Perceptions of climate change in the Spermonde archipelago

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Cindy and other friends on our way to Pulau Bontosua.

TABLE OF CONTENTS

- Preface

In studies correlated to the impact of climate change, abundant space is reserved for tropical areas, that appear to be the most sensitive ecosystems to the change[1], to archipelagos, threatened by the sea level rise, and to small fisheries, that depend on a delicate balance between nature and human activities. The Spermonde archipelago, situated in Indonesia, contains all of these features and it is a perfect sample of a delicate ecosystem where climate change is affecting local livelihood. Inquiring the perceptions of local people and institutions allowed me to collect all the different facets of this phenomenon and to discover the strategies developed to deal with it.

This work is composed of an introduction, five central chapters and the conclusion. A bibliography and one appendix follow, including a map of the area of research.

In the introduction, I am going to explain which changes occurred in my research during the time I spent abroad, on the fieldwork, comparing my initial purposes with the actual data collected once there. Then I will explain the main goal of my thesis and the motivations behind the choice of my research question. Furthermore, I am going to introduce the main concepts that guided me throughout my study and the approach I have chosen to conduct my research.

In the second chapter, the theoretical framework of my research, I examine the main concepts of the study, the guidelines to the whole work. Here I face the theoretical discourse inserting my thesis in a wider debate about climate change and its effects on tropical archipelagos and local livelihood in small fisheries.

The third chapter is about the practical part of my dissertation, with all my methodological and ethical considerations; here I also specify the choice of my informants and demarcate my field, drawing artificial borders in order to delineate the limits of my research. Every place I visited was interconnected with others and the links could be infinitive; in order to set my research in a precise time and space, and to give it a sense, I had to delimit a certain portion of land and sea, as well as to fix particular characteristics for my informants. This delineation is

[1] "The reasons that the poor living at low latitudes will bear the heaviest burdens of climate change are meteorologically, economically, and geopolitically complex, but they all arise from an inescapable statistical fact: normal temperature ranges in the tropics fall within a narrower range than those in more northern climes, and so any deviation is likely to have more significant effects" (Martin 2015, n.p.)

not only geographical: I demarcate my field also according to the aspects I wanted to include or exclude in my thesis.

In the fourth chapter, I focus on the core of my study, investigating local institutions' and local people's perceptions of climate change.

The fifth chapter is about two issues that are able to influence, and modify, the perceptions of climate change. In particular, I analyse how blast fishing and the garbage management's problem may affect perceptions of nature, human intervention, climate change and its consequences.

In the sixth chapter of this dissertation, I consider some projects developed in the area, using them as samples to examine the influence that similar projects might have on local perceptions and to underline the importance of taking local opinions into account while developing a conservation program. I am going to focus on two representative projects, whose consequences I directly witnessed, on the islands of Badi and Bontosua.

In the conclusion, I sum up all my findings, bringing the main arguments together in a complete analysis of the issue, explaining the way my data, belonging to a *local* reality, answer to my research question and fit into a wider and *global* discourse about climate change.

1. Introduction

image 1

1.1 **Empirical gap**

My interest for environmental issue and tropical ecosystems led me to gather information about the effects of climate change on analogous areas; while I was collecting literature and developing, at the same time, new ideas for my thesis, I noticed how little space was actually dedicated to the local perceptions of this phenomenon; climate change[1] and its effects on tropical and maritime ecosystems were abundantly discussed (Cheung, W. W., Lam, V. W., Sarmiento, J. L., Kearney, K., Watson, R. E. G., Zeller, D., & Pauly, D. 2010), and several authors (Ferse et al. 2014, Glaser et al. 2012, Ferrol-Schulte et al. 2013) treated the practical consequences occurring in this particular area, that is to say, the coral triangle (image 1), where Sulawesi is the centre. That said, I found few writings describing the locals' points of view regarding the issue, and none of them was taking into account the area where I developed my research in the end. Most of the literature connecting climate change and local perceptions refers to India (Byg & Salick 2009) and Tibet (Vedwan &Rhoades 2001) or, if we focus on tropical areas, to the African continent (Apata et al. 2009, Hassan & Nhemachena 2008, Lema & Majule 2009, Maddison 2007, Mertz et al. 2009). Narrowing down to the South-East Asia I was able to find one paper about Vietnam (Chaudhry & Ruysschaert, 2007) but nothing about Indonesia, its archipelagos and small fisheries. Even less space is dedicated to the juxtaposition of different perceptions coming from people working at conservation projects and local inhabitants. Integrating my thesis in the wider discourse about the effects of climate change on a tropical and marine environment and on the livelihood of communities depending on the small-scale marine fishery, I hope to give voice to one of those populations directly involved in the practical consequences of the global warming. The analysis of the difference between local people's and local institutions' opinions can provide precious insights with both a societal and scientific relevance, as they can help to better understand the dynamics inside the society and the way citizens and institutions interact; even more, they may contribute to the development of a bottom-up approach successfully including the collaboration of local people and to a deeper comprehension of the effects of global warming unfolded at a local level.

Most researchers agree in retaining communities as a fundamental actor in biodiversity

[1] Here I assume climate change is an urgent problem threatening the survival of many species, including humans. This assumption underlies my whole thesis, and I do not discuss here the accuracy of my opinions, leaving this argument to the current debate between deniers (Jastrow, Nierenberg & Seitz 1991) and supporters (Hansen 2010, Pearce 2010).

conservation and similar projects regarding environmental issues (Berkes 2007), though there is a general discouragement towards community-based conservation projects, which fail in collaborating at multiple levels (Berkes 2004, Campbell 2003, Mehta 2001). One of the main accuses addressed to community-based conservation programs is the lack of a proper implementation, "especially with regard to the devolution of authority and responsibility" (Songorwa 1999, Murphree 2002 in Berkes 2004). There is the necessity to actively involve the population into the management processes, in a climate of collaboration and transparency (ibidem). "Because each level of a scale is different, the perspective from each level is likely also different. The global lens of biodiversity conservation (that it is a global commons) is therefore different from the local lens on biodiversity (local commons for livelihoods)" (Berkes 2007, 15189); indeed, we may expect different perceptions, both valid, coming from the social actors involved in a conservation project, especially when the projects encompass a wide range that goes from global to local.

The collection and analysis of the perceptions of people involved in a community-based conservation project can bring a pluralism of knowledge able to enrich the project itself, to rethink its planning, to dismantle the misleading dichotomy between "local knowledge" and "science's perspective" and to fulfil the project's goals. Generally, the study of local perceptions can fill a gap in the literature regarding both climate change and conservation efforts, rising the attention towards daily problems, situated solutions, bottom-up approaches.

In order to prove the importance of the different perceptions of people involved in similar projects, I compare the different opinions of the two big groups (local people affected by the consequences of climate change and involved in the projects, as well as local institutions promoting the projects) dealing with climate change and projects related to it in the area I have chosen, with a focus on the juxtaposition of these different perceptions.

I hope my research will partly fill this gap in the existing literature and promote a new approach towards conservation projects' management.

1.2 **Research question and main goal**

The main goal of my research is to investigate the juxtaposition between two different points of view about climate change: the local islanders' and the local institutions' (operating on the Spermonde archipelago, in Indonesia).
My research question is: "How do the locals' perceptions on the effects of climate change in the Spermonde archipelago, and the practices that derive from these very perceptions, relate to those of the local institutions?"
The sub-questions I will give an answer along my study are:

-How do the local people of Spermonde archipelago perceive climate change, and its causes and consequences as well? How do they put these perceptions into practice?

-How do local institutions such as scientist and conservation projects' staff perceive climate change?

-What are the similarities and differences between these two-sided perceptions?

I have collected perceptions both coming from the islanders and from those institutions that are supposed to study the phenomenon of climate change and carry out projects to face it, that's to say, in this very specific case, the Faculty of Fishery and Marine Science (Fakultas Ilmu Kelautan dan Perikanan, known as FIKP), as well the Anthropology department (in the department of social science, the "Fakultas Ilmu Kelautan dan Perikanan" known as FISIP) at the Hasanuddin University, in Makassar, Sulawesi. In my limited period of time on the field I could encounter different projects carried out by the Hasanuddin University; apart from the COREMAP project, designed by the government, and one private project on Badi Island, which I will discuss in the last chapter, all the projects I came to know were conducted by the university. It led me to decide to take this university as a sample of the institutions whose perceptions I wished to inquire, making contacts and interviewing students and professors working in the aforementioned departments. My investigation was not developed uniquely for the anthropological and human importance of those opinions *per se*, whereas, indeed, in order to contribute to an improvement in the community-based conservation projects discourse, as I will thoroughly explain in my theoretical framework. I will question my findings all along my

writing, also explaining the different solutions-to-be I could perceive, coming from my informants.

Before leaving for the field, I had decided to inquire the more specific issue of the sea level rise but once there, on the islands, I realized that it was not perceived as a problem, or something happening in such a urgent way. On the other hand, several consequences of climate change were experienced daily by the local population (and sea level rise was one of them, but it was not the most pressing or well-known) and this fact encouraged me to investigate the perceptions related to the more general issue of climate change.
To sum up, my research investigates which responses to global warming local people and local institutions consider more appropriate, providing a pattern of adaptive response that might be used in future studies linking climate change to tropical archipelagos and small fisheries.

1.3 **Main concepts**

Here I introduce those main concepts that guided me throughout my research. First of all, the notion of "climate change" and the idea of "perception" , the very basis of my research question. Subsequently, I focus on my informants: I can divide them into two groups, the islanders, so the fishermen and their families, and the academic world. Focusing in particular on the first group, that's to say the fishermen living on the islands of Spermonde archipelago, I analyse the conception of "indigeneity" and the myth of the noble savage; these two concepts helped me in better "categorizing" my informants (for the sake of the research) and investigating their idea of "nature" and "conservation" without prejudices, thus avoiding weighing them down with my own expectation. In particular, if the concept of "nature" helped me in understanding the different perceptions I gathered regarding environmental issues, the concept of "conservation", instead, allowed me to examine the strategies local people and institutions are willing to achieve.

1.4 **Approach and methodology**

My theoretical approach was empirical, exploratory and ethnographic. These three terms overlap, all indicating a collection of subjective data in the field, starting from a condition of *tabula rasa* (without biased pre-concepts) and put into action through participant observation, interviews and conversations, as through the analysis of quantitative data provided by the local institutions. As I will later explain in the paragraph dedicated to my methods, this approach allowed me to study

the different perceptions of reality experienced by my informants, instead of a unilateral concept of "truth". Later on, I could also compare my own data with the literature I collected, and the results of this comparison will be discussed in the conclusion.
In particular, I here underline that my conceptual approach and the methods chosen, such as face to face and semi-structured interviews instead of questionnaires, permitted me to explore the local ideas of climate change and its causes and consequences, nature, perceived daily problems and possible solutions, conservation, etc. without spoiling their perceptions with my personal definitions of those issues, as it could have happened using a questionnaire or a structured interview. This "unbiased" approach, completely explorative, led me to analyse, for example, the influence of religion on the perception of "nature", something that I had not expected to do before my fieldwork. Furthermore, my approach allowed me to inquire the phenomenon of climate change at a local level, so that I could engage with the discipline of environmental anthropology, that studies the relationships between human beings and their environment, as well as situate my thesis in the studies correlated with climate change, providing data about the responses, opinions and strategies developed at a local scale and inserting these very reports in the bigger discourse of global warming.
I will further discuss the benefits of my approach in the paragraph dedicated to my methods.

Before continuing further with my research, I briefly summarise the contents of the following chapters.

In my theoretical framework, I explain the notions that guided me through my whole work, from the creation of my research questions to the analysis of the main concepts I inquired in my study. In chapter 3 I explore the development of a suitable approach which enables me to better pursue my aim, explaining also my methodological and ethical issues.

From chapter 4 to chapter 6 I get to the heart of my dissertation, answering to my research question through the description and analysis of my informants' perceptions, the factors that influenced their opinions, such as other daily problems claiming their attention and some projects they have been involved in, and the responses developed to face climate change's consequences.

In the conclusion I gather my findings, summarising the relevance of my research in the broader context of studies correlated to climate change, conveying my personal opinion on the data collected and underlining the importance of this study at a global scale.

2. Theoretical framework

2.1 **Perceptions and climate change**

During my period in the field, I inquired how the locals (people and institutions) rationally and sensitively understand and describe the phenomenon of climate change, and how they perceive its causes and future consequences. According to this purpose, it was essential to my investigation to inquire the concept of "climate change" before dealing with the ways this concept is perceived by the locals.

According to Roncoli (2009), anthropologists are able to give an important contribution to the debate around climate change's impact, expanding the discourse beyond the fields of science, policy and social media (Roncoli et al. 2009, 90). Thanks to this discipline, a voice was given to folk narratives and livelihood issues, as to the agency of the peoples involved. "Anthropological research can illuminate cognitive, symbolic, and even linguistic aspects of climate change, as well as behavioural responses and power dynamics at both micro- and macro-scales" (ivi, 104).

As already explicated in my Introduction, little space was dedicated to the perceptions of local people, in the literature I collected about climate change and its effect. Nonetheless, in my opinion, perceptions about climate change cast light on the way people describe its causes and consequences, the strategies they are willing to apply, as the feelings triggered by the phenomenon and its possible future implications, and for these reasons I consider them extremely relevant for a comprehensive research about environmental issues.
According to Wilbanks & Kates (1999), responses to climate change can involve mitigation, abatement and adaptation. Mitigation means reducing the causes of climate change, such as the production of greenhouse gases, the reduction of forests, etc. Abatement, generally referred to emissions, involves a stronger standpoint in order to considerably reduce the causes of the phenomenon. Differently, adaptation develops an approach of coexistence together with the problem instead of trying to solve it. Treating the problem as inevitable, adaptation measures aspire to reduce natural and social vulnerability and they are usually carried out locally, even though assisted by global policies (Wilkbank & Kates 1999, 615).

In my study, the juxtaposition of the perceptions coming from institutions and local people enabled me to investigate different points of view produced by the social actors included in my field and their different responses to climate change. In the dictionary, perception is defined as "the act or faculty of perceiving, or apprehending by means of the senses or of the mind; cognition; understanding" (http://www.dictionary.com/browse/perception), while the verb "perceive" means recognising, discerning. The different backgrounds people have were an important factor of influence of those perceptions, and objects of my analysis. The understanding of the similarities and differences between (what it turned to be) two-sided perceptions is at the basis of the launch of a successful conservation project. I consider fundamental to inquire local perceptions, for several reasons; first of all, we can assume that individuals with a direct experience of the effects of a certain environmental phenomenon would be more likely to undertake measures to deal with it or even prevent it. Moreover, I believe that studying a phenomenon at a local scale, instead of only at a global one, helps the comprehension of it in all its complexity. Gathering the perceptions of local people about the changes they are daily facing can give us a clear insight of how climate change is depicted, which causes are recognized at fault, which consequences are perceived as more urgent and impacting, if local people think to have contributed to such causes, how effort at mitigation and adaptation can be locally put in practice, which strategies the population is willing to undertake, etc.

2.2 **Noble savages, conservation efforts and dichotomies**

In this paragraph, I focus my attention on the main characters of my research question, the two groups of social actors involved in my field. In particular, I take into exam the first group of my informants, that's to say the local people. Indigenous[2] people are often recognized as in possess of a unique environmental knowledge due to an assumed deep relationship with their surrounding environment: subsequently to this idea, several authors suggest involving indigenous populations in conservation efforts in order to improve these environmental projects (Gadgil et al. 1993, Steven 1997, Warren 1996). Where does this very idea come from?
In his book, Todorov (1987) explains the myth of the noble savage: *conquistadores* and missionaries brought back to Europe two conflicting and equally twisted pictures of the indigenous population of Mesoamerica; if the Spanish conquerors described those people as

[2] Here in its first acceptation of "native, local".

cannibals and pagans, bloodthirsty and violent, the priests depicted a naïve and gentle kind of man, pure and open to receive a Christian education, who lived peacefully with the surrounding nature. This latter idea, whose birth has to be attributed to Fray Bartolomé de las Casas, (1484-1566), of an ecologist population able to live in harmony with the environment in a perfect symbiosis, remained along the centuries and was embraced by some authors (Mead and Boas 1973) while rejected by others (Grande 1999, Freeman 1983, Whelan 1999) opening a debate which has been lasting decades, involving scholars from different fields (Alvard 1993, Buege 1996, Fernández Herrero 1989, Perez 1994, Rangel 2007, Raymond 2007, Selin 2013, Sebreli 1991). As Rowland points out "when indigenous peoples are stereotyped as ‘noble savages’ they are once again frozen in the past and therefore can have little to contribute to human history" (2004, 2). Deconstructing the biased idea of an eco-friendly population living in Spermonde archipelago allowed me to gather data and analyse their perceptions without spoiling my research with similar prejudices; thanks to this conceptual approach I myself avoided the preconception of an indigenous folk characterized by conservation efforts, an attitude of care towards the environment and the so-called "indigenous knowledge", a notion exalted by many scholars (Farooquee et al. 2004, Ghai & Vivian 2014, Lenachuru 2016, Sen 1992), especially against the discourse supported by Modernization Theorists and Marxists describing indigenous resources as an obstacle to development (Agrawal 1995). "Indigenous knowledge becomes central to later debates about sustainable development because of the way in which such knowledge has apparently allowed people to live in harmony with nature for generations" (Briggs 2005, 4); as Briggs underlines, this bucolic symbiosis between humans and nature can be just illusory. Therefore, there is the necessity to approach environmental studies related to indigenous communities with an initial tabula rasa and inquiring the concept itself of "indigeneity", which is not sociologically neutral. Talking about indigenous knowledge creates a chasm that opposes the natives' cognitions to the "western" science, emphasizing a dichotomy where western people (and I do not pronounce myself here on the meaning of "western" in order not to protract it too long) are depicted as pollution-causing and harmful while indigenous (another term whose legitimacy I will not discuss here) people are seen as harmless and environmentalist, in a binary divide.

