

SASI AND COMMUNITY ENGAGEMENT IN MARINE PROTECTED AREA: A  
QUALITATIVE CASE STUDY OF AY ISLAND, MALUKU, INDONESIA

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Master of Science

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by

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The undersigned, appointed by the dean of the Graduate School, have examined the thesis entitled

SASI AND COMMUNITY ENGANGEMENT IN MARINE  
PROTECTED AREA: A QUALITATIVE CASE STUDY OF  
AY ISLAND, MALUKU, INDONESIA

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SASI AND COMMUNITY ENGAGEMENT IN MARINE PROTECTED AREA: A  
QUALITATIVE CASE STUDY OF AY ISLAND, MALUKU, INDONESIA

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**ABSTRACT**

Marine Protected Areas (MPAs) are commonly used worldwide as an adaptive instrument to balance the sustainability of ecological biodiversity and community life through promoting sustainable marine resource use. Each MPAs has a unique social, cultural, and ecological context that influences MPA implementation and impact. This case study applies qualitative analysis to investigate the integration of local knowledge and marine tenure system “*sasi*” and the process of community engagement in establishing marine protected areas in Ay Island, Maluku, Indonesia. It also examines the factors that influence these processes and explores the impacts of MPA.

This qualitative case study conducts in-depth interviewing with 29 key informants from the Coral Triangle Center (CTC) staff, Ay Island’s conservation team, and the local community. The study found that bridging science “*ilmu kampus*” with local knowledge “*ilmu kampung*” becomes the central perspective of the integration process of integration *sasi* and how communities are engaged at MPA. The findings show four main dimensions (themes) such as the integration of *sasi* into the MPA program, community engagement in MPA, social dynamics and factors that influence community engagement and the sustainability of MPA, and the impacts of MPA on ecology and the local community. The study provides some insights on MPA establishment and management by suggesting that considering the local community context and

knowledge is crucial for the sustainability of MPA in the process of establishment. The study might contribute to the large body of existing literature related to community engagement in MPA, community-based natural resources management, the integration of local knowledge in establishing MPA, and other conservation projects. This study also might provide new knowledge regarding the process of reviving a local cultural practice and traditional conservation concepts such *as sasi*.

The study highlighted that the ability to build a sense of ownership and a sense of pride of the community towards the natural resources they have is the key to establishing MPA sustainably. This process can be achieved by appreciating the values of local knowledge in the village and building equal relationships with all stakeholders involved in the decision-making process, from the initiation stage to the management of the MPA.



## CHAPTER ONE: INTRODUCTION

Indonesia is an archipelago country located in the triangle coastal area (S. J. Green et al., 2011) and identified as one of the high levels of terrestrial biodiversity in the world and the most important nation for global conservation agenda (Dutton et al., 2009). On the other hand, most Indonesians live in coastal areas having a strong connection between natural resources exploitation, fishers' livelihood dependencies, and their present and future health (Glaser et al., 2015). The communities living in coastal areas rely on the sale of fish and other marine products to feed and support their families (Elliott et al., 2001). Considering the sustainable marine resources use is crucial for balancing the sustainability of biodiversity and community. Therefore, a specific conservation approach is needed to manage natural resources and communities in the coastal area.

Marine Protected Areas (MPAs) are commonly used worldwide as an adaptive instrument (Hargreaves-Allen et al., 2011) to promote sustainable marine resource use. The International Union for Conservation of Nature-IUCN has defined MPAs as "any area of intertidal or subtidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment" (Westera, 2000). Additionally, MPAs are known as the area of ocean purposed to enhance the conservation of marine resources (Lubchenco et al., 2003) and is a fundamental tool for conservation and fisheries management (Bennett & Dearden, 2014a) .

Effective management of marine ecosystem requires combining biological, socio-economic, and governance aspects (Hughes et al., 2005). Each MPA has a unique social, cultural, and ecological context that influences its implementation and impact (Mccay et al., 2003). Local history and local demographic profiles can have a significant impact on the way the local communities are being engaged in an MPA. It is crucial to consider the social subsystem and the ecological subsystem. Ecological knowledge that people hold, and the rules and norms by which humans interact with the environment are the keys to linking the ecological and social subsystems (Berkes, 2015.p.27). Looking at the role of social interaction, the development of norms and behavior, and the institutionalization of rules and norms, social capital's development can help us understand the social driving forces that lead to environmental change (Rudd, 2000), including in MPA's context.

The Coral Triangle region is the global epicenter of marine biodiversity (Hoeksema, 2007; VERON et al., 2009) and Indonesia is one of six countries in the Coral Triangle region implementing in the MPAs the local and national level (White et al., 2014). To ensure the sustainability of marine resources and achieve the I-chi target 11/SDGs 14, Indonesia's government has committed to establishing 32.5 million hectares of Marine Protected Areas (MPAs) by 2030 with 24.11 million hectares of MPAs currently already assigned through the collaboration of The Ministry of Marine Affairs and Fisheries (MMAF) with the provincial and local governments, universities, and NGOs.

The Coral Triangle Center (CTC) is an Indonesian NGO establishing Banda Sea MPA Network. Ay Island and Rhun Island MPA is a community-based Banda Sea MPA networks situated in the heart of the Coral Triangle and the remote Maluku area of Indonesia. The process of establishing MPA in Ay Island and Rhun Island started in 2012 and concluded with The Ministry of Marine Affairs and Fisheries' (MMAF) designation as a new marine protected area in 2021. Rossi (2016) and Sifrit (2017) pointed out that the CTC involved local communities and integrated local ecological knowledge and culture for the establishment of an MPA in Ay Island (Rossi, 2016; Sifrit, 2017). A study is needed to capture the entire process of establishing the MPA in Ay Island for the last nine years and to investigate the integration local knowledge and marine tenure system “*sasi*” into MPA design and community engagement.

### **Marine Protected Area and Sasi**

*Sasi* is a broad set of rules and regulations governing resource use (I. Harkes, 1999). It incorporates unwritten seasonal rules of entry and harvest and authorized activities in a particular area with natural resources enforced by community leaders (I. Harkes & Novaczek, 2002). The practice of *sasi* strengthens a community's ability to use a common resource to limit access of outsiders and to self-regulate its harvest (I. Harkes, 1999). However, von Benda Beckmann *et al.* (1995) argued that *sasi* is not simply an institution designed to regulate resource use, but it also has a significant cultural role related to the relations between people, the natural environment, and gods and ancestors and spirits. In the Mollucan organization system setting, *sasi* is also associated with other aspects such as political and administrative, economic, and ecology (von Benda Beckmann *et al.* 1995).

The beginning of sasi remains unclear. The term *Sasi* was possibly introduced in the pre-colonial era or existed earlier back (von Benda Beckmann *et al.* 1995). The term *sasi* was perhaps known by different names considered as an older tradition of the indigenous community to control and protect the exploitation of natural resources (von Benda Beckmann *et al.* 1995). The establishment of clove trade monopolies under the colonialism era and the introduction of Islam and Christianity between early 10<sup>th</sup> and the 15<sup>th</sup> centuries have strongly impacted the practice of sasi (von Benda Beckmann *et al.* 1995). In the 18th century, even though the Dutch tried to weaken the power of *kewang* leaders by abolishing the *kewang's* rights to enforce sasi rules, the sasi institution continued to survive and evolve in many villages (I. H. T. Harkes & Schefold, 2006) . The case of wholesale slaughter happened in Banda (including in Ay Island) during the ‘spice wars’ of the 1600-1900s forced removals, alienated people from their territories. This phenomenon perhaps influenced the practice of *sasi* in Ay Island. In the 19th century, sasi was practiced as the centerpiece of village common resource management with the intervention of the colonial government (von Benda Beckmann *et al.* 1995). At the same point, the religious institution such as churches also came to have a role in sasi by working together with government and *adat* leaders (I. H. T. Harkes & Schefold, 2006). In addition, there are different kinds of sasi: “sasi adat”, the sasi is enforced customary institution; and “sasi gereja” or church sasi, and “sasi masjid” or mosque sasi, which are enforced by religious institutions. (Harkes, I., & Novaczek, 2002)

On the other hand, during the Japanese occupation in war world II significantly threatened all *adat* institutions (I. H. T. Harkes & Schefold, 2006) running the practice of sasi. The development agenda during the "New Order" regime (1966-1998) has weakened many *adat* or indigenous cultural institutions regulating access to and use of local resources and territories

(Thorburn, 2002). Furthermore, despite the external factors explained, such as colonialization, religion, and developmental agenda, have threatened the existence of *sasi* in the village community. von Benda Beckmann *et al.* (1995) emphasized that the lack of respect for and resistance to *sasi* regulation and *kewang* or *adat* authority probably also contributed to the existence of *sasi*.

