about it. Currently bomb-fishing still happens, and I heard bombs going off (blasts) when I went for menyulu with Ridwan in October, but I could not see their boat or the people involved since it was already dark.

The people involved in bomb-fishing are mostly fishermen from outside and Bajonese. Since fishermen from outside do not come from Wakatobi, I decided not to include them in this research. Bajonese are involved in bomb-fishing, because they are very poor and often they use bomb-fishing as a quick way to make money. The lack of job opportunities, money and the ease with which a bomb can be made are main reasons to start bomb-fishing (Budi; Tofa). When I asked the fishermen why they stopped bomb-fishing, Budi mentioned that he found another job; he realized the danger of using explosives; combined with the recent illegality of fish-bomb use since 1996, he decided it was time to stop. Tofa stopped because he spend one year in prison after being caught by the authorities. Prison was not a good experience, so he decided to stop bomb-fishing altogether.

The practice of bomb-fishing is sustained in different ways, and the fishermen can get resources for bombs from different places. Namely from within Indonesia, or from Singapore or Malaysia. Budi always went to the same sellers of equipment. He said that the sellers in Singapore and Malaysia came from Binongko and from Mola. He revealed a whole system of bribing the authorities to get lots of manure, wicks and matches into Indonesia by boat. When I asked how he managed to avoid the border security he explained: "*give some money to the big boss of the Malaysian or Singaporean border security. After this you can continue your trip without being checked or arrested and you can keep your materials. So bribing is very common nowadays and it enabled us to import our bomb-materials*". The Indonesian authorities are bribed in the same way as the Singaporean and Malaysian authorities. The Indonesian authorities only recently started to check the ships coming from Malaysia and Singapore, since Wakatobi became a regency in 2003, "*then the border checks intensified immediately*". Today: "*from both sides the checks are very thorough, and if they find out about the bomb-materials then all your materials are confiscated*". He emphasized that it is very important to be on the same side as the authorities from Singapore, Malaysia and Indonesia and then you are ok: "*If not enough money is given, then you have a problem. So first you have to get acquainted and create a good relationship before you can import your bomb-materials*" (Budi).

Tofa got his materials from Kendari, so he did not face the problems with border patrols like Budi. He send people regularly to Kendari by boat to pick up the bombs he ordered beforehand. He

used another person every time, so the authorities would not become suspicious. This person brought the explosives in bottles. He said he maximally ordered three or four bottles each time, because otherwise it would attract too much attention. The bottles were often beer bottles of around half a liter filled with manure, a wick and a match. One bottle is enough to make one bomb. He added: "*From these materials I made the bomb myself before I went out at sea to use them*".

When the bomb-materials arrived to Wakatobi, both Budi and Tofa made the bombs for fishing themselves. When he was around 6 years old, his uncle who was also a bomb-fisherman taught Budi how to make a bomb. So he learned by doing and watching how a bomb should be made. The same was mentioned by Tofa, who made his first bomb when he was 7 years old, only he learned it from people in Kendari. After making 2-3 bombs at night, Budi went for the reefs early in the morning bringing his bombs. He often used the reefs near the villages. When he arrived there he used all his bombs at the same spot (selected by how many fish he saw there), with intervals of a few minutes in between. He explained further: "*When the fish were dead and floating on the water, I collected the big fish only. My targets were baronang, seganus and katamba*[6]*, but other big fish I also collected. The small fish that floated were just left behind. Sometimes I took a few to eat myself, but usually I caught so many fish that there was enough for my family and for the fish buyer from Kaledupa. I always sold my fish to a middleman from Kaledupa. In my time as a bomb-fisherman there were two middlemen in Kaledupa, one from Buranga and one from Ambewa*".

According to Budi the middlemen knew how the fish was caught, but they were only interested in fish not in fishing-techniques. The middlemen sold the fish locally at the markets within Wakatobi. He said that today there still is a middleman active in Kaledupa. Tofa often sold the fish he caught himself at the local market, or to a middleman in Kaledupa who also sold at the local market.

Budi mentioned that today: "*It is very difficult to get your bomb-materials to Indonesia, and it is much more difficult with the current checks by local people, TNC-WWF and the park rangers*". He never encountered those checks, because at the time he was using bombs (1990-1998) bomb-fishing was not seen as illegal yet and everybody knew that he used bombs for fishing. Today these local checks are present, and he told me that bomb-fishermen who encounter a check just throw all the bombs overboard without exploding them. After the check the bombs are dived up and they can still be used, even though they have been underwater for a while. He also told me that there are no checks on the land to see if you are making a bomb in your house, only at sea patrols for bombs are present (Budi). Another difference he sees today is that: "*Earlier it was much easier to find out where you could obtain bomb-materials. Today that is much more difficult, the information is hidden. The people selling bomb-materials are different, as well as the buyers of bombed fish*".

Tofa said he never encountered checks on the reefs he used for bomb-fishing: "*Since there were no checks near the remote reefs, I did not realize it was illegal to use bombs for fishing there. I never had education about it, so I was very surprised when the police came to my house, saw the bomb-materials I owned and arrested me for bomb-fishing*". The only other fishermen Tofa saw near the remote reefs were fishermen from outside who also used bombs. He never experienced clashes with local fishermen, because he used reefs at another location.

2.4 Coral mining

The main group of people involved in coral mining are Bajo people. They are the people of the sea, who only recently settled themselves in houses above the seawater in Wakatobi since the 1980s.

[6] All local fish names, again representing more fish species per name.

When I asked Mahasa (mining for more than 30 years now) when he started mining he remembered the first time he went with his father to get materials to build a house. He was still at elementary school then. He describes it as follows: "*Before we were living on our boats, we didn't build a house. But when we started building houses we used the coral stones. In 1975 I started to build my house here, and after a few years other people asked me to mine coral for money (around the 1980s). That's how the coral mining business started here*".

Fulltime miners were first only present to provide coral for local use, and mining was not done on a large scale. This changed when the group of coral buyers extended from Bajonese only to 'land people' and the government. Land people used the corals for their houses, but government also started to use it as a building material for roads, canals, government buildings, harbors and bridges (Mahasa). In other words, building projects that need a large amount of coral to succeed. For example the Wanci harbor needed 83 traditional boats filled with coral to be build (Mahasa). From that moment onwards (the late 1980s until now) the occupation of mining grew larger, because the market demand rose quickly. According to the coral miners, mining coral and sand is today their main occupation, with the government as their largest buyer (Mahasa; Gantang; Mining observations). Even though government turned into the largest buyer, they accepted a law which stated coral mining as an illegal activity in 1996 for the declaration of Wakatobi as a National Park. This caused problems and conflicts between coral miners and the government, which are further discussed in paragraph 4.4.

The mining observations were done with three different coral miners. They were all present at the same location near the harbor, namely around 2km from the village (Mola) and around 1km from seaweed plantations and approximately 100m from the shore. Mining normally occurs near the shoreline, just like in the observations done here. At 5:00 o'clock in the morning it is low tide and the best time for mining, because then the coral is more easily accessible (water is shallower then), and the sun is not very hot yet. The area visited is used by a lot of coral miners, and neither fish and living corals, nor fishermen or tourists were present. The sea bottom was covered with sand, and these spots were searched with a lingis, a long iron spear (approximately 1.5-2.0m long). The following description of coral mining was obtained during these three observations in October:

"*When we arrived at 5:15 there were three boats present in the area with four people involved in coral mining. One woman was alone and she was standing in the water at chest level next to her boat, and she used a lingis. The lingis is held in 2 hands and used to hit the sand until a hard surface is hit. The hard surface is dead coral. When dead coral was found the woman hit the spear really hard into the surface before she bent the spear to loosen the coral from the ground with her hands (like a lever). When the spear was bent very far she took a paddle to find her balance and she stepped on the spear barefooted and jumping up and down on it to loosen the coral even further. She wore swimming goggles to be able to look in the water several times to see how loose the coral was and how big the coral piece was that she was getting. It was also used to check the water for coral if a hard surface was hit. When the coral was loose from the ground she went completely underwater to pick it up with her hands and to place it in her boat. If the coral was very firmly squeezed to the ground she used a small lingis (around 15cm) with a hammer. She placed the point of the small spear on the edge of the coral and used the hammer to hit the small lingis on the edges of the dead coral to loosen it from the ground. During this activity she was completely underwater. This process was repeated until the boat was completely filled with dead coral*".

The practices seen from the other two boats were very similar. One man working alone only used the large lingis, and he did not step on his lingis to loosen the coral but he only used his hands

and arms (pulling the lingis from left to right when it was stuck in the coral) to loosen it. He did not bring a small lingis and a hammer. A couple was also present and they worked together. The woman held the boat in place with a bamboo stick that is also used to move the boat if they do not want to use the engine. Her husband was using a large lingis to loosen the coral and to place it in the boat in the same way as the man who worked alone.

The dead corals obtained are from different coral species, and none of the miners preferred a certain species. So every coral found below the sand is taken. The coral obtained are white and hard as a rock. Some obtained pieces are very large whereas others are very small. The miners separate the dead from the living coral by looking at the presence of mucus. "*Living coral has mucus if you hit it whereas dead coral has no mucus. And we only take the dead coral because that is suitable as a building material, so only spots where the corals are covered with sand are searched. And only those stones are taken*" (Mining observation). None of the coral miners referred to the dead coral as coral. For them the dead coral is not coral anymore but stone. So instead of referring to 'karang mati' dead coral, they refer to it as 'karang batu', or coral stone. In the following statement this is made quite clear by one of the coral miners when I asked what he was doing with the obtained corals after he brought them to the shore, then he asked me: "*Do you mean corals or do you mean stones? We never bring corals to the shore, because we know that if we take the corals the fish will also disappear. So we only take the stones, not the corals*" (Mahasa).

The miners acknowledge that living corals and fish are connected and intertwined, and they are also clear that taking dead corals is not affecting the fish near the living reefs (Mining observation; Aba). The presence of fish is for them a sign of living corals, and thus not a suitable place for mining coral. That is why Aba states that there are no problems at all between coral miners and fishermen: "*The areas where we take the stones are no fishing areas, because all the corals are dead and there is rarely fish present in our mining sites. So we do not have any problems with fishermen, because they use different areas than us*".

The miners were also clear that their sites are no spawning area for fish, because of the absence of fish (Mahasa did say that fish leave the living reefs for spawning). When I asked the miners which reasons they heard from the government to restrict mining, they said: "*Coral mining is really bad for the reefs and that the reefs are protecting the land against tsunamis. After mining there is less reef and the protection against tsunamis is taken away with the dead reefs. But in Wakatobi there are neither tsunamis nor serious earthquakes which could cause tsunamis, therefore this is just an incorrect argument*" (Aba). According to the miners the government has tried to stop coral mining for years already: "*They just say stop coral mining, and they don't offer a solution for the fact that a lot of people who are fulltime miners don't have a job anymore if they stop. We just need a solution*" (Mahasa).

When I asked the miners if there were certain zones where they are allowed to mine, they all responded negatively. Gantang was spotted by local fishermen near Liya: "*I was mining in Liya area, and when I did not want to pay the local people who discovered me (they wanted to profit from my earnings in their area), they called Sara (local conservation organization). Then my coral, equipment and my boat were confiscated. Besides the confiscation I got a warning that I should not be mining there (no education present like with fishing in the wrong zone). When I was released I had to buy a new lingis and boat, because you never get your things back after confiscation*" (Mining Observations). So local people often know that mining occurs in the 'no-take zones', but for a bribe they will not tell the authorities involved in protecting these zones. When I discussed this bribing procedure with several authorities they said they never heard of it before.

To be able to sustain their livelihood of coral mining, coral miners need equipment, and a boat with a motor. The large and small lingis, can both be bought at the central market in Wanci. The boat is often made by family members and bought from them. When I asked about the lingis, the miners described it as being 'their eyes underwater'. The search for corals can only be done with a large lingis, and therefore it is the most important object for coral miners (Mahasa; Gantang). This is also the main reason why I followed the large lingis.

In Wakatobi, Binongko island is said to be the center of blacksmiths. Being a blacksmith is originally a 'land people's job'. When I visited Mola there were neither blacksmiths available, nor shops where iron equipment was sold. The options on Wangi-Wangi island to buy a lingis are a blacksmith near the central market in Wanci or to order one from Binongko. A lingis seller at the central market said it in the following words: "*A large lingis can be ordered from Binongko. I can make a phone call now and then the lingis will be ready within a day. When it arrives here depends on when the boat arrives from Binongko… A lingis of 2meters costs around 200.000IDR. A lingis for coral mining should be ordered beforehand, the blacksmith doesn't have them in stock*" (Lingis seller). Another blacksmith with his shop and workplace near the central market also makes the large lingis on order only. The small lingis is often in stock, because it is also sold as an agricultural tool to make pits in the ground to plant corn. Besides within Wakatobi, several miners got their lingis from Bau-Bau or Kendari where blacksmiths are also available (Mahasa; Gantang). The relationship between the blacksmith and coral miner is not very tight, perhaps because a new lingis is needed only after seven years of use. After seven years the lingis has become thinner because of corrosion of the iron in seawater. The lingis is then not strong enough anymore to serve as a lever for hard coral rocks so it needs replacement. On average once every seven years a new lingis is bought, and often not from the same seller. The lingis sellers also told me that they do not have regular customers, and that they also see lingises coming from outside of Wakatobi (Lingis seller; Laode).

The equipment used for mining (lingis: 200.000IDR, boat with motor and sail 6million IDR, small lingis and hammer: 100.000IDR) cost together around 6.3million IDR. The lingis is hand- and custom-made, so the coral miner can get the lingis exactly how he wants it to be (the length, grips and thickness). Usually the blacksmith provides the iron, but in other cases the miners provide their own iron. If the iron is self-provided, then the price of a large lingis is 80.000IDR (Laode). In short, to be able to become a coral miner a lot of capital is needed before they can start.

Other prices important to miners is the price for one boat filled with coral. Currently this price is 120.000IDR, and it takes a coral miner approximately 3-5 hours to fill one boat completely, depending on how fast the miner finds coral under the sand surface. If not a lot of coral is found by one miner, then the group in which he works (usually friends) will give him or her some of the corals they obtained so everyone gets home with a full boat. Relations between miners are often friendly and they help each other when needed.

According to Halim, a government project leader who leads a project to improve roads and canals in Mola, coral is not the only building material used. Besides dead coral he also imports mountain rocks. The main reason for buying mountain rocks is that they are quicker to deliver, so the project would take much longer if only coral was used. The downside of mountain rocks is that they are more expensive. One car of mountain rocks costs 140.000IDR, whereas one boat filled with corals costs 120.000IDR. Besides corals being cheaper, one boat filled with coral contains more rocks than one car filled with mountain rocks. According to Halim, no quality differences between the two materials are present.