The idea of a fixed and heterogeneous "indigeneity", with recognizable characteristics, may lead to the deployment of an "indigenous status" and an indigenous "identity", with the risk that some

sites and populations could be privileged while others might be excluded and forgotten (Dove 2006), as only people recognized as indigenous could apply for aids and certain rights. Moreover, the term "indigeneity" usually indicates a belonging to a specific land, a feature that does not apply in the Spermonde case, whose inhabitants move between different islands.
As the concept of indigeneity could spoil the debate around "authenticity", the assumption of a fixed indigenous knowledge can damage environmental studies and programs related to sustainability and development as well. Dismantling these pre-concepts helped me in finding out the interconnections between the Spermonde's inhabitants and the rest of the world, instead of focusing on them as a close, isolated system. Plus, it allowed me to inquire their perceptions toward the environment without assuming any ecologist intention. Ecologist intentions, that imply an intentional effort to preserve a certain ecosystem or species, may be gathered under the definition of "conservation". A debate was launched as to whether any indigenous people anywhere in the world had ever practised anything that could properly be called conservation (Stearman 1994), which includes an intentional effort in preserving the particular condition of a certain habitat.

According to Raymond (2007), we can distinguish true conservation, that requires the intention, the deliberate purpose of protecting the environment, from what Hunn (1982) calls epiphenomenal conservation. In this last description, conservation is a side-effect, generally due to a reduced population, whose members are unable to cause damages, such as a resource degradation. Low density is not the only factor: limited technology and demand of goods also can influence. According to this theory, indigenous population do not possess an innate conservation ethic that transforms them in guardians of their habitat; they instead maintain a long-term equilibrium with their ecosystem as there are not the proper conditions for a huge impact on the environment. If a change occurs, such as an increase in consumer demands, a reduction of land or the creation/introduction of a new technology, able to mainly exploit resources, then the way of living of the indigenous population X will not be sustainable anymore: on the other hand, if a population intentionally practices conservation, then the group will put effort in adjusting the new conditions in order to preserve their habitat and uphold the previous situation (Raymond 2007, 180-1). This discourse brings a very important point to light: indigenous populations, as every other population on Earth, are submitted to changes, and not fixed in period outside the flux of time; indeed, some characteristics we recognize in them might

be a reaction to the encounter with the "Otherness" (Todorov 1987), or to other destabilizing factors. Furthermore, I think local opinions must be considered unique and valid *per se*, and single perceptions can diverge from the majority's one and from the so-called "indigenous knowledge".
To sum up, I think local people should be better and more involved in conservation efforts and projects of climate change mitigation not for their possession of a particular knowledge, even though they are surely more aware of direct consequences on their territory than other people can be thanks to a daily experience, whereas because locals are the first to deal with the effects of a certain phenomenon on their living area, as well as the first to live with conservation projects.
In chapter 6 I will discuss how perceptions of climate change are influenced by the presence of conservation projects, and how local people perceive conservation projects too, inquiring if these so-called, at least on paper, "community-based" projects do really involve locals.

Another concept I here analyse is the one of "nature", a pillar in describing the perceptions regarding climate change coming from my informants.

In the next sub-paragraph, I examine the concept of nature through the lens of religion, as an important factor of influence in its comprehension. Surely, the idea of nature can be dissected through culture, language, society, etc. but religion was the most influencing agent I could experience in my field, also determining characteristics of the society and culture themselves.

Religion has been also a tricky component of my research, generating in me a prejudice that I could demolish only once there; in fact, coming from Europe, I brought with me to the field the idea that Islam, being a monotheist religion as Christianity, would necessarily share the same idea of "nature".

2.3 **Religion and Nature**

In the Genesis, the Christian God grants the human domination of nature, which could be exploited and used, even abused, by human beings. According to John F. Haught, even though the dogma of creation declares the value of the cosmos, the welfare of the environment has seldom been a real concern to the Christians and, apart from St. Francis of Assisi's and Ignatius Loyola's preaching, every other doctrine is strongly anthropocentric (Haught 1993 in Gottlieb 1996).

Vignette genesis 1:26-29

26 Then God said, “Let us make mankind in our image, in our likeness, so that they may rule over the fish in the sea and the birds in the sky, over the livestock and all the wild animals, [a] and over all the creatures that move along the ground.”

27 So God created mankind in his own image, in the image of God he created them; male and female he created them.

28 God blessed them and said to them, “Be fruitful and increase in number; fill the earth and subdue it. Rule over the fish in the sea and the birds in the sky and over every living creature that moves on the ground.”

29 Then God said, “I give you every seed-bearing plant on the face of the whole earth and every tree that has fruit with seed in it. They will be yours for food.

According to the Christian belief, human beings have a soul that separate them from the other species, giving them a transcendent value and connecting them to God "in a vertical stretch rather than a horizontal tie to other creatures" (Peterson 2000, 240). The relation with God defines human nature more than its relation towards every other creature, which is inferior from the beginning. Adam himself gives a name to every non-human being, and by doing that he claims a possession. I will not discuss here the influence of Christianity on the European perceptions of nature, instead, I would rather point out how a single definition of "nature" does not exist. The way local people on the archipelago and people working in institutions in Makassar (most of them "local" in Makassar themselves) perceive and define the term "nature" is clearly influencing their attitudes towards climate change. Before leaving for my fieldwork, I

assumed a certain similarity in the conception of nature between Christians and Muslims; nevertheless, I was expecting an influence in the institutions' concept of it, even though people working for institutions were Muslim as well, due to the academic literature about climate change and nature itself.

The concept of "nature" is far from being uniform and universally recognised, especially in the way it unfolds the difference between "natural" and "man-made"(Wohlwill 1983). Understanding the way my informants perceive the environment has been fundamental in order to reach a full comprehension of the way they deal with climate change. Multiple factors influence the perceptions of nature and during my fieldwork, religion appeared to be the most prominent. About this specific influence I more thoroughly discuss in chapter 5.

3. The Research

3.1 **Methodology**

3.1.1 Demarcation of the field

In order to carry out my research, I have been living in Indonesia for three months, from January to March 2017, in South Sulawesi. For my fieldwork, I have chosen Spermonde archipelago for several reasons: first of all, it was a perfect example of a maritime ecosystem, whose inhabitants' livelihood was depending on the marine resources, now threatened by climate change. Second, few anthropologists actually went there to conduct a field; there was enough literature to start collecting ideas about the local situation but, at the same time, it was a "wild" place, not spoilt by the number of anthropologists working there. Moreover, none of the researchers involved in the area had ever studied the fishermen perceptions of the phenomenon. An empirical gap in the available literature that gave me the chance to explore a new field in this debate. That is the reason why I consider the Spermonde archipelago to be a perfect spot where to investigate the effects that climate change may have had and may still be having on the livelihood of a population living in a maritime and tropical ecosystem and to collect local perceptions about these effects. Besides, the Hasanuddin University is situated close to the archipelago, in the city of Makassar; this university is very involved with projects and researches about climate change and it provided me several informants. It gave me the opportunity to inquire academic perceptions, in particular, to investigate the reasons why so many professors had studied (and were still studying) the phenomenon of climate change on the archipelago without engaging with local perceptions.

The demarcation of my fieldwork *inside* the archipelago, that's to say the islands I visited, was influenced by different factors, above all the weather. The archipelago where I conducted my research consists of hundreds of islands, some of which inhabited[3]. I rented a house in the big city of Makassar, in the mainland of Sulawesi, where I took boats (owned by the fishermen, as there is no public service) from the harbour every week to reach a different island of the

[3] It is not easy to define if the majority of the islands are inhabited or not. Even the number of islands considered part of the archipelago is not well defined. According to Marion Glaser (2010), some authors mention 120 islands, others 150. Some inhabitants may be not permanent, or just not officially registered; others might be seasonally living on the islands.

archipelago. I have been there during the rainy season so I decided to prioritize those islands that were closer to the city. The farthest island I visited could be reached by boat from Makassar in two hours. I was obliged to leave out of my research those islands which were too far from the mainland, since no boats were going there because of the heavy rains.

My field includes the Makassar District, as both the city of Makassar and some islands I have been to are under the same administration, and the Pangkep District, as other islands I visited, such as Pulau[4] Badi or Bontosua, belong to this administration. The Spermonde archipelago is divided into several districts, like the regency of Pangkep or municipality of Makassar. They have different jurisdictions. Apart from the islands, I was able to interview fishermen also in the harbour of Makassar, that were coming from different islands, for example from Bonetambung, in the Makassar District, and Balang Lompo, in the Pangkep District. So, I must say I did not draw my fieldwork line according to a particular district or ethnicity (even though people I interviewed were mostly Makassarese and not Buginese, as Buginese usually live on islands farther from the cost), whereas I was pushed by practical factors such as the weather and the availability of fishermen that could give me a ride and host me. Furthermore, I have chosen some islands instead of others for the presence of conservation projects on them (for example, the COREMAP's one in Bontosua, or the Mars program in Badi).

The city of Makassar is the nearest gate to the international market for the archipelago; those two places are interconnected as lots of fishermen are selling their fish in the city harbour, and they are used to receive visitors from the university, especially researchers. The fishermen need to go far away from their island to catch a good amount of fish, sometimes even to Bali, Borneo, Papua or Australia; that connects them to several places and peoples, in a fluid exchange of habits, *mores* and ideas. We cannot consider the Spermonde archipelago as a closed system, isolated from the rest of the world. Every family, even the poorest, has a TV and a mobile phone (but you can find service only within the little harbour of every island, as close as possible to the sea); they receive news from the world, which is able to influence their priorities. Furthermore, every fisherman visited and lived on other islands during his lifetime, some of them actually were born somewhere else and decided to move to Spermonde to live with the wife's family. Every new member of the islander community brings new thoughts, creating new connections with other places and people. In this writing, I will also inquire the effects of these

[4] "Pulau" means "island" in Bahasa Indonesian.

interconnections regarding the sharing and influence of ideas, and also the possible outcomes in the environmental issues.

When I first arrived at the archipelago I was fascinated by the beauty of the coral reef, visible thanks to the clearness of the water, all around the island. Some images immediately jumped out at me: the big number of houses, the garbage on the beach, the few trees, lots of ducks and chickens with a colourful plumage[5].

Makassar, instead, is completely different: it's the provincial capital of South Sulawesi, a messy and noisy city where it is far too easy to get lost and the difference between the lower and the upper classes is huge and glaring, as the dissimilarity between a street market and a luxurious mall. In this kind of malls, rich people, probably used to travel, do not stare at you, asking for selfies, astonished by the presence of a *bulé*, as said before, a white person, in the city; whereas, in a street market, your personal space is violated by lots of people that make you feel like a famous actor. My fieldwork included two close but different realities: both the city and the islands have been fundamental collecting fields for my data and the dissimilarity they embody is representative of the different perceptions they have. Makassar has got two harbours: the biggest one is for cargos and ferries going to other Indonesian islands or abroad; the smallest one, the "Paotere harbour" is where I took the boats to go to Spermonde. The islands I visited in the archipelago were few kilometres long, crowded with houses, surrounded by boats and a beautiful reef, and few trees left. They all had a primary school and an E.R. on it, sometimes even a middle and a high school. The streets are filled to the brim with little shops that sell the most variegated array of goods: from shampoo to candies. The houses do not have lots of furniture inside: a carpet where to sleep (but somebody has also a mattress), a TV, some chairs. The kitchen is the most furnished room of the house. As women, my interpreter Cindy and I always received a separate room where to sleep, divided from the men. In every family, the wife is in charge of the accounting, managing the money, and taking care of the children; the husband is at the sea, most of the time. But during rainy season few fishermen go out to fish so I had the chance to talk to them at their houses, finding them easily and with spare time to answer my questions. On every island I was hosted, along with my interpreter, by one local family. Every host family also provided us with the food: rice, fish and vegetables. The host "father" was also

[5] In order to distinguish the owner of the birds, ducks and chickens are painted in pink, green, blue etc. Every color points at a specific owner.

my "gate-opener", introducing me to other families on the islands and guaranteeing for me, explaining my intentions with the help of my assistant.

3.1.2 Informants

The main characters of my research can be divided in two groups: local people and local institutions. Every group can be divided in smaller groups: with the term "local people" I include entire families of fishermen (husband, wife, sons or daughters) but also inhabitants of the archipelago who are not fishermen (teachers, employee, etc.); for "local institutions" I mostly include professors and students from the Hasanuddin University, that relate to different faculties. I have interviewed entire families of fishermen, including wives and sons, as I believed they could help me in collecting more insights about the situation of the islands, even though they were not personally fishing[6]. I selected my informants on the islands according to their age (as I wanted to talk with fishermen and women that might be able to describe some changes to me, so they had to be more than 30 years old) and the years they had been living in the archipelago (but I also talked to people moved few years before, coming from other archipelagos, as they might have had a different perception, being outsiders, noticing particular changes taken for granted by the local community). I also tried to talk more with fishermen fishing near the reef and able to dive.

My informants in the university were both students and professors coming from the Fishery, Marine and Anthropology Departments. The first two of them provided me with scientific data about the situation of the islands and the reef, and tell me about the projects they developed there; some anthropologists had done research with the local people of Spermonde and they shared their findings with me. I mostly interviewed men, both professors and fishermen, but I had the chance to talk also to some women on the islands, married with fishermen. The group of students I interviewed from the different university departments were both girls and boys.

Among the fishermen, I interviewed both *punggawa* and *sawi* (of whom I will talk later) whereas in the city I could talk both to students and professors from the Anthropology, Fishery and Marine Department. That put me in a different position, as I could be a researcher interviewing a

[6] Actually, the sons of the fishermen start fishing at 10 years old, if they do not study. But the boys I had the chance to interview on the islands were all studying, in high school or in a university in Makassar

professor, a student talking to people of my same age that were studying as well, or a foreign guest in the islands, a *bulé*, that is to say, a white person in Bahasa Indonesian. The people I interviewed were related according to a hierarchical relationship. Sons and wives wanted to be interviewed after the father/husband, and in his presence; they mostly agreed with his statements, at least in front of me.

In every island of the Spermonde archipelago, there are patrons (*punggawa*) and clients *(sawi).* In this relationship "notions of kinship or affinity are translated into business interests and vice versa" (Acciaioli 2000; Meereboer 1998; Pelras 2000 in Pauwelussen 2016,11-12). The *punggawa* are richer than the other fishermen, so they hire men giving them the boats, or the money for buying one through a loan, as well as the equipment for fishing. "The patron provides boats and money for his catchers and so does with subsistence and security. The *punggawa's* "employees" are the *sawi*. There also middlemen, transporters that bring the fish to the harbour in Makassar every morning to sell it. "The social network in form of a patron–client system is central for Spermonde‘s fisheries. Patrons have a key position in the local society and are well connected to external traders and buyers. This allows them to obtain information on demands for resources and products, which they then pass on to their clients. In addition, patrons fill existing gaps in social security and provide some insurance against arbitrariness and uncertainty in the legal apparatus. While patrons decrease transaction costs for their clients, they also filter information in accordance with their own interests. This creates information asymmetries so that fishermen do not fish according to the real market demand, but in response to information given by their patrons" (Crona and Bodin 2010 in Ferse et al 2012, n.p.). It may seem a source of exploitation, but the patrons support the clients in several ways, especially where the government is absent, in a mutual benefit. Patrons lend money to the family of *sawi* while they are away for fishing, even for weeks. *Sawi* have limited resources, and during the rainy season (also called West season, for the strong wind coming from West) they are not able to go out to catch something, because of the storms. Whereas during the wet season, they can fish, but the debts they own to their *punggawa* oblige them to sell the fish to the patron for a low price.