All these factors might contribute to the existence of *sasi*, which disappeared for the last four decades in Ay Island, Maluku. Interestingly, in this context, the conservation issue of MPA became a central trigger for *sasi* resilience after many years were nonactive. The function of *sasi* might generally be embedded in natural resource management issues rather than conservation issues. However, in the MPA context, some studies showed the integration of customary law such *sasi* into marine conservation (Cinner & Aswani, 2007; Cohen & Steenbergen, 2015), the incorporation of local knowledge (Aswani & Lauer, 2006), tradition such as *sasi* into MPA design and management (McLeod *et al.*, 2009). Interestingly, these studies show how important to recognize local knowledge and tradition in managing MPA. MPA management could be effective when local ecological knowledge and customary sea tenure are incorporated (Gleason *et al.*, 2010). In Ay Island and Rhun MPA, only in Ay Island, the CTC incorporates *sasi* into MPA design to prevent the over-harvesting of the local community and protect the sustainability of marine resources. Furthermore, Rossi, (2016) suggested that the CTC integrates the traditional marine resource management with modern management in the management of MPA in Ay Island.

## **Marine Protected Area and community engagement**

Community engagement in MPA can be conceptualized as any activity indicating that there is the development of relationships among local community members, staff, and managers at a nearby MPA (Davis et al., 2014). Another study suggested that community involvement and stakeholders' participation are recognized as essential elements in the stage of establishment MPA (Aswani & Lauer, 2006). The local community plays a critical role in the success of an MPA. The MPA can fail without gaining local support for conservation efforts and emerge conflict (Rodríguez-Martínez, 2008; Bennett & Dearden, 2014). Regarding the efforts to engage communities in MPA planning, it is essentially needed to communicate the true value and function of MPAs (Voyer et al., 2014). In addition, empowering the community to manage their resources, participate, and continue activity could lead to the success of an MPA project (Rodríguez-Martínez, 2008).

In the co-management framework of (Cohen & Steenbergen, 2015) local communities partners were NGOs or research organizations, with some involvement from the government. Natcher et al., (2005) emphasize that the fundamental things related to Co-management are managing relationships, not resources. Therefore, we need to investigate the relationship and interaction in the community engagement of MPA. Placing community context in natural resources management such MPA, Qin et al., (2017) suggested that the study needs to capture the community complexity on both the unit and level of analysis in the relationship with natural resources. The social construction considered by Flint et al., (2008) might shape the different community perception and behavior toward natural resources including in MPA context. In addition, building trust and deep engagement with local communities are considered as a crucial

issue in the conservation projects such as MPA, which can improve conservation impact on both social and biophysical (Bennett & Dearden, 2014a).

Furthermore, the stakeholder's participation can be beneficial for the MPA process and conservation interest (Gleason et al., 2010). In the MPA project, conservation can be successful, often predicated on local support for conservation (Bennett & Dearden, 2014a). The involvement of local people in collaboration with Coral Triangle Centre (CTC) in Ay MPA can be described as the practice of community-based resource management. According to Berkes, F. (2015, community-based resource management can solve the exclusion and subtractability problems. In this case, the community engagement and traditional conservation system practice can figure out subtractability, which relates to what Berkes, F. (2015) notices as the ability of social groups to design a variety of mechanisms to regulate resource use among members. However, (Lane & Corbett, 2005) suggested that in community-based environmental management, the decision-making process at the local level can be influenced by powerful or vocal groups. Therefore, understanding the power relation and social dynamic is required to explore community engagement in the local community context deeply.

## **Research Need**

Considering social complexity in Marine Protected Areas (MPAs) is essential for sustainability (Patrick Christie, 2019). MPAs can benefit the community if the residents are involved in the project (Pollnac et al., 2001; Bennett & Dearden, 2014). In the MPA of Ay Island context, the Coral Triangle Center (CTCT) plays a fundamental role in engaging residents and local ecological knowledge such as *sasi* into the community-based management MPA (Rossi, 2016; Sifrit 2017). This study is needed to construct a more in-depth understanding of unique social, cultural, and ecological contexts that influence MPA implementation and impact (Mccay et al.,

2003). The primary purpose of this case study is to capture the entire process of establishment MPA in Ay Island for the last nine years by investigating the integration of local knowledge and marine tenure system "*sasi*" into MPA design, community engagement, the role of local people and the CTC. This study will also address the social dynamics that influence those processes.

### **Research Question**

This case study explores the following research questions:

- 1) In what ways does the CTC integrate SASI into the MPA in Ay Island?
- 2) How does the CTC conduct community engagement of MPA in Ay Island?
3. What mechanisms influence these processes, and what are the impacts of MPA establishment in Ay Island?

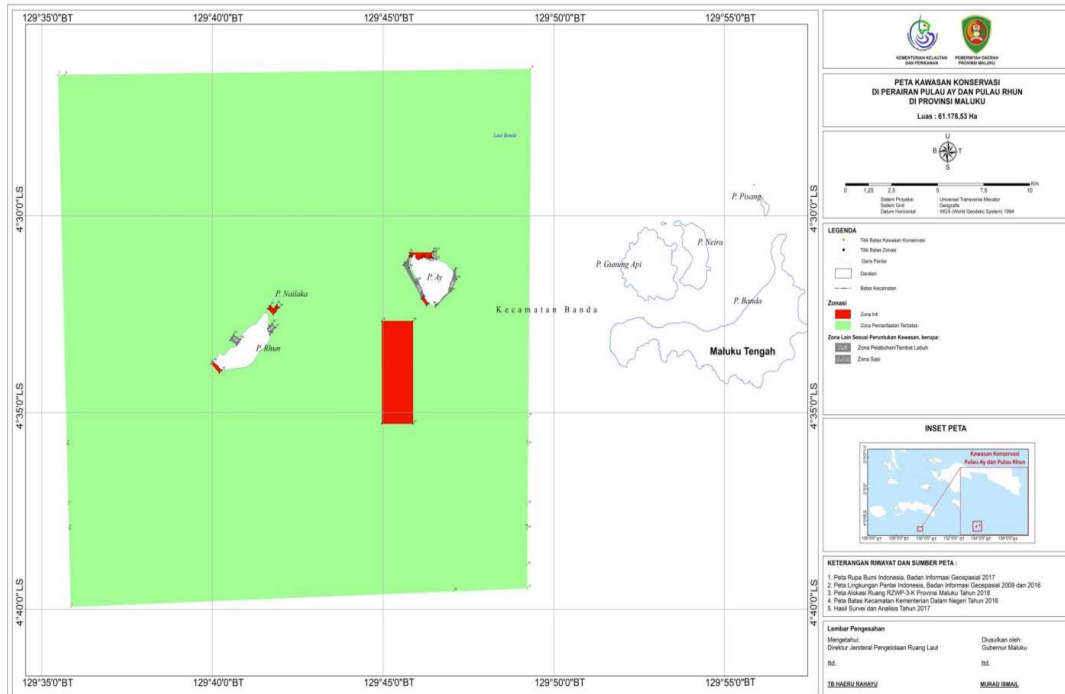


## **CHAPTER TWO: METHOD**

### **Study Area**

Approximately the total of Ay island's population is 1,335, where the Ay Island community depends on fishing and gathering marine resources and nutmeg plantations on the Island to sustain their life. Ay island was known as a beautiful marine tourism place. It is crucial for marine biodiversity because Ay Island is home to some of the most resilient reefs in the coral triangle region. As a part Ay and Rhun Island, in 2014, the Ay Island community declared the community based MPA. This MPA was established under a decree from the Maluku Governor in 2016 then officially signed as a new MPA by The Ministry of Marine Affairs and Fisheries (MMAF) in 2021. This MPA is in Banda Islands, Maluku Province, and is situated in the heart of the Coral Triangle region. Furthermore, as a key stakeholder in a community based MPA project in Ay Island, Ay Island communities actively participate in working together with the CTC staff and local government for some activities such as forming local regulation, involving in community conservation, establishing community learning center, and managing tourism place. The Coral Triangle Centre (CTC) is an independent and non-profit foundation that aims to promote the conservation of marine biodiversity and the sustainable management of marine and coastal resources across the Coral Triangle (Coral Triangle Center 2017). Located in Bali, Indonesia, the CTC has a mission to train the generation to care for coastal and marine conservation through Training and site-based learning (Coral Triangle Center 2017). To reach the goals and mission, the CTC conducts some programs such as Training and learning, Field Learning Site, and Learning Networks and forums, Working with the public and private sector, and New Center for Marine Conservation (Coral Triangle Center 2017). Since 2012, the CTC has signed a long-term partnership with the Ministry of Marine Affairs and Fisheries (MMAF)

Indonesia. The CTC is one of the NGOs involved in collaboration with MMAF to establish MPA in Indonesia.