The miners are upset about this new competition from mountain rocks, because it can make their job obsolete. Besides that, government facilitates people mining the mountains, whereas government does not facilitate coral miners: "*We are just neglected in what we do for the government. We are needed to build their buildings… And at the same time they are telling us that we should stop mining because it is bad for the coral reefs and fish. For me coral mining earns me the money I need for my family, and I am very concerned and angry about the restrictions*[7] *government is making for coral miners*" (Aba). Mahasa is also concerned and resistant against the restrictions of government: "*I always fight the police, navy and the national authority (TN) about the mining restrictions. Especially when they are here for patrols. They then want to punish me for mining in a wrong area, and then I say look at the bridge of the harbor, without us there would not be a bridge. It is made entirely of the corals we mined… The navy often sympathizes when I say this, and then they let me go. The authorities close their eyes, because they know there is no solution for this problem now*".

[7] The restrictions are discussed in more detail in paragraph 3.2.2 about Patrolling.

3. Tourism and conservation realities

This chapter deals with the realities 'Reefs for tourism' and 'Reefs for conservation'. In 'Reefs for tourism' the emphasis is on making the reefs and the practices that take place near the reefs as positive for tourists and their reef-experience as possible. Issues that disturb or frighten the tourists should be dealt with adequately. In this reality tourists, diving- and snorkeling equipment and tourism facilitators are present. 'Reefs for conservation' deals with how the reefs are or should be protected. Different conservation organizations, and the government are present in this reality. First I discuss 'Reefs for tourism' followed by 'Reefs for conservation'.

3.1 Reefs for tourism

The tourists I interviewed (Anna, Boris, Robbert, Peter, Jean and Hanz) all come from European countries, and all have a passion for coral reefs and watersports such as snorkeling or diving[8]. Anna and Boris were interviewed on Hoga island where a small resort owned by Geertje (Dutch woman) is situated next to a locally owned tourism facility managed by Jufri. On Wangi-Wangi island the village Patuno has a big resort very near the airport. Patuno resort is owned by Bupati (head of Wakatobi regency), and managed by Mohini. Hanz and Peter are interviewed at this resort. Robbert came to the TNC-WWF office with complaints about park management, so he was interviewed at the TNC-WWF office. Jean was interviewed at Tomia, near the Wakatobi Dive Resort. Sudirman is head of Tourism Community Waha, where he rents rooms and snorkel equipment and Noval is working for the tourism department of government.

The experience of Anna, Boris, Robbert (all snorkelers) and Jean (diver) with the reefs near Hoga island was very negative. They all said they were very disappointed, because they did not see large fish, and the corals were in a bad condition: "*In the period of 5 days I snorkeled here I only saw one big fish. The rest is very small and there are very little fish*" (Boris). Or Anna: "*some places did not have living coral anymore and there were not a lot of fish… Overall the reefs were very disappointing*". Jean had a similar experience on Hoga: "*No the reefs were not what I expected to see at all. All the big fish were gone, like the snappers and groupers and other big reef fish. I also did not see any sharks around there… The lack of fish made the experience less exciting than I hoped it to be*". They all mentioned the presence of visible coral destruction, but they did agree that the present coral garden was very beautiful.

Another important thing Boris, Anna, Robbert and Jean missed next to the big fish and good reef condition was the presence of authorities checking the National Park. Or in Boris's words: "*I was amazed by the fact that this is a national park. I did not see anything from it. No sign, no entrance fee, people fishing in the area where we snorkeled and people throwing garbage in the sea on the boat trip to Kaledupa*". This while the advertisements are claiming that Wakatobi is a National Park where you can see the best reefs of Indonesia. Boris, Anna, and Robbert felt scammed by the advertisements that brought them here: "*They advertise a lot how beautiful this area is, but actually there are only very small fish, and no turtles or sharks. It is nothing like the advertisements they spread or the stories cited from Jacques Cousteau about how special the reefs are here... If I had known the reefs were in this condition before I arrived, I would not have come here. It really is misleading advertising they do for this area… I have seen much better reefs than the ones out here*" (Boris). Robbert also mentioned that he expected to see the best of what Indonesia has to offer

[8] Only interviewing European tourists was not planned beforehand, I simply did not meet Indonesian tourists who stayed long enough for an interview during my stay in Wakatobi.

when it concerns coral reefs because of its status as a National Park, while he has seen better reefs in places that are not a National Park or special protected area.

Mohini confirms the stories of Hoga tourists that both government and the resorts show a lot of beautiful reef-pictures to tempt tourists into Wakatobi. Patuno resort shows reef-pictures on a screen at international dive shows and exhibitions. At these shows leaflets and brochures with pictures of the reefs are present. Also on their website reef-pictures are shown. When I asked Noval how local government promotes Wakatobi he said: "*With events, we organize Sail Wakatobi, underwater photography competitions, national seminars and conferences, and finally we organize the Wakatobi festival. We also have the world record in underwater marriages, namely 2000, which also attracts tourists. Another upcoming event is Deep Indonesia and this is the biggest dive exhibition in the world which is usually held in the USA*". Besides this local government has: "*a website, booklets, leaflets, brochures, cds, dvds (movie), and the events are promoted on national television. We also promote Wakatobi in Garuda Airline flight magazine and we invite national celebrities to come here. Mostly people know where celebrities are, and when they see that a celebrity visits Wakatobi the number of tourists rises quickly*" (Noval). Mohini said that these activities of local government are very helpful for attracting tourists to the park.

Besides the feelings of being misled by nice pictures, Robbert went to the WWF office to express his concerns for the protection of the National Park: "*It really has been a disappointing experience for me and I hope WWF will do something about it. I am also very concerned about all the waste that people just throw in the ocean here*". Jean also mentioned the presence of waste: "*I saw a lot of plastic and other waste types floating around the reefs. Even underwater I saw plastic bags. That was something that really bothered me*". Mohini also mentioned waste as a common complaint of her guests.

The lack of signs that Wakatobi is a National Park such as an entrance fee and authorities checking the park are not only noted by tourists. When I asked Noval about the lack of an entrance fee he said that an entrance fee for the park will be launched in 2012, of which the revenue will go to TN for reef conservation. Mohini added to this that Patuno will refuse to sell an entrance fee if: "*we still hear bombs and see poison. How can we sell an entrance fee to our guests if they can hear the bombs going off underwater? Then the park is obviously not protected, and it cannot really be called a national park. You cannot sell a national park when it is not well established and protected yet. Our guests would feel ripped off, because they are paying for a protected coral reef and they hear it being destroyed*".

Contrary to the Hoga tourists the Patuno tourists (divers) were very enthusiastic about the reefs and the reef condition. For example in Hanz's words: "*The reefs are very exceptional. This is nothing like I have seen before, and I have seen a lot already. In the Red Sea the reefs are over-dived, inexperienced divers who accidentally break parts of coral by coming too close is such a shame. The reefs here are well preserved and I would call them pristine*". Peter described the reefs as follows: "*the reefs and fish are absolutely amazing, really it is the birthplace of anything nautical*".

But also the Patuno tourists are worried about the reef condition and about bomb-fishing. One of the divers told me they had to abort a dive because the bombs were going off too close for comfort: "*On the 13th of November we were diving at around 30 meters underwater and we really felt the concussions. This was near Kaledupa, at Karang Gurita. We had to get up immediately because it was really a scary experience for us all. So we had to abort the dive because of bomb-fishing. It really breaks your heart*" (Peter). Right after the bombs were heard: "*The dive guide immediately made a*

call to the resort to report the bomb-fishing and they contacted TNC-WWF". Unfortunately after the call there was no "*boat speeding in to check it out*" (Peter).

Mohini said that bomb-fishing is currently increasing, and that it is not dealt with sufficiently by the park rangers. When I asked her why TNC-WWF was called instead of the park rangers she responded: "*if you want to get things done, you should not ask the park rangers. They are not doing anything at all is my opinion. If you call them when you hear bombs or you see poison, they just do nothing at all. Then the boat is broken, they have no budget, or staff is missing. That is very frustrating for us. That's the reason why we usually call TNC-WWF when we encounter issues like this, because they tend to care more and act quicker than the park rangers*". Besides TNC-WWF Bupati (Head of Regency) is also informed about bomb-fishing and other complaints of the guests, for he is the owner of Patuno resort. He is the political head of Wakatobi, and after being informed about the complaints he puts political pressure on the organizations responsible for protecting the park to do a better job. Mohini added to this that she would prefer to make the reefs in front of the resort a no-take zone, so the resort can protect the reefs nearby without depending on other authorities. I also asked her if she, her staff or tourists ever tried to make contact with the bomb-fishermen. Her response was very clear about this: "*No I always advise them to stay away from the bomb- and poison-fishermen. There are serious vendettas going on and militant revenge issues are very normal for them. So we always advise everybody apart from the authorities to stay away*".

Another issue the Patuno tourists were concerned about are the bubus placed on the reefs. Hanz told me that he with another diver: "*untrapped one of the traps, because it was placed on the coral so we placed it on the sand. When we retrieved the trap we saw a tiny hole in it, but we did not make it bigger when we moved the trap. Some of the fish did get out, but not all of them*". He did say the traps are a much more sustainable way of fishing than the bombs. Peter also said he sabotaged one of the traps he saw: "*Actually I broke one of the traps myself. There was a beautiful fish inside and 'accidentally' my elbow happened to hit the trap and let the fish out. I saw large and small traps, with beautiful colored fish inside, I really felt sorry for them*". Mohini also mentioned the traps as a serious complaint from her guests. And she added to this: "*I think the bubu trapping deserves more attention as a harmful fishing-technique for the reefs than it gets now, because it happens at a large scale. Our guests often want to break the bubu and let the fish out, but we advise them not to do so to keep good relations with our neighbors*". The bubus and the bombs were not mentioned by the tourists on Hoga or Tomia, because they did not see the traps or hear the bombs in their dive or snorkel sites.

Even though tourists are very concerned about reef-protection in Wakatobi, and in Hoga they are very unhappy about the reefs and the present species, the tourism department of government and local tourism facilitators are completely unaware of the problems tourists have with the reefs, reef-protection and other reef-practices in the areas used by tourists. According to Noval, Jufri and Sudirman all tourists are very happy about the reefs in Wakatobi. Noval added to this that: "*I do think students from Operation Wallacea can see the reef degradation which is present here, but a tourist probably won't recognize this*". In other words, tourists' experiences with the Wakatobi coral reefs are not known and thus also not taken into account by the government or the local tourism facilitators.

3.2 Reefs for conservation

This paragraph deals with different organizations, people, practices and objects involved in conservation. The paragraph is divided in two parts, namely research and monitoring, and patrolling

and education. These parts are separated, because both research and monitoring have as main purpose to gather information about current reef-status and –condition, while patrolling is done to check who is using which reefs and to catch and educate reef-violators. Since education is not only provided for reef-violators, but also for and by the people patrolling the reefs, education and patrolling are combined in one paragraph. First I will introduce the actors present in those activities, after which I will continue with how they are involved in these activities.

For research Operation Wallacea, their main facilitator Jufri and the students doing research are the main actors. For monitoring TNC together with WWF, TN, and COREMAP are the most important actors. Patrolling is done by TNC-WWF, TN, COREMAP, DKP (fisheries department of government), marine police, navy, Sara (local reef-protecting organization) and FORKANI (local reef-protecting organization) where TNC-WWF has a key role in educating both fishermen, coral miners and the other conservation organizations involved in patrolling. TN, COREMAP and FORKANI are also involved in educating fishermen, and TN is also involved in educating coral miners.

3.2.1 Research and monitoring

TNC is a science-based NGO responsible for collecting and analyzing data about the reefs and responsible for patrolling. On the other hand WWF is more focused on fisheries. The cooperation between TNC and WWF started in 2003 in the form of the Joint Program (Sugi; Sahri; Arifuddin; Saleh). This program is a mixture of TNC and WWF staff, and they form the link between the data generated and the local people. Besides sharing data on how the reefs are doing, Arifuddin added that the Joint Program is active in educating people about sustainable ways to catch fish, fish processing, fish size, policies and permits[9] needed to catch reef fish (and how to obtain such a permit), the zonation system present in the park and what happens if violations occur of the permits or the zones. For coral miners separate meetings are organized to stress the negative effects of mining, to discuss alternative livelihoods with miners and how to deal with the current problems they face. There are two five year plans of which the second ends in 2013. Sugi is responsible for the work plans they make for both TNC and WWF. According to him: "*The cooperation between TNC and WWF has been very fruitful until now, since we have the same goals, namely protecting the Wakatobi coral reefs*". After their cooperation started, TNC and WWF decided to use the same building to shorten the lines between both organizations, and they changed their name to TNC-WWF instead of using both names separately.

TNC-WWF has an agreement to support the work of TN. In other words: "*TNC-WWF has an MOU with the park rangers. They have to share their information and we can only publish our data together*" (Sahri). Sam confirms the tight relations TN has with TNC-WWF: "*We work closely together with TNC-WWF and we share our monitoring results with them. Monitoring means for us: identifying spawning areas of fish, monitor reef-fish, corals and dolphins*". Besides sharing monitoring results, also patrolling results are shared.

Officially TNC-WWF is monitoring 45 sites of reefs every year, whereas TN is monitoring only 10 sites a year. According to Sahri, TN can only monitor and patrol reefs near the islands, because they have budgetary problems. He explains the problem they have as follows: "*TN is centrally organized from Jakarta. Indonesia has in total 50 national parks, so also 50 TN. Of these 50 TN, we only have 8 marine national parks. So the marine parks are underrepresented… and the protection of a marine park is more costly than the protection of a terrestrial park. We need a lot of fuel to reach*

[9] Permits are only obligatory for commercial (reef) fishermen

the protected areas, and speedboats are costly in maintenance. But TN Wakatobi gets the same amount of money as a terrestrial park. The capacity in terms of money is therefore lacking, and this means TN can only do patrols and monitoring very near the islands. The remote areas are rarely visited". This problem is very difficult to deal with, and TNC-WWF tries to fill the gaps for TN by monitoring and patrolling in many places, including the more remote reefs. Ahyar, Made and Sam all agree with Sahri on the budgetary problem TN faces, and Made added to this that TN is not able to do all the monitoring and patrols they should do. Since this budgetary issue is influencing both monitoring and patrolling done by TN, they are both mentioned here. More in-depth information about patrolling is presented in the next paragraph.

TN officially has ten days a month which they should spend on monitoring: "*The monitoring is done by park rangers and it consists of diving and snorkeling while counting fish and reef species and their abundance. We also do monitoring by walking on the beach while checking species there*" (Ahyar). The monitoring activities he describes are all done near Wangi-Wangi island. Ahyar is head of SPTN1, which means head of TN for the reefs surrounding Wangi-Wangi island. He does make clear that monitoring and patrolling only occur near the island, and that trips for remote reefs are rarely made. Made, speedboat driver of TN told me that the last time they visited the reefs near Runduma island (very remote reefs and core zones) was more than a year ago. Sahri added to this that most violations occur near the remote reefs, such as bomb- and poison-fishing, entering protected zones and permit violations (including fishermen from outside entering the park).