In order to fully understand the dynamics inside the islander community I must underline that the scale of power might different from one island to the other: in the Makassar District, the chief of the village for each island is called " Lurah" as every island is a "Kelurahan". But, under the

Pangkep District, the islands are seen as "desa" (village) and the chief himself is called *Desa*. The *Lurah* is an official employee chosen by the government while the *Desa* is chosen by the population of the village, not by the government; he is elected by the people. Makassar is a municipality, whereas Pangkep is a regency, and they have a different administration. In my empirical chapter, I will deeper discuss the dynamics of power inside the communities and how it might affect the spread of information and, consequently, the perceptions of every inhabitant.

Generally, I may say I could talk to many people, from fishermen to professors, as I expected and hoped. Of course, I am not sure people did not lie to me or trusted me as I was a foreign researcher asking questions about their lives; but I have asked the same question more than once, seeking for details, trying not to take anything for granted.

I did not have the chance to interview NGO's staff, as expected since the projects encountered in the islands was carried out by universities or by the government. NGOs are actually more active on other Indonesian islands such as Bali, especially regarding the conservation of the environment.

3.1.3 *The approach and the methods*

My fieldwork research was exploratory[7] and ethnographic[8], carried out through participant observation, informal conversations and face to face interviews. I relied on the quantitative data (position papers, publications, photos, maps, power points, etc.) provided by the academic institutions, collecting myself qualitative information about the livelihood of local people, as their perceptions and strategies. More specifically, I conducted several face-to-face interviews and I had the chance to participate in one focus group[9]carried out by some anthropologists from

[7] According to Stebbins (2001), an exploratory approach means putting one's self in a place for a long period and collecting data through personal experiences. In my opinion, it is the act itself of investigating a certain reality in order to confirm or dismantle an hypothesis through the collection of empirical data.

[8] An ethnographic fieldwork is a qualitative research whose aim is to provide a detailed and deep description of everyday life and practices, a "thick description" as described by Clifford Geertz (1973): "doing ethnography is establishing rapport, selecting informants, transcribing texts, taking genealogies, mapping fields, keeping a diary, and so on. […] is like trying to read (in the sense of "construct a reading of') a manuscript-foreign, faded, full of ellipses, incoherencies, suspicious emendations, and tendentious commentaries, but written not in conventionalized graphs of sound but in transient examples of shaped behaviour" (Geertz 1973, 9-10).

[9] The focus group was part of a wider research commissioned at the Faculty of Anthropology of the Hasanuddin university by the Mars Company. The company is interested in developing a community-based

the University Hasanuddin in Bontosua island. My interviews were semi-structured in order to give my informants the chance to talk about their lives and explain their perceptions in their own terms. Thanks to my topic list I could keep the conversation under control, even though a few times the informants (especially women) redirected the speech towards different theme they were more interested in and demanded that I answered to their questions as well. The interview setting for the professors and students used to be the university, whereas for the fishermen's families was their home. Sometimes fishermen took me outside their houses to show me their boats, nets and the *tanggul*[10].

Differently to what expected before leaving for the field, I also analysed some photos made on the islands[11] increasing the quantity and the accuracy of my data; in fact, I had the chance to show the students I interviewed the photos I made on the islands in order to discuss about the quality of the reef, the level of the water, the constructions of *tanggul* and wave breakers and other information.

I was allowed to record every interview except two, aiming at listening again to the records with my interpreter and transcribe the interviews, expanding my field notes. The people I talked to on the islands did not know the expression "climate change" but they could describe me some consequences of this phenomenon; so, I asked about general changes in the weather etc. instead of focusing on the issue itself. That's one of the reasons for which I preferred to use face to face interviews rather than distributing questionnaires: I was not sure that local people and I used the same parameters and criteria to describe the surrounding reality, and I wanted to question personally their perceptions and the usage of a certain vocabulary rather than another one. I fact, one of the first challenges in the fieldwork has been inquiring what climate change looks like; if professors and scientists had a clear answer to this question, built up through their studies and the academic literature, the local people did not know the term "climate change" while they could describe me some aspects of it. So, I had to dig into their own experiences in order to find out the phenomena connected to climate change and the explanations the locals were given about these ones. Moreover, I think questionnaires imply the loss of precious information such as the body

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project on the island of Bontosua. They commissioned the anthropologists to investigate the local interest about the project. Participating as audience, together with my interpreter, I was able to collect information about the community life, and the locals' priorities as well, of that particular island.

[10] I will discuss about the meaning of "*tanggul*" in chapter 4; briefly, they are portions of land artificially constructed on the islands.

[11] The benefits of using pictures in an anthropological analysis have been discussed in Collier & Collier (1986).

language's aspect and I deemed them unnecessary for this kind of research, which is mostly qualitative.

Living on the islands allowed me not only to have interviews but also to practice a participant observation all along the fieldwork's period, sharing daily difficulties and rituals. I could experience the danger of navigating with a small wooden boat in the ocean, during a storm, realizing the importance of the recent approval of a life insurance for the fishermen, decided by the government. Participant observation allowed me to inspect the "backstage" of people's lives, not only the "frontstage" they showed me during our interviews. Most of the time, the backstage gives anthropologists the biggest amount of information, as well as the chance to test informants' words. Participant observation is a daily job that lasts 24 hours per day while you are living in the villages of your informants.

Being on the islands allowed me to be a full-time researcher and even in the city, in my own homestay, while I was not interviewing professors at the university, I was working on my data with my computer. Of course, my room was sort of a "safe space" where I could take a break, leaving out the rest of the world, enjoying internet and the air conditioner, two luxuries impossible to find on the islands.

Despite my purpose of being a full-time researcher, taking a break was necessary to charge my batteries up and find new energies to face such an overwhelming reality. In fact, almost every week I visited a different island and during the weekend, in Makassar, I took my time to transcribe everything on my computer. While on trips I gave the host families money for the food and the accommodation, both for me and my interpreter, who received a salary as well.

3.1.4 Linguistic issue

About the usage of interpreters, anthropologists have expressed different opinions (Borchgrevink 2003, Fabian 1971, Ferguson 1999); Fabian considers inevitable for an anthropologist to speak the local language, as language is not only a tool, but also a way to immerse yourself in a world of communicative competencies. The anthropologist, submitting him/herself to the language can live and experience reality as that local population does, describing it with the same parameters and criteria, stepping into the same historical context they live in (Fabian 1971). Unfortunately, I had not the chance to learn Bahasa Indonesian before leaving for my fieldwork, so that I was obliged to use interpreters while learning a little bit of vocabulary on the place. In the end, it

turned out to be an added value, as the help of my interpreters, also in the quality of research assistants, contributed to the improvement of the collection of my data.

My first interpreter and research assistant, Cindy, a student from the Faculty of Anthropology at Hasanuddin university, has been fundamental: thanks to her I could organize most of the trips and she was always willing to translate my questions. At the university, as professors could speak English, I was alone during the interviews. She explained me local habits and taboos and helped people to figure out what my research was about and what I was doing there. Of course, I must underline that when I quote an informant from the island I am actually quoting Cindy's translation, relying on her accuracy in translating to me; sometimes people was using the Makassarese dialect (spoken on the islands nearby the city, while on the further ones the Buginese dialect was used), so that even Cindy found it difficult to translate. After one month and a half, I had to substitute her with another research assistant, a guy, due to her personal qualms correlated to the danger of navigating during the rainy season. I did not perceive a different treatment due to the fact that I was travelling with a boy instead of a girl, even though I was expecting it from the Muslim context. Both of them gave me their opinions after every interview (for example, if the words used or the body language suggested the person was lying or trying to convey pity[12]), helping me collecting more reliable information. According to the author of "Silencing language" we should pay more attention to the usage of an interpreter during the fieldwork instead of hiding his or her presence, afraid that he or she will undermine our ethnographic authority; ‘’Fundamental issues related to language competence have remained largely unexamined’’ (Borchgrevink 2003, 95). As said before, I could experience every positive aspect the author describes: my interpreters introduced me to local costumes, were discussion partners, since with them I could check on my data fruitfully and notice new aspects and implications. They have been "gate-openers" (ivi, 109) as well, providing me many contacts and helping me in gaining people's trust.

I was fully dependent on them on the islands, so when they were busy I was obliged to stay in the city and organize interviews only with students and professors. Even going to the islands alone, not for interviewing, but for practicing participant observation was not an option, as I needed them to arrange transportations, accommodations, and for "protection" too, as going

[12] I think the factor of lying or "conveying pity" must not be underestimate as they are attempts to make sense of the world and social interactions.

alone, as a woman, would not have been perceived as appropriate and acceptable by local people. I am sure that I could not have collected so many data if I had learnt the Bahasa, going alone in the field. I must disagree with Borchgrevink when he says that the anthropologist can recognize 'the use of different styles of speech to acknowledge social hierarchies' only by speaking the local language (Borchgrevink 2003, 107); in fact, my interpreters were able to explain social hierarchies and different styles better than I could have ever done on my own.

3.2 **Ethics**

Ethics in Anthropology can be a blurred line and sometimes anthropologists must play a role, pretending to be part of a certain religious community or to be a someone with specific beliefs, and sometimes they have to simplify their research while explaining it to avoid influencing informants. In Sulawesi, everybody is categorised according to his or her religion. As an Italian, they took for granted I were a Catholic, and for that reason nobody asked me to cover my hair: I am Catholic, so I do not need too. In "real life" I am an atheist, but there, explaining the reason why I do not believe in God was too complicated and led people to think I was not reliable. During my field, I was forced into wearing a certain mask (as explained by Goffman in "The Presentation of Self in Everyday Life"): Catholic, young researcher, engaged. People wanted to know why I was not married to my boyfriend and they assumed we were engaged and ready to marry after our studies. I had to specify several times I was not investigating illegal methods such as blast or cyanide fishing. People were more relaxed about the idea to talk to me once ascertained I was interested in something else. I tried to be as sincere as possible about the focus of my research, the usage of my data and of my recordings; I have always asked people their permission for using their names and for recording them. "Informed consent does not necessarily imply or require a particular written or signed form. It is the quality of the consent, not its format, which is relevant" (AAA, 2012 – www.aanet.org) we must say that *verba volant et scripta manent* and an oral consent may be denied. We need to be sincere about our intention and make sure those who get interviewed understand our goal. Thanks to my research assistants I could check if people were influenced by my, or their presence, saying what they thought I wanted to hear. They helped me inquiring my informants' sincerity and they also explained to me

how to behave in order to respect the islanders. In the chapter about ethics of my research proposal, I pointed out how respect also means accepting that our points of view may not be the most valid one, that there is no "universal truth" and that we do not have the right to speak for someone else. We have to avoid the arrogance of thinking that we fully understand native's different points of view and we are perfectly able to summarise and explain them. Moreover, we should remember that writing our findings means fixing them in a certain lapse of time, extracting them from the temporal flux, which means they might be no longer applicable to the present. Writing my thesis, I am trying to describe the reality I discovered and how the locals experience this very reality; I submitted myself to the language (Fabian 1971), trying to embrace the same criteria locals use to face daily experiences. Of course, I was still influenced by my cultural background, watching the world around me through my European-white-Italian-female-student eyes.

Anthropologists have to know their words may be used by media, readers etc. in a different way compared to the one we expect: we have to be prepared for the distortion of our own words and all the misunderstandings that may follow. "Anthropologists have an ethical obligation to consider the potential impact of both their research and the communication or dissemination of the results of their research" (AAA, 2012 - www.aanet.org) but we are not always able to forecast the impact of our work, which may go over the consideration made. At this moment, while I am writing my thesis, I realise people may have lied to me, or have exaggerated their version of the story in order to obtain something, even only sympathy. I have to write their opinions and points of view, as well as the counterpart's ones, leaving the choice about who has to be believed to my readers. Truth has got always different shades, and I may tell what I experienced and perceived as "real" in my conclusion, but I am sure some fishermen and professors too may not agree with me *in toto*. I also have to consider the possibility my interpreters translated to me twisting the original meaning; every information I got has been filtered by their process of translating.

Avoiding judgements has been easier than I thought: I did not blame any actions or thoughts coming from my informants, as I could understand the logic and the necessity behind them. Contextualising any behaviours let me be impartial, empathic and sympathetic; even though I am an environmentalist, I did not consider some actions towards the environment as negative, even

if they were clearly damaging the ecosystem. It is always a matter of priorities. Almost every professor I talked to asked me to share my thesis once completed and almost every fisherman I interviewed asked me "How will this research benefit me/us?". They seemed to be interested in the practical consequences of my research for their lives: a new project by the government or the university, money coming from abroad, such as from Leiden University, to help them to improve their lifestyles, or other researchers coming. For example, according to my interpreter Cindy, most of them replied to my questions exaggerating their conditions in order to inspire pity and hoping for money or interests coming from "the West" or from the "big" city, Makassar.

As already mentioned in the previous chapter, I arrived at my field "biased" by my own idea about the correlation between Islam and the concept of nature. Nonetheless, as soon as I realised the situation was different from what I expected, I tossed aside my prejudices.

All my informants, except one, agreed to have their names and pictures on my thesis. They were actually proud of the idea to share their own thoughts outside of their islands. Anyway, to respect their privacy, even though their consensus, I will use their names without surnames, unless there is a homonymy. Another important ethical consideration is compensation: I compensated my guest families (on the different islands) giving money to the wife, like both professors and interpreters told me to do, in order to cover for the meals and the housing for me and my interpreters. My guest families were my first informants on every island; but I never paid to get information, and, as said before, people were glad to talk to me most of the times.

Another ethical issue is represented by the danger my interpreters and I faced during our trips; sometimes we were caught in a storm and once the motor of the boat went ablaze. At a certain point, I stopped going to the islands and started having interviews with the fishermen only in the harbour since I did not want to put me and my assistants in danger anymore. Apart from the fact that those small wooden boats are never completely safe (and that you need to buy your own life jacket), I should underline that we were there during the rainy season, so the heavy rains and the wind made everything more difficult and dangerous.

When you debate of environmental anthropology there is the risk to be biased by your love for nature and to ignore the validity of local points of view as local people may put something you care about, such as a specie threatened of extinction, or a particular ecosystem, in danger.

Nevertheless, there is also the chance to overreact in the opposite way, once in the field. We tend to adhere to the points of view of local people, because we live with them, sharing daily emotions and making friendships, with the risk to forget our former studies, the literature we collected before leaving, and to perceive every behaviour as acceptable and legitimate, even if against our moral. During the fieldwork, it is important to suspend the judgment and to be as impartial as possible in writing our findings. To me, it means whoever is going to read my publication should not either perceive a value judgment nor understand which side I take in my personal opinion.

During my fieldwork, I quite succeeded in being impartial, respecting everyone's opinion without letting my cultural background interfere (as much as possible). Once arrived on the islands, I have immediately realised local people and I had different framings: we perceived coral reefs, sea, nature, etc. in a different way. Even though looking at the reality through their framing let me build up a certain opinion, I want to write about their perceptions the most objective way possible.

4. Perceptions

In this chapter, I analyse the core of my thesis, the main characters of my study: the perceptions of the different groups I investigated, examining their points of view through my findings.

4.1 The institutions' points of view

In this paragraph, I am presenting the perceptions regarding climate change of the academic world, that's to say professors and students from the Hasanuddin University. First, I introduce the points of view of the Fishery and Marine Faculty, then the impressions collected interviewing professor and students from the Anthropology Department.
A common idea shared by the scientific world in the Hasanuddin University in Makassar, is that climate change is affecting the coral reef's health and survival, with a huge impact on the marine ecosystem and a big loss in biodiversity, in the Spermonde archipelago. Every professor from the Marine or Fishery Department I interviewed also agrees on the idea that local people in the archipelago perceive some changes, experience the consequences of climate change.
Nonetheless, local people are considered/thought to do that without relating these changes to a bigger issue.

According to Professor Dewi Yanuarita, teaching at FIKP, in the Department of Fisheries, local people do not believe in climate change. Even when researchers try to explain it, most fishermen blame the overpopulation of the islands for the scarcity of fish.

"They tend to think practically, concerned more about the daily survival than the ecosystem they live in, and those fishermen involved in conservation projects such as the COREMAP are seen as arrogant; their collaboration has not produced any positive effect. But the sea is every year more acid and warmer, while the wind is stronger" (Dewi Yanuarita, Hasanuddin University, January 2017)

She had collaborated several times with local people during university projects, but now she retains it useless. A similar opinion is shared by prof. Dadang[13], who works in the same department:

[13] Professor Dadang is the chief of PHL (pusat Studi lingkungan hidup), a study Centre for the environment.