Source: Decree of the minister of marine affairs and fisheries number 48 2021

**Figure 1:** The map Ay and Rhun Island Marine Protected Area

## Data Collection and Participants

Understanding the role of Ay island’s residents and the CTC in integrating *sasi* into the MPA is very complex. Hence it is necessary to use a qualitative study to develop a detailed understanding of these complexities (Creswell & Poth, 2018. p.45) around the contextualization process of Ay Island MPA. Initially, the researcher used an analysis framework by (Lejano et al., 2007) called contextualization consist of four elements (contextualization, integration, blurring, and maintenance) which is a process that indicates how local people or local institution are involved in the development of the conservation program in order to make sure the program fits

with the local context. However, the researcher found that this framework might not be used appropriately to capture the voice of information and the whole process of integration sasi into MPA and community engagement in Ay Island. Therefore, the case study research approach was applied (Creswell & Poth, 2018. p.96; Yin, 2009.p.4) by exploring multi source of information (interviews, observation, documents, and reports). The consideration of using case study design in this research is because of the focus of study addressing “how” and conducting “in-depth” description of the process and social phenomena (Yin, 2009.p.4) in integrating sasi and community engagement at MPA in Ay Island.

In the data collection process, in-depth interviewing with key informants was applied to gain understanding (Brounéus, 2014; Chaigneau & Brown, 2020) of the Ay island community and the role of CTC in the integration of sasi in MPA and the community engagement and it’s dynamic in Ay Island. The research also considers raising the voice of local communities by letting the data tell their voice.

A total of 29 participants were interviewed. The participants for this study were selected from three different stakeholders such as the CTC, the conservation team, and the Ay Island community (Table 1). The key informant from the CTC is who has been working closely with the Ay Island Community to establish MPA. The Ay Island’s conservation team was established in 2014, consisting of residents who firmly committed to supporting conservation efforts in the MPA project. The Ay Island community comprises Ay village leaders, fishermen, local tourism managers, residents, women, and others.

Group category of participants	The role of participants in Ay island and MPA	Total
The staff of Coral Triangle Center	Senior MPA specialist	1
	Former CTC staff	1
	Banda Officer	1
	Banda MPA coordinator	1
The Ay Island Conservation Team	Members of conservation team	2
	The conservation team leaders	2
	Women representative in the conservation team.	1
The Ay Island Community	Local leaders from "adat" traditional institution, Village government, Village Deliberation Agency (BPN),	7
	Elders	2
	Member of "adat" institution	2
	Tourism manager	1
	Fisherman	3
	Local resident	1
	Teacher	2
	Women representative	1
	"Penatua" An elder in church	1
<b>Total of all participants</b>		<b>29</b>

**Table 1:** The distribution of participants in three group categories.

This research uses purposeful and snowballing sampling. The purposeful sampling (Creswell & Poth, 2018) was applied for selecting the participants from the CTC's staff and the community conservation. The assumption is these participants can purposefully provide an understanding of Ay Island MPA. Meanwhile, snowball sampling (Creswell & Poth, 2018) was used in identifying and selecting informants from Ay Island communities. The interviews were conducted during November 2020-August 2021 using the interview protocol (Appendix 1) as the guideline (Creswell & Poth, 2018. p.164) to open and talk with participants. The questions are differently designed for the three group participants, focusing on the role of participants, community engagement, and the integration *sasi* into the Ay MPA context. The CTC staff interviews were conducted over Zoom and took approximately 50-120 minutes to complete. Meanwhile, the researcher conducted interviews with the Ay Island conservation team, and the local community in person at Ay Island lasted 15-60 minutes. The participants were assured of confidentiality and provided with a consent letter and letter of recruitment material. The participants were asked their consent verbally and provided the consent and requirement when is needed. All interviews used the Indonesian language and were recorded based on the participant's consent. During the

interview, the researcher took a field note to capture the main theme of the information given. The researcher represented and introduced himself as a graduate student in the School of Natural Resources, University of Missouri-Columbia, and an Indonesian who grew up in Maluku. Each participant is contacted previously to set up the time and place for the interview based on the participant's preference. Field observation was applied during the researcher staying in Ay Island though involved in some activities of the conservation team, observing the area of MPA, and initiating "*coffee talk*" with some participants regarding the MPA.

Regarding ethical consideration, the study was reviewed and approved by Institutional Review Board approval of University of Missouri (reference IRB #2020285). The researcher also followed the Indonesian government regulation by obtaining the official permit from the Indonesian authority in "*Kesbangpol- Kesatuan Bangsa dan Politik*" National and Political Unity Agency of Maluku province at Ambon and central Maluku Regency at Masohi, and district government at Banda. Before starting the interview with the CTC, the researchers obtain permission from the director of Coral Triangle center by providing all documents needed. Meanwhile, the research in Ay Island can be conducted after gaining approval from the village government.

The researcher also used secondary data by reviewing the following documents (Table 1): The annual CTC's report from 2013 to 2020 published on ([www.coraltrianglecenter.org](http://www.coraltrianglecenter.org)), local regulation (*Peraturan Negeri*), Marine Rapid Assessment of The Banda Islands 2012, and all regulation related MPA in Ay Island. All the CTC's annual reports with the timeframe were selected because we explored the program's timeline and activities associated with establishing MPA in Ay Island. Meanwhile, the Marine Rapid Assessment of The Banda Island 2012 will be crucial information towards establishing MPA in Ay Island. The researcher analyzed the legal

document of village regulation to investigate how the content and rules in the regulation manage marine natural resources, revitalize sasi, and support Ay Island MPA. In addition, we review other legal regulations related to capturing the legal standing of the MPA.

Name of documents	Year	Institution	Code	Number of pages
Marine Rapid Assessment_ The Banda Islands, Maluku Tengah, Maluku – Indonesia	2012	CTC	MRA-12	167
The Annual Report CTC	2013	CTC	ARCTC-13	15
<i>Peraturan Negeri Admistratif Pulau Ay Nomor 1 2014</i> (Local Regulation Number 1 2014) about natural resources management.	2014	Ay Village Government	AVR-14	23
The Annual Report CTC	2014	CTC	ARCTC-14	21
The Annual Report CTC	2015	CTC	ARCTC-15	15
The Annual Report CTC	2016	CTC	ARCTC-16	16
The Annual Report CTC	2017	CTC	ARCTC-17	19
The Annual Report CTC	2018	CTC	ARCTC-18	19
The Annual Report CTC	2019	CTC	ARCTC-19	13

**Table 2:** The documents reviewed

## Data Analysis

The interviews were transcribed firstly, then outlined into a document world, and prepared the data for analysis. All the data transcriptions were translated into English. However, in the coding and analysis data process, the original version of documents in Indonesia was used to interpret the data. The inductive coding approach (Creswell & Poth, 2018. p.84) was applied in the coding process. The data were imported into International's NVivo qualitative analysis software (Fischlein Miriam et al., 2010) version 12 for conducting the coding. Before starting the coding process, the researcher read through all the data and field notes to build the understanding and familiarity of the data and highlight the most interesting finding by taking memos. Then the

researcher begins with open coding (Creswell & Poth, 2018. p.85) by scratching and creating codes based on the data. The codes were organized and generated into four different main them that best represent the process of integration sasi and community engagement (Creswell & Poth, 2018). In this process, the researcher critically reviewed all the codes' themes and associated sub-themes to make sure the analyzing process captures participants' voices and addresses research questions.

The researcher adopted and modified data matrix explanation by Schatzman (1991) to present findings with a central perspective of findings and four dimensions (themes). This matrix explanation shows the correlation of each dimension and the central perspective that shapes the process of integration sasi and community engagement in MPA.

## CHAPTER THREE: FINDINGS

Using an inductive coding approach, the researcher codes the data within four main dimensions: integrating sasi, community engagement, the factors influencing community engagement and the sustainability of MPA, and the impacts of MPA. In addition, the matrix explanatory (figure 1) describes the dimensions are identified with the detailed sub-themes; the process of the CTC incorporates sasi as a local wisdom into MPA and involves the local community in Ay Island, factors that influence the process and the impacts of the MPA. Bridging science “*ilmu kampus*” with local knowledge “*ilmu kampung*” becomes the central perspective of how CTC integrates sasi and engages the local community the marine protected area in Ay Island. Table 3 describes the timeline of establishing Ay-Rhun MPA and some detailed activities of CTC regarding the integration of sasi and community engagement in Ay Island for the last ten years.