Everybody interviewed from TN and from TNC-WWF agreed about how well the reefs are monitored and checked for illegal fishing activities. They say very similar things like when I asked Made if the park is protected sufficiently he said: "*No not at all. We have not enough budget to do more patrols or monitoring. So we have to do what we can, but as you can see 10 reports each month for poison or bomb-fishing is quite a lot, and this is only in our reef area (SPTN1). So in our spare time we also go on patrols to check the reefs. We just hope to get more money next year so we can really succeed in protecting the park properly. For now it just isn't enough, and there is nothing we can do about it really*". Ahyar also emphasized the help TN gets from TNC-WWF when it concerns monitoring and surveillance: "*We cannot guarantee the conservation of the reefs right now. We really depend on TNC-WWF to help us, and even with their help it is not enough*".

The only respondent satisfied with the current practices of reef-protection is head of DKP Hajifu. When I asked him if the reefs were currently sufficiently protected he answered: "*Yes I think so. TN, TNC-WWF and COREMAP are doing a good job to protect the reefs. And actually the corals are in a good condition now. In fact last year we had a coral growth of 4%/month. So our reefs are doing good, and I really think the protection is at a sufficient level now. There are regular patrols which is a good thing. Perhaps the institutions that protect the reefs should get a bit stronger still, but that is only a minor issue*". This is a very different story from the respondents of TN and TNC-WWF.

COREMAP is an organization funded for 70% by the World Bank, and for 30% by the local government. It is an organization spread throughout Indonesia where protected reefs are present. Their main goal is to sustain the reefs and improve reef health, for which they use the following slogan: "*terumbuk karang sehat, ikan berlimpa masyarakat sejahtera", meaning: "healthy reefs, high fish abundance and prosperous communities*". COREMAP is focused on training local people to do reef-monitoring. Hardin describes it as follows: "*our team trains local people to do monitoring themselves. So we provide a training for them how to do an interview and how to recognize species of coral and fish. This training is voluntary. Besides local people, also students from Unhalu (Kendari university), Unhas (Makassar university) and IPB help us occasionally. For local people the only*

prerequisite is that they can read and write, and only if they have finished the training they can join in monitoring". If they have finished the training COREMAP provides snorkeling equipment for them. Occasionally COREMAP cooperates with TNC-WWF and TN if there is a clear overlap in their goals for reef-protection, but often this cooperation is absent. For example the absence of quickly sharing information such as monitoring or research results. These results can be obtained by both TNC-WWF and TN, but only through a bureaucratic procedure. Subsections of TN such as SPTN1 always have to ask their headquarters in Bau-Bau for COREMAP's results, so these results are available but very slowly obtained.

Kamus explained a bit more about the monitoring COREMAP is involved in. She said that COREMAP is only involved in monitoring reef fish, not coral species. She said that the local people play a big role in this part of data collection: "*We have 5 forms we use for monitoring and the local community plays a big role in gathering the required information. Each village has two Motivator Desa (facilitators working for COREMAP who gather the data). We from the monitoring team go every three months to the villages to collect the data that the MD has gathered. We arrange the data input in Excel here and then we send it to COREMAP Center in Jakarta*". The data is also published in poster format and given back to the communities. There is an information point in every village (small building with reef information) where posters and leaflets are placed when we have analyzed the data they gathered (Kamus and Hardin).

There are five forms used to collect data on reef fish: 1) fish landing (place where fish is brought to the land); 2) survey fish landing (containing questions on fish species caught, price per kilogram of fish, fishing ground used and the equipment used to catch fish); 3) form with information on season, weather condition and number of boats landing there; 4) catch capacity form (contains information about the respondent such as marital status, number of family members but also more detailed information about the fishing-technique used, like in case of bubu-trapping, bubu size is asked, in case of netting mesh size is asked etcetera) filled in together with the fisherman; 5) this form brings information together and contains some extra questions on time spend fishing. So the facilitator is the one who gathers all the data we need, and based on his information we can say things about the current status of reef fish (Kamus). Fish species that are not caught are not taken into account in this monitoring program, the same goes for fish caught by fishermen from outside.

Besides monitoring a lot of research is done on the Wakatobi coral reefs. Most (ecological) research is done by students[10] who want to do research for their master thesis. Operation Wallacea started in 1995 and it facilitates research for these students, and also for their supervisors. Sugi was assigned to introduce Operation Wallacea in Wakatobi and Jufri is the current facilitator of the students and researchers on Hoga island. According to Jufri there are around 300-400 students in the high season (June, July and August). The main activities they do are diving and snorkeling: "*One month before a student or researcher arrives I am informed about it, and about what this person needs (like scuba gear, internet access, homestay, medical issues, laboratory equipment, water for the cottage (is normally sea water), allergy information for food etcetera). If the students want to go diving I prepare the gear, if they need food without peanuts I take care of it*". In other words, one month before the student arrives he/she has to fill in a list. This list contains all the information Jufri needs to prepare their stay in Wakatobi.

Operation Wallacea is nowadays locally organized by four people from Wakatobi. One is a contact person who speaks fluently English, the students and their supervisors can contact him if

[10] No students or researchers were present at the time I was in Wakatobi, therefore no interviews with them are done.

they need something special. He on his turn contacts Jufri about it. Then there is someone who arranges the immigration procedure, like applying for a visa. The third person arranges the financial side: payment for their stay in the cottage, rent for diving gear, money needed for visa procedure etc. And in the end Jufri is the facilitator, he arranges all the equipment the students need to do their research. The local organization of the Operation is from the last three years, before they hired an organization specialized in English language to arrange the contacts with the students. This because the English language level of the local people was too low to deal with foreign students properly. Now there is someone graduated in English who takes care of the contacts. So only recently this is done by locals.

Besides Jufri, Sugi has been involved (and still is) in this operation. According to him there are two main programs of the operation: 1) Wakatobi marine ecosystem and 2) Hobo Buton (terrestrial research). Since the focus of my research is on the Wakatobi reefs, I will focus on that part of the operation. Sugi said: "*It started with a diving club from IPB (Institute Pertanian Bogor: University of Java) that wanted to place the coral reefs of Wakatobi in a more central position. Together with LIPI (scientific institute) IPB gave a presentation about the potential of the Wakatobi coral reefs. Then the company Ecosurvey joined in, a company active in data collection on ecological topics such as coral reefs. At the time Ecosurvey was already cooperating with WDI (Wallacea Development Institute). The main goal of Operation Wallacea was to get volunteers for data collection on the Wakatobi reefs to increase and improve the information the Indonesian government has about reef status and health. Ecotourism is also part of the operation. So besides diving for fun, the tourists can also help in research projects. In the first place the participants of Operation Wallacea were not students but tourists who were willing to help with research, and who were able to dive. Later on the focus shifted from tourist volunteers towards students"*.

The first volunteers started in 1998, which was a mix between students and tourists, and the research goals and methods were determined by the Operation, and not by the volunteers. He said that the data they gathered was presented at universities in Europe and Asia to attract more students. The research done in the starting period of the operation was steered by the operation itself, there was little room for students' or volunteers' own ideas about research. The research done was for example fish surveys or reef assessment. Later on sponges were also added to this list. He said: "*Today the students are given the opportunity to create their own research objectives. I am still involved in the Operation in helping students to create their objectives and in presenting their goals. The Operation is currently active in getting students from universities to Wakatobi for research*". Even though the students are free in choosing their topic, he is also concerned that he data they gather "*just ends up the shelves, while the Operation is meant to inform the government, so that the government can take informed decisions about the reefs and reef-related problems*".

The facilities present in Hoga today were in the first place created for tourists. The relation between local people and tourists was not very good in the beginning. That changed when Sugi suggested local people to build cottages for tourists. When the tourists stay there they have to pay the cottage owner rent, and in this way the local people also profit from the tourists and students that stay on Hoga. When more tourists and students arrived, they also started to rent boats from local people from which the locals also profited.

The tourists and students that come to Wakatobi are mostly from the USA, Canada, Europe and Australia. According to Sugi this is because Wakatobi is difficult to reach and it is very expensive to get there. Often Asian students do not have the resources to come to Wakatobi for their study.

The focus of the operation is now mainly on students from western European countries, as well as the USA, Canada and Australia, because they can afford to come to Wakatobi.

When I asked him why Hoga island was chosen as the center where students and tourists could stay he said: "*Because on Hoga there were no inhabitants who already claimed the land, and because the people here really had to get used to white people. Still today you have probably noticed that people are still looking at you strangely because you are white, in the beginning this was a lot worse than it is now. So for the tourists and students it was nicer to have a place for themselves. Another reason is that the reefs near Hoga were not well researched before, so a lot of data of those reefs was needed. This together made Hoga island the best location for cottages and equipment for tourists and students*".

3.2.2 Patrolling and education

In 2003 TNC-WWF started many programs to educate park rangers and other authorities involved in patrolling (marine police, DKP (fisheries department of government), navy, and COREMAP). These programs were active from 2003-2009 in which Sahri saw a quick decrease in the cases of bomb- and poison-fishing. TNC-WWF was very active in organizing patrols and in teaching the authorities how to handle the different cases they encounter. In other words, TNC-WWF made sure that every patrol was planned and done. Their leading role in patrols also made TNC-WWF the contact point for local people when they heard bombs or saw poisoning. According to Sugi this should become the responsibility of TN over time. According to Sahri this was a capacity building project for the authorities, with as main goal that the authorities could do the patrols themselves after 2013. Now they are in the transition phase (2010-2013) in which TNC-WWF is decreasing its involvement in and responsibility for patrolling. Sahri said that there was a quick increase visible of illegal fishing techniques from 2010 onwards.

Besides monitoring, patrolling and education are also important activities of TNC-WWF, TN, COREMAP, DKP and other government organizations. When I asked Sahri if I could join one of the patrols they do for the reefs he immediately said I could. But in the two months I spend in Wakatobi no patrols were organized. Officially they should patrol the reefs once a month together with TN, but in practice this does not happen. Partially because of budgetary issues mentioned before, and also because of a lack of manpower to do the patrols (Sahri): "*in fact we only patrol 4 times a year together at max, sometimes it's 1 or 2 times a year*". Sahri added that there are two types of patrols present: 1) "*One is called 'patroli gabungan', this means a joint patrol with everyone on board who is involved in patrolling. So someone from DKP, TNC-WWF, COREMAP, TN, navy and the marine police. This is a big patrol, with our large boat, we call it the FRS (Floating Ranger Station). This is part of the regular patrols which should be done every month, but which really happens only a few times a year.* 2) "*The other type of patrol is the incidental one. If a violation is reported TN is going to check it out. The idea is that they are ready 24/7 but this is not the case. If a report comes in at low tide or in the middle of the night, it happens that the place is checked out the day afterwards*" (Sahri; also see Sugi). Sahri does recognize that this diminishes the chance that illegal fishermen are caught, and he added that this is the way it is organized now. On the contrary, Ahyar stated that TN is available at any hour when someone wants to report bombs or poison: "*a team is send out at once. There is a contact person the people can reach when they hear bombs or see poison*". Made confirms the two types of patrols described by Sahri, and he added that the joint patrol is done throughout Wakatobi and not only in SPTN1, but also in SPTN2 (Kaledupa) and SPTN3 (Tomia and Binongko). He mentioned

that the incidental patrols are the majority of patrols they do, with around ten reports and thus ten patrols per month (Made; also see Sam). For 2011 only one joint patrol was done.

For TNC-WWF Sahri is the only person responsible for patrolling, and if he does not have time the patrol is cancelled. If TN goes for a patrol, they often ask TNC-WWF to join them. The two months I was there, no such request occurred. When I had my interviews with TN, they told me they had just returned from a patrol. The first patrol they would have again would be after a couple of weeks.

Besides TN and TNC-WWF also other parties patrol the reefs individually such as marine police, DKP, COREMAP and the navy. Sugi explained the problem with this as follows: "*Often we don't know when they are patrolling or where. So we had several occasions that we were patrolling an area while the navy was patrolling the same area at the same time. This is very inefficient, that's why I would like improved cooperation between the patrolling parties and for openness of budget. If we share budgets we can work much more efficient on patrolling and surveillance, because we know each other's capacity*". Manan agrees with this, and he also mentioned overlap in reef-problems where DKP, TNC-WWF and COREMAP are working on but with different implementation plans. Improved cooperation between these parties should get more attention, because they are working on similar issues with separate implementation plans (Manan; Sugi).

COREMAP is also doing patrols, but then locally organized. They organize the patrols in a similar way as they organize the monitoring of reef fish. Hardin explains it in the following words: "*The monitoring controlling and surveillance unit is involved in patrols near the beaches to make sure that no-take zones are indeed no-take zones. The communities are organized as follows: they have an LPSTK (someone appointed as the local policeman for reef protection). He is supported by POKMAS (kelompok pengawas masyarakat) which is a community surveillance group consisting of 10 people. The LPSTK can thus be seen as the head of POKMAS*". He added to this that an LPSTK can only be appointed in a village if Pa Desa (village leader) agrees with it, if he does not agree there will not be a group of local people checking the reefs. Besides the local organization of COREMAP, COREMAP employees also join the 'patroli gabungan' around three times a year, and they organize their own patrols throughout the year. In other words COREMAP is also organizing patrols, but they work separately from TNC-WWF and TN.

Sara a local organization active in Liya territory (part of Wangi-Wangi island) is also involved in patrolling the reefs. The main task of Sara is: "*to keep Liya's assets safe and protected. The assets are the forests and the sea (including the reefs). So we want to avoid that others are destroying them, so they remain well preserved and conserved*" (Musi). Sara has 120 members in total, all of Liya or Kapota origins (land people). The leaders of Sara together with all of its members decide on rules and the enforcement of rules to protect the reefs. Sara sees both coral mining and bomb-fishing as destructive reef-practices which should be stopped. Musi told me the following procedure they use when they encounter coral mining: "*The rule for coral mining is that we confiscate their boat and materials and they have to throw the corals overboard. This is a local law we invented to protect the reefs of Liya. Sometimes we also call the police and let them handle the case*". The confiscated boats and equipment are stored in the Liya harbor, they are not sold or used. Sara finds the miners during patrols or because they are called by locals. Patrols are done around three times a year and often in cooperation with TNC-WWF who provide fuel and education about patrolling (Musi).

For bomb- and poison-fishing Sara has another strategy because of safety reasons: "*we immediately call the police and let them handle the case. At first we wanted to confiscate their boats and equipment as well, but because it is quite dangerous to approach them we prefer to let the police*

handle cases like this. I mean, the bomb-fisherman could just throw a bomb at you when you try to confiscate his boat. And a poisoner can throw poison at you. Because of these dangers we think it is a case for the police. And then the boat and the bombs or poison can be used as evidence in the police case". He also added that the law is well in place for bomb- and poison-fishing, and that the people caught face jail time. Local people also call Sara if illegal fishing-techniques or miners are spotted, then Sara checks the sites mentioned by them.