"I do not work with the fishermen now, but I used to in the past. They have never understood the theory of climate change. They think practically: islands become smaller because of the strong winds from the west, so they fight this phenomenon by building the *tanggul*" (Prof. Dadang, Hasanuddin University, 27/01/2017)

According to his opinion, local people create waves breakers (also called "sea walls") in order to protect their houses from the sea level rise and from the waves, that are becoming bigger, but they use living corals, tearing apart the natural protection offered by the reef. I observed myself several wave breakers and *tanggul,* which I will describe later in this chapter, during my stay on the islands. Prof. Dadang explained to me how climate change is also causing frequent floods and landslides that deposit sediment from the mountains to the sea. This totality of stones and dust dropped off in the sea can contribute to the death of the coral reef. According to him, this last consequence of climate change is too far from the daily reality of the islanders, as are the causes themselves of this phenomenon, and this distance prevents the inhabitants of the archipelago from fully understanding the problem.

In Mr Idrus' opinion, professor at FIKP at Hasanuddin University, the wet season has an unusual amount of rain now and the schedule of the monsoon is upside down. "In June and July, it used to be very dry, but in the last years it rained as well" he explained to me. He added that during the dry season the temperature is higher than usual, and this leads to forests fires, especially from May to August.

The professor of marine science Ipul Yusuf rarely goes to the islands. He had a lot to tell me about the phenomenon of the coral bleaching, a phenomenon brought about by an increase in the sea water temperature. It is not a continuous phenomenon, but it appeared several times: in 1973, 1998, 2009, 2010 and 2016 are only examples of years when a portion of the reef died and the amount of fish has decreased. The recovery of the reef needs centuries, so once a part of the reef suffers from the bleaching, the present generations will not be able to benefit from it anymore.

"Few fishermen understand the causes of climate change when we explain them; they see bigger waves, smaller amount of fish, they experience the erosion of the cost, the strength of the winds but they do not relate what it is going on to the pollution. They do not use cars, and even motorbikes, with the exception of some bigger islands. They are not responsible for polluting the air so why should they suffer the consequences? They do not see the logic in it." (Ipul, Hasanuddin university, 23/01/2017)

Professor Ipul confirms that the scarcity of fish is due to an increase of the fishermen population too; as a consequence, fishermen are forced to fish far from their island, like near Buton Island (south-east of Sulawesi) or even near Borneo or Bali. "We cannot stop climate change but we can teach how to deal with it" continues Ipul "we should teach local people how to adapt to it. Today, two or three families live in the same house at the centre of the island, because of the erosion of the cost due to the sea level rise. Where once there were houses, now there is sea. So far, no social problems have come from this but we do not know what is going to happen in the future" (Hasan. Univ. 23/01/2017).

In his opinion, people have not migrated towards the city of Makassar or different islands so far, but it may happen soon. And it may start from those islands where the reef is dead, as they do not have protection anymore.

According to all of them, almost every island experienced a loss of a portion of the land, that may correspond, according to the analysis, to the passage of recorded storms (2008-2009 and, according to the islanders, in 2010 as well) and a massive coral bleaching (2009-2010). I attach here some images that show the loss of land, or the gain of it (image 2,3,4).

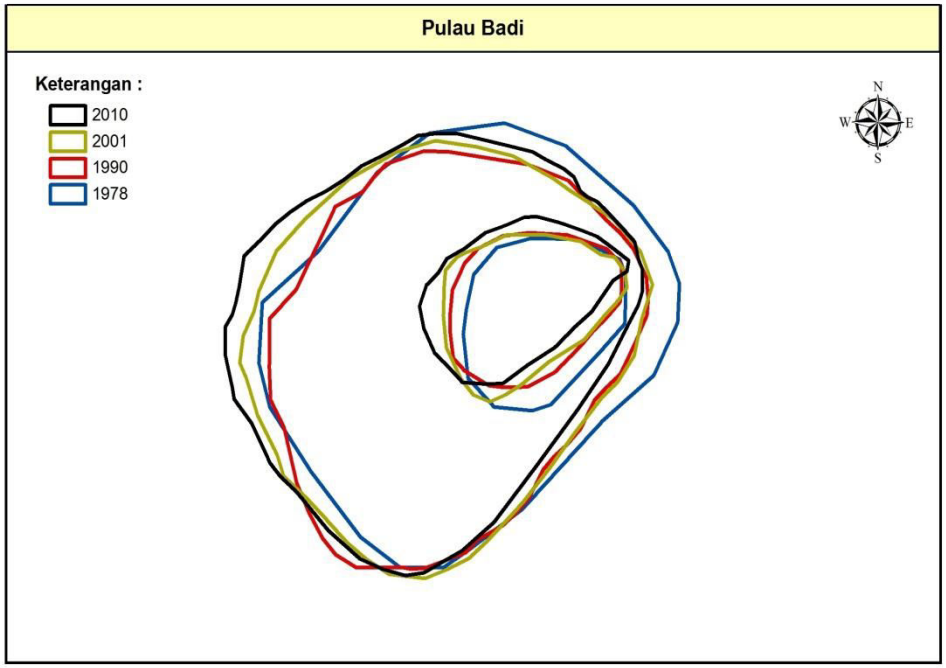

image 2

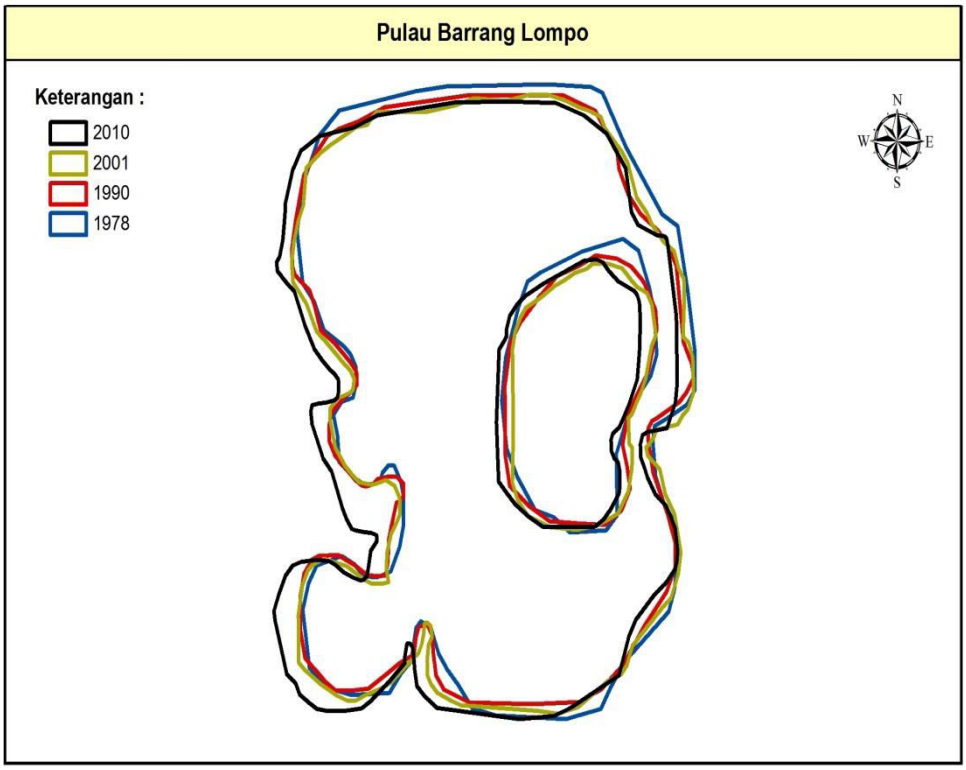

image 3

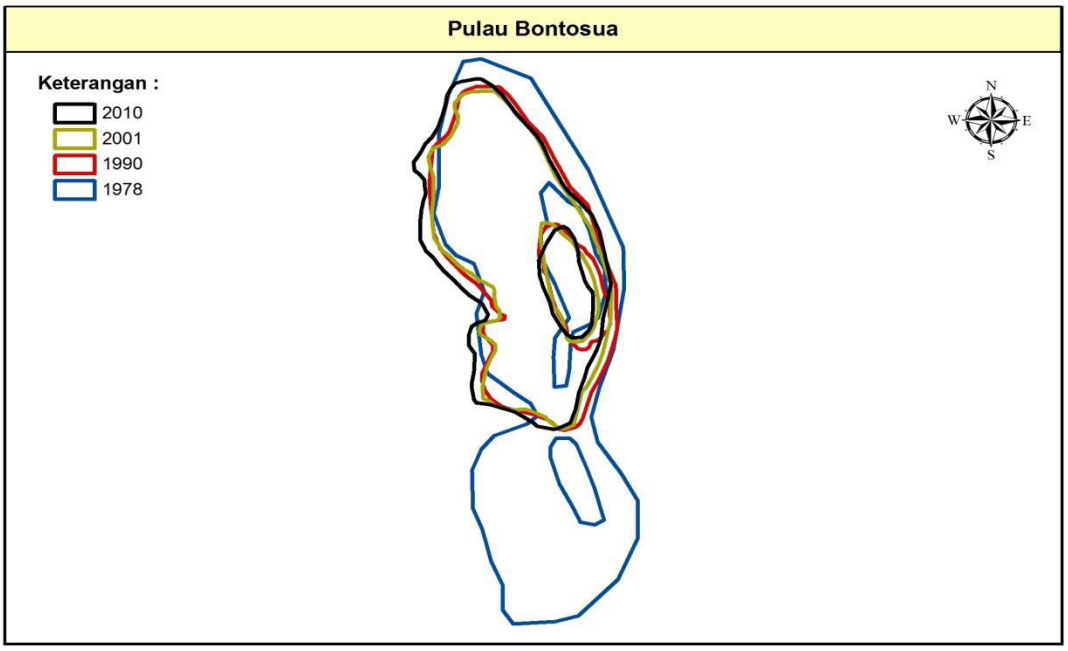

image 4

In the following pages, I will analyse charts that are part of a wider research conducted by Dr Dewi Yanaurita and other professors of Hasanuddin University. The charts show the extent of the lost and gained area, both reef and land areas, of the islands of the archipelago, subdivided into four zones. "For research proposes, Spermonde waters are divided into four zones [...] the First zone, the inner shelf, is area closest to the main island, Sulawesi, with depth average of 10 m and bottom substrate dominated by sand and mud. The second zone is approximately with the distance of more or less 5 km from the mainland, average depth 30 m and characterised with many coral islands. The third zone, starting at 12,5 km off Sulawesi with depth ranging from 20 to 50 m and where there are a lot of submerged coral reefs. The fourth zone, the outer shelf, is the zone of the barrier reef and about 30 km from the mainland of Sulawesi" said Dr Dewi (Hasan. Univ. January 2017). She gave me the permission to use her images and charts, still unpublished, and I reaffirm here her property on these data (image 2, 3,4,5-table 1,2).

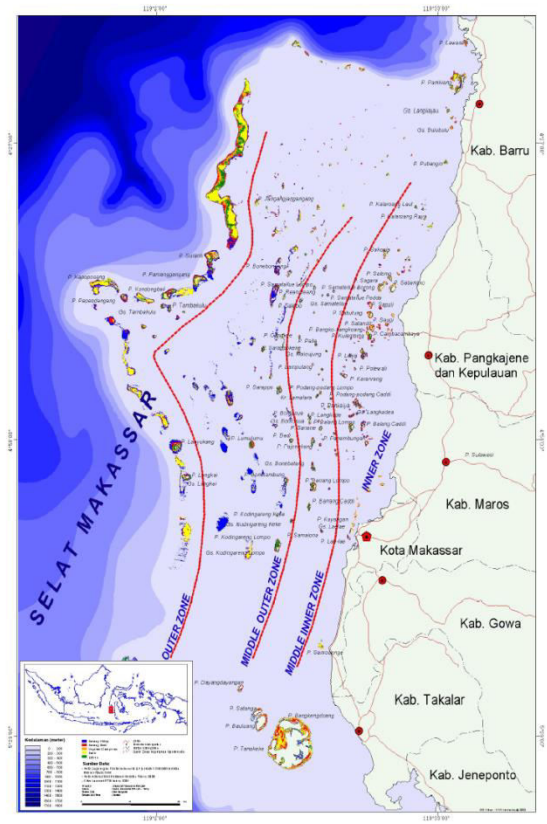

Image 5. Maps showing the study coverage of Spermonde Islands

Distribution Zone Island Extent Reef Extent

Distribution Zone	Island Extent		Reef Extent	
	Add	Loss	Add	Loss
I	4	12	12	4
II	5	13	6	12
III	2	5	2	5
IV	2	7	4	5
Total number	13	37	24	26
Total %	**26**	**74**	**48**	**52**

Table 1. Number of Islands and Island's reef flats being changed in 32 years per coral distribution zones

The studied period covers 32 years, from 1978 to 2010. It is important to underline that in the 1978 there was a growth in the fishing activities on the coral reefs, while in the 1990, destructive activities such as blast fishing became popular.

The following chart, instead, is a summary of the changes occurred in the coral reef flats from 1978 to 2010. In the next paragraph, I use a part of this table to inquire the different perceptions coming from the fishermen regarding the addition or loss of the reef flat.

Table 2. Recapitulation of Reef Flats changes over time

Islands	**Changes of Reef Flats Over Time in Hectares**			
	1978-1990	**1990-2001**	**2001-2010**	**1978-2010**
Barrang Caddi	-1.195	-0.564	0.255	-1.504
Barrang Lompo	1.82	-1.95	0.28	0.15
Bonetambung	-5.62	-13.96	10.2	**-9.38**
Sanane	-0.219	-0.39	0.808	0.199
Sabangko	-0.64	-0.01	0.45	-0.2
Bonto Sua	-3.651	-0.59	0.808	**-3.433**
Karanrang	0.141	-2.427	3.833	**1.547**
Badi	-0.506	1.464	-0.028	0.93
Pajenekang	-1.022	-0.799	1.412	-0.409
Lamputang	-0.992	-0.006	0.062	-0.936
Podang Caddi	-0.583	-0.268	0.42	-0.431
Podang Lompo	1.626	-1.802	0.328	0.152
Sabutung	5.464	-1.267	1.724	**5.921**
Laiya	-0.44	-0.51	2.83	1.88
Polewali	-0.173	-0.456	0.72	0.091
Kondong Bali	-2.73	-0.4	1.95	-1.18
Balang Lompo	-1.595	-0.705	3.53	**1.23**
Bangko-Bangkoang	-0.779	0.306	0.511	0.038
Kulambing	0.34	-0.93	-8.408	**-8.998**
Jangang-jangangan	2.16	0.267	-0.187	**2.24**
Sagara	-0.79	0.95	0.43	0.59
Bone Batang, GS	na	na	na	na
Kodingareng keke	na	na	na	na
Camba-Cambaya				0.581
Sapuli	0.883			

Labua, Gs	na	na	na	na
Cangke	na	na	na	-0.276
Lamputang	-0.992	-0.006	0.062	-0.936
Pala	na	na	0.211	-0.424
Sarappo Keke	na	na	na	-0.828
Sarappo Lompo	-6.477	2.052	na	na
Suranti	2.25	na	na	**-3.15**
Tambakulu	na	na	na	na
Tambakulu, GS	na	na	na	na
Kapoposang	na	-2.68	5.7	na
Papandangan	na	na	1.93	0.98
Salebo	na	na	0.644	-0.141
Samatallu Caddi	na	na	0.497	0.341
Samatallu Lompo	na	na	-0.24	0.081
Samatallu Tangnga	na	na	na	na
Samatellu Borong	na	na	0.266	na
Samtellu, Gs	na	na	-0.4453	na
Salemo	0.818	-0.378	na	na
Lamalara, Kr	na	na	na	-0.416
Langkadea	0.161	-1.203	na	na
Langkai	na	na	3.59	-0.23
Lanyukang	na	na	-5.78	-10.35
Lumu-lumu	-2.28	1	-0.03	-1.31
Pamanggangan	-0.16	na	na	-2.95
Panambungan	na	na	0.102	-0.137

These charts and similar quantitative data were shown to me as evidence by the professors, in order to reinforce their words. Supporting their perceptions with scientific data, professors depicted their point of view as the "real" and logical one, mostly agreeing on the pointlessness of involving local people in conservation projects; a feeling arisen after years of attempted collaboration.

A similar opinion is shared by the students of the Hasanuddin University working at environmental projects in the area. In February, I discovered the existence of a diving club composed by students of the Fishery Department, which was born in 1998 and since then it has been involved in different scientific projects on the islands regarding the rehabilitation of the reef, the collection of data, the transplantations of corals etc., as well as social projects such as empowerment of local people of the archipelago.