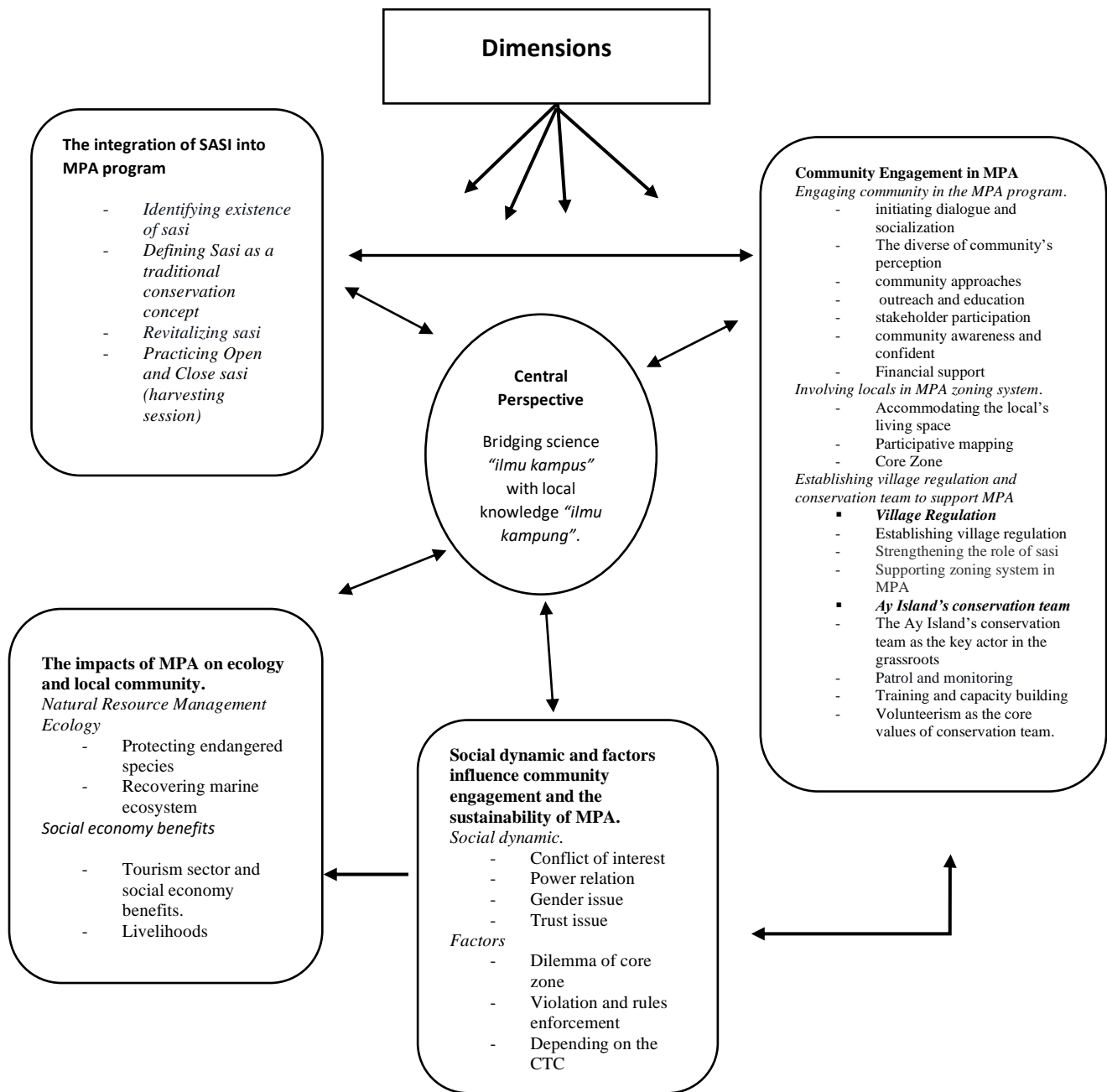
Year	Activities and Events
2012	Conducted scoping study including manta tow marine monitoring, social-economy survey, and marine rapid assessment to develop plan of establishing MPA.
2013	Socialized and purposed the MPA for the Ay Island community Conducted community outreach and stakeholder approach Facilitated the local community to establish “Tim <i>Pengelola Sumber Daya Alam</i> ” Natural Resource Management Team. Initiated brainstorming to revive local knowledge “sasi” and integrate it into MPA plan. Facilitated the community to develop the draft of village regulation regarding the natural resources. Provided training and capacity building for the local community. Strengthened the “adat” traditional institution. Involved the local community in zoning system and MPA design
2014	Facilitated Intensive public meeting and consultation to discuss the village regulation draft. Conducted expert consultation for village regulation Village regulation was verified by Central Maluku Regency The local community approved and declared a complete design of MPA in Ay Island under the Village Regulation and “sasi” Reimplementation of “ <i>tutup sasi</i> ” close sasi session. Facilitated the community to establish the conservation team
2015	Socialized MPA design and Village regulation Established A community leaning center
2016	Maluku Province reserved the Ay-Rhun MPA; Central Maluku Regency legalized Ay Island conservation team
2017	Conducted RHM; supported the development of the Ay-Rhun MPA zoning and management plan and establishment of Banda Islands MPA Network Management Forum.
2018	Conducted RHM; supported development of Banda Islands MPA Network Forum structure and work plan  Intensive training and capacity building for conservation team.
2019	Conducted biophysical and socio-economic surveys in the Ay-Rhun MPA; supported the establishment of the Ay-Rhun Island MPA Task Force and MPA Management Unit.
2021	The Ministerial Decrees declared the Ay-Rhun MPA as new protected zones were signed.

Source: The information was developed based on the interview and the timeline of CTC on :[https://www.coraltrianglecenter.org/banda-islands-](https://www.coraltrianglecenter.org/banda-islands-mpa-network/)

[mpa-network/](https://www.coraltrianglecenter.org/banda-islands-mpa-network/)

**Table 3:** The timeline of MPA establishment.





**Figure 2:** Explanatory matrix of coded data

## **1. The integration of sasi into MPA program**

The CTC integrates establishing and managing the MPA program into the local context, especially by revitalizing sasi as customary law and traditional conservation concept and connecting this traditional concept into the modern zoning system in the MPA program. The CTC tries to combine the modern conservation approach in the MPA context to fit with the available traditional conservation model such as sasi in the Ay Island community. The integration sasi into the MPA program was identified as a crucial stage in establishing MPA in Ay Island. We found four sub-themes explaining this process: the existence of sasi, sasi as a traditional conservation concept, revitalizing sasi, and open and close sasi practice.

### **1.1.The existence of sasi**

Before revitalizing and integrating sasi into the MPA program, the CTC had learned and identified the practice of sasi in Ay Island. In 2012, the existence of sasi was almost extinct on the island. Since the practice of sasi has been nonactive for approximately the last 50 years, this has become a big challenge for the CTC. It also indicated how massively local people exploit their marine resources without any regulation, and people might forget about practicing sasi.

*"When we (CTC) came to Ay Island, some of the local wisdom there was nonactive. There was no sasi; it has been almost 50 years and had not been implemented anymore. So, they told me that they had sasi laut (marine) there before it was not implemented. How many years ago, well, I forgot, they just told me it's almost 50 years old. Then I think it's a big challenge, if sasi existed in 50 years ago, it means that some of the elders might forget a little bit the procession and regulation of sasi" [S1]*

A member of the local customary institution (dewan adat) [A3] confirms that the implementation of sasi was in the 70's when he was child and the elders told him about sasi. Furthermore, a

fisherman and member of the conservation team said that the exploitative behavior of the community without the implementation of sasi impact on marine ecosystem damage.

"Before conservation (MPA) was established, it was no longer sasi. People who are free to go to marine area and want to gouge coral, want to take anything, they are not prohibited in the marine area". [C3]

Based on the interviews, we investigate that the phenomena of sasi become weaker and disappear due to oral speech culture, the lack of enforcement (fine or punishment), the degradation of customary values, and the lack of role of local customary institutions (*lembaga adat*). For instance, [S1] emphasized that "the culture of the people in Maluku including Ay island's community is oral, not written culture. People talk about customs and sasi through speech, and they do not document it in written form or legal form. And that, frankly, the potential for bias largely". On the other hand, even though a customary institution exists in the village but is not functional, it does not work well. Regarding the degradation of customary values, it seems that the reality of local people does not put trust and obedience above their kings (*raja adat*), traditional institutions, traditional values, sacred places, or the power of their sacredness anymore. Additionally, all these factors have influenced the existence of sasi then become challenges for both CTC and Ay island's community to reactivate the practice of sasi.

### **1.2.Sasi as a traditional conservation concept**

To sustain the conservation plan in the MPA program, the CTC needs to develop the concept of MPA to fit the local context by viewing sasi as a traditional conservation concept. Therefore, it has been reasonable for the CTC to combine the modern conservation approach and traditional conservation model in MPA and explain the role and purpose of MPA by using existing traditional practices such as sasi.

*"I just thought simply that SASI is good practice, SASI is the simplest form of conservation. It is the simplest form of conservation that is very close to the community. Especially the people of Maluku. Although many people say that the SASI concept is more about restocking.... Well, what's the difference. In conservation, restocking is one of the components." [S1]*

Other CTC staff also showed that how sasi is relevant with the purpose of MPA to protect and sustain marine resources. Another CTC [S1] also emphasized the local community feels that sasi is an ancestral culture which is in line with existing conservation (MPA), therefore the local community are very enthusiast.

*"I think for SASI itself as a culture in Maluku, but also part of conservation as well. So, it must be very related. It may be in the Indonesian language is called conservation practice. However, in the area of Maluku, it is called sasi. So, the goal of both (conservation and sasi) is for sustainability and its positive impact on society; in this case, if there is sustainability, it will automatically impact both economically and ecologically, even tourism potential for the community. That's right. So that, SASI was included in one of the management plans for the management of the Aa-Rhun MPA. There is more value associated with local-based conservation area management with local wisdom that still exists. For me, it is crucial and very sustainable. Why? because the both aim to - how the sustainability of natural resources there." [S3]*

### **1.3.Revitalizing sasi**

The CTC consider the problems associated with sasi and the potential traditional conservation practice meeting the purpose of MPA. Before initiating and establishing MPA, revitalizing sasi had become a primary choice of CTC to accommodate local ecological knowledge and strengthen the role of sasi and the customary or traditional "adat" institutions in Ay Island to sustain resources in MPA. The CTC's first step is to start approaching the community to revive

local wisdom, especially sasi. In revitalizing sasi, the CTC plays an important role as a facilitator in facilitating the elders and communities to reactivate the practice of sasi.