FORKANI is also involved in patrolling the reefs, and Beloro is the leader of this organization. It is an organization run by local seaweed farmers which started to stop poison-fishing. Poison is very harmful for seaweed, the crops die and get a white color. In other words if a fisherman in the area uses poison to catch fish, many seaweed farmers lose their crops and thus also income from the crops. Later on bomb-fishing was added to their list of harmful fishing-techniques, not only for the protection of coral reefs but also for the protection of seaweed and seaweed-farmers. Bomb-fishing is also damaging seaweed but on a smaller scale, also because bomb-fishermen often use different locations than the seaweed-farmers. With bombs only parts of the crops are blown up (the lines are released onto which the crops are attached), the rest of the crops can still be harvested for sale. The detection of bombs is also a lot easier than the detection of poison, since poison spreads quickly over the sea, whereas bombs are only causing damage in certain spots (Beloro). Their organization has an educational approach towards bomb- and poison-fishermen. They patrol the reefs and if bomb-fishermen are detected they approach them directly to convince them that other fishing-techniques are more sustainable. Beloro added to this that bomb-fishermen are now also involved in bribing the police: "*Still bombs and poison are being used, and I think the police is being bribed by the perpetrators. Because one bomb-fisherman was brought in, and the next week I saw him again in Samban Hari (Bajo village of Kaledupa)*". Beloro knows who is using bombs for fishing and who is not on Kaledupa island, because he and his organization approach these fishermen directly without the police or other law enforcing organization. He wants these fishermen to become part of FORKANI so they can help and convince other bomb-fishermen to stop using bombs for fishing. He also mentioned that it is very difficult to change their mind. Today FORKANI consists of many seaweed-farmers and some ex-poison- and ex-bomb-fishermen.

According to TNC-WWF, Sara, government (DKP and COREMAP), and TN bomb-fishing and coral mining are destructive reef-practices that are damaging coral reefs and its species, and they agree that alternatives for these activities should be found. FORKANI is mainly organized against poison- and bomb-fishing which they see as destructive reef-practices. The reasons why coral mining is bad for the reefs and its species are different. Therefore these reasons are explained further. In short four main reasons are given why coral mining is a destructive practice, namely: the dead corals are spawning areas for fish; coral mining causes seabirds to disappear; coral mining has negative effects for seaweed farmers[11] and finally the dead corals could recover. All these arguments have in common that they are ecological in nature and aimed at protection of the reefs. It must be said that only the first of these four arguments is used by all the actors mentioned above, the other arguments are used by TNC-WWF only.

[11] Even though seaweed farmers are said to experience negative effects of coral mining, they are not further taken into account in this research. Because of limited time for fieldwork, their reality of coral mining is not further taken into account. They are mentioned because they could face negative effects of mining according to TNC-WWF.

Saleh from TNC-WWF uses the arguments in the following words: "*The dead corals coral miners take are spawning areas for fish, so even though the corals are dead they are still very important for fish reproduction*" (also see Made; Sahri; Hajifu; Musi). Besides that "*the seawater level rises as a consequence of mining and this can cause seabirds to disappear, and seawater level rise also has negative effects on seaweed plantations (and thus on seaweed farmers). So there are a lot of negative effects from coral mining*" (Saleh; also see Sahri). According to Sahri (2011) dead corals still have potential to recover: "*Well the dead corals are mined, but these corals can become alive again if a certain algae returns to the area. So we are quite concerned that if all the dead corals are taken, they will be lost for good*".

Saleh uses the following words for it: "*If we patrol the area, and we find people mining we only give them education about why it is not good to do mining. But we don't bring them to the police and they will not end up in jail. This is because there is a law that states they are not allowed to mine, but there is neither implementation of this law nor law enforcement present. The current focus of the government is marine tourism, there is barely attention for coral mining at the moment. We just hope that by educating the coral miners we can get them to find another job such as becoming a fisherman instead of a coral miner*" (also see Hardin).

To get these arguments heard by the coral miners, meetings are organized by TNC-WWF in cooperation with COREMAP and TN to discuss coral mining and its negative effects on coral reefs and its species. They are trying to educate miners about the negative consequences of coral mining and why they should stop mining altogether. In a meeting like this Saleh (2011) also spoke on behalf of the fishermen, in that: "*the fishermen say: 'take the fish don't take the corals'*". Meetings like this and education in general is currently a big part of patrols. Many organizations involved in conservation (TNC-WWF, TN, COREMAP, Sara, DKP) are working together in patrols and in educating miners about negative effects of mining. Besides organizing discussions TN works with a point system: "*We give them a card in which they have to declare not to go for coral mining outside the permitted areas again. This is when they are found mining in a place where they are not allowed to mine. They get a warning after they sign the card and they have to put all the corals overboard. Once they have received and signed three cards we take them into custody and they will have to face a certain time in prison*" (Sam).

Besides education and patrolling, TNC-WWF is also active in putting pressure on the government to buy mountain rocks instead of corals as building material. According to Sahri this is a difficult process: "*We urge for a solution, we tell government to buy rocks and sand from Buton island, but they are not very responsive because it is much more expensive than getting the corals from their own backyard*". There are also zones where the same authorities, tolerate mining because government is the largest buyer of coral. In the words of Made the situation is as follows: "*The harbor is like a small lagoon, and in front of the lagoon is a large dead reef. So if it is low tide the ships cannot enter or leave the harbor. This has been a problem for a while now, so we allow the miners to mine there so in the future the ships can also enter the lagoon when it is low tide. Mining has a good function in this case*" (also see Sam; Hajifu; Sahri).

Even though meetings are organized for coral miners, there are no special programs available for coral miners to shift towards a new livelihood. Manan said it as follows: "*we avoid making a program especially for coral miners, because we saw in other areas that programs aimed at coral miners only actually increased the amount of coral miners (they all wanted help from government to start a better alternative livelihood). So we do not start a program for them especially*". The programs are thus aimed at Bajo communities in general, also to make a shift from reef fishing towards pelagic

fishing. The ideas behind the meetings and alternative livelihoods are that education is provided to get the coral miners organized and to establish new norms in how to use the reefs. Then alternative livelihoods are discussed with them and the NGOs before an alternative livelihoods program/project is approved and set into motion (Manan). On a monthly basis there are meetings between TNC-WWF, other NGOs and DKP to discuss approaches for coral mining. Besides NGOs such as TNC-WWF, COREMAP is also an important actor in this field. COREMAP is the organization who has contact with coral miners when it concerns education and training for new livelihoods.

According to Hajifu and Noval coral- and sand-mining get priority in 2012, and from 2012 onwards these activities are not allowed anymore not even near the harbor. Noval emphasized that with these plans: "*The government should import rocks, stone and sand from the other islands... We should make a good example, but now we are not very successful yet*". Hajifu said that from 2012 onwards the government will buy all the stones needed from miners in the mountain, because of a new focus on coral-mining. He added that if government is not buying the corals anymore, the market for corals will disappear in the future. Besides that government has been active law-enforcement by joining the joint patrols and in educating locals about why it is bad to go mining, and which other options are available for them.

This new agenda against coral-mining is not set by the local government, but by international NGOs such as CIDA (Canadian International Development Agency) and JICA (Japan International Cooperation Agency). Other international organizations helping to improve Wakatobi are UNESCO (United Nations Educational Scientific and Cultural Organization), UNDP (United Nations Development Program) and MDGs (Millennium Development Goals). Noval explained it in the following words: "*These organizations decide on the vision for Wakatobi. The international NGOs will help us with all the aspects needed to make Wakatobi a successful tourism destination* ". In other words these international NGOs are setting the policy-agenda for the Wakatobi reefs and now their focus is on coral- and sand-mining.

Besides education for miners, there is also education about bomb-fishing and the negative effects for the reefs and fish. Sugi said about educating bomb-fishermen: "*they do not only need communication and awareness but also law enforcement. And the last part is still not what it should be*". According to him law enforcement should be tighter to discourage bomb-fishermen, poison-fishermen and fishermen from outside. TN, COREMAP, DKP and Noval agree with this, Noval adds the responsibility of government in law enforcement by stating: "*The government should invest more in patrolling. Now the capacity is too low, there are not enough people and there is not enough money to do patrolling sufficiently*" (2011). Manan added that government is currently focused on shifting from reef-use (including coral mining) towards pelagic fishing. He said that many fishermen from outside are exploiting Wakatobi's pelagic fish, whereas the local people should get the profits from these fish. In education the government is mainly focused on stimulating locals to shift towards pelagic and demersal fish. Besides education they also provide money and equipment for the people to make this change in livelihood (Manan; Hajifu). Government is also active in trying to improve patrols, according to Noval: "*government is working on a satellite to see which boats enter which zones at what time*". This should increase the knowledge about where violations occur of the zones.

Made adds to this that there are new rules about mining since 2000. From 2000 the approach changed from education only and putting the corals overboard to the warning system with points which could result in prison sentences after three warnings. The rules have thus become stricter over time for coral mining. But both park rangers agree that they in practice often provide education when someone is found mining in an area where it is not allowed. With education the park

rangers hope to make the miners more aware of the negative effects of coral mining so they become less likely to continue mining as their main livelihood. So the park rangers are more active in education and giving warnings than in confiscating boats and equipment.

4. Analysis: Multiple realities, discourses, practices and coalitions

This part of the thesis starts with reflecting on 'Reefs for making a living', 'Reefs for tourism' and 'Reefs for conservation' distinguished in the previous two chapters. These realities are not straightforward and simple, on the contrary they are complex and incomplete. During the analysis it is important to realize that it represents my reconstruction of the encountered realities. Other realities can be present which are not researched or encountered during my stay in Wakatobi. Therefore this analysis is only a tip of the 'realities iceberg' present in Wakatobi, and even within these realities the coral reefs are ordered in multiple ways. To get a better insight in these multiple orderings, it is important to look at which definition of coral reefs the main actors use, what kind of practices they perform and what the relationships are between the actors present in a network. First I will start with 'Reefs for making a living', 'Reefs for tourism' and 'Reefs for conservation' and their main actors, followed by the main discourses and practices used by these main actors and finally a paragraph showing the coalitions and conflicts between and within these different realities.

4.1 Distinguished realities and their main actors

'Reefs for making a living' does not show a tight network of different reef-users sharing the same definition of coral reefs, and performing the same practices on these reefs. In fact they are very different, not only culturally (Bajonese or land people) but also in the equipment they use for the reefs (spear, trap, lingis, bomb) and which reefs they use (dead versus alive or local versus remote). So even though these reef-users have the same underlying motive to use the reefs, namely making a living, they use different modes of ordering for the reefs they use. These differences are shown in Table 1 below. The group of reef-users is placed on top of each column and the main actors, discourse, practices and coalitions with other actors are present in the first column and elaborated on per group. In the following paragraphs reef-status, discourses, practices, coalitions and conflicts are further elaborated upon.

Table 1: Reefs for making a living

	Coral miners	Bubu	Menyulu	Bomb-fishing
Main actors	Bajo people, mined coral, reefs used	Land people, bubu, reefs used	Bajo people, five-pointed spear, reefs used	Bajo people, bomb-materials, bombs, reefs used
Main practices	Using a lingis to loosen and remove dead coral stones from the seafloor as a fulltime job	Set a bamboo-trap as a part-time job during the dry season on or near the coral reef and use living coral stones to camouflage it to catch fish for dinner	Menyulu is a fishing-technique practiced in the dry season by Bajo only (both men and women) as a part-time job to catch fish for dinner or the market	Make and use bombs at remote reefs to catch high-value target fish which is sold at the market and eaten for dinner
Reef status	Dead and disconnected. The dead reefs are not connected to the living reefs	Alive and used as camouflage material. Living reefs are needed, because that is where the target-fish lives	Alive and disconnected. Living reefs are needed, because living reefs are the place where the targets live	Alive and disconnected. Living reefs are needed, because living reefs are the place where target-fish live
Main discourse	Mining is about	Using bubus is an old / handicapped or lazy	Menyulu is a very old Bajo spearfishing-	Bomb-fishing represents quick

	removing dead stones from the sea to make money for the family, and the lingis represents their eyes underwater	man's / woman's job if they are not able to go for pelagic or demersal fish anymore. Bubu-trapping represents a non-damaging reef-practice	technique done with friends to catch very different targets depending on the lunar-cycle. Menyulu and the five-pointed spear represent a non-damaging reef-practice and -object	cash if no other options to make money are available and if money is urgently needed. Bombs are not discussed in terms of damaging the reefs
Coalition between	Government and miners, because government is the largest buyer and because government appoints mining zones	Conservation organizations, government, bubu-fishermen and bubus. Bubu-trapping is seen as not harmful for the reefs and bubus are widely accepted and used in sites appointed for local use.	Conservation organizations, government, menyulu-fishermen and the five-pointed spear. Menyulu is seen as not harmful for the reefs and the five pointed spear used for menyulu is widely accepted and allowed in sites appointed for local use.	Government and bomb-fishermen, because both are involved in bribing. The bombs and bomb-materials are the main actors determining their relationship

Different modes of ordering the reefs are also present for 'Reefs for tourism'. A distinction can be made between the tourists themselves who are mainly present to enjoy the reefs, and between two types of tourism facilitators. The tourism facilitator from outside (Mohini) has a very distinctive way of looking at the reefs and reef-protection compared to the local tourism facilitators (Jufri and Sudirman). Mohini does not only want the tourists to enjoy the reefs but she is also interested in preserving the reefs from reef-destructive practices, which also damage tourism. Since tourists do not enjoy damaged reefs, she reports all the damages and what tourists experience as damaging reef-practices that are encountered underwater. Sudirman and Jufri on the other hand did not receive complaints from their guests, therefore practices to protect the reefs are absent from their side just as the absence of attempts to influence conservation organizations. In Table 2 below the main differences between tourists and the outside and inside tourism facilitator(s) can be seen. In this case the local tourism facilitators (Sudirman and Jufri) are separated from the outside tourism facilitator because they never received complaints from tourists about the reefs.

Table 2: Reefs for tourism

	Tourists	Tourism facilitator from outside	Local tourism facilitator
Main actors	Divers, snorkelers and their equipment, coral reefs	Mohini, coral reefs	Jufri and Sudirman, coral reefs
Main practices	Diving and snorkeling, and report damaging reef-practices to the tourism facilitator or act to reduce the damage done to the reefs	Support tourists and act upon their complaints about the reefs and other reef-users by reporting to TNC-WWF	Support tourists by providing a place to stay, diving and snorkeling equipment
Reef status	Deteriorating, unprotected and fragile	Deteriorating, unprotected and fragile	Good and protected

Main discourse	Diving and snorkeling is about seeing a lot of different reefs and its species underwater to enjoy it. Reefs are currently unprotected	The reefs and its species should be well-protected to conserve them for the future and for guests visiting Wakatobi for the reefs	Tourists come to see the reefs for enjoyment. Because the reefs are in good shape tourists are very happy with the reefs
Coalition between	Tourists, Mohini, TNC-WWF and theoretically laws / law-enforcement is in place to protect the reefs. TNC-WWF is pressured to protect the reefs. Mohini is the main representative of tourists towards TNC-WWF	Mohini and TNC-WWF through reporting tourists' complaints and feedback on reef-protection. Mohini and Bupati also form a coalition by pressuring for reef-protection	-

'Reefs for conservation' also knows different actors and multiple modes of ordering the reefs. A distinction is made between the government and conservation organizations, because 1) the government has a much more positive view about current reef-condition than the conservation organizations and 2) the government is mostly involved in creating policies for the reefs, whereas the implementation of these policies is mainly in the hands of the conservation organizations and 3) because the government makes decisions for the reefs based on research and monitoring results of the conservation organizations. Thus the government is involved in different reef-practices and has a different discourse than the conservation organizations. In Table 3 below the different modes of ordering the reefs per actor are shown.