I met them for the first time at Paotere harbour, while they were going to Bontosua island to monitor a project started one month before. When I talked to the students of the club, in their headquarters, they explained me their different projects, which usually do not include collaboration with local people, with the exception of the project on Bontosua. In particular, they gave me precious information about the transplantation of baby corals, which I will discuss in the last chapter of my thesis, and about the construction of the??, of which I will talk in this very chapter. Their opinions mostly collide with the professors' perceptions.

"There is a decrease in the quantity and quality of the reef. The biggest impact is caused by blast fishing, but bleaching must not be underrated; there has been a huge bleaching in 2016, between May and June. Reef still has to recover from then" (boy, headquarters Diving Club, 14/02/2017)

Analysing the pictures of sea walls and *tanggul* I made, together with the help of the students, I noticed that some of corals used to build *tanggul* and sea walls were alive, some dying by bleaching, while others were already dead. We were able tell the different conditions of the corals apart thanks to their colours. According to the students' opinions, most fishermen are not able to distinguish between a dead coral and a dying one, which is white because of the process of bleaching but it still has a chance to recover and survive. So, they think the coral is dead and pull it out of the water.

"Fishermen do not see the difference between dying and dead coral reef. After you use bombs the reef is dead, it cannot recover. But after the bleaching it is just ill, it can recover!" (girl, headquarters diving club, 14/02/2017)

4.1.1 The anthropologists' points of view

According to some anthropologists working in the area, what local people perceive more as an occurring change is a variation in the weather: seasons have become unpredictable, and the fishermen themselves are no longer able to forecast the weather and schedule their fishing activities according to it. It is Muhammad Neil opinion, a professor of Anthropology at Hasanuddin University, that the perception of an unpredictability in the seasons is due not only to natural factors, but to human capacity as well: the ability to predict the weather used to be fundamental for the population of the archipelago up until 30 years ago. But nowadays the

population does not sail anymore: they use motor-boats instead. That changed the perception of the weather, as they do not need to avoid storms anymore: they can come back home in few hours thanks to the new technologies. They do not risk being caught in a storm in the middle of the ocean, days far away from their home. According to this view, due to this factor the old skill of sailing has been lost and the weather is perceived as more instable.

Generally, anthropologists agreed with the other scholars in describing local people as more focused on practical issues, in particular on direct threats to their economy, than on environmental issues; but they consider wrong the approach of people involved in conservation efforts: instead of focusing on what is relevant according to their studies, scholars interested in collaborating with fishermen should prioritise factors with a local relevance.

Social and cultural surveys may underlie a successful community-based program, providing the necessary requirements for a fruitful collaboration.

To sum up, the academic perceptions illustrate a unified idea about the consequences of climate change, that must be mitigated through conservation projects. The opinions regarding the best approach for developing these projects diverge between my informants. Analysing my findings, it seems that both professors and students consider local people able neither to conceive local phenomena at a global level nor to foresee a long-term effect of climate change. Their perceptions conflict with the idea of an indigenous knowledge and surely, they do not describe the islanders as “eco-friendly noble savages”. Moreover, they all suggest that religion may play a role in affecting local perceptions. Nonetheless, they never connected this influence to their own perceptions, even though they are Muslim as well.

4.2 "What is happening to your island?"

After examining the scientific point of view on the effects correlated with climate change, I want to introduce the opinions I collected from the fishermen and the other inhabitants of the islands of the Spermonde archipelago. What is going on, according to them?

Every person I talked to, agreed on the necessity of building sea walls to protect the islands from big waves and from the sea level rise. None of them related the rise of the water or the increase in the dimension of the waves to a bigger and more general issue such as climate change. Actually, some of them specified that it is a natural phenomenon that already happened in the past (but they could not tell me exactly when).

"The level of the water is the same, it changes only according to seasons" (H Mante, Pulau Badi, 12/02/2017)

"Yes, the water level is rising, but it is a natural phenomenon, it used to happen also when I was a child and when my grandfather was a child. Now it is just faster than it used to be. But we build wave breakers and we are fine" (H Abd Kadir-*pungawwa* of the island, Pulau Bontosua, 25/01/2017)

Every informant named the *tanggul* and the wave breakers, so I am going to dedicate one sub-chapter to this argument and their fundamental importance for the islanders, as the main survival strategy to face the impact of climate change.

Apart from the sea level rise and the bigger waves, most fishermen, and their wives as well, complained about the amount of fish. Today, they say, there is less fish than years ago. If the half of my informants could not explain the reason why the fish is less, the other half of them either blamed the death of the reef:

"I only know there is less fish because the reef is dead. Actually, some scientists told me that, but I do not dive. I do not know the reason why it is dead" (old fisherman, Pulau Badi, 12/02/2017)

"It is sure that the fish is less; I think the fault is of the fishermen who use bombs, because they destroy the reef " (Rasul, Pulau Barrang Lompo. 2/02/17)

or blamed the overpopulation of the islands, a fact confirmed by the academic world:

"There are too people on the island, and they can catch lots of fish thanks to the new techniques"(Dg Sai, Pulau Barrang Lompo, 3/02/2017).

"We are so many fishermen compared to the past "(Rahmat, Pulau Barrang Lompo, 5/02/2017).

"There is less fish compared to years ago because there are more fishermen. That's normal, there were lots of births in the last decades and there are still lots of children every year" (H Abd Kadir-*pungawwa* of the island, Pulau Bontosua, 25/01/2017).

Few informants did not perceive a decrease in the amount of fish. On the contrary, thanks to new technologies they can catch more fish today compared to years ago. Catching more, they perceive an increase in the amount of fish in the sea itself.

"There is much more fish today than in the past; we have better and new technologies and we catch a lot. But there are more people so the prices are higher, because there is more competition: today you have to pay 3000 rupiah for a *katombo* while years ago I used to pay 5000 rupiah for ten of it!" (Ridwan's *ibu*[14], Pulau Bontosua, 24/01/2017).

"I think today the fish is more than in the past, we catch a lot" (Andi, Paotere harbour, 10/03/2017)

A good percentage of the interviewed noticed that the wind is stronger than it used to be a decade ago, and only a few complained about the change of the currents, which forces them to find new places to fish. The majority of my informants agreed on one phenomenon: compared to the past, the seasons are unpredictable today; it is impossible to say how long it will rain, and sometimes it rains during the dry season as well. At the same time, there are days without a single drop of water during the wet season. Unpredictable seasons, changes in the currents or in the amount of rainfall and changes in the direction and in the intensity of the winds: all these factors contribute to an economic uncertainty, due to a different amount and quality of fish, as to the necessity to move to new places to catch something. Most of my informants said they have been obliged several times to sail far from their islands, even to Kalimantan, Bali, Papua or Brunei. One of my informants, Rasul, an old fisherman living on Barrang Lompo Island, actually overpassed the border to Australia and got imprisoned for that.

When I started my thesis, I thought the most urgent and pressing consequence of climate change

[14] "Ibu" means wife. She did not tell her name, though she agreed in been quoted as "Ridwan's wife".

occurring in the archipelago was the sea level rise. But this factor, even though it is present, is not perceived as urgent as others, such as, for example, the unpredictability of seasons.

"During my life, I had to fish all around Indonesia, in Java, Kalimantan, even in Borneo and Papua" ((Rasul, Pulau Barrang Lompo. 2/02/17)

"I am obliged to fish far away from home: in Borneo, Moluccas and Kalimantan, both to find fishes and sea cucumber" (Anonymous, Pulau Barrang Lompo, 3/02/2017)

In page 33 and 34 I attached some images that show the loss or gain of some islands. I have asked people from Badi, Bontosua, Bonetambung, Barrang Caddi and Barrang lompo if they perceived a difference in the extension of their land.

Table 2. Recapitulation of Reef Flats changes over time, an abstract

Islands	**Changes of Reef Flats Over Time in Hectares**			
	1978-1990	**1990-2001**	**2001-2010**	**1978-2010**
Barrang Caddi	-1.195	-0.564	0.255	-1.504
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Bonto Sua	-3.651	-0.59	0.808	**-3.433**
Karanrang	0.141	-2.427	3.833	**1.547**
Badi	-0.506	1.464	-0.028	0.93

According to the image and the table, the island of Bontosua, in about 30 years, had lost 3.4 ha of coral reef, and we can see a decrease in the land portion of the island as well. The people I interviewed explained to me that the loss of land due to the sea level rise is a natural phenomenon that has always existed, but it has been quickly worsening, so that they have to build wave breakers and *tanggul*.

"I do not perceive any change except for the fact the island is a little bit smaller and the water is rising. It always happened but now it is faster and the wave breakers are submerged" (Dg Juma, Pulau Badi 11/02/2017)

"The water comes and goes, it is normal...sometimes it rises, some years the opposite. I think it is nature" (Mapudo, Paotere harbour 1/03/2017)

The island of Barrang Lompo actually gained 0.15 ha of reef flat, while the island area did not lose land but changed its shape, due to the wind, that moved the sand. People here, according to the results of my interviews, share the idea of a coastal erosion that reduces the dimension of the island, but this it is not perceived as a problem, as they build lots of *tanggul* to gain land. Actually, they think the island is bigger now compared to the past thanks to their intervention.

The island of Badi gained 1.5 ha of reef flat and conserved the same amount of land, even though the winds contributed to the movement of the island toward the west. Yet, the general perception of the people here is that the island is getting smaller and smaller every year.

Both people from Bonetambung and Barrang Caddi did not know what to answer me, but I must underline I have spoken with few men coming from these islands compared to the others.

A particular fact, the island of Karanrang gained a good percentage of reef flat, even if the population of the island is known for the systematic usage of blast fishing and other illegal methods. The result of the table is not in contrast with the reality of facts as every fisherman, and professors as well, confirmed that people using bombs or similar illegal methods make use of them far from their islands. In Bontosua, in order to defend their reef from "bombing" fishermen coming from other parts of the archipelago, local men created a group of "fake policemen". They organise in patrols and, by showing fake weapons actually made of paper (image 6) and by pretending to be policemen, they succeeded in shooing away unwelcome fishermen. Some of these men collaborated with the COREMAP a project I discuss in one of the next chapter, and it contributes to a different perception of the coral reef and its biodiversity.

In Bontosua my informants also explained to me how different laws and technologies changed their way of fishing. Some nets were forbidden by the government in order to protect the reef. They also possess new devices able to measure the temperature and the depth of the sea.

My first informant on this island, Mr Ridwan, of whom I talk better later on, started a pearl cultivation some years ago; he believes that climate change's consequences are actually helping his new activity: bigger waves and stronger currents bring more plankton and other nutrients to the pearls, that flourish.

In Pulau Badi, a huge, very ancient tree fell down (image 7) during a storm and destroyed the school of the island. Nobody was able to tell me the precise moment when it happened, but according to the researcher Muhammad Neil, it was seven years ago, in 2010. "It is not clear who has to pay for it, so nobody moves the tree and repair the school" (Hasan. Univ. 14/02/2017). Being in Pulau Badi for some days I could see that they use another building as a school. This incident influenced the locals' answers about my questions regarding latest changes and consequences of climate change; everybody immediately told me about the tree, complaining about the strong winds threatening them.


image 6

 image 7

4.2.1 Young fishermen

During my stay on the islands, I had the chance to interview some fishermen' sons too. I mostly wanted to inquire their future plans: were they willing to remain in the archipelago, or did they prefer the idea of moving to Makassar, Java or abroad, leaving the islands for good? Is there a sense in worrying about the future livelihood of the Spermonde archipelago if nobody is going to live there anyway? I collected answers to my questions and new insights as well. First of all, most teenagers who attend high school and universities are girls. The boys start working with their father at 10 years old. Only a few islands have middle and high schools (such as Barrang Lompo), whereas most of them only have primary schools. Sending children to other islands to study has a cost, and boys are considered future fishermen. I met few boys representing an exception, as they were attending the University in Makassar. As women are not going to fish, they usually go on studying even after primary school. I have never seen a girl after her 17th on the islands: when I asked the parents, they told me daughters were in the city to attend classes at the university, high school or to work there. Later on, some of them manage to find a job on the mainland, or even in Java, and do not come back to their home islands. Others decide to come back, marrying a fisherman and becoming teachers at the primary school, nurses in the little emergency room of their island or housewives. When a son or a daughter decides to attend university, he/she usually goes for a "practical" faculty like the Economy one. The Faculty of Economy is considered to be the best faculty to find a job soon, and a good way to help the family improving business skills and bargains as well.

Sending a child to school is expensive and it often requires a loan by a *punggawa*, but every single father and mother I talked to wanted his\her kids to have a better education and find a good job in a city, leaving the island. Apart from one man, in Badi, who answered me: "I have no money to send my son to school, so he has to be a fisherman" all the others were making big sacrifices to guarantee their heirs a "better life". Mr Ridwan, for example, has three boys and a little girl, the youngest of the family. He thinks his third boy, who is now ten years old would be a perfect *pungawwa*. But he hopes the others will go and find a job in the city. The older sons, 15 and 20 years old, are now studying at a high school and in a university in Makassar. On Bontosua, I had the chance to interview the sons of a *punggawa*. The eldest is studying in the "Unismo" University in Makassar, in the Faculty of languages. He never heard about the "climate change", either he noticed any changes in the surrounding environment. I could collect the same answers from the younger brother. The *pungawwa*'s sons are emblems of the types of answers I could get from every young guy I interviewed on the islands: they all swim, dive and fish; they know some parts of the reef is dead and blame fishermen that use explosives for that. I have asked them if they have ever heard the term “climate change” at the university, but they replied to me that they are attending faculties that have nothing to share with environmental problematics. Talking with them about the causes and consequences of climate change, they connected all my observations to blast fishing. None of them have ever been involved in a conservation projects, and neither have been their parents, so they could not tell me a lot about that. Some of them have been fishermen since their 10, others were studying in high school or university, mostly Economy or Languages. In Barrang Lompo there is a high school and, according to a local teacher, 4 kids out of 10 go to the university after high school. Once finished studying, half of them will stay in Makassar looking for a job, while half will come back to the island to be a teacher, a doctor in the E.R. or working in the major's office (especially women). According to Ibrahim, the local teacher, "everybody would like to send their children to school: being a fisherman is too risky". And the new generations seem to agree: most of them wants to study and work in the city of Makassar. "But some of them change their mind while they are studying in Makassar" adds Muhammad Neil "they are used to live on a small island, where everybody knows each other, where their mother is providing food and money, administrating the finance of the house. They do not spend much time with the father, always fishing, but they

are used to rely on the mother for every need. And on the whole community". The young boys I talked to on the islands were students, living in the city; they agreed about the fact sons and daughters of the fishermen often feel lonely and lost in the Makassar, stressed by the level of competition inside the university, while in the islands everybody helps each other. Sometimes they come back and decide to be a fisherman, in the end. Daughters attend the academic world more than sons; even if their purpose is to come back to the island and get married, they want to study Economy or a similar course in order to be good administrators of the house's finances. It is a responsibility of the wife. In several families, it is the wife that every morning goes to the market at the harbour of Makassar to sell fish. "The kids grow up roaming freely around the island, with no supervision. They ask their mothers for money every day to buy candies or toys in the little stores of the island (run by the women too)" Neil continues "when they arrive in Makassar they are not used to manage their money or live alone. Boys often quit and come back to their home" (Hasan. Univ. 14/02/2017)

As young girls were studying in the city I did not have the chance to talk with them while on the islands, and I was not able, through my contacts, to find them in the city. The limited period of time at my disposal for my research did not allow me to search for them.

Nobody on the island was worried about a possible future depopulation of the archipelago, neither for causes related to climate change nor for a massive migration of the new generations towards the mainland for job issues. Despite their parents' wishes most sons will be fishermen and have families in the same place they were born. What worried local people, especially parents, was the future quantity of fish: they were experiencing a decrease in the number of fish caught day by day and, on some islands, even an increase in the human population. They worried about the possibility that the fish will not be enough to feed everybody.

4.3 The *tanggul*, or the reef as a barrier

Another bias I discarded was the idea of the coral reef as an important ecosystem according to the local population. Apart from the richness in biodiversity, I thought the islanders would have considered the reef as a fundamental factor to their economy, and I imagined they would have been keen on preserving the reef's health in order to defend their interests, as well as their livelihood. After one month of interviews, I could understand I was wrong. They catch different kinds of fish, according to the domestic and international market's requests, both near the reef and in the open ocean. From my interviews and my experience there, I am able to say local people do not perceive a correlation among the health of the coral reef and the amount of fish or the wellbeing of their activity. They perceive fish as something that comes and goes, and if there is little fish, that might be because too many fishermen are working in the same area or because Allah has decided like this. That is "nature", and the "natural order of things" always shows moments of abundance and moments of scarcity. Most of my informants showed confidence about the idea that nature will provide what they need without any human intervention. People who had been involved in conservation projects, or had heard about them, suggested to address those efforts towards other problematics, such as the garbage management, being sceptical on the benefits of directly affecting the marine ecosystem.