*"We (CTC) support the community to activate the existing Sasi practice. Sasi is a long-standing ancestral practice, but we realize that it no longer existed on Ay Island at that time. Yes. we discussed with the community, with community leaders, traditional elders who were there about how we tried to reactivate sasi, and they were very supportive. So that they became enthusiastic and had discussions among themselves, we just facilitated it". [S2]*

Some elders and informants of Ay Island community showed how the CTC supported them to revitalize sasi.

*"When conservation (MPA) comes, sasi is reactivated" [A1]*

*"Because there were no regulations when the CTC came, we gathered and we started doing a program, namely activating sasi, we made sasi. After about how many years, we reactivated SAS. Marine biota that was almost extinct, finally there is available more, sir. Then people start realizing it" [C3]*

The CTC integrated sasi into the management of Ay Island MPA in 2014 by legalized and revitalized. As an unwritten rule, sasi is needed to be legalized to strengthen the rules of sasi in both Ay Island Community and MPA. Undeniably, the tradition of sasi disappeared in the last 4 decades due to over exploration of marine resources and the transition of social-cultural change among the generation in Ay Island community.

This study found two approaches taken by CTC and the local community to revitalize sasi and integrate into MPA. Firstly, reregulating sasi, they consider that oral rules of sasi were weak to enforce sasi for the past years. As an unwritten rule, sasi is needed to be legalized to strengthen the rules of sasi in both Ay Island Community and MPA. Therefore, the CTC played an important role in facilitating the locals to legalize the sasi from unwritten rules (oral speech culture) into formal regulation (village regulation) by consulting with the elders and the local community. This effort strengthens the existence of sasi by reregulating the existing punishment which previously based on social or cultural penalty or criminal penalty for those who violate Sasi's rule back then.

*"Related to reregulating sasi. I told them what the mechanism was. Then they agreed that there was usually a fine. Okay, then we applied and adopted some of those mechanisms. For example, the caning law, well, if we do the caning law, I don't think it's ethical either for now. But, they agreed, sir, no sir, give them a fine. Then we ask what if the fine is not paid? If he is considered a criminal, his offense will turn into a criminal offense. Based on the report, it is up to the police if he does not want to pay the fine because the fine is a domestic settlement process. If you don't pay the fine, you'll have to deal with the police".*

[S1]

The findings show that sasi regulates: 1. when people can harvest natural resources in a certain time (open sasi or harvest session). 2. what kind of species are prohibited during close sasi (closing harvest session) such as teripang or sea cucumber (Holothuroidea), Siput lola (Trochus niloticus), lobster (Nephropidae), batu laga (Turbomarmoratus). 3. where area that people not allow to access and where the harvest resources, mostly in the core zone or other MPA area.

Secondly, the CTC supports and strengthens the role and existence of customary (adat) institution that run the sasi practice and traditional ceremony procession associated with sasi.

*"We are in adat and conservation (CTC) supporting each other. We cooperate with conservation (CTC). Conservation (CT) is entitled; we are the same. When there is an opening of sasi, it means that customs can also be maintained. Nowadays young people (in Ay Island) still recognize our traditions, cultural preservation e.t.c." [The Head of Adat/costmary institution]*

#### **1.4. Opening and closing sasi session**

The CTC supports the local to practice "buka sasi" opening session and "tutup sasi" closing session back and forth in Ay Island to prevent overharvesting marine resources. This process begins with the "tutup sasi" ceremony, a traditional ceremony indicating four years of restrictions prohibition to access marine natural resources from 2014 to 2018. In this process, the annual report of CTC in 2018 reported that the local community, conservation team, and elders were pivotal in enforcing the sasi rules. In 2018, the CTC facilitated Ay Island community to do traditional ceremony of opening sasi session to allow local villagers to catch valuable marine resources after a prohibition period of four years. These resources include some popular seafood such as lobster (*Nephropidea*), sea cucumbers (*Holothuroidea*) and shareholdings such as lola (*Trochus niloticus*) and batu laga (*Turbomarmoratus*).

*"When the "Sasi" is opened (harvesting session), local fishing communities are allowed to catch the protected marine creatures for two weeks before restrictions are reinstated. Designed fishing gear and size restrictions are put in place during the two weeks. Village elders closely monitored this period and violations were subject to penalties by the community" [ Annual Report of CTC in 2018 -ARCTC18]*

The procession of “*buka sasi*” opening session and “*tutup sasi*” closing session for elders is more than a ceremony for protecting resources. These are sacral processes with a ritual to reconnect with their ancestors and God. Therefore, they must begin with “*buka kampung adat*” ritual, a sacral tradition in Ay Island, by doing various custom rituals in the village. Then, members of ‘*adat*’ customary or tradition institution go to some sacred place to present “*siri pinang*” or ritual offerings.

*"First, we are in the tradition intuition “adat”, we customarily make a place of offering for the ancestors called "tampa siri". That's customary. Then we take it to sacred places; there are five places. Then after this traditional procession, we determine the opening date of SASI when... when will sasi is closed" [A1]*

Even the implementation of sasi for four year (2014-2018) was a good sign for both locals and CTC. Some residents argue that it takes a long time and impacts their sustainable livelihood system.

A fisherman [F2] argues that marine harvesting resources regulated by sasi for 4-5 years will impact the way they sustain their livelihood after evaluating the first implementation of sasi for the socio-cultural, economic, and ecological impacts. The CTC with the local community then revises the duration of sasi only in two years. However, when sasi is opened to allow people for harvesting marine resources effectively that it should be estimated well based on tradition and scientific evidence.

*"Then they open sasi regularly, once every two years they harvest marine resources together. That's what we also help, assisting the community for when they must open Sasi, when they should close, and how much to take out. In my opinion, the CTC should*



*give them the scientific ability for scientific analysis so that they can do it by custom or instinct. Still, scientifically there is a basis when they open and close the SASI. I think that's how it is in practice" [Senior MPA Specialist of CTC]*

## **2. Community Engagement in MPA**

The CTC has been conducting some efforts to develop MPA to fit with the local context in Ay Island, especially in community engagement. Community engagement is crucial for the CTC in all stages of establishing the MPA program, including initiation, design, establishment, and management. In the context of community engagement, interesting findings show how the CTC engages the community and views them as the subject of the MPA program by following approaches.

### **2.1 Engaging community in the MPA design.**

#### ***Initiating dialogue and socialization***

After conducting a baseline survey regarding the condition of biophysics and social economy in 2012, the CTC engaged Ay island's community by **initiating dialogue and socialization** to introduce the purpose and plan of MPA. Then the CTC facilitated the locals to initiate *tim Pengelola Sumber Daya Alam or PSDA (Natural Resources Management Team)* as the core team to outreach other communities and support the initial process of establishing MPA. Two local leaders reflected their involvement and the process when CTC staff came to their village for the first time.

*"Anyway, I was involved from the beginning, there was no main person yet. Mr. Mad Korebima from CTC came for the first introduction in the beach. This was the beginning of starting conservation (MPA). Then we went to the community to do socialization, we held meetings at schools, in villages, in homes. We moved around. Then we started*

*forming a..... Prior to this, before conservation (MPA) was initiated and implemented, we had formed a natural resource management team." [The head of Ay island's BPN]*

*"They sat under a tree with the community to socialize (MPA). So, apart from seeing the condition of Ay Island, they also directly interviewed the community about the state and condition of the resources in Ay Island under the tree, above the para-para (bamboo or wood chairs used by locals to gather) involved elderly women and men. Young people were also involved" [Former Ay Village Secretary]*

### ***Community perception***

The diverse **community's perception** toward conservation agenda in MPA was about a problem and challenge for the CTC regarding of intention to involve the community at the first time. Some of the community showed a positive response towards the MPA because it will protect and sustain their resources. However, some of the local communities feel threatened by the emerging conservation program in their area. I found that regarding of the polemic (pro and cons) in Ay Island's community, it was shaped by how highly their marine resources dependence and the level of knowledge toward the sustainability.

*"At the beginning of this conservation, this is what we (katong) say is one of the scourges for the community. Because at that time these people did not know what conservation really was like. Some local communities argued that conservation is the intent of prohibiting, that people should not do this activity, they should not do this or that." [S3]*

*"In Ay Island, with this conservation (MPA), there are those who refuse. They don't want to because they may also feel depressed. yes, feeling depressed because it has to do with where (area) they fish". [F1; Local fisherman]*

### *Community approaches*

There was a lack of knowledge of the local community towards the goals of MPA to protect and sustain marine resources in Ay Island. Effective **community approaches** of the CTC are essentially needed to involve the local community in the MPA program. The CTC uses the persuasive approach to communicate with those who are against the MPA. The intense presence of CTC staff in Ay village showed a clearly appropriate community approach. Some residents said that they are interested and joining the conservation efforts through MPA program because they like the way staff of CTC treats them, such as staying on the island for a long time to build strong ties with the community.