Table 3: Reefs for conservation

	Government	Conservation organizations
Main actors	DKP, planning and tourism department and the reefs	TNC-WWF, COREMAP, TN, Sara, FORKANI, navy, marine police, international organizations, Operation Wallacea, and the reefs
Main practices	-Patrolling the reefs -Provide education, resources and alternative livelihoods for Bajo communities active in bomb-fishing or coral mining -Base laws, policies and implementation plans on research -Using mined coral as the main building material in Wakatobi -Accepting bribes from bomb-fishermen	-Patrol, monitor and research the reefs, to gather information about reef status and about the different reef-practices used in Wakatobi -Organize and or attend joint patrols to align patrolling procedures -Occasionally share reef information -Enforce and implement the laws created by government, or create and apply self-made law-enforcement procedures -Pressure government to stop buying mined coral -Provide education and resources to convince miners and bomb-fishermen to change livelihood
Reef status	Good but fragile and connected. Connections are present between the dead and living reefs	Deteriorating, fragile and connected. Connections are present between the dead and living reefs
Main discourse	Reefs are about creating laws, policies and implementation plans to stop/reduce scientifically proven damaging reef-practices such as	Reefs are not sufficiently protected at this moment, more cooperation is needed between the organizations that are trying to protect the reefs at all levels (from local to international

	coral mining and bomb-fishing	organizations)
Coalitions between	DKP and COREMAP, DKP and international organizations, government and TNC-WWF, TN, and Operation Wallacea	TNC-WWF and TN TNC-WWF and FORKANI TNC-WWF and Sara In joint patrols: TNC-WWF and COREMAP, marine police, navy, TN, Sara In joint education projects: TNC-WWF, TN, DKP and COREMAP

4.2 Main discourses

Three main discourses can be distinguished based on the tables presented above. Namely reefs for fishermen, dead versus living reefs, and finally reefs as (un)protected attraction.

4.2.1 Reefs for fishermen

It is interesting to see that all fishermen are emphasizing that they need living reefs, because the target-fish (and other targeted species) live near the reefs. They all agreed that living reefs are needed, otherwise the fish and other targets cannot survive. Even though they emphasized that they all need living reefs, they do not see a connection between different reefs, such as between the dead and living reefs or between remote and local living reefs. They thus approach the reefs as little islands that are not connected to each other in any way. For example bomb-fisherman Tofa said: "*Because we use remote reefs we do not have problems with local fishermen since the local and remote reefs are far apart and thus not connected*".

Even though they share the discourse that the reefs they use are alive and disconnected, they talk in very different ways about how they use the reefs or who is practicing the fishing-technique. For example bubu-trapping is done by "*old, handicapped or lazy (land people) ... Healthy able-bodied people should go for pelagic fish like tuna, which can be sold at the market, not for small reef fish*" (Yansen). The bubu is thus enacted as an easy, quick and not time-consuming fishing-technique that is used by land people only. Besides being alive, the reefs are important to use as camouflage material for the trap.

The discourse is very different for the fishermen and -women practicing menyulu. Menyulu is talked about in terms of Bajonese history and learned very young. This was clear when I saw many children joining menyulu fishermen at their boat and trying the technique themselves. The fishermen did not know when the technique was invented or tried for the first time, for them it is connected to their ancestors and rooted in their history as sea-people.

Bomb-fishermen discuss their fishing-technique as a quick way to make money. Not only is it very easy to make a bomb, there are also rarely checks by the authorities at the remote reefs. Since local reef-users do not use the remote reefs, problems are non-existent with the neighbors. Lack of other options to make money and an urgent need for money are the main reasons to get involved in bomb-fishing. Again history is important, because bombs have been used for a long time already. First it was a widespread accepted fishing-technique, so local reefs were also used for bomb-fishing without problems. Children learned how to make bombs at a very young age and they joined their parents or other family members to learn the technique. This is very similar for how children learn to practice menyulu.

Within the group of fishermen is another difference, this is that bomb-fishermen use remote reefs whereas bubu- and menyulu-fishermen use local reefs. The fishermen do not see a connection between the remote and local reefs, just as they do not see a connection between the living and

dead reefs. Not one of the fishermen mentioned coral mining as a reef-practice causing negative effects for their own reef-practice, which means that the mined reefs and the living reefs are not connected for them. The last part is also underlined by coral miners, because they discuss the reefs they use as dead without functions for or connections with the living reefs. In other words the reefs they use are disconnected. Location is thus key in the discourse used by both fishermen and coral miners: if they do not use the same location, then they cannot cause problems for each other.

4.2.2 Reefs as dead or alive

The coral miners are very clear that the reefs they use are dead and covered with sand. This is an important prerequisite for them, otherwise the corals are not hard enough to be used as building material. In fact they do not even discuss the corals they remove from the sea as corals or '*terumbu karang*', instead they call it coral stones or '*karang batu*'. The fact that a different word is used for the mined coral underlines the difference they make between the dead and living coral. Mahasa mentioned that corals are never brought to the shore, instead only the stones are taken otherwise the fish will disappear. In other words living reefs are seen as the place where fish live and depend on, whereas the dead reefs they use are not connected to the living reefs and thus also not to other actors such as fish, fishermen, seaweed farmers or seabirds. Aba's words underline their discourse in terms of areas used: "*we do not have any problems with fishermen, because they use different areas than us*". The absence of these other actors at the mining sites is for the miners a confirmation that their reef-practice does not have negative effects for the other actors. They thus define the reefs they use as dead, used by miners exclusively, as a completely separate space that does not relate to the living reefs, her species or the living reef-users, and finally coral mining is not framed as a reef-destructive practice. To support their discourse, fishermen and spawning fish are represented by the miners as actors not facing negative consequences from their activities.

The conservation organizations and the government use very different words when they discuss the mined coral reefs. According to them the reefs used by coral miners are indeed dead, but they still fulfill important ecological functions for the living reefs. Examples of these functions are: dead reefs are spawning areas for fish, and they can recover if a certain algae returns to the area. Because spawning areas are removed, less fish will be present in the future which causes negative effects for fishermen. Other reasons used to frame coral mining as a reef-destructive practice are: mining causes the seawater level to rise, which causes negative effects for seabirds and seaweed (thus also for seaweed farmers). In other words the mined reefs are not as dead as they appear, instead many connections are present between the living and the dead reefs. To support their discourse of coral mining being a destructive reef-practice, conservation organizations represent fishermen, fish, seaweed, seaweed farmers, and seabirds as facing serious negative consequences of coral mining. These organizations thus represent many silent actors that could act otherwise.

Interestingly enough none of the interviewed fishermen had problems with coral miners because they destroy spawning areas for fish which leads to less fish for the fishermen. The main reason for their position is that they use different reefs from the coral miners, and because of that they do not face negative consequences from the miners' activities. So the fishermen are on the same page as the miners in the way they discuss the reefs they use in relation to the reefs used by coral miners. The same separation in space and the same separation for living and dead reefs is used by the fishermen and the coral miners.

4.2.3 Reefs as an (un)protected attraction

Tourists and their facilitators want the reefs to be in good condition. Tourists are attracted to Wakatobi to see and enjoy the reefs. They are attracted to the park by governments' park-promotion initiatives such as websites, brochures, booklets, leaflets, events, cds and dvds. Other promotion activities are commercials on national tv and inviting celebrities to visit Wakatobi to spread the name of the park and its beautiful reefs. Many nice reef-pictures are used to attract tourists. These efforts of the government work very well, and the tourists that arrive have high expectations of the reefs since they are sold as the best reefs Indonesia has to offer. Also the label National Park is key in selling the park, because this term represents for tourists an area which is well-protected and conserved. The expectations of the tourists are thus very high before they enter the park.

After arrival tourists want to see a lot of different coral species, (large and many) fish, turtles and sharks. If they see this, they really enjoy their experience. Especially because tourists visiting coral reefs have often done this before so they have other reefs to which they can compare their Wakatobi reef-experience. There is a divide in how happy the tourists are with the reefs they visited. On Hoga island the tourists were very disappointed with the coral reefs, whereas tourists staying at Patuno saw very different reefs which they described as '*pristine*'. As can be seen in the previous chapter, many tourists were very disappointed with the current reef-condition of the reefs surrounding Hoga and the accompanying species living there. Some tourists even mentioned that they would not have come if they knew the reefs were in this bad condition.

The absence of signs at the entrance of Wakatobi that it is a National Park, the presence of bomb-fishing, bubu-traps and people throwing garbage in the sea without punishment and the absence of an entrance fee and reef-patrols were all opposite to the tourists' expectations of a National Park and how it should be protected. Because bomb-fishing, bubu-trapping and waste being thrown in the sea classify for tourists as destructive reef-practices, they were not happy to encounter these practices. Both Hoga tourists and Patuno tourists agreed about the lack of protection for the reefs of the National Park. The label National Park is central here, because National Park represents a well-protected coral reef for them. This was not the case in practice, therefore the tourists were very disappointed with the Wakatobi reefs compared to other unprotected reefs they visited before coming to Wakatobi. The vulnerability of the reefs and the long time before a reef can recover is for them a reason to be concerned about the reefs. Thus the discourse used by tourists for the reefs is narrowly intertwined with their ideas about lack of protection, weak authorities, a lack of reef-species and a bad reef-condition. Indeed they see the Wakatobi reefs as an unprotected and deteriorating attraction. It must be said that for Hoga tourists the attraction part of the reefs was a lot less existent as for the Patuno tourists, but both were attracted to the reefs because these are marketed as a unique tourist attraction.

Mohini is very happy about Wakatobi being marketed as a tourist destination for divers and snorkelers. For her the reefs have to be protected, because tourists are mainly attracted to Wakatobi because of the reefs. If the reefs do not live up to their expectations they might lose people visiting the park, next to the fact that the reefs deteriorate as a consequence of destructive reef-practices such as bomb-fishing and bubu-trapping. In the first place the reefs are a tourist attraction and tourists want to go diving and or snorkeling to see the best of Wakatobi's reefs. This cannot be combined with bomb-fishing, because it is too dangerous for the divers or snorkelers to cope with concussions while they are underwater. Combined with a lack of protection by the authorities the reefs are indeed an unprotected and deteriorating attraction. Reef-protection is thus below a sufficient level, and something should be done to increase the level of protection for Wakatobi.

For Jufri and Sudirman the reefs are currently well-protected and in good condition. They did not receive complaints of tourists about waste, bubus or bomb-fishing. Since there is an absence of complaints for them, they do not act to safeguard improved reef-protection because the reefs are according to them already well-protected and enjoyed by tourists. The reefs thus represent a well-protected tourist-attraction for them, opposite to the unprotected attraction discussed by tourists and Mohini.

4.3 Main practices

In this paragraph the main reef-practices of the actors using the reefs are discussed. First the three different fishing-techniques are discussed, followed by coral mining, recreation and finally conservation.

4.3.1 Fishing

Three different fishing-practices are distinguished. These are bubu, menyulu and bomb-fishing. Each practice is shortly described, and some extra attention is given to the objects used by the fishermen and the relationships on which they depend to sustain their fishing-technique. So both the human and non-human actors play an important role in the fishing-practices they perform.

Bubu

This reef-practice is done by land people only. There are several nonhuman actors important for this fishing-technique. The most important nonhuman actors are the bubu-trap, goggles, living pieces of coral, rope, target fish, sea snakes, tides and the coral reef itself. Important relationships are with the trap-makers- and –sellers, because they enable the bubu-fishermen to practice bubu-trapping.

The bubu is made out of bamboo, and different bubus are present and used on or near the coral reefs depending on the target fish. The selected trap for this thesis is the small bubu which has a tapered entrance and it is used without bait. Different fish can be targeted with the trap, the fish targeted during the observations were kalibomba, baronang and napoleon. The reefs used are at a walking distance from the fisherman's house and at a walking distance from the shore. The reefs are assigned for local use, and bubu-trapping is assigned as a local reef-practice. The traps are placed near the shore, and in case of kalibomba the trap is placed on top of the reef. To get the trap there the fishermen walk over the reefs at low tide in the morning. Low tide is chosen, because then the water is low and the trap is easier to place. When the reef is reached the goggles are used to check places where many target fish are present, those are the places selected for the trap.

The trap is placed with its entrance facing the shore, because the target-fish follow the tides. Meaning that the fish will swim towards the shore at high tide, and back to the sea with low tide. Since the trap is checked at low tide, the fish will still be present inside the trap because they are not swimming towards the shore yet when high tide starts again. Before the trap is left at its place it is covered with living coral pieces. These pieces are searched by the fishermen near the spot where the trap is placed. The living coral pieces are placed on top of and around the trap to serve as camouflage material. The fishermen agree that living coral pieces are needed, because otherwise the trap stands out too much from its environment and the fish refuse to enter. If a lot of large fish are caught, then the trap is kept in the same place, if only a few entered the trap it is relocated. Relocating is done using the same technique to find a bubu spot (using goggles to find spots with many target fish).

For the target kalibomba the trap is covered completely with coral pieces, for baronang and napoleon the trap is only covered at the sides to avoid sea snakes entering the trap. The position of

the trap is also different if baronang and napoleon are targeted. The trap is then placed on the sand before the reef starts. This is because the baronang and napoleon swim further away from the reefs when the tide changes. They are looking for food near the shore and the traps covered with coral are good resting places when the tide changes from high to low again. This trap is not moved quickly, because baronang and napoleon are very sedentary fish.

For both ways of using the traps, the time to place them is around one hour to an hour and a half, and after the trap is placed it is left there for 24 hours. The next day at the same time the trap is checked with goggles to see if something is caught. If something is caught the fish are brought to land and divided by the men/women who helped setting the traps. Often the fishermen work in groups because it can be dangerous to walk on the reefs. Since bubu-trapping is not very time-consuming, the fishermen who use this technique have time for other jobs besides using bubus.

The traps are maintained by drying them in the sun after a few days of use, because then the trap gets covered with algae which discourage fish to enter. After drying the bubu is also repaired if necessary. Rope is used to close up holes by tying it onto the bamboo. Holes are created by sea snakes or large fish that entered the trap after subsequently biting themselves a way out of the trap through the bamboo. One trap lasts on average for around seven months, after that a new trap is bought at the market or at the bubu-makers' home. The bubu-fishermen often go to different trap-makers, and not to the same trap-maker every time.

Menyulu

Menyulu is a spearfishing technique used to catch fish and other targets for dinner, preferably with friends. This technique is practiced by Bajonese only, by both men and women. This technique is very old, and several nonhuman actors are used or taken into account for this technique. The nonhuman actors distinguished here are the weather, the lunar-cycle, the boat, the oil lamp, the five-pointed spears, and the coral reefs used.