That said, all my informants perceived the reef as a barrier, a protection against the big waves and the rise in the level of the sea. In the next chapter, I make my considerations about the failure of some conservation projects that tried to save the reef, especially from blast fishing; these projects conveyed the message that the reef was precious for its rich biodiversity and its importance to the economy, partially ignoring the protection it offers. Every island I visited had several "sea walls" and "*tanggul*". The difference between these two elements is often blurred and unclear. For some people, these are two synonymous: a wall built in the sea, few meters far from the beach, made of stones, construction materials and corals. There are lots of sea walls surrounding every island, some of them are already under the water, even though they had been built only 4 or 5 years ago. Every person I talked to agrees on the necessity of building more sea walls to protect the island. On some islands, the *tanggul* was not synonymous for sea wall, whereas a portion of land created ex novo using stones, sand and corals. Where once was sea,

now a new part of the land has been created so that new houses can be built. This process is not perceived as necessary because of the overpopulation of the islands, but because of the loss of land almost every island is experiencing. Sea level rise and erosion of the beaches steal land to the people, who decided to gain new space, taking it back from the sea.

The construction of a *tanggul* is easy: it starts by outlining a squared portion of sand nearby the beach which has already been submerged by water, the aforementioned sea walls. When sea water has evaporated they begin to fill the hole with scraps of metal, stones, bricks and corals, both dead and alive, and even garbage. When they are done, they cover the newly created *tanggul* in concrete, allowing houses to be constructed on it.

About the usage of corals in the construction, I received different answers: some fishermen said the corals used for the *tanggul* were already dead, while others explained to me how they took corals from the reef, still alive, to build the wall. As explained before, according to the students of the diving club, few fishermen are able to distinguish between dead and dying coral and just use both of them for the *tanggul*'s construction.

Local people recognise as daily reality certain consequences of climate change, re-conducting their causes either to a natural order of things or to a human action. Therefore, they are sceptical towards the usefulness of conservation programs and, as I deeply discuss in chapter 6, generally disappointed by the past projects. They developed strategies to face these practical issues (sea level rise, bigger waves, etc.) and showed confidence in their capability to deal with future challenges. A man told me on the boat back to the harbour “if the water comes, we will find a solution to survive”. That is the spread mentality I could perceive while talking to my informants: a sense of confidence bestowed by their adaptation capabilities and faith in Allah.

5. Influences

During my time on the islands, I soon realized neither climate change nor its consequences were perceived as problems. Local people answered to my questions underlining an aspect of their daily life that I did not consider before entering the field and that they perceived as the most urgent problem: waste management. The islands were packed with garbage and people expressed their frustration towards the government, which had forbidden them to dispose of the waste in the way they deemed more appropriate, without providing an indispensable service. Both locals and institutions, that's to say, professors and students, perceived another problem as more pressing than climate change: blast fishing.

Blast and cyanide fishing are two illegal methods that catch fish through the usage of bombs and poison. Professors and students recognized it as the first cause of reef's death, whereas fishermen that do not use such illegal methods blamed people using them for the scarcity of fish and the destruction of the reef.

I consider these two factors as very important for the full comprehension of local perceptions related to climate change, since their influences generated specific reactions in the social actors involved in my study.

Another factor of influence, aforementioned in my theoretical framework, is the role religion plays in the perception of nature. In the last paragraph of this chapter I examine my findings about this very influence.

5.1 The garbage management

Living on the islands I directly experienced problem of the waste management. It is an urgent problem that comfortably beats the consequences of climate change or every interest in conservation projects according to the islanders I talked to. The garbage produced on the islands stays there or ends up in the sea. More than 30% of my informants mentioned the problem of the garbage even though I had not asked about that. Some people stopped me around the islands to ask me if I had been sent by the government to check on the wellbeing of the island and to solve the problem of the garbage.

The mainland does not send boats to collect and manage wastes, but, at the same time, the law forbids the inhabitants of the islands to get rid of it by burying or burning it. In response to that, local people throw everything on the beach, waiting for the tides to take the waste away. But most of the islands I visited do actually dig holes to bury or set it on fire, even though these practices are illegal. Some people in Barrang Lompo asked me if I was an employee of the government sent to solve the garbage problem. Barrang Lompo is the island where I perceived more intolerance towards the problem:

"They sell objects in plastic and then forbid us to burn them; once everything was made with wood and it did not stay in here, but today it is different and the government left us alone to face this problem: plastic is everywhere" (Anonymous, Pulau Barrang Lompo, 3/02/2017)

People feel abandoned by the government of the mainland and regret the time everything was made of wooden instead of plastic.

This problem is not perceived as "natural", due to Allah's will[15], whereas as something the administration of Makassar should take care of. Nobody does nothing and the beaches are packed with plastic bottles, tampons, broken toys, plastic packaging and glass splinters. Some fishermen connected the bad condition of the reef or the scarcity of fish with the pollution caused by the garbage.

"They teach us to recycle but nothing more. The say 'do not do this, or that' and teach the children in primary school not to throw garbage on the street but the garbage is left on the island. The government does not do enough about it. I also think that a project such as the transplantation could not work here, it is too polluted" (Jamal, keeper of the university research station, Pulau Barrang Lompo 1/02/2017)

"I think the fish is dying for the plastic it is in the ocean...maybe also for the bombs, or because the reef is dying, but I think the biggest cause is the plastic" (Anonymous, Pulau Barrang Lompo, 3/02/2017)

In Barrang Lompo there has been a project carried out by students from the Hasanuddin University, alongside the government, about the garbage. They went to the primary school to

[15] Differently from climate change, which was perceived as natural according to some informants, a phenomenon due to God's will.

educate children. They also built trashcan, which can be seen in the streets. But once the garbage is collected the process does not go on. The government stopped the digging of a hole in the centre of the island in which to bury the garbage, but it did not give alternative solutions. So, people go on burying and burning waste, as no barges are coming from Makassar to take it.
I asked both local people and professors of the university what their opinions were about the idea of making Spermonde become a site for eco-tourism: the presence of tourists interested in diving and snorkeling may help to preserve the coral reef and to keep the beaches clean. The locals seemed interested in a new source of profit and enthusiastic about the possible presence of *bulé* or Indonesian coming from other parts of the Country, but the argument remained on a theoretical level. On the contrary, professors seemed to be quite pessimistic: they consider the islands unable to host tourists and the ecosystem of the reef too delicate to handle the damage brought by careless visitors.

According to Mr Idrus, "tourism is good but not a panacea, not the answer to everything: there is this national trend of thinking that tourism is always good; the heads of local areas want tourists, from abroad or domestic ones, even overseas tourists. But not every time you can have a touristic destination: you need the beauty of nature but also a certain situation (hygiene, security, facilities, etc.). Local leaders would like it but I am not convinced".

In the end, the garbage management is a problem still present in the daily life of islanders and it obfuscates every other matter.

5.2 Blast fishing

"They forbid us to use bombs but we are let to starve"
(Dg Sai, Pulau Barrang Lompo, 3/02/2017)

Since a man of the island has once lost his arm because of a bomb, nobody in Bontosua uses blast fishing anymore. In addition to that, the COREMAP project helped raising awareness about illegal methods of fishing and the importance of a healthy reef, at least according to the opinions of some fishermen living there, who collaborated with the governmental program itself.

"COREMAP explained to us why bombs are dangerous for the environment but we were not using them even before, since when one of the old men of the islands had that accident" (Ridwan, Pulau Bontosua, 24/01/2017)

In Barrang Lompo people refused to talk to me about blast fishing. The only answer I got was "it is a business of people using it" from a man who wanted to stay anonymous. According to the professors I interviewed, some people on this island still use illegal methods, especially blast fishing. "They use big boats, similar to the Navy's ones, so nobody will stop and check them" explained to me, Professor Neil "they call themselves 'ice traders', in Bahasa '*Pa es*', spelled also '*panges*' and they actually have lots of ice on board, but that is because fish killed using bombs deteriorate quickly, so you need more ice to preserve it; but if someone stops them, they can say they sell ice!".

There are some important points that explains the reasons behind the usage of illegal methods, and I came to know them talking both to fishermen and professors. First of all, trivially, bombs allow catching a bigger amount of prey, while poison allows to catch bigger fishes. Sometimes fishermen do not catch more fish in order to sell it and earn more money but because they are forced to by an important visitor. When the mayor of Makassar, or another important guest, is coming to an island, he/she expects to eat fresh fish, and a big amount of it. Blast fishing is the fastest way. Another important factor for using blast fishing is the social one. That's a factor only the anthropologist Neil talked me about, while scientists never mentioned it. But his theory was confirmed by the fishermen I asked to. When a fisherman decides to use bombs, everybody knows that, and follows him to the spot. After throwing the bomb, fishes die for the shock wave and they start sinking. At the same time, fishes that have not died for the blast wave start swimming away. While the "bomber" is diving to collect the dead fish, other fishermen are surrounding the spot with their nets in order to catch the fish that's escaping. They will be able to collect a lot of fish; it is an implicit pact that the fish caught around the explosion spot is a "gift" the bomber is doing in return for the silence of the community about this illegal practice. The *Pagai* use little bombs in their nets as well, when they catch too many, or too big, fishes, in order to avoid them breaking the net and swimming away. Differently, the usage of cyanide (Potassium Cianida) has no social factors, and it is less dangerous for the environment compared to bombs, according to my informants' perceptions, who describe poison has a practice with a smaller impact.

"I do not think fishermen should use bombs...but the poison is not bad. Sometimes we need to catch big fishes, or just a lot of them, because an important guest is coming, then, in that case we are forced to use certain methods...[...] but poison, I am not sure poison is illegal" (Muhammad, Paotere harbour, 8/03/2017)

"We used to do blast fishing, but years ago...it was a rich catch for everybody but now it is forbidden so we stopped" (Undung, Paotere harbour, 27/02/2017)

"We had to stop using bombs. I am not happy about it, we catch less without bombs, but it is the government that decided" (Anonymous, Pulau Barrang Lompo, 3/02/2017)

Blast fishing, beside killing a large number of creatures, destroys a big portion of the reef, leaving behind a cemetery of debris; "furthermore, reef destruction through blast fishing was shown to increase the proportion and spatial extent of coral rubble, which because of its low resistance to physical dislodgement by waves and currents may provide a killing field for coral spat" (Harrison and Wallace, 1990; Fox et al., 2003 in Sawall et al. 2013, 375). Instead of killing plenty of fish, cyanide is used only on few chosen preys, especially big fishes. The poison stuns the fish, makes them feel tired and sleepy so that it is easier to catch them. According to my informants' words, that is a lonely activity, from which only one family benefits. It is less dangerous as it infects only few, and grown up, fishes, not the younger ones. Moreover, it does not destroy a large part of reef, unless a big quantity of it is used. Cyanide is used for catching coral reef fish too, for the international market. About the damages it can bring to the reef, different opinions could be found on the web: "the greater damage inflicted by cyanide fishing is to the coral reefs where it is employed, as cyanide kills the reefs and also many of the life forms that rely on them. Researchers estimate that more than a million kilograms of cyanide have been squirted onto Philippine reefs alone over the last half century" (https://www.scientificamerican.com/article/cyanide-fishing/), and "coral exposed to cyanide can bleach and die. Non-targeted fish and other organisms left behind also can die. Even the fish caught for sale in pet shops may die within a few weeks or months after the cyanide treatment." (https://www.sciencenewsforstudents.org/article/catching-dory-fish-can-poison-entire-coral-reef-ecosystems). According to Dzombak (2005) there are various kinds of cyanide and they vary in their toxicity to animals and plants; it can actually cause bleaching and death of coral reefs, and be dangerous for human beings as well. The poison has not been universally recognized as dangerous for human beings, and it has been recently introduced by Japanese in Indonesia-South East Asia, whereas the blast fishing was introduced a few decades ago by the Chinese, at least according to my informants. Only fishermen with a "*joloro*", a type of big boat, are able to use cyanide, as it requires diving, with an air compressor; "the large size of the *joloro* allows the

fishermen to carry a compressor, which allows them to dive deeper and longer, especially to catch the fish with the highest economic value in the market, such as the High-finned grouper (Cromileptes altivelis)" (Radjawali 2012, 552). A small boat, called "*lepa-lepa*", allows to catch only few fish for week, while a *joloro* guarantee more than 15 fishes per week. "This increases even more to about 20 fish if they use cyanide" (ibidem).

All the professors I interviewed agreed in defining blast and cyanide fishing the major causes of coral reef's death, as well as a decoy for local people to focus their attention, that's to say an issue preventing people from realizing the consequences of climate change. According to Professor M. R. Idrus, a solution to stop the usage of poison or bombs might be the creation of a market that requests only healthy fish. While it is not easy to understand if a fish has tracks of cyanide in the organism, the effects of a blast on the marine fauna are extremely evident. Anomalous body inclinations and crushed bones are very easy to spot; the shockwave generated by a blast greatly wounds organs, such as stomach, liver and heart, which causes a massive and fatal internal bleeding, eventually leading to an inevitable death. "Coastal communities care about something only if it is important for their livelihood, in terms of economy" Prof. M. R. Idrus explained to me "We need to raise the awareness of the value of the reef, so they will care about it. In Wakatobi[10] they used to sell dynamite fish locally because you cannot sell it abroad, for its low quality; the traders in charge of the export market only wanted fresh alive fish, so they use only poison, not bombs, for the fish destined to be sold abroad. Generally, fishermen prefer to sell abroad, as it gives more money to export instead of selling locally. But recently from Singapore and Hong Kong, they are asking for fish not poisoned, really caught with natural methods, so local fishermen in Wakatobi[16] stopped using cyanide. Now, they use lines because the sellers are requiring it, and they pay more for the fish caught with lines than poison. The intermediators became expert in distinguishing good fish and poisoned one, so the fishermen do not use poison anymore, otherwise they cannot sell their fish for a lot of money. They earn 400 000 rupiah per kilo for one kind of fish caught like this, for example, for the grouper. You can earn even millions of rupiah using sustainable methods. If you catch two big groupers in one day you have 1 million and a half of rupiah[17]. If I do that I could not teach anymore!" (Hasan. Univ.

[16] Wakatobi is an island in the regency of the same name, in the national park of Taman, south east Sulawesi.

[17] One million and a half rupias are around 100 euros, but for Indonesian standards it is a lot of money, that may guarantee the survival of one person per one month.

20/02/2017).

In conclusion, a market requiring fresh alive fish caught with sustainable methods, both for aquariums and for food market will discourage the usage of blast fishing and avoid the creation of debts, as it does not require fishermen to possess a big boat and the appropriate equipment, contrary to blast fishing.

In Barrang Lompo most of my informants did not agree with the government's decision to make illegal methods such as blast and cyanide fishing: "sometimes people need them otherwise they will starve" said Mr DG Sai, "the government gave us some boats...sometimes they allocate funds, for projects or just to help us, but they do not use that money properly". Both he and his neighbour, Mr DG Bali showed me the boats, left abandoned on the beach "those boats, we received for free, are low end. The quality is poor, they sink, we cannot use them"; when I have asked if they complained about that, they answered that they did not know *how* to do that and to *whom*.

Blast and cyanide fishing are not the only illegal activities. Some fishermen in the Spermonde are "*pa trol*", where the "*troll*" is a thin net fishermen use to catch fishes. It is illegal, as it destroy the sea bottom, coral reef included. But these fishermen name themselves "*parenreng*" or "*parere*", which means "to pull", so they are fishermen "pulling the net" and their activity is no longer illegal. "If you change the name of an illegal activity, it becomes legal. That is how Indonesia works" concludes the anthropologist Muhammad Neil. Even fishermen using cyanide introduce themselves as "*paselang*" (literally "the diver") that is the same term used by spear gun fishermen; in fact, both of them have to dive in order to catch fishes.

Generally, I could myself perceive a blurred line between legal and illegal methods while living on the islands, as the major influence on people's choices is survival, guaranteed by a certain income of fish and money.

As for the garbage's problem, people feel abandoned by the government, that forbids things without providing alternatives.

To sum up, both problems modify the local perceptions about climate change and are connected to the very idea of "nature" which is shared by the population of the islands and by the academic world; indeed, if the last group recognizes nature as something to protect from the pollution caused by the garbage and the destruction caused by illegal methods of fishing, the first group of my informants perceive an annoyance in living surrounded by waste and a disadvantage in

giving up on blast and cyanide fishing, relating both issues (garbage management and the ban of illegal practices) to a personal, and community, inconvenience able to condition their livelihood in a negative way. These two concerns push local people to shelve the problems correlated with climate change and lead local perceptions in considering climate change's consequences as secondary.