*"If I see that (MPA), I prefer the CTC staff who often visit Ay Island. But the other CTC staff rarely come to this village. If working in conservation and working with the community means you must stay in the village often. Yes, you must stay in the village often and do a lot of socialization with the community. This means that some locals are wondering whether this conservation still exists (MPA) or not". [C1]*

**Outreach and education** become another concern of CTC's staff to approach the community. The CTC develops the understanding of the community towards MPA by educating them through some public meetings and training. In educating the community, the main issue is the use of language and how the message is delivered simply and easily understood by the community.

*"I think the key was actually training. The community understands its resources. but it's like we provide background science in management. For example, why should this area be closed or without utilization? There is a zonation system. If a conservation area is managed with a zoning system, sometimes people don't understand it in more detail. If it's like a sea area, the community will freely take advantage of it. For example, we explain*

*the example of the case of sea cucumbers, if the small sea cucumbers have not laid eggs, have not reproduced yet, they have been caught, the local community will lose. It was a scientific point of view, then we explain in the language of the community which is easier to understand and more obedient to it". [S2]*

*"After CTC delivered an explanation and materials. Finally, people are excited too. Finally, one by one, of local community began to know about conservation (MPA). Well, at first, they didn't understand what conservation (MPA) was, but after being explained, they finally knew the meaning and purpose of conservation. Especially the problems at sea. People have started destroying nature, the environment, and corals. Well, that's... in the forest too. Finally, everyone supports it." [Local resident, member of Ay village BPN]*

### ***Stakeholders' engagement and support***

Other efforts identified in engaging the community are **stakeholder participation, community awareness and confidence, and financial support**. The CTC involves stakeholders in the decision-making process of establishing MPA in Ay Island, provides training, and builds understanding of the community towards the basics of conservation areas and resource management. Some local stakeholders are involved, such as village government, Village Deliberation Agency (BPN), elders, traditional "adat" institutions, religious leaders, fishermen, youth leaders, tourism manager, and Ay Island residents. The stakeholder's participation will strengthen the community's role awareness in MPA.

*"There are several teams. I don't remember anymore. Then there is the PSDA team which involves all community leaders, both traditional and government, religious leaders, women leaders, youth. We formed PSDA for the first time in Mr. Andre's house. It took*

*place from a neighborhood to another neighborhood. That was the beginning of the formation of the PSDA team, and then it kept moving again and again (to discuss conservation and village regulation). Until we convince the public that we are really in the conservation (MPA)." [VG2: Village leader]*

Another participant (elder) spoke that this process is perfect because the CTC did not invade their path. They cooperate with the traditional "adat" institution and village government to regulate and manage natural resources through conservation (MPA). On the other hand, because of the CTC profoundly engages the community, the stakeholders sometimes rely on **the financial support** of the CTC for their participation sustainably in MPA, such as patrol or the opening sasi ceremony.

*"So... we want to do more activities. How about going on patrol? How are we going to pick up trash again? While there is no funding support from CTC anymore" [C2]*

*"Well, for a process like SASI, for example, if you want to be regulated by the traditional "adat" institution, it requires costs. Well... it is usually supported by conservation (CTC)." [A1]*

### ***Community awareness***

Furthermore, the impacts of engaging Ay island's community can build the **awareness** of the local community toward MPA, environmental issues, and the sustainability of the natural resource. I found that five main factors which shape the local's awareness: knowledge, fear of regulation violation, collective action, self-confidence, and pride and ownership. Some informants showed that after being involved in training and regular meetings with CTC staff, they have knowledge and reason why they must protect their conservation area.

*"Well, if there is no conservation, the marine ecosystem will be damaged. Initially, we didn't know about the corals. Because we didn't know that's why we damaged them. Then we know that the coral is where fish live and where fish lay their eggs. Previously, because we didn't know it, we just broke it. We don't know. So... we lift the living coral and the dead one, we just break it. As a fisherman, we used to take a living stone to fish. But now, with this conservation (MPA), it's forbidden, it's not allowed to take corals, damaged ecosystems can be recovered. Then the fish in the reef can also lay eggs". [ C1; conservation team member]*

*"Moreover, there is a coral area where fish lay their eggs. If we want to take and break, it means there is no growth for fish and coral anymore. So, we have to take care of that area." [F1: Fisherman]*

The level of community awareness increases because they feel belong to the MPA since the CTC views them as the main actor in regulating the protection area. A staff CTC empathized that when the locals are very proud to be involved and showing their ownership.

*"So, the more they are proud of what they have (resources and tradition), what they make (regulation), the resources that they protect, and they make their own rules. Then the level of compliance will be higher. Because of their participation." [S1]*

## **2.2. Involving locals in the MPA zoning system.**

Another crucial consideration in the establishment of MPA was the zoning system. The CTC considers involving the local community in the zoning system of MPA in Ay Island to avoid conflict of the marine resource use at the conservation area. On the other hand, the local community knows more about their place. The CTC tried to incorporate the context of the

modern zoning system in MPA with the traditional marine zone in the Ay Island community by the following process and issue:

### ***Accommodating the local's living space***

In the local's living space, the community highly relies on marine resources in the area that would be established as MPA. Therefore, in conducting zonation in MPA, the CTC realizes that accommodating the space for local people is needed in which local people can use the resources and sustain their livelihood. The CTC educates the community regarding the sustainability of their resources as the main principle of MPA.

*"So. the most important discussion in a conservation area is its zoning. Whether on land conservation or marine conservation, the key is zoning. We must be able to accommodate the community's living space, the community's use space. We must also provide education that if this living space is not used wisely, it is not managed properly, it will be potentially exploitative." [S1]*

### ***Participative mapping***

Due to zoning MPA area is a critical issue in the context of multi-use zone in Ay Island. The CTC used participative mapping to involve locals directly in identifying the potential area for zonation in MPA (core zone, restricted use zone, sasi zone, use zone, and tourism zone). The CTC and community decide the zonation based on local knowledge, which is supported by scientific evidence (baseline ecology survey).

*"Even though at that time we already had the data science, but we haven't talked about the zoning yet. We map out which areas they (community) think are important or areas that have special value. So, it's plotted, and participatory mapping is applied. For example, they say that this is a taboo or sacred "keramat" area, but this can be accessed,*

*and young people mark the area using GPS. Later, we will scientifically display the data on the marked area. Then we will begin to explain and have a general agreement to decide which area is good to be a core zone, a tourism zone, this zone, or that zone. The most important thing is to find common ground where the community does not feel disadvantaged, and the results of science can be implemented properly. That's the point, so look for a meeting point and a real compromise point that doesn't have a big impact on the area" [Former Banda MPA Coordinator]*

We found that it took years to have the local consensus on the zonation system, especially in the local community with a high level of exploitation. It would not be easier to achieve the collective consensus. Another CTC staff spoke that they educate the community about the zonation, conduct a survey with the community, and then design the zone altogether with the community. He also emphasizes that this process is a bit long and tough to discuss with Ay island's residents. It takes a long time from 2012-2016 in community assistance. We decide to reserve the area then establish it as MPA. On the other hand, local communities said that in establishing the zonation of MPA, they had a consensus in "*musyawarah*" deliberation.

*"Yes, at the time of the mapping process, we were involved. In conducting the map is led by CTC. But for the placement of an area to be the specific zone, here is for this zone, there is for this zone is through "musyawarah" deliberation. [C2]*

### ***The core zone design***

Instead of other zones of MPA in Ay Island, the core zone or protected area is a pivotal area for protecting and sustaining marine resources and biodiversity and is known as a sacred (taboo) area for the local community and place for fish breeding. By using the evidence of scientific



data, the CTC staff found that this specific zone is a spawning area for fish, and it shows highly marine biodiversity compared to the other areas.

*"So that area is a sacred area, and that area is indeed a breeding ground for several types of snails and clams, including lobsters of all kinds. Because usually in sacred areas, if properly maintained, these areas have great potential as spawning areas of fish. Then... It became the core zone because I said that the concept of a core zone, everything that is inside, must be protected. It must not be disturbed. The border is clear. They were thinking at first, but I said that it was not a big place, and you can catch fish in other places around this island. Finally, they agreed. I showed this area is very suitable to be used as a core zone based on our survey results in 2012". [Former Banda MPA Coordinator]*

On the other hand, the "adat" traditional institution leader [A1] confirmed that they pointed the sacred place to be the protected zone. In addition, the Ay island's elder also showed that this area is a "pamali" or taboo area, which is a sacred place and not freely accessed; therefore, it should be protected as a core zone.