Before the decision is made to leave for menyulu a 'weather assessment' is done. First hard wind and rain are taken into account. If one or both weather conditions are present menyulu is not practiced, because it influences visibility in the water. With high waves or lots of rain it is very difficult or even impossible to see the sea-bottom clearly, let alone being able to spear a target. That is also the main reason why menyulu is often practiced during the dry season and not or less during the rainy season. If the weather is good enough, then the lunar-cycle is evaluated. The lunar-cycle determines the target for the evening and thus also the fishing-grounds used. In case of full moon the targets are squid and crab. Squid comes to the surface during full moon, and crabs are more active when it is full moon so both are more easily seen then. Another reason to go for these targets is that fish can see the spear reflecting in the moonlight which gives them a higher chance to escape compared to new moon when there is practically no light from the moon. So fish are the preferred target when it is new moon. Even though they have preferred targets depending on the lunar-cycle, everything is caught that swims or walks by underwater.

The boat is needed, because even though the reefs used are near the village it takes a while to reach the fishing-grounds. The boat is prepared before the fishermen leave for menyulu. This preparation entails: position a burning oil lamp at the front of the boat, just in front of the fisherman. Since menyulu is only done after sunset, a lamp is needed to be able to see the targets underwater. The second preparation is bringing two five-pointed spears (points placed similar to a the number five on a dice) on board. Always two spears are brought to make sure a reserve spear is present if one spear breaks during the fishing trip. Thirdly a bucket is placed on board just behind the

fisherman that serves as a place where the catch is released from the spear. Then the people joining are getting on board just before leaving. Young families bring their children so they can start to practice menyulu.

The reefs used are assigned for local use, and menyulu is assigned as a local reef-use. The reefs used are thus near the village and they can be reached without a motorboat. The fisherman thus uses the spear to move the boat through the water while searching for targets. If a target is found it is speared quickly and placed in the bucket on board. If the weather remains good, menyulu can be practiced all night until sunrise. After the catch the fish is eaten immediately with friends (in case of a bad catch) or it is prepared for the market the next morning (in case of a good catch). Because menyulu is not always a fulltime practice, menyulu-fishermen have time for other jobs during the day.

A lot of equipment is needed to practice menyulu and the spear is one of the key objects for this practice. The stick attached is made out of bamboo and the spear-point is made out of iron. Bajonese are from origin no blacksmiths, so they always buy the spear-point from land people. One spear-point can last for a couple of years, the bamboo is more fragile and it breaks after 1-2 years. Often the menyulu-fishermen repair their own spear by attaching a new piece of bamboo to it. Because of the long time one spear-point can last, there are no tight relations with the buyer and seller of spear-points. The other materials used are made by Bajonese themselves, often by family members or friends.

Bomb-fishing

Bomb-fishing is a fishing-technique used by Bajonese and by fishermen from outside. Several nonhuman actors are needed for this technique to be successful, and relationships are very important to sustain the technique. The most important objects needed are: bomb-materials, a motorboat and remote reefs. Good relationships are needed with government officials to be able to import or transport bomb-materials and relationships with suppliers of these materials are necessary to order them.

Bomb-materials are obtained from Kendari or from Malaysia and Singapore. In case of Kendari someone is sent to Kendari to contact the person selling manure, wicks and matches. These materials are then placed in half a liter beer bottles so not a lot of attention would be given to them. Only three or maximally four bottles were ordered at a time, and every time another person was asked to bring the bottles to Wakatobi. One bottle is enough to create one bomb. In case of Malaysia or Singapore the materials arrive by ship. To avoid detection at the border good relationships are needed. Good relationships are built by offering bribes, both to the Malaysian / Singaporean and Indonesian authorities. If enough money is given, then the boat can continue without being checked, if not enough money is given the boat is confiscated and the people on board are arrested. The relationships with the authorities or with the traffickers from Kendari thus have to be good for the bomb-materials to arrive in Wakatobi. Once they have arrived, the bomb-fisherman picks them up and brings them home. There he creates the bombs before he goes out at sea to use them.

The reefs used by bomb-fishermen are currently both near the villages and at the remote reefs. During the 1990s the bombs were often used near the villages, since bomb-fishing was not seen as a reef-harming or illegal fishing-practice. In other words it was widely accepted and everybody knew who was using bombs. When bomb-fishing was forbidden by law in 1996 the focus went to remote reefs where checks are seldom present of the authorities. Both interviewed bomb-fishermen were never checked by the authorities during their bomb-fishing practices. One strategy to

escape checks was to throw all the bombs overboard and dive them up after the check was done. A new strategy is using connections that are present near the islands who can see whether or not a large patrol is on her way to the remote reefs. These contacts call the bomb-fishermen so they can leave before the patrol arrives at the remote reefs.

The practice itself is not very difficult. The bombs are brought in the boat, mostly three or four, and a place near the reefs is chosen where schools of target-fish are present. The wicks are lit by matches and the bombs are thrown at the center of these schools to assure a great impact. Quickly after the first bomb the second, third and sometimes fourth are exploded at the same spot. The fish and other species die from the blasts and they start floating on the water. The fisherman collects the highest-value fish and he goes home again. Back home a middleman is contacted to sell the fish to, or the fisherman sells the fish himself at the market. Usually a part of the fish caught is used domestically.

4.3.2 Coral mining

Coral miners are Bajonese, and different kinds of equipment are used to remove dead coral from the sea. The following equipment is always brought: a lingis, boat and goggles. Besides materials, the relationships they have with authorities and blacksmiths are important to sustain this practice.

Coral mining always starts very early, at around 5:00 o'clock in the morning. This because of the low tide and because the sun is not very hot yet. Low tide is preferred because the dead corals are more easily accessible because the water is shallower than with high tide. Coral mining always occurs near the shore. Contrary to bubu-trapping and menyulu, coral mining is a fulltime job and it takes one miner around 5-6 hours to fill one boat with coral. The only preparations needed before leaving are bringing the lingis and a boat with a motor. For miners a motorboat is needed, because otherwise the completely loaded boat is too heavy to move with a bamboo stick.

The area used by miners consists of large dead reefs that are covered with sand. Fish, fishermen, tourists and authorities were all absent at the site the miners used. Their main activity is to stand in the water next to their boat while they hit the sand covered coral with their lingis to loosen it from the ground. Once the coral is loosened it is checked by going underwater with the goggles to see how big the piece is and what needs to be done to loosen it further. The lingis is thus used as a lever to get the coral stones out of the water. Once it is completely loose they pick it up and place it in the boat. If the corals are too difficult to obtain, other spots are searched with the lingis to find more accessible corals.

Coral miners often work in groups, so they can help each other. Only a full boat can be sold, so if one group member does not have a full boat yet the other members give some of their corals to him or her. When they return to the village together they go straight to the coral buyer. Since the government is their largest buyer, this is often a government project leader who is responsible for building canals, bridges, harbors or government buildings. Other buyers are family-members, friends, or land people who need coral to build their house.

To be able to continue their practice, coral miners need a lingis which they call their '*eyes underwater*'. The lingis is obtained at the market where it can be ordered from Binongko, or it is ordered straight from a blacksmith living near the market. The lingis is hand- and custom-made and it is ready within a day. The lingis is widely available for sale, and no restrictions, rules or regulations are in place by the authorities. Making or selling a lingis is thus not treated as a crime and there are no legal consequences for both the seller/maker and buyer of the lingis.

As a reaction on government restrictions for miners, the miners refuse to comply to the zones suggested by the government. Since the reefs near Waha and Liya have better accessible stones because the water is shallower there with low tide, they continue mining there (which is appointed as a no-take zone). Other practices are convincing authorities that they in fact work for the government, and that government cannot finish their buildings and other infrastructural projects such as canals, bridges and harbors without the miners. In short, the relationship between the government and coral miners is thus not very good, because the government is accepting laws and policies to limit and finally stop mining in the future while they are still the largest buyer.

4.3.3 Recreation

The main practices of tourists are diving and snorkeling to see and enjoy the reefs and its species. The objects they need are thus diving and snorkeling equipment, and they need relations with people providing this equipment and knowledge about the reefs. Besides needing equipment, tourists have strong feelings about the reefs and how they are protected. Therefore the practices they perform to protect the reefs themselves are also taken into account.

The equipment needed for diving and snorkeling can be rented at Hoga island from Jufri and at Patuno resort from Mohini. Sudirman provides snorkeling equipment in Waha, and he can also facilitate divers by contacting a local dive center to bring equipment and a dive master. The difference between tourists staying at Hoga and Waha and at Patuno is that the Patuno tourists often bring their own equipment, whereas the Hoga and Waha tourists often rent the equipment on site. When tourists want to dive they need a dive master to join them who knows the reefs and the currents. All places can provide a dive master next to the equipment.

As was mentioned before the tourists are not very happy about the reef-condition and how the reefs are protected. The first thing they do to express their concerns is to complain about it to Mohini and/or the dive master. This practice only occurred at Patuno, because the Waha and Hoga tourists did not complain to the local tourism facilitators Jufri or Sudirman. Other tourists contact TNC-WWF themselves to get their complaints about the reefs and reef-use heard. Sometimes tourists also act directly upon what they consider a destructive reef-practice. For example relocating or sabotaging bubus. In case of bomb-fishing two different practices were performed depending on how far the bombs are away. If the bombs are near, the dive is aborted immediately after which the dive master informs Mohini. If the bombs are far away the dive is continued and after finishing the dive Mohini is informed. Mohini does emphasize that tourists should leave the bubus alone, and they are also discouraged to confront the bomb-fishermen for their own safety. Since bombs were not encountered by Hoga or Waha tourists, practices to deal with it are absent.

Once bomb-fishing is reported, Mohini contacts TNC-WWF immediately to inform them about the location and time of the bombs being heard. Head of Regency Bupati is also informed since he is the owner of Patuno. The other conservation organizations are not informed by Mohini, she only reports to TNC-WWF and the owner of the resort. By continuously reporting illegal reef-practices to TNC-WWF, and by also discussing the complaints of tourists about bubu-trapping, pressure is put on TNC-WWF to improve reef-protection, and to also take action against reef-practices that are currently seen as legal. By always informing Bupati about illegal practices near the reefs that are encountered by his guests, he starts to put political pressure on the organizations responsible for protecting Wakatobi such as TN.

4.3.4 Conservation

Governments' main practice is to develop policies, laws and regulations to protect the reefs and they partially implement these policies. Not only are their policies about reducing and finally eliminating destructive reef-practices, it is also about following the same lines as and keeping good relations with international organizations who are behind the government creating the vision for Wakatobi. If government does not comply to the requirements made by these international organizations, they do not receive funding for projects anymore. These projects entail improvement of livelihoods with attention to protecting the current reef-condition. In other words the government is under pressure of these organizations to act in favour of reef-protection.

Also the other conservation organizations are pressuring the government to protect the reefs. For example the government is still buying large amounts of coral from the miners. This practice does not complement the vision of conservation organizations to protect the reefs. Therefore conservation organizations continuously pressure the government to switch from corals towards mountain rocks, even though mountain rocks have to be imported and are more expensive than corals. Only if the government changes this practice, the conservation organizations can change their 'soft implementation of the law' with coral miners. Now this cannot be done because the government is undermining the conservation organizations by buying the corals.

The current practices used for coral mining are different per conservation organization, because clear rules about how to implement the mining law are absent. In other words, everybody is doing their own thing when they encounter coral mining on patrols. Examples are Sara who confiscates all the miner's equipment and boat, or TN that works with a three point warning system, or TNC-WWF that works with warnings and education only. Sometimes only a warning is given by the other authorities (navy and marine police) because they sympathize with the miners position. Other actors outside the conservation organizations are also involved, because locals try to profit from Sara's strict mining rules. They ask for money in exchange for not contacting Sara about their illegal mining-practice. The government uses zones where the miners are allowed as long as they still buy corals. These zones are appointed by the government and the miners did not have a say in this new development for them. In fact the miners are strategically used by the government to deepen the shallow boat-tracks in front of the harbour. Since no education is practiced by the government, none of the miners knew about the zones.

In contrast to coral mining, the rules and regulations for bomb-fishing are clear and straightforward and used by the majority of the conservation organizations. When bomb-fishing is encountered during a patrol the marine police checks the bomb-fisherman's boat for evidence of bombs. The fisherman is then taken into custody if enough evidence is gathered and he is prosecuted and very likely to go to prison. If other authorities encounter bomb-fishing, the marine police is usually informed to deal with it. Only FORKANI has a different approach and that is educating bomb-fishermen without informing the authorities. They approach the bomb-fisherman and explain why bomb-fishing is not a good reef-practice, and they try to convince him/her that joining FORKANI is a better alternative. If a bomb-fisherman is caught by a conservation organization, there is always an explanation why bomb-fishing is a bad reef-practice.

Government's policies are based on scientific research and monitoring results delivered by TNC-WWF, TN, COREMAP and Operation Wallacea. Government is thus also influenced by conservation organizations because of the knowledge they have about the reefs. This gives the conservation organizations arguments and discourse extra convincing power, because they are treated as the experts on the reefs. Especially TNC-WWF is in that position, because when Wakatobi

was declared as a National Park they started initiatives to protect the park by educating the people about the new laws and what it means for them (mainly an explanation of the zones).

Not only is TNC-WWF active in educating the people, currently together with TN and sometimes in cooperation with COREMAP, they are also educating other conservation organizations about how they should deal with different zone-violations and with illegal reef-practices. They can thus spread their ideas easily amongst TN with whom they have an MOU, but also amongst the navy and the marine police because they organize joint patrols or 'patroli gabungan', to make sure that everybody is on the same page when they deal with different reef-violations.

The joint patrols are thus an initiative of TNC-WWF to educate other conservation organizations, but since 2011 the transition phase started which means that TN is taking over responsibilities to organize these patrols. Even though their responsibilities increased, they did not receive more funding from TN Jakarta and therefore often these patrols were not actually done. In 2011 a joint patrol only occurred once. This means that the remote reefs are only rarely patrolled, because these are only patrolled jointly. TNC-WWF is reducing its interference with the joint patrols, because they also received a cut in budget since TN took over the responsibilities for organizing patrols. Because of TNC-WWF's efforts to organize patrols in the past, many people still report reef-violations to TNC-WWF instead of to TN.

Besides the joint patrols, there are also incidental patrols. These patrols occur after illegal fishing-practices are reported by locals or tourism facilitators. Theoretically the boat of TN should always be ready to check the reports at the moment they are filed. In practice this does not happen, because TN has some financial issues which are described in the previous chapter. So because of a lack of finances and people, many reports are not checked at all or too late. This reduces the amount of bomb-fishermen being caught, since it gives them plenty of time to leave the area before authorities arrive (if they arrive).

As was mentioned before, also other conservation organizations such as Sara and FORKANI are educated by TNC-WWF in how they should officially deal with different reef-violations. Not only does TNC-WWF educate the local organizations, they also support them in terms of resources such as fuel for their boats. This to facilitate them to continue their reef-protecting practices. Government is not involved with the local organizations when it concerns reef-protection, even though they do appreciate the efforts of local organizations to protect the reefs. This again shows that TNC-WWF is the spider in the web that connects to every organization involved in reef-protection.