5.3 The influence of religion

As already mentioned in Chapter 2, before leaving for my field I took for granted that my informants, both islanders and scientists, being Muslims, shared the same notion of "nature", a notion very similar to the Christian one: I though these two monotheism agreed in depicting "nature" as a gift received from God, something "inferior" compared to human beings, who could use and modify it for their needs. In Christianity the role of humans is strong: either to preserve nature in its quality of part of God's creation, a paternalistic attitude more than a recognition of the importance of nature *per se* and in its guarantying humans' livelihood, or to exploit it in order to "be fruitful and increase in number[18]", the doctrine is firmly anthropocentric. In addition, I expected an attitude more centered on the safeguard of Nature coming from the scientists, because of the influence of academic literature about climate change.

Once there, I had to partly reconsider my prejudices: compared to my expectations, local people on the islands had a different attitude towards nature, which was influenced by an aspect of their religion that is missing in Christian dogma; scientists, instead, were strongly influenced in their perceptions by the global academic opinions regarding the environment, its safeguard and the issue of climate change, as I had foreseen.

First of all, I must specify that I found quite a syncretic environment, where Islam encountered a process of *métissage* with local habits and pre-Islamic practices. One example is a temple I saw on every island I visited, a wooden shed on the beach where almost every morning, according to my informants' words, a rooster is killed to propitiate a rich catch. As far as I could see, fishermen do not perceive nature either as something they possess or as something in need of

[18] Genesis 1:28

protection; they do not feel in charge of conserving and preserving nature, also because it is included in a flux where everything varies. Nature, exactly as human beings, is exposed to Allah's will and everything can change according to Him.

The perception of nature I found on the islands only partially reflects the Muslim preaching about the environment. "In Islam, the conservation of the environment is based on the principle that all the individual components of the environment were created by God, […] with different functions" (Mawil Y. Izzi Deen 1990, 164 in Gottlieb 1996). So, according to the doctrine, Muslims have to protect the environment in order to preserve a sign, and a gift of God, and in order to maintain a balance required by God itself as well. As for Christianity, Islam puts men above the other creatures, but together with the responsibility to promote and protect them, not only to benefit from their existence. But a particular aspect of the doctrine is fundamental in relation to my thesis: "what happens, happens according to the natural law of God (sunnah) and human beings must accept this as the will of Creator. Attempts to break the law of God must be prevented" (ivi, 165). That is the part I could mostly face during my fieldwork: the idea of a natural balanced wished by God where humans must not intervene. There is a natural balance that humans should not stop or modify: the effects of climate change were perceived by most of my informants as natural facts decided by Allah. Humans could develop strategies to guarantee their livelihood *in spite of* these phenomena, but without intervening in their causes to stop them. Clearly, there are lots of types of Islam, and it manifests itself in different habits according to other factors, all over the world. Protestantism, Catholicism, Buddhism, Confucianism and Hinduism together with several non-official religions are still present in the Country; in particular, it should be underlined the fluidity of a region such as the Spermonde archipelago, whose inhabitants sail to sea so farther to reach foreign Countries, having contacts with a broad range of cultures, habits, *mores*. My impression regarding the influence of religion in the local attitudes is restricted to the island I have visited and the people I talked to and it does not want to universally apply. I just consider this influence an important issue to take into account in the development of a successful community-based approach.

All these factors I mentioned contribute to a deeper understanding of the collected perceptions of climate change; if, as a European researcher, I have always considered climate change as an urgent issue threatening the livelihood of coastal and island communities, once in the fieldwork I

experienced a different attitude towards the problem. The academic perceptions partially overlap with my vision, and yet they consider blast fishing a bigger threat as well as fishermen do. On the other hand, fishermen do not consider climate change as something negative that is affecting their environment and livelihood, whereas as a part of a natural flux, identifying instead blast fishing and the garbage management as their ordinary problems, daily issues they constantly have to deal with. Blast fishing is described as a vicious cycle caused by men who want to catch more fish; this method causes a decrease in the amount of fish, due to the death of the reef and to the exaggerated number of caught fish, pushing other fishermen to use bombs as well in order to face this renewed scarcity. If I personally connected the initial scarcity of fish to one of the consequences of climate change, considering blast fishing as a strategy developed to face climate change, fishermen usually related it to the initial usage of bombs by some of them for several reasons, that go from the desire to enrich to the necessity to prepare an abundant banquet for some important visitors.

Garbage management, instead, is depicted as a failure of the government in providing services to the island citizens, a perception shared both by local people and scholars. These two concerns, together with my reflection regarding the influence of religion in perceiving the concept of nature, contribute to explain the reasons why climate change appears to be secondary in my island informants' list of priorities. They mostly engage with short-term problematics, an attitude that conflicts with the academics' goals.

6. Projects

An assumed influence is exerted by community-based projects regarding the conservation of the environment or the mitigation of climate change, on the local perceptions of "nature" and "climate change" concepts. Travelling around the islands I came to know some projects, described both by fishermen, students and professors. The most well-known program was COREMAP, recently terminated. But, apart from on Bontosua island, most fishermen knew that project just from hearsay, whereas they had experienced other projects personally, carried out by the Hasanuddin University. Fishermen I interviewed seemed to take for granted the presence of researchers from the universities collecting information or transplanting corals. They were used to it and they asked me several times if I had the intention to develop a certain project after collecting my data. This fact led me to retain the influence of conservation, and similar projects as a strong factor, able to determine a particular perception towards environmental issues.

In this chapter, I first analyse the influence of the COREMAP project on the perceptions of the inhabitants of Bontosua island, according to my experience there. Bontosua is the first island I visited and the only one where I perceived an instinct of protection and an awareness of the precious biodiversity and of its importance to the local economy. Some men in there were actually recruited by the COREMAP project with different tasks, such as Mr Ridwan, a coordinator of the village in charge of sharing information among the inhabitants and making sure nobody practices blast fishing. According to Mr Ridwan's opinion, the project raised an awareness, a conscience towards the environment and its safeguard. In scientists' opinions, instead, the COREMAP cannibalized on funds without actually doing anything concrete.

Later on, I investigate the presence of transplantation sites on some islands with a focus on a specific case where the community-based conservation project has been promoted by a private company. Both the Hasanuddin University and the aforementioned private company carried out a transplantation project, one of the most widespread kind of project in community-based conservation efforts in Indonesia; the goal is the restoration of the coral reef, together with the raise of an awareness towards environmental problematics among the local population involved.

6.1 COREMAP (Coral Reef Rehabilitation and Management Project)

"The primary goal of COREMAP is to protect, rehabilitate and achieve the sustainable use of coral reefs and their associated ecosystems in Indonesia […] is a 15-year project funded by several sources through loans […] and grants, funds made available for implementation of development activities that carry no repayment obligation when utilized for the agreed activities (AidFlows1)"(Radjawali 2012, 547). According to Radjawali, the final goal of this project is to develop a community-based management for the protection of the reef and "[…]to reinforce the national policies governing coral reef rehabilitation, management and conservation". Designed to promote sustainable usages of the reef, to raise awareness about the reef's destruction due to overfishing and unsustainable fishing techniques, COREMAP aimed "to contribute to the Government of Indonesia's objectives of sustainable utilization of the coastal ecosystem, decentralized natural resource management, and, raising income levels and improving living standards in the coastal zone and on small islands (particularly in small-scale fishing communities) through marine reserves"(ivi, 547- 8). One of the purposes of this program was to facilitate an active community role in managing the protection of marine areas; the idea was to work at the village level decentralizing political power and placing more attention on community-based approaches (Glaser et al. 2012); bluntly put, the aim was to involve local people in conservation efforts, although there are different opinions about the success of the aforementioned goals.

According to the literature I collected on the argument, COREMAP's programs are perceived as printed to benefit only the 'elites', a category of people which is not including the residents of the islands or who is directly affected by the project itself (Glaser et al. 2012, Radjawali 2012). In fact, even though the project provided lots of training, there was no selection for the targeted participants, and the knowledge resulted in being not properly spread (Baitoningsih 2009, 72). "Local public announcements about loan availability were not made in the villages where we conducted our interviews. Accessing resources and participating in decision making were not features that were open to the majority of villagers […] one interviewee on Karanrang Island said that collateral/material wealth, as well as a connection to COREMAP, was unofficially required in order to obtain loans […] despite the suggestions of scholars from various disciplines

on the need for more community participation in conservation processes (Pomeroy, 1995; Agrawal and Gibson, 1999; Agrawal and Gibson, 2001), there has been some concern regarding the shortcomings of the rhetoric and promises of community-based natural resources management (Leach et al., 1997; Kellert et al., 2000)" (Radjawali 2012, 549). Another shortcoming of COREMAP was its "lack of focus on the existing networks in […] fishing and trade and an inability to incorporate them in COREMAP's strategies and policies" (ivi, 555). According to my informants from the academic institutions, most of the money stayed in the city and the staff was not able to involve local people pressing the right buttons. Moreover, they distributed computers among the population without explaining to them how to use one: in the end, nobody was able to use this technology, from computer to communication radio; boats were abandoned or misused and the information distribution remained limited to certain people (Baitoningsih 2009, 70-71).

If the opinions collected from the academic world related to the COREMAP were negative, my informants on the islands either never heard about the program itself or they knew it as something going on somewhere else, so they did not feel it as something they should have cared about. The only exception is represented by the island of Bontosua, where I collected positive feedbacks about the program from people who were involved in it. Nonetheless, people living on Bontosua who did not collaborate with COREMAP either had not a personal and clear opinion about it or did not even know what the program was about.

6.1.1 COREMAP on Bontosua: a case

As already mentioned, I had the chance to interview a fisherman who worked as one of the COREMAP's coordinators, Mr Ridwan. Apart from being a fisherman, he is also a transporter bringing the fish to the Makassar harbour to sell it. Actually, most of the times his wife is doing that, while he takes care of the pearls they are breeding. He started this new activity three years ago and thinks the consequences of climate change could be good for his activity, as bigger waves and stronger currents mean more plankton for his pearls. He used to be a *punggawa* on other islands, one of this is Bima, in South East Sulawesi. When he was no longer able to pay for

his *sawi* he sold his boat for a little money, "but I was desperate", and wrote a proposal to the government, in order to receive money for starting the pearls cultivation. He managed to do it as he had contacts in the right bureau, where a friend told him that the government was interested in funding a similar activity. He is waiting for the first "birth" as pearls take up to four years to grow. He was involved in the COREMAP project and thanks to it he discovered that the coral reef was dying and he found out the damages caused by blast fishing as well. When we finished my interview he showed me, quite proud, his certificates and the camera he had won for being a COREMAP's coordinator . He said the project succeeded in stopping illegal activities such as blast fishing at least among the people of Bontosua, but he added, people on this island were already aware of the danger of using explosives since one guy had lost his arm because of a bomb. He knew other islands, such as Karanrang still use bombs and poison, but he thought Bontosua was richer and happier than the others thanks to its eco-friendly mentality. In his opinion, now the coral reef around the island is healthy. As a coordinator, he helped the COREMAP's staff to spread information and he obtained a diving card as well so that he could dive and catch fishes that way.

"Before COREMAP we used to fish with a trawl (*chantran*), collecting also small fish, which is useless, pieces of the reef and shells, using a kind of oil for our boat now forbidden by the law. Now we use the line and we do not destroy the coral reef around the island anymore: it is healthy and full of fishes; they also gave us new technologies to measure the depth of the water and it is useful: the village was happy to cooperate with COREMAP" (Ridwan, Pulau Bontosua, 24/01/2017).

He is now the chief of a local and non-governmental organization whose aim is to help the environment. He thinks the government now cares more about the archipelago, even though he still needs all his contacts to receive attention for his own proposals. If he succeeded in starting the cultivation of pearls is due to his friendship with an office manager in Makassar, that put his proposal on the top of the list. "Otherwise you need to wait for months, and the answer you probably receive is a "no" or you just do not get enough money. In Indonesia contacts are important, and corruption is a daily reality" (Ridwan, Pulau Bontosua, 24/01/2017).

6.2 Transplantation of baby corals

One of the most well-known projects developed in the Spermonde archipelago is the transplantation of new corals in the sea. Both the Hasanuddin University and the Coremap applied this intervention on several islands.

The students of the Fishery Department I interviewed exposed me the different structures that are being used for the transplantation of corals, such as the "spider", "the square" and the "biorock system". Spider and square types are structures with different shapes, both made with iron, where baby corals are attached in order to give birth to a new coral ecosystem, accelerating the natural recovery process of the reef. They are built quite easily and then put into the water. The Biorock instead uses solar panels and it applies a low voltage electric current in order to dissolve minerals, which are similar to the composition of the natural coral reef, in the water. The minerals adhere to the structure and help the formation of a new reef.

In Bontosua the people gathered in order to make a proposal to ask for a coral transplantation from the government for money. The project started but it was soon abandoned for the lack of money, as the government, according to the islanders, did not provide enough funding. In Barrang Lompo there has recently been a transplantation project promoted by the University Hasanuddin. Local people were involved to build the structures but nobody explained them the reason behind it. "They told us what to do, not why" said an informant who wants to stay anonymous, "they told us how to build them. I do not know why the reef is dying". When I asked if they would have liked to replicate a similar project they all said no:

"We expected money from it: we worked hard with the iron, etc., and we never got paid" (Rahmat, Pulau Barrang Lompo, 5/02/2017).

Local people never understood the reason behind the project and now they are disappointed, as they were expecting a payment for their job. Plus, the project failed, as the students left the transplantation site abandoned, without instructing nobody to take care of it. Every informant of this island was critical toward both the "garbage project" and the transplantation one. None of them is willing to collaborate again in new projects. "They can succeed in doing that in Badi, where the reef is nice...not here" said Rahmat, one of the fishermen of the island "I got injured

from working the iron for the structures and nobody paid me for that". Jamal, the keeper of the Marine station, is critical towards the results of the transplantation: "maybe they put the coral during the wrong season...or maybe the water is too dirty because of the garbage, but they all died. Once I used to dive, but now it is too dirty nearby, you see the garbage in the water. This is the main problem, the waste management! People are not interested that much in the health of the reef".

Some of the professors of the Marine and Fishery Department I had the chance to talk to made negative reviews on the transplantation projects. They consider it a placebo that might actually worsen things: they registered an increase of blast fishing since when the projects have started. "Fishermen think we are able to build a new reef" said Professor M. R. Idrus "they think they can destroy it as the university, or the government, will continue with the transplantations and new reefs will raise soon. They do not realize how long the process takes. It takes years for the reef to recover, to grow. Transplantation is giving the wrong message. Our coral reef is long about 50 000 km squares and there is no way you can substitute it with transplantation. It is good to educate children but it is not able to substitute dead corals, it takes hundreds of years" (Hasanuddin University, 20/02/2017). Quoting Prof J. Jompa, the dean of the department, Mr Idrus added "We must encourage the protection of the coral reef: we are afraid that local people might think they can break the coral because tomorrow we will do the transplantation and the reef will be back in one year".

A transplantation project was carried out by the Mars Symbioscience as well, a branch of Mars Company, on Pulau Badi, in Pangkep District. According to their website[19], since 2007 Mars has been working to restore the reef of Badi Island, installing rejuvenated reef in square structures; the benefits brought by the program have been the creation of new job opportunities, the rehabilitation of a marine ecosystem, the promotion of sustainable practices and an increase in the fish stock, or at least these are the forecast advantages. Once in Badi, I saw the marine protected area and some people busy in putting “spiders” in the sea, near the beach. The sea around the island is filled with these structures for transplantation and most of them have a "spider" and a "square" shape. Despite that, only people working on the construction of these

[19] http://mars.com/nordics/en/press-center/press-list/news-releases.aspx?SiteId=94&Id=6613

structures were able to explain their role and utility. Once arrived in Badi I came to know of a sabotage perpetrated by local people against the Mars' transplantation sites.

6.2.1 The Mars unique case

"Everybody was so angry...they did not inform us or share the money with us...so we went and took the corals out of the sea"

Anonymous, Pulau Badi, 12/02/2017

According to the anthropologist Muhammad Neil, the local people's sabotage in Pulau Badi could have been predicted and avoided. "That is a problem on every island, with every project" he explained to me "every time there is a project on one island, the staff only cooperates with one family, and the rest of the community is jealous. The money is not spread across the island, divided between every member, so the population riots". In his opinion, the COREMAP, the Mars Company's project and many others have failed because they were not able to understand the local dynamics of power and sharing. The way power and information are spread among the islands is affected by the patron-client relationship that permeate the whole island society and it influences also the organisation of projects on the islands. Working only with one person, or family, keeping the secret to the rest of the community, is going to make the project fail. "One year ago, we discovered that the Mars company had been running a project on our island, for years!" says Unding, my first informant on this island "everybody was mad about it so they destroyed the transplantation site and every coral died" (Pulau Badi, 11/02/2017).