*"First, the kind of conservation (CTC) with this core zone is good. Don't make it dirty there, in this "pamali" taboo place. The second, from ancient times, this place should not be arbitrary access, it should not be dirty. Indeed, the conservation (core zone) rules are correct. They helped clean up this village, and they strengthened and corrected the "adat" custom value." [E2; Ay island's elder]*

### **2.3. Establishing village regulation and conservation team to support MPA**

Based on the interview and document reviewed, the most strategic ways of CTC in terms of community engagement in MPA sustainably are establishing village regulation and conservation

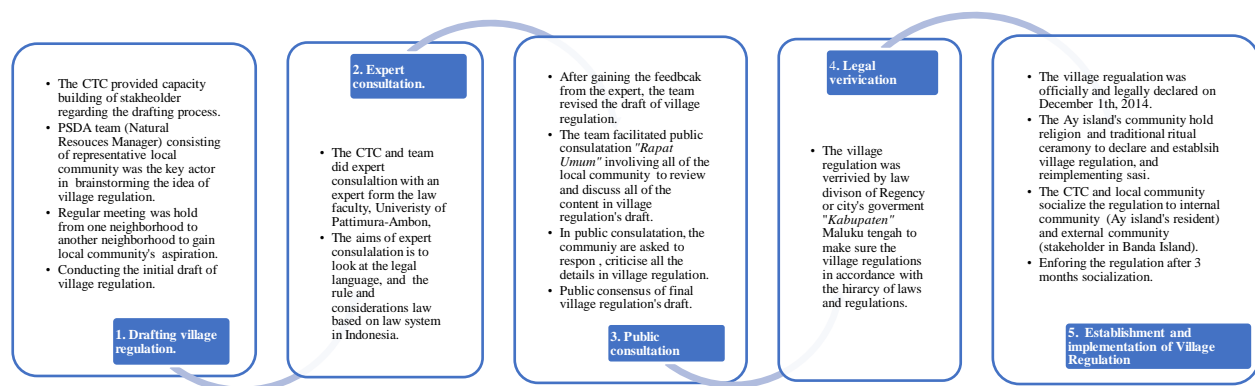
team. Firstly, the CTC facilitates the local community to develop **the village regulation** for managing natural resources, strengthening the role of *sasi*, and supporting the zonation system. Secondly, the CTC facilitates the establishment of **Ay island's conservation team** consisting of local people who demonstrate a strong commitment to building people's awareness toward *sasi* and MPA and regularly patrol and monitor MPA.

### 2.3.1 Village Regulation

#### *Establishing village regulation on natural resource management.*

The role of regulation is fundamental to managing the natural resources, including MPA in Ay Island. To enable the design MPA management to fit with the local's need and context, the CTC facilitated the local community to initiate village regulation, namely *Peraturan*

*Negeri Admistratif Pulau Nomor 1 2014*. In 2013, the CTC began to facilitate the local community to draft the regulation, and then the local government has declared a regulation on sustainable natural resources in 2014. The informants of CTC staff and Ay island's community highlighted that forming the village regulation indicates a high level of local community participation. Figure 4 describes the process and stages of the CTC facilitate the community to establish the village regulation.



**Figure 4:** The process of establishment Ay Island's village regulation

The former village secretary involved in this process showed how the community is actively engaged during several meetings to establish village regulation.

*"Previously, we joined a training from the CTC. Then we held meetings to formulate Village Regulations by involving all the community, involving the village head, involving the BPD and all. Then it (draft) was given to the public through a general meeting to see who agreed and disagreed regarding the rules (draft) that we presented. However, it had been previously reported to the public. Finally, all opinions were embraced. We just formalized them, then they were promulgated to be issued. It's just a village regulation to support conservation (MPA) and sustainable natural resources management". [Former Village Secretary]*

Furthermore, the head of Ay island's conservation team emphasized that the most crucial thing in this process is accommodating and listening to the local community's voice. Therefore, they hold the meetings in all neighborhoods' *lingkungan RT*" and public meetings "*rapat umum*" to ask the public consensus toward what kind of resources should be protected and restricted through village regulation. He said we need to ask the community whether they agree or disagree with sasi and village regulation draft. If the community disagrees, we do not force them. The former village leader of Ay Island spoke that an expert consultation is essentially needed to review legal language and structure regulation of documents. Then it would be verified by the law division of the city's government to make sure the village regulation is not contrary to or against any related higher level of law and regulation.

In general, the village regulation (*Peraturan Negeri*) constructs a set of rules (12 chapters and 55 articles) collectively agreed upon by the local community. It regulates the use of natural

resources among local people, including the following elements: the goal, objective, principle, scope, border, zonation, conservation teams, management of natural resources, sasi, marine protected area, fine and prohibition [*Peraturan Negeri Admistratif Pulau Nomor 1 2014*].

### ***Strengthening the role of sasi***

The village regulation (*Peraturan Negeri*) strengthens the practice of sasi by regulating the area of sasi and prohibition from unwritten rules to legal regulation. The village regulation reformulates a clear penalty (punishment and fine) for those who violate the rules of sasi and catch and kill the endangered species such as napoleon fish, turtles, dugongs, sharks, etc.

dolphins, manta rays and whale shark areas in sasi and MPA areas. [*Peraturan Negeri Admistratif Pulau Nomor 1 2014*]. The head of Ay island's Village Deliberation Agency "*Badan Permuyawaratan Desa*" assures that through village regulation, sasi becomes stronger than in the past when sasi was not legitimated by legal protection and people freely violated the sasi practice and devastated the ecosystem. Other local leaders confirm that the village regulation strengthens the sasi practice.

*"The village regulation also regulates sasi. Yeah, so it is also regulated in the regulations. So sasi practices and regulations are getting stronger". [Fomer Village Secretary]*

*"In the past, when sasi was implemented, for example to protect marine biota such as lobster (*Nephropidea*) and Lola (*Trochus niloticus*) used to be caught carelessly. Prior to the village regulation, people take octopus carelessly. After the sasi was stipulated in the village regulation, they (villagers) finally obeyed it. So, every community activity is bound by rules, not arbitrary. If there are damages both at sea and on land, there will be sanctions". [Staff of Ay Village government- the village's treasurer]*

### *Supporting zoning system in MPA*

The CTC's annual report in 2014 [ANRCTC-14] reported that the Ay Island community declared an 18,000 hectares Community-Based Marine Protected Area (CBMPA) under traditional (sasi) and village level regulation. This report indicated how village regulation became such a community's legal standing on supporting MPA. The zoning system is clearly stated in chapters IV and VII of village regulation "Peraturan Negeri Admistratif Pulau Nomor 1 2014" about the area of MPA in Ay Island, zoning system, and prohibitions. Referring to these chapters, the marine area of Ay Island consists of different zonation such as core zone or protection zone, sustainable fisheries zone with traditional fisheries sub-zoning and Sasi sub-zone, utilization zone with marine tourism sub-zone. A CTC's staff who facilitated the process of the zoning system said that the village regulation helped them to easily decide the zoning system of MPA with the local community in Ay Island because the local community has declared the zoning system in their village regulation.

*"The zoning already exists. In determining the discussion of the zoning of Ay Island, it was easy because it was already in their village regulations. They already understood. When the CTC discussed system zoning with the people of Ay Island, they said that we had talked about it and agreed on the village regulations. It is regulated in village regulations. So, we (CTC) only adopted from their village regulations when zoning is made in regional marine conservation areas (MPA)". [S1]*

The Ay island's conservation team leader [C2] also said that the village regulation effectively becomes legal standing when they patrol, monitor, and require the entry fee or retribution fee from tourist or tourist sailing ship who dive or visit the marine tourism zone.

### ***2.3.2 Ay Island's conservation team***

The CTC and the local community had strategical approaches to establishing and managing MPA through meeting the local context by integrating sasi, engaging community, and establishing village regulation. However, this study found that the village regulation also legitimates the establishment of Ay Island's conservation team. This team is essentially needed to sustain the role of local people in the management of MPA and enforce sasi and village regulation. Furthermore, based on the interview with all informants, I revealed that the Ay island's conservation team is the spearhead or key actor in the sustainability of MPA through the following roles and process:

#### ***The Ay Island's conservation team as the key actor in the grassroots.***

A local leader [B1] said that Ay island's conservation team consist of representative local community who demonstrate high commitment and care to manage natural resource and MPA. The village regulation becomes a legal standing for the conservation team to do the roles such as patrolling and monitoring the MPA and enforcing village regulation. Regarding the conservation team role, most informants of Ay Island emphasizes that this team is the key actor in MPA management and enforcement of sasi and village regulation. For example, A local resident [LC] confirms that in MPA, the conservation team intends to approach the community to build awareness toward MPA than the CTC staff. As a key factor in the grassroots level, the conservation team has an intensive intervention to the community in terms of educating the community toward conservation issues, involving the community in patrolling and monitoring. Meanwhile, the CTC just play role of facilitator to support the activities of conservation team and let the locals build the community's awareness and ownership toward MPA.