4.4 Coalition and conflicts: consequences of multiplicity

Many coalitions and conflicts exist between the different reef-users and also between the conservation organizations, and tourism facilitators. The conflicts and coalitions are mainly based on the use of certain materials and on their absence or presence in reef-areas. This paragraph shows the complexity and multiplicity of different realities of coral reefs and how they are able to co-exist. A distinction is made between the discursive, practical and material side of conflicts and coalitions, and both the human and nonhuman actors are discussed. First I will start with the coalitions, followed by the conflicts.

4.4.1 Coalitions

Several coalitions are present, discursively, practically and materially. First the menyulu-fishermen, the conservation organizations and the government agree that menyulu is not a harmful reef-practice, and therefore it is assigned as a reef-practice allowed in reef-zones appointed for local use.

In other words, both Bajonese people and the equipment they use for menyulu are accepted by the authorities. A similar coalition is present between the bubu-fishermen, the conservation organizations and the government. Bubu-trapping is also assigned as a non-destructive reef-practice and therefore allowed on reefs appointed for local use. The fishermen have a coalition with the government and the conservation organizations, which is based on their aligned definition of good local reef-practices, the objects used for these practices and the location where these practices are allowed. The objects used for these reef-practices are thus actively part of this coalition (they are enacted as harmless), which means that this coalition is possible because of discursive, practical and material relationships and interactions between human and nonhuman actors.

Another coalition is present between the government and bomb-fishermen. Bomb-fishermen are only able to make and use bombs if they can get manure, wicks and matches into Wakatobi. Since the amount of border checks have increased since Wakatobi became a regency, a good relationship is needed between the government officials and the bomb-fishermen for a successful import of bomb-materials. This relationship is mainly financial in the form of bribes sold to government officials to persuade them that not checking the bomb-fisherman's boat is in their best interest. In case of bribing, the fishermen and government officials thus have colliding interests and they support each other. The officials are financially supported, whereas the bomb-fishermen are practically supported by not being checked. This coalition is present because illegal objects (bomb-materials) are needed by bomb-fishermen to make bombs. These objects thus play a central role in this coalition, and it shows how the bomb-materials are constantly (re)negotiated by government officials and bomb-fishermen in terms of what needs to be paid by the fisherman to import his materials. The bomb-materials here are thus not enacted as harmful for the reefs, instead they are enacted as objects crossing the border based upon a financial agreement. The coalition between government officials and bomb-fishermen is enabled because government officials decided to accept bribes and turn a blind eye to the law and law-enforcement. Of course this coalition is constrained at the same time by government officials and conservation organizations who do enforce the law. In the next paragraph this conflictive relationship is further elaborated upon.

Within the group of conservation organizations the relationship between TNC and WWF has been very tight from the moment the Joint Program started. TNC focused on gathering scientific data and patrolling the reefs whereas WWF presents this data to local people, other conservation organizations and government in the form of advice and education. For local people this advice entails discussing good and bad reef-practices, for other conservation organizations it entails explaining why the reefs need protection and how this protection should be done, and government is advised about policy measures and implementation plans for reef-protecting policies. The cooperation between TNC and WWF is so tight, that they use the same words for the reefs and reef-protection and their practices are intertwined by organizing meetings, workshops and education together. Their resources such as monitoring and patrolling-equipment (boats, diving equipment, etcetera), and education material are all shared and used together to protect the reefs. Internally a continuous alignment of their position toward reef-users, government and conservation organizations is taking place when yearly work plans are created. Their name has become one in the form of TNC-WWF, and they share an office to strengthen their cooperation.

TN is responsible for protecting the park. Quickly after the cooperation between TNC and WWF, TN was also invited to join the coalition. The main goal of TNC-WWF then became to support TN with park protection by explaining new policies to local people, and by educating them about new policies and good reef-practices. Besides that TNC-WWF is active in educating TN about how to

organize patrols and how to deal with different reef-violations. During these activities TNC-WWF and TN share many resources such as boats and diving-equipment besides knowledge about the reefs. These objects form the material connection between both organizations. Also information obtained about the reefs is quickly shared between TNC-WWF and TN. Both are involved in monitoring, and they always publish their data together. So practically (perform monitoring and patrols together) and materially (published reports, share boats etc.) there is a tight connection between TNC-WWF and TN. Also discursively their connection is present, in that they both agree that more cooperation should occur between the different conservation organizations in Wakatobi (alignment). And also that the current protection of the reefs is insufficient. In other words, TNC-WWF and TN are narrowly intertwined with each other and they form a strong coalition, discursively, materially and practically.

Another partner in this coalition is Operation Wallacea. TNC-WWF is involved in supervising students doing their research in Wakatobi. By doing so, the information obtained by these students is easily accessible for TNC-WWF and her partners. Operation Wallacea started to inform the government about current reef-status and condition by letting students do scientific research in Wakatobi. This is very similar to the goal of TNC-WWF, namely to increase the knowledge of government in terms of scientific knowledge so they can create better policies and implementation plans for the Wakatobi coral reefs. In terms of materials, the students present their research results to TNC-WWF in hardcopy, and TNC-WWF provides literature for the students. Within Operation Wallacea, many connections are present between the students and the facilitators of the Operation. Their relationship is also very tight, especially seen from a material perspective. The Operation provides diving-equipment, transport, a place to stay, food and laboratory equipment to facilitate the student during his/her research period, where the student pays for these services. Practically they are supported by dive-masters, English speaking contact persons and help with immigration procedures. Discursively they are connected, because both the students and the Operation want the research to be a success. Again a tight coalition is present in a discursive, material and practical way. Between TNC, WWF, TN and Operation Wallacea a very strong coalition is present, because they support each other in discourse, practices and materials with as common goal to align local people, conservation organizations and government to improve park protection based on scientific results.

The relationship between TNC-WWF and COREMAP is a lot thinner. This because COREMAP is mostly working alone to protect the reefs. In discursive terms, TN, TNC-WWF, COREMAP and the government share each other's discourse in that the reefs need to be protected based on scientific results. As a consequence of this they also agree about which reef-practices and objects used for these practices are good or bad, and if allowed at which location. Practically their cooperation is still quite shallow when it concerns sharing of information and working together on similar issues (which is rare). Another difference is the way of working on monitoring and patrolling. COREMAP is depending on local people whom they educate, while TNC-WWF and TN are doing the monitoring and patrolling themselves. So even though they do cooperate in some cases (mostly educational projects), this cooperation is shallower in other fields (information sharing, patrolling and monitoring). This coalition is thus about science-based reef-protection, but without clear practical agreements about who is doing what, where and when using which objects, materials or information.

Sara and FORKANI form a tight coalition with TNC-WWF. They share the same goals for the reefs in terms of protection, but they are different in their practices to protect the reefs. Sara is very strict when it concerns coral mining by confiscating the miners' boat and equipment, whereas TNC-WWF is giving a warning and education only when they encounter miners in no-take zones. FORKANI

is especially dealing with bomb-fishermen, and they are mainly involved in educating these fishermen about the negative consequences of bomb-fishing. TNC-WWF is active along the same lines, only they do report and arrest bomb-fishermen when they encounter them. Both local organizations and TNC-WWF share the vision of reefs needing protection, and both organizations get practical support from TNC-WWF in the form of education (how to deal with different violations) and material support in the form of resources such as fuel for their boats to enable their patrols. Again discursively, practically and materially this coalition works, even though some differences are present between the practices of these organizations.

The navy and marine police are also connected to TNC-WWF, because they receive education about how to deal with different reef-violations from TNC-WWF. They also cooperate in joint patrols, which are at the same time an educational opportunity for TNC-WWF to spread their discourse and their practices amongst other conservation organizations. So practically TNC-WWF, the navy and marine police are connected and materially this connection is present by sharing a boat and other resources during joint patrols. The law is connecting these actors as well in prescribing which reef-practices, objects and zones can be used by whom.

The international organizations only have tight connections with the government. They are practically and materially connected in that government receives funding from the international organizations to improve peoples' livelihoods while incorporating the coral reefs to improve current reef-status. Government is thus less powerful than the international organizations, and the ideas of the international organizations are quickly taken up by the government to maintain a fruitful financial relationship with them. So both practically, discursively and materially (financially) the government and the international organizations form a coalition.

Tourists are also part of a coalition, namely with TNC-WWF, outsider tourism facilitator Mohini and Bupati. Discursively tourists argue for an improved protection of the reefs, since many (illegal) reef-practices still occur which makes the reefs less attractive to visit for tourists. The tourist's position is stronger than the position of TNC-WWF, because tourists also argue for the curtailment of bubu-trapping whereas TNC-WWF has placed this fishing-technique on the local reef-use list. Besides these disagreements, all groups agree that the reefs are insufficiently protected and that something should be done to improve protection. Mohini has tight connections with TNC-WWF, because she reports to them about illegal reef-practices and they also discuss bubu-trapping as a bad reef-practice. Some tourists also go straight to TNC-WWF instead of getting their reef-complaints heard by tourism facilitators. Mainly on a discursive level there is a coalition between TNC-WWF, Mohini and tourists. On the practical level Mohini represents tourists in their complaints about the reefs to Bupati and TNC-WWF. Also Bupati plays a powerful role, for he owns Patuno resort and often he is the connection between Mohini and TN. Because he has a politically powerful position, his complaints are taken very seriously by the conservation organizations. In this coalition discussions about what are good reef-practices are central and constantly (re)negotiated. The objects used for reef-practices (like bubus and bombs) are central in these discussions as well as how tourists experience these objects and practices when they use the reefs.

4.4.2 Conflicts

A lot of conflicts are present, both within and between the different realities distinguished in the previous chapter in a discursive, practical and material manner. The first conflict discussed is between tourists, tourism facilitators and bubu-fishermen. Discursively they have conflicting ways of discussing the reefs and the reef-practice bubu-trapping. The bubu-fishermen see their way of fishing

as not harmful for the reefs. Bubu-trapping is discussed as a practice used to catch fish for dinner, where the bubu and living coral pieces are their main equipment. The tourists on the other hand see the bubus placed on the reefs as harmful because coral parts break if traps are placed on the reefs, and the living coral pieces are damaged when they are picked up to cover the trap. Practically they also conflict with each other, because tourists occasionally sabotage or relocate the traps. Of course this is not good for the bubu-fishermen who have to repair their trap or buy a new one and who do not catch fish because of broken or relocated traps. Interestingly enough the fishermen are not aware of the problems tourists have with the traps, and also not that tourists are sabotaging or breaking the traps. So even though they have conflicting discourses and practices, this conflict has not surfaced for the fishermen yet. The bubu and how it is used on the reefs is thus what this conflict is about. This conflict can co-exist with the acceptance of bubu-trapping by the government and conservation organizations because in the end it is the government who decides what is and is not a harmful reef-practice, and how it should be dealt with. As long as they define the bubu and its use on the reefs as a good local reef-practice, no official legal or practical measures can be taken against bubus and bubu-trapping. The tourism facilitator is the main representative of tourists, and she pressures the conservation organizations to act against bubu-trapping, to align them with their definition of the bubu and its use. This is a clear example of a process of translation between the tourism and conservation realities which are incompatible and conflicting in this case.

Another conflict the tourists, Mohini and Bupati face is with bomb-fishermen. Discursively the conflict is about what is a good or bad reef-practice. According to tourists, conservation organizations and government the reefs get damaged from bomb-fishing and they want to eliminate it completely from the park, whereas the bomb-fishermen discuss their reef-practice in terms of quick cash and good relationships with government officials. Practically this conflict is about space. Bomb-fishing and scuba-diving or snorkeling cannot be done at the same location at the same time. It is too dangerous for the divers to deal with the concussions underwater caused by bombs, and if the bombs are too close the dive has to be aborted. Bomb-fishermen are not aware that they are disturbing tourists when they use bombs. Especially because bomb-fishermen often use the remote reefs, which are not used by tourists. But in practice there is no such strict division in space anymore as was mentioned earlier. Again Mohini represents tourists, because she reports the bombs heard by tourists to the conservation organizations, to pressure them to act quicker against bomb-fishing and to get the bomb-fishermen caught by the authorities. Also Bupati is informed who puts political pressure on the conservation organizations to actively deal with bomb-fishermen. The conservation organizations on their turn organize patrols, both joint patrols for the remote reefs as well as incidental patrols based on reports from locals or tourism facilitators about bomb-fishing to catch the violators. Importing, making and using bombs for fishing is illegal by law, and enforcing procedures are in place for conservation organizations and government if bombs are encountered. In short this conflict is present because bombs and using bombs for fishing is differently defined, practically and materially incompatible with diving, practically dealt with through patrols, and illegal by law. The bombs and their use are central in this conflict, and they actively shape relationships between bomb-fishermen, tourists, Mohini, Bupati, government and conservation organizations. This illustrates the process of translation between the conservation organizations and bomb-fishermen. This conflict can co-exist with the coalition of government officials and bomb-fishermen, because some government officials accept bribes and act not conform the conservation network of which they are officially part.

Bomb-fishing is not only conflicting with tourism, it is also conflicting with menyulu. If bombs are used in menyulu fishing-grounds, menyulu-fishermen face negative effects from it because fish-

habitat is damaged and decreased as a consequence of bomb-use. Menyulu-fishermen need living reefs, because fish do not live near the dead reefs. So both discursively as well as practically menyulu-fishermen have a conflict with bomb-fishermen, if bomb-fishermen use menyulu fishing-grounds. Discursively because menyulu-fishermen see bomb-fishing as a damaging reef-practice, and practically because less living space for fish is present after bomb-use, and thus also less fishing-ground and fish for menyulu-fishermen. The bombs and its use is again central in this conflict, together with the location in which the bombs are used. This is what shapes and defines their conflict, showing the importance of objects and performances in relationships. Even though the menyulu-fishermen experience this conflict, they are not organized in a group to stop bomb-fishing, and the bomb-fishermen are not aware that their fishing-technique is harming other fishermen.

Another conflict is between conservation organizations and the government, and between coral miners and the government. Discursively the government is on the same side as the conservation organizations. They use the same reasons why coral mining is a destructive reef-practice and why it should stop completely. But practically the government acts not conform her own and conservation organizations' discourse by being the largest buyer of coral from the miners. Buying the corals is also not conform the law and conservation organizations' practices against mining. Because of this difficult position of government, they decided not to make implementation plans for the mining law. So the conservation organizations have to decide for themselves what the appropriate way of law-enforcement for coral mining is. This led to very different practices of dealing with coral mining by the different conservation organizations (see paragraph 4.3.2). The majority of the conservation organizations are pressuring government to stop buying mined corals to decrease the demand for coral, decrease mining and to develop solutions for the miners. This conflict is about the mined corals, and the practice coral mining. This conflict can co-exist with the coalition of government and conservation organizations against mining, because the government acts not conform the conservation network of which they are part. This is accepted by the conservation organizations, because the conservation organizations want the government in their conservation network for closer and better cooperation to protect the reefs (for the government decides on laws, policies and implementations). By pressuring government, conservation organizations try to get government further aligned with their conservation requirements, while preventing them to walk away from the negotiation table about the reefs, reef-practices and the conservation-network.