"There are lots of signs all over the islands but I cannot read them, only a few people can. We are not able to read or write. The government, the Mars staff... maybe they put the signs, I do not know. Nobody tells us something about these projects […] only the chiefs of the islands know, they collaborate, and they get the money" (Dg Juma, Pulau Badi 11/02/2017)

Some of my informants on Badi Island were not able to tell me anything about the Mars. They did not know about the projects developed in the islands, both from the government and other institutions. Some of them recognized the name "Noel Janetsky", the Mars' chief of the project

here. They told me about the "German guy, Noel" who was doing something but only with one family. I found the man who was working for Noel, who showed me the laboratory and his tasks. He was taking care of a mariculture of seahorses and different kinds of fish, such as the clownfish. Most of them were sold abroad, "Noel comes and takes them", while other were released near the island, but he was not able to explain to me why the fish were set free. He was also constructing structures for the transplantation of baby coral, working to keep the coral safe and fend blast fishermen off every day. "I am paid to protect the coral and the fish and seahorses we breed" he added. He was not sure about the destiny of the fishes or the seahorses. "My job is to put the structures for transplantation in the water" he continued "I have never heard about climate change". According to Mars website, the mariculture of seahorses and other species has a clear goal, that's to say to be a replacement of blast and poison fishing, and overfishing as well. The idea was to partially replace the activity of fish with a new source of income: breeding and selling animals abroad1. But nobody I talked to was aware of these goals.

"I have heard about the COREMAP, but they are not here. I have never heard about the Mars or a similar project here" (H Mante, Pulau Badi, 12/02/2017).

"I do not want to talk about blast fishing […] you asked me about Noel, but I do not know what he is doing exactly, if it has to do with blast fishing or not, because I don't work with him […] but I never heard the name Mars" (Anonymous, Pulau Badi, 13/02/2017).

In Badi, I experienced a strong community life. More than on other islands, people tended to gather, to dance together, to play volleyball or football at the centre of the island, to pray together when the *muezzin* calls. The fact the few people knew about the Mars and their projects surprised me a lot. It might be that they did not want to talk about that, and of the sabotage as well, or maybe there was a lack of interest in it. According to the Mars papers, lots of projects were developed together with the mariculture of seahorse: "The businesses include a seaweed farm, a coral farm, and a sea cucumber system" (Bunting et al., 2008). These three projects are explained in the paper of Bunting (2008) and in the Mars website, but nobody on the island could tell me something about them. The reason might be the fact that the chief of the island, the *saiet*, in charge of this project, was away during my trip to Badi.

"On every island of the Spermonde the power is divided between more families but in Badi is different: only one family has the power, they are *saiet*: they come directly from the Prophet Muhammad. They define themselves as

descendants of Muhammad, so special and different from the rest of the population, considered as "immigrants" in their own house. Projects do not work out in Badi, as everyone interested in starting a project collaborates with the family in charge of power, but the family does not spread knowledge, power, to the rest of the people. They do not share their information, do not talk about the projects and the people is jealous. Also in Barrang Caddi, where a project gave the custody of a freshwater tank to one family, there was a sabotage: other people destroyed the tank. But in Badi is worse as only one family holds the power" (Neil, Hasanuddin University, 14/02/2017).

According to my data, rarely anthropologists are involved in social surveys before the launch of a conservation project. While I was in Bontosua a focus group was carried out by the anthropologist of the Hasanuddin University, requested by the Mars Company; according to the anthropologists I talked to, it was demanded in order to avoid a similar sabotage as the one happened in Pulau Badi. The Company was interested in discovering if people in Bontosua would have liked to develop a project similar to the one in Pulau Badi. The results of the focus group showed that the local community was not interested, while they would have preferred to receive more money for *tanggul*, wave breakers and other necessities, from the government.
To sum up, the Mars Company actually realized a marine protected area and constructed several spiders for the transplantation, but the part related to the mariculture is unclear, as the parts regarding the seaweed, coral farming and the sea cucumber system as well. It is not my job to make considerations about the projects carried out by this Company, as well as their results or shortcomings, but I can use it as an example of a community-based program that faced difficulties and opposition. Nobody on the island seemed to be aware of the reason why the coral reef needs to be restored, or the fishes raised and released, while few people knew about the project at all. There was a lack of practical and theoretical sharing and the locals' opinions about the reasons and the consequences of the projects had not been investigated at all before starting the procedure.
In my opinion, Mars' project could have been helpful in raising awareness towards environmental issues, sustainable methods and the problem itself of climate change, but living on the island showed me that the program failed in these purposes. Furthermore, recreating the reef did not consequently stopped the usage of blast fishing. Such a "recovery method" is useless if not combined with the spread of necessary information to prevent people from using illegal methods in the first place. This consideration applies also to transplantation projects carried out by the University.
All these projects could have changed locals' opinions of the environment and climate change

but, according to my data, they did not; a lack in the spread of information and in the involvement of local people undermined a possible long-lasting change of the local mentality and attitude towards nature and conservation efforts, preventing people from actually modifying their perceptions in light of the received information.

To sum up, I perceived a detachment between what it is declared on paper by the organisations involved in conservation projects and the perceptions of my informants. Academics consider similar projects carried out by the government as corrupted, where money and resources just disappear[20], whereas for the projects carried out by the university they admit they rarely involve locals, as they used to do that in the past but the actual outcome did not meet their expectations. Most of my island informants, instead, criticise the management of these projects, as, even though the claim to be "community-based", in the end they appeared to be authoritarian and characterized by a top-down approach; there was only a one-way direction of information and local people had to take care of the practical aspect of the project without any theoretical explanation or dialogue during the analysis of the issue and the planning of the main steps.

Generally, it appears from my data that local people are selectively involved in conservation projects, which fail in spreading information among the whole community. This failure leads to two consequences: a possible riot of the local population as it happened in Pulau Badi or a missing opportunity to influence practices and perceptions of local people and to develop a more "eco-friendly" attitude, which is, in the end, one of the main goal of every community-based conservation project.

One of the purposes of these projects was to raise awareness towards climate change but my insights clearly indicate it did not happen.

Moreover, according to the materials I collected, only scientific surveys are conducted before a project starts, not anthropological or sociological ones; a socio-economic survey conducted by anthropologists may be necessary to reveal the complex power dynamics among the inhabitants of the island involved in order to obtain successful results.

[20] I do not single out the names of the professors expressing these opinions to avoid them having issues with the government.

7. Conclusion

Starting from the very idea that climate change firstly affects the livelihood of local people daily facing its consequences, I insert my thesis in the wider discourse related to environmental issues and human livelihood, filling an empirical gap I noticed while collecting literature on the argument: local perceptions are rarely investigated, in spite of the contribution they can provide to the study of climate change. In particular, local people can provide new insights regarding the strategies applied to deal with environmental issues, the causes perceived at fault, the consequences considerate as more pressing, the relationship between human beings and natural phenomena, specific solutions, what approaches people are willing to put into practice, etc.

Inquiring different perceptions of climate change through their juxtaposition allowed me to discover which notions overlap and which conflict, as well as what compromises might be necessary to develop a fruitful collaboration between locals and scientists.

Thanks to this study it came to light that islanders of the Spermonde archipelago and local institutions in Makassar do not share the same perception regarding the phenomenon of climate change and its consequences. They also have different approaches towards the development of possible solutions and strategies able to guarantee and enhance their livelihood.

My data allowed me to compare also the different strategies developed by the social actors involved, which derive and are influenced by these very perceptions.

If the perceptions of the islanders were different from one another, also depending on whether there had been a collaboration on behalf of the single islander with a community conservation project or not, the academic world is quite united in recognizing the causes and effects of climate change and it agrees on the solutions needed to deal with it. They promote conservation projects that either do not involve local people or do that on a practical level, doubting of the locals' capability to understand the causes of climate change.

For the academics, the real problems are the survival of the coral reef and the sea level rise. They worry about the death of this unique marine ecosystem and about the risk that island families will have to relocate as rising water will encroach on islands and erode houses.

The biggest discrepancy could be found in the concept of "solutions" to face the consequences of climate change provided by the scientific world and by the anthropologists. Anthropologists suggest a deeper and wider social survey before the launch of a project, in order to better involve local people. Instead, I perceived a sense of discouragement coming from my informants of the Fishery and Marine Faculty, regarding a successful cooperation with locals.

The idea of "climate change" produced by the fishermen and their families was quite different compared to the academic one. Moreover, I collected different perceptions coming from different families among the islands I visited. Generally, local people of the archipelago do not perceive global warming as a problem, at least not the most urgent they have to face.

According to my data, local communities of the islands recognise as present phenomena, or even problems, some of the consequences that the academic world attributes to climate change's effect: storms, unpredictable seasons, decrease in the amount of fish, bigger waves, sea level rise, stronger winds and currents, as well as dying coral reef are a daily reality. Only a part of the islander population, usually involved in conservation projects, connects these events to the wider issue of climate change. The rest of them, perceive these phenomena as part of a natural order of things, of a flux, or as God's will. This last perception leads to the consequential idea that human beings should not interfere with nature, a mentality that may have been contributed to the failure of community-based conservation projects in properly involving local people.
Nonetheless, people of the archipelago have to deal day by day with the consequences of this environmental phenomenon, in order to survive and defend their sources of profit. Put into practice, those perceptions lead to develop certain strategies, such as the creation of waves breakers and *tanggul* with the aim to protect the islands from the rising sea and gain back part of the lands grabbed by the water.

Some of these behaviours can be considered dangerous for the environment and are actually worsening the consequences of climate change; for example, for the construction of *tanggul* local people use portions of coral reef (both dead and alive) destroying a natural protection against the sea level rise and a delicate ecosystem fundamental for their main source of income: fishing. Another practical solution, implemented in order to solve the problem of the scarcity of fish, has been the usage of blast and cyanide fishing, with terrible consequences for the ecosystem.
The usage of blast and cyanide fishing as a solution to face the scarcity of fish also caused by

the acidification of the sea, the increase in its temperature and other effects of global warming, is only creating a vicious circle that exacerbates an already critical situation; these illegal methods endanger the reef, nullifying the protection it offers to the islands and decimating the number of species living and getting caught by the fishermen in the area. Despite it, the usage of blast and cyanide fishing are not depicted as environmental issues by the islanders, whereas as either a good method of fishing or a destructive technique causing the decrease of marine species.

In the first case, blast fishing is described with a positive connotation and a nostalgic gaze, as something useful that the government has unfairly forbidden. In the second case, these illegal methods are perceived as negative and causing the destruction of the reef, as well as the decrease in the amount of fish, threatening the livelihood of the whole archipelago.

However, locals consider climate change as secondary compared to the problem of the garbage management, which is a more urgent issue according to local people's perceptions. Islanders agree on the necessity of a top-down approach providing a systematic solution in order to get rid of the waste for good.

Nonetheless, this wide range of different perceptions must be taken into consideration in order to develop a successful approach to mitigate or solve problems related to climate change. The analysis of the different perceptions produced by people directly affected by climate change can contribute in creating a fruitful community-based project. In particular, the comparison between the opinions of local people and of academics working on environmental issues and conservation programs put together a more practical knowledge (coming from a daily experience of the issue), and a more theoretical knowledge (from studies and analysis of quantitative data), combining these two-sided perceptions into a more complete understanding of the situation.

As explained in my theoretical framework, during my research I inquired the concept of nature shared by my two groups of informants and, regarding the first one, that's to say the islanders of the archipelago, I also investigated if the concept of "the eco-friendly noble savage" could apply in this specific case.

In his research, Krech (2005) tried to verify if Native American were conservationist and/or ecologist, describing the act of being ecologist as the ability to understand environmental interactions and the fact of being conservationist as characterized by systematic efforts to

preserve non-human species. Based upon his definition, I can say in most cases fishermen (I interviewed) living in the Spermonde archipelago are neither ecologist nor conservationist: they mostly do not think environmental dynamics as intertwined to one another or link them with human behaviour, and even those who do it usually do not care about environmental problems unless they directly influence human economy and/or livelihood. Moreover, no conservation effort is put into practice by most of the population.

As already mentioned, the shared mentality I could perceive in the islander communities consider every change occurring as something natural, in harmony with God's desires. They tend to live day by day without worrying about the future, and that might be one of the reason why conservation programs in this area rarely succeed in involving local people: the notion of "nature that has to be preserved" and of "a change that has to be stopped" is not shared by the community. This mentality is partially perceived as a problem by the institutions that are carrying out projects in the area, and certainly go against the idea of an eco-friendly attitude typical of every indigenous population. Far from the bucolic discourse of an indigenous knowledge consecrated to a symbiotic life spent in the respect of nature, my findings show how this local population, native of this archipelago, is able produce a big impact on the surrounding environment, exploiting it for its own survival.

Religion only partially influence the perceptions of nature: both groups of my informants were Muslim, yet only islanders considered nature as a domain where humans must not intervene; academics, on the other hand, seem to be more influenced by their studies, approving a human intervention to preserve the environment.

Academics share the goal of a mitigation (Wilbanks & Kates,1999) of climate change: they do not consider possible to stop its causes, but agree on the chance to reduce them and on the effort of preserving the marine ecosystem. Local people, instead, seem to prefer a strategy of adaptation (ibidem), as they perceive every phenomenon as inevitable; they act at a local level, putting into action behaviours able to reduce the social and natural vulnerability caused by the issue itself.

In my opinion, to work with locals efficaciously, academics should not build a theoretical approach based uniquely on their opinions and data: instead, they should study the locals' points of view of the phenomenon, analysing what the population perceive as a problem and constructing a strategy able to gather both locals and academics' goals.

The strategies developed so far by local people are just a short-term solution, which would not enable the islanders' livelihood age-long; at the same time, strategies applied by the University do not include a sharing of the information among the population, which perceive similar projects as useless or even negative[21].
Better and long-term strategies could be developed through the collaboration between local people and institutions, such as universities, only if the latter were willing to embrace the validity of locals' opinions and to outline a plan of action involving the islanders, while taking their necessities and desires into consideration at the same time.

My insights, deriving from the collection and comparison of different perceptions allowed me, through this juxtaposition, to better represent a reality as closer as possible to the "truth"; *in medio stat virtus* and melding different perceptions about the same argument helped me in being as realistic as possible, describing an occurring reality from every possible[22] points of view.
These data, clearly inserted at a local level, suggest a model applicable at a global scale as well, connecting two different spectrum of perceptions, in order to create an efficacious plan to deal with environmental issues.

[21] We should remember the case of page 69, where men complained about the fact of having worked for a transplantation project without being paid.
[22] In terms of time and availability of informants.

Appendix 1

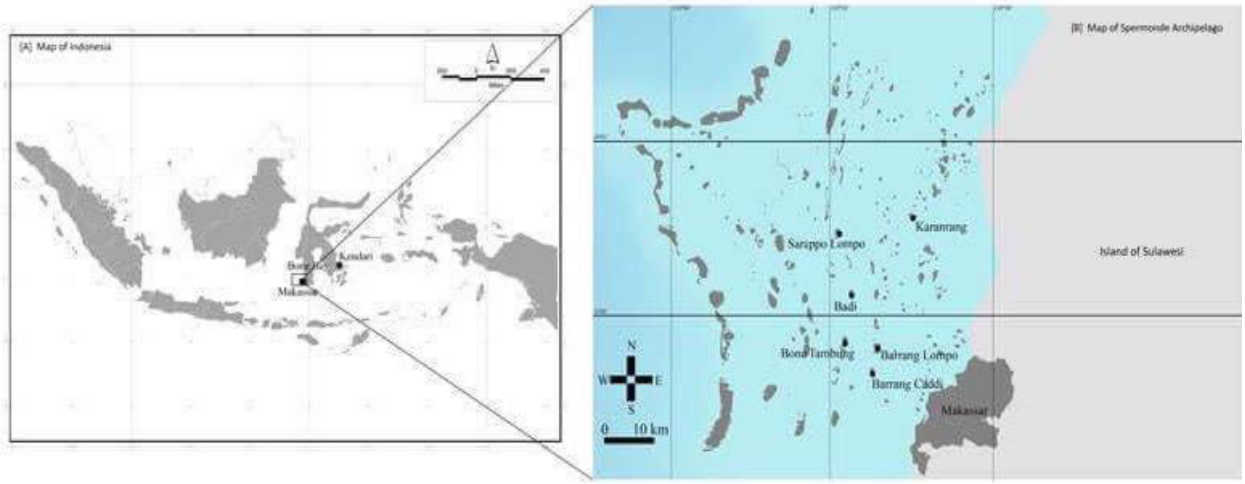

Figure 1. (A) Map of Indonesia and (B) Spermonde Archipelago

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