The coral miners also have a serious conflict with the government, because they are being restricted in their mining activities by their largest buyer. Discursively the miners do not see mining as a harmful reef-practice, they see it as removing dead stones from the sea to make a living, whereas both government and the conservation organizations see it as destructive and harmful. By basing their arguments upon scientific research and monitoring results, both government and the conservation organizations give their arguments extra power. By representing silent actors such as fishermen, fish, seaweed, seaweed farmers and seabirds in favor of their arguments they try to convince miners to switch to another way to make a living. The miners disagree with these arguments, because they are the only ones using the mining areas, therefore other species, seaweed farmers and fishermen do not have problems with their reef-practice. Space is thus central in this conflict, as well as connectedness (whether or not the dead reefs are connected to the living reefs by fulfilling ecological functions for the living reefs). Besides discursively, the miners also have practical conflicts with the government and the conservation organizations. This relates to the miners being unaware of where mining is and is not allowed, resisting the mining restrictions by mining in no-take areas, the absence of alternative livelihoods, and by convincing authorities that they work for the

government to avoid problems. This conflict is thus based on the mined corals and the functions they (do not) fulfill. Many silent actors are represented, which shows conservation organizations as very powerful actors in defining the situation for the mined corals and other reef-users and species depending on these corals. Objects and many other nonhuman actors (mining rules, restrictions and species), together with human actors are thus central in this conflict, and they are enacted into being in space, discussions, practices and performances of/between miners, government and conservation organizations.

Finally there are conflicts present between the conservation organizations and also between conservation organizations and the government about park protection and cooperation. In terms of cooperation TNC-WWF and TN are pressuring for an MOU with COREMAP and DKP to share information quickly and to open budgets to see who can organize what kind of protection for the park. Information sharing now goes slowly (from COREMAP to TN and TNC-WWF) and through bureaucratic procedures before it is obtained by park rangers or TNC-WWF. Because budgets are not open, it is not clear who has which capacities to do something for park protection. Another problem is information about park patrolling. Often TN and TNC-WWF are not informed when or where the navy, marine police, DKP or COREMAP are patrolling. Patrol planning is thus organized by the organizations themselves without consulting or informing other organizations which is very inefficient according to TNC-WWF and TN. Only during joint patrols they know what the other is doing. In 2009 a draft version of an MOU was made by all actors patrolling the reefs individually next to the joint patrols, but it never transformed into a final agreement. TNC-WWF already stated that they will continue to negotiate on an agreement to align their discourses and activities to form a stronger coalition against reef-damaging practices. In this conflict the absence of an MOU, and sharing of resources and information are central. It is thus not only about human or organizational relationships, but also about objects such as documents stating cooperation, procedures for information sharing and the physical sharing of resources such as money, boats and patrolling schemes are also present at the center of this conflict. Its absence is at the heart of the conflict, which defines the relationships and position of and between the organizations, human- and nonhuman actors.

5. Discussion and conclusion

This research describes and connects different enacted realities of the Wakatobi National Park coral reefs, with as main question: *Which different enacted realities co-exist of the Wakatobi National Park coral reefs?* This final chapter starts with a discussion of the strengths and added value of ANT for this thesis by discussing multiplicity, nonhuman agency, cutting the network and political ontology. In the conclusion I discuss the reefs from an ANT perspective as multiple and complex and the importance of relations between human and nonhuman actors who together determine the distinguished realities 'Reefs for making a living', 'Reefs for tourism' and finally 'Reefs for conservation' in this thesis. I also discuss the consequences of multiplicity briefly in the conclusion.

5.1 Discussion of ANT

ANT is fairly new in research about natural resources, especially treating a coral reef as a nonhuman actor is a new phenomenon which led to new insights in the form of multiple realities of coral reefs. In this discussion multiplicity, nonhuman agency, cutting networks and political ontology are central concepts, because why are they so important for ANT and what is their added value for studying coral reefs?

Within ANT there is a 'nuance towards multiplicity' (Jóhannesson et al., 2012: 7). This means: "*when reality is produced, this work is most probably done in different versions in different places by different sets of actors. An emerging post-ANT insight is that many different networks exist and enact multiple versions*" (Jóhannesson et al., 2012: 7). In this case multiple versions of the Wakatobi coral reefs are distinguished, but previously multiplicity of tourism destinations or objects (Ren, 2011) and even of the body in case of atherosclerosis (Mol, 2002) and liver cirrhosis (Law and Singleton, 2005) were investigated. So a coral reef, which is a seemingly singular nonhuman actor is indeed enacted in multiple realities as can be seen from the analysis and results of this thesis.

As can be seen from the previous chapters different realities of the Wakatobi coral reefs exist practically, discursively and materially. The concept multiplicity shows the complexity that different actors have to deal with, and their relationships with one another. For example that actors are being aligned concerning one practice (government and the conservation organizations concerning bomb-fishing) but conflicting on another (government and the conservation organizations concerning coral mining). Multiple realities can thus also conflict or collide with one another on different occasions. In the words of Jóhannesson et al., (2012: 4): "*Incompatible 'definitions of the situation' and resulting practices and enactments may lead to divergence or even controversy*", what also appears in this thesis. ANT allows and acknowledges these multiple, and sometimes conflicting realities, therefore it was very useful in revealing multiplicity and different kinds of relationships between actors, both within the same reality as well as between different realities concerning coral reefs.

Multiplicity also: "*highlights that any order is a precarious achievement and there is no final ground or a root order on which ordering work is based*" (Jóhannesson et al., 2012: 7). This emphasizes the fluidity of realities, that are not built upon some kind of basis that determines the presence, absences or importance of some realities compared to others.

To illustrate the importance of multiplicity, this thesis distinguishes three different fishing-techniques and coral mining which show very different discourses, practices and materials used for the coral reefs. But it must be said that at least 15 other reef-practices (mainly fishing-techniques) exist besides the ones I have researched. In other words, many more realities (built up of discourses, practices and materials), conflicts or coalitions can be present when it concerns the reefs. This can even differ for fishermen performing the same reef-practice on another island.

Nonhuman agency is the second concept to be discussed. For this thesis nonhuman agency of coral reefs is very important. By treating the reefs as a nonhuman actor and by dissolving the dualism between the human and nonhuman, new information is obtained in the form of three different realities that are distinguished. In this case not only the reefs and human actors are present and connected, but also other nonhuman actors are connected in networks such as fishing and diving equipment. It is thus important to realize that the reefs are enacted in different versions in which both human and nonhuman actors play important roles, therefore none of these actors were excluded from the analysis (also see Ren, 2011). On top of this the enacted realities of the reefs simply cannot persist without the presence of enacting nonhuman actors. In other words: "*the spectrum of what (a coral reef) is and who its actors are, is broadened*" (Jóhannesson et al., 2012: 5). Following actors connected to the reefs thus meant following both human and nonhuman actors.

This leads straight to the third concept of cutting the network(s). The quest of following actors comes to an end at some point where the network is cut. In the words of Strathern: "*analysis, like interpretation, must have a point; it must be enacted as a stopping place*" (1996: 523), because networks grow and grow after more connections and actors are followed. ANT is clear that the discovered networks have to be cut at some point, and this point can be decided upon by also allowing for pragmatic reasons. For this research several reasons are present to cut the networks (or in this thesis the realities) and research area. Because of limited time, money, language barriers, slow and insecure public transport I decided not to go further than Wangi-Wangi island for observations and interviews with fishermen and coral miners. Thus for fishermen and coral miners the network is cut surrounding Wangi-Wangi island, including Kapota. For tourists Tomia is also visited, because this island also provides tourism facilities. As a consequence of cutting the networks, less complexity and multiplicity (and thus also fewer realities) are encountered and taken into account.

The role of the researcher is thus very important in cutting the network, because he/she is in fact making a tainted decision about his/her data and how he/she wants to proceed with it. By doing so the researcher has a big influence on the realities he/she studies. This can even be the case right from the beginning, by following certain actors, and not others. This has an effect on the studied networks, because actor-networks are not a fixed entity waiting to be discovered. A strength of ANT is that the role of the researcher is taken into account, both in following actors as in cutting the network. In this thesis, these tainted decisions are also made mainly based on pragmatic reasons.

Tainted decisions of the researcher, both in terms of cutting the network as in his/her writings on distinguished realities lead to the final concept: political ontology. By other authors this concept is also referred to as 'radical ontology' (Ren, 2011), or as 'ontological politics' (Law and Urry, 2004; Law, 2009; Jóhannesson et al., 2012). This concept mainly deals with the consequences of using ANT for the coral reefs. In the words of Jóhannesson et al.: "*The attention to how our research impacts and intervenes into our fields of study raises increased awareness of how research and knowledge creation is always a matter of doing ontological politics, i.e. bringing certain realities into being*" (2012: 12), while othering others. Law (2009: 154) argues for the following: "*since our own stories weave further webs, it is never the case that they simply describe. They too enact realities and versions of the better and the worse, the right and the wrong, the appealing and the unappealing. There is no innocence*" (Law, 2009: 154). In other words, the realities distinguished in this thesis also enact on their own. Similar to the field of tourism studies: "*By acknowledging - and exemplifying - that scholars enact different versions of ANT, we rather stress its openness and multiple potentialities in creating new ways of seeing, thinking…, working*" and studying the field of coral reefs (Jóhannesson et al., 2012: 2). In short "*our choices as researchers and our efforts to conduct research*

projects are by definition interventions" (Jóhannesson et al., 2012: 11). And as Gad and Jensen (2010: 67) argue in addition to this: "*analysis and description cannot be separated from political convictions and normative hopes*".

For studying coral reefs along the lines of ANT, the main advantages are that "*it brings the ability to expose contingencies and deconstruct the usual common-sense categories of analysis, consequently demonstrating the underlying complexities*" of reef-related activities (Ren, 2010 cited in Jóhannesson et al., 2012: 9). The enacted character of the coral reefs provides more complex understandings of the relations and actors that construct and enable the reefs. These understandings are not only useful for academic purposes, but also for management plans concerning the reefs. By improving the understanding of different realities of the reefs (of different (groups of) actors), more effective management or conservation plans for the reefs can be made, because the basic understanding of what a coral reef is and how it works can be taken into account. Using ANT for the reefs could thus have large effects for the daily practices of using, managing, protecting or providing education about the reefs.

From a political ontology point of view, this thesis and texts in general are also relational: "*They come from somewhere and tell particular stories about particular relations*" (Law, 2009: 142), "*hence, the production of science realities is enacted in and through relations*" (Jóhannesson et al., 2012: 11). As a consequence of this, "*no real singular, independent, objective reality exists. What appears are different and valid knowledges that can be neither entirely reconciled nor dismissed*" (Mol, 2002; cited in Jóhannesson et al., 2012: 11). By dealing with political ontology in research, the decisions of the researcher can be made more transparent (including allowing for pragmatic reasons) and his/her accomplishments in writing can be approached more humble since neither a complete network, nor an objective reality is revealed.

To move ANT forward, I argue with Jóhannesson et al., (2012) that the focus of ANT should be on studying relations and how they come about, in combination with the idea of multiplicity. For studying natural resources, new enacted realities can be revealed which can lead to new solutions for problems surrounding natural resources. Not only does this add to the development, adaptation and change of ANT for natural resources (for ANT is not a static entity, see Gad and Jensen, 2010), it can also provide new practical solutions for problems surrounding natural resources in terms of policies, management or practices performed on the natural resource studied.

5.2 Conclusion: Coral reefs as complex and multiple

This thesis describes and connects different enacted realities of the Wakatobi National Park coral reefs to answer the main question: *Which different enacted realities co-exist of the Wakatobi National Park coral reefs?* The reefs are enacted in three different versions, namely: 'Reefs for making a living', 'Reefs for tourism', and 'Reefs for conservation'. These three different coral reef realities show that the enactment of a coral reef is constantly constructed, renegotiated, reassembled and influenced by actors present in the same or other realities. This is done by following actor-network theory (ANT) and viewing the coral reef as an object enacted in multiple versions. The different reef-actors are defined by their ability to influence the network or reality of which they are part, and their ability to influence other networks that try to define and use the coral reefs in a different way. By using the reefs as the central object of investigation, it is clear that different reef-uses are not only made possible by human actors, but also by (informal) rules and regulations and the law. Objects such as diving- and snorkelling-equipment, fishing-equipment (bamboo traps, five-pointed spears, bombs), and mining equipment (lingis which is a long iron spear) are just as

important as the human actors and rules in place for making different reef-uses possible. By connecting these different entities with the coral reefs instead of looking at them separately, shows how different reef-practices are performed through shifting connections between a coral reef, new developments such as reef-protection and tourism, and reef-practices that have been present for a long time already (bubu (trap-fishing), menyulu (spearfishing), coral mining and bomb-fishing).

By describing different reef-practices and -discourses in combination with different reef-users in Wakatobi shows how different enactments of the reefs construct and change relationships, connections and associations between different actors (both human and nonhuman). Even though three different realities are presented, these realities are not mutually exclusive, they '*coexist in more or less consistent enactments*' (Ren, 2011) of the reefs. As can be seen from the pressure of certain actors to align other actors with their version of the reefs (or objects used on the reefs), it is clear that the realities themselves do not have strict borders but that they are influenced, rearranged, reconstructed and changed through processes of translation. During these processes of translation some practices, discourses and actors are present and taken into account, whereas others are othered. The distinguished reef realities were present in diverse ways, sometimes opposing but also overlapping each other in discourses and / or practices and which in some cases led to serious conflicts or coalitions. A number of discourses (reefs as dead or alive, reefs as (un)protected, reefs for making a living, reefs as (dis)connected), practices (fishing, coral mining, diving, snorkelling, patrolling, monitoring, researching), nonhuman actors (fishing-, mining-, diving-, snorkelling-, patrolling-, monitoring- and research-equipment), places (remote or local reefs), human actors (fishermen, coral miners, tourists, tourism facilitators, government officials, conservationists), agreements between human actors, laws and law-enforcement engage with each other simultaneously, where the coral reefs worked as a resource used for making a living, as an attraction for tourism and as a fragile ecosystem in need of protection.

By using ANT with the coral reefs as main object of investigation, it shows that the coral reefs indeed are enacted in different versions at the same time. The networks and realities presented in this thesis are not straightforward and clear, instead they are complex and multiple. By viewing coral reefs as multiple and complex, and at the same time acknowledging how this multiplicity is created through different practices, objects and discourses, provides space for looking at coral reefs and natural resources in a new way. By acknowledging multiplicity and thus viewing the reefs in a broader perspective gives a more complex understanding of what a natural resource is and it provides a confrontation of a static reality of coral reefs. This confrontation helps, because the problems surrounding coral reefs can also be viewed in a new way and this could lead to finding new solutions for complex problems surrounding natural resources in terms of policies, management, conservation and practices performed on the natural resources.

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