*"The CTC only facilitates us. But we are local people who spearhead the MPA. Communities on the conservation team. So... if there is a problem related to the MPA Area, we will handle it. We will coordinate every problem with the village government and the CTC". [C4; Member of Ay Island's Conservation Team]*

The head of Ay Island's conservation team [C2] also emphasized the crucial role of the conservation team. If they resign from the conservation team, it will impact both the effectivity of village regulation and sasi, and conservation efforts in MPA.

### ***Patrol and monitoring***

As a key actor in MPA, the conservation team regularly patrol and monitor the area of MPA to enforce the regulation and prevent the area from destructive activities. The secretary of Ay island's conservation who was involved in conservation team since established describe how they do patrol in MPA Area.

*"We conduct patrols to look at the core zones within the area. Then at the same time, keep an eye on maybe someone is taking turtles, using nets to catch sharks, bombing fish, etc. ... then, as a team we patrol maybe 2-3 times a month. But I personally monitor the core zone every day because it is close to my area.". [The secretary of Ay island's conservation team]*

Both the CTC staff and conservation members were interviewed assuring that actively involved in patrolling and monitoring the MPA. The conservation team usually involves related stakeholders such as youth, fishermen, village government's staff, and "babinsa" noncommissioned law enforcement officers posted in villages and wards and affiliated with the civilian administration. This stakeholder's involvement was indicated the public participation on managing MPA. The senior MPA specialist of CTC [S2], Village government

staff [VG1], and some members of Ay island's conservation team highlighted that the aims of the patrol are not only focusing on core and preventing violation on MAP. But also, it monitors the tourist activities on marine tourism zone and communities' activities on sasi area. In addition, two members of the conservation team, who are also fishermen, showed that they patrol and pick up the garbage destroying marine ecosystem and involving another fisherman in patrol.

*"When we do patrols, we also often pick up trash that pollutes the sea as well" [C1: a member of conservation team and fisherman]*

*"In conducting patrols. There are also many observers from fishermen who like to find boats that are being around in the area at night. So..we are not only cooperating with fellow members of the conservation team, but we are collaborating with fishermen. They surely agree it. So, when we heard the information, they said don't be fun, there is a "motor" boat that is active behind the island (MPA area). We immediately went to patrol. Not only us, but the community also participated. [C3]*

### ***Training and capacity building***

As a facilitator, the CTC staff informed that the CTC would like the locals, such conservation team, and other local stakeholders actively involved in MPA management. Therefore, the CTC is responsible for strengthening the capacity and improving the quality of conservation through various training and capacity building.

*"The task of CTC is how to strengthen the team; we only encourage that there must be a team that manages it (MPA). It is not us who form the team, but the community itself that forms the team. So, CTC is more about facilitating and strengthening them in terms of capacity building. And the CTC supports them on how they can work well. Well, the*



*support isn't always with money, it's through training, capacity building..." (S1; Former Banda MPA Coordinator]*

The current Banda MPA Coordinator [S4] also underlines that capacity building and training in one of the main concerns of CTC in Ay-Rhun MPA. In addition, the senior MPA specialist of CTC describes how the CTC provides training and capacity building for the community is a key in building the community's understanding toward MPA.

*"We always carry out capacity building to the community. For example, we conduct training on conservation area management, the basics of conservation area management for communities on Ay Island. So that at least they can understand it technically. How can they assess the ecological impact, socio-economic impact of the area? That's what we do regularly." [The senior MPA specialist of CTC]*

On the other hand, the Ay Island conservation team listed some training and capacity-building activities from CTC to support their role in both MPA and community, such as (a). Dive training for area monitoring marine ecosystem and identifying the coral reef, (b). training on tourism management, (c). training on strengthening the knowledge and the techniques of managing MPA, (d). public speaking, (e). Training on conducting social economy surveying and reporting, (f). Waste management, and (g) competence test. The Ay Island conservation team secretary said that the CTC involves them joining the training and capacity building in Ay Island and at regional and national levels. He also confirmed that some of the conservation teams were certified in diving. The transfer of knowledge process was identified though the informants of the conservation team said that after joining the training and capacity building, they educate and teach the community about all the learnings. So, they can teach other team members and the community to dive.

*"The CTC gave training related to coral reefs. So, we convey to the community that how to identify dead corals, live corals. We're from the conservation team, so let's tell the community" [The head of the conservation team]*

A woman in the conservation team describes how the CTC involves them in such hands-on marine ecosystem and MPA activities.

*"I took part in the training to go down to the marine area to find out about coral reefs in the sea, the use of the core zone and the use zone. During the training, we learned a lot about ecosystems and coral reefs. After they give training, the CTC also takes us to practice in the marine area and invites us to practice identifying which fish can be caught and which fish should be released". [Women Representative and Ay Island Conservation Team]*

***Volunteerism is the core value of the conservation team.***

Based on the interview with the local community and conservation team, I found that values of volunteerism have shaped the consistency of the conservation team's role in MPA for the last seven years. Undeniably, some locals consider that sometimes local people join a program because they get paid or have direct benefits such as income from their participation. But it has not happened with the conservation team; they patrol, monitor, and do other roles in the MPA area voluntarily and consistently.

*"I see the persistence of our brothers and sisters who are part of this conservation team. Even if they are not paid, this means that if we want to talk about salary, they will automatically have a monthly income. But it's not, so they just work without ulterior motives. They work earnestly." [B1]*

The conservation team explains that they are voluntarily involved in MPA management because they are concerned about developing their village and the sustainability of the marine ecosystem and livelihoods needs for their future generation.

*"What supports us is the spirit of building this village (through MPA), even though we are not paid by the or any other institution. Because we look to our children's future if we just leave it, our village will be destroyed. Because garbage is scattered just like that, people pick up stones and coral reefs freely in the marine area; people transport sand freely. Sometimes coral reefs are just destroyed like that, and people look for protected marine biota... That's why we do night patrols. Even though there is rain, waves, and wind, we keep going. We leave our wife and children at home. But it's interesting, sir, why sir, why do you want to do that. Sir, we are also surprised. It means to feel 'called'". [Ay Island's Conservation Team and the vice leader in "RT" neighborhood]*

### **3. Social dynamics and factors influence community engagement and the sustainability of MPA.**

The participants often spoke about the social dynamics and factors that influence the integration of sasi, community engagement, and MPA management sustainability in Ay Island.

#### ***3.1.Social dynamics.***

Based on the interview with the local communities, I found that some social dynamics such as conflict of interest, gender issue, power relation, and trust issue have formed the way people see the conservation plan of MPA in Ay Island.

#### ***Conflict of interest***

A staff CTC expressed that when they began to introduce the MPA to the local community, some people initially rejected the idea of conservation in Ay Island. The main reason for this rejection was not the conservation issue, but it was related to conflict of interest within the local community regarding local political problems. On the other hand, the senior MPA specialist of CTC also describes how this conflict-of-interest shapes how people see the establishment of MPA.

*"Actually, what we understand or analyze from this condition is not that they support or reject conservation. But more towards what is called their internal conflict. They don't want to, don't agree with the village head, and if this conservation is successful, the "raja" the village leader will automatically get a name." [Senior MPA Specialist of CTC]*

The former Banda MPA coordinator emphasized that the CTC avoid being co-opted with those involved in the conflict of interest related to the village political issue. He also said that the CTC tried to accommodate them when they made community approach

*"So don't let us be co-opted. So, I always shy away from the co-optation process. I remember once that some people in the village did not agree with conservation. They are very confident with the election of this new king. They say that we will disband conservation." [S1: Banda MPA coordinator]*

On the other hand, conflict of interest was also related to natural resource use. A local leader [TB] said that even the establishment of MPA is good for the village. Still, every community has its own needs and interest regarding their livelihood depending on the conservation area. Therefore, even the conservation team patrol regularly, but some people always harvest marine resources in protected areas.

### ***Power relation***

Another local resident [Fisherman and conservation team] showed how the economic motive and benefit have influenced the community's behavior for supporting a big development project that extracts the sand in a nearby beach conservation area.

*"Some communities also support a large project that takes sand from the beach. It's only the people who benefit, those who work there. If people don't work for the project, they do not support it. Because the profits are for personal gain and the contractor's profit. Then, for example, the contractor has an estimated sand price of Rp. 700,000 per 1 cubic, but because he takes the sand near here. Yes, he only gave Rp. 200,000. Yes, the profit is the contractor while the community loses a lot" [C1]*

Regarding the case of banning big development projects extracting the sand in Ay Island. The Ay island's conservation team explained when they and the local community resist the owner of the project, who has pretty good networking with the government, they feel comfortable and safe to fight for protecting their island from sand extraction. The reason is they know that the CTC

also has strategic networking with governments at all levels. Furthermore, based on the interview and my observation in the field, power relation also becomes a factor that shapes the village key leader's participation. We investigated that with the existence of MPA, the local leader has bargain power in the district, regency, province, or national level.

Another power relation issue is indicated by the involvement of an army "*Bintara Pembina Desa* or *babinsa*" (noncommissioned law enforcement officer posted in villages and wards and affiliated with the civilian administration) in patrol the MPA area. Since the local community felt afraid to "*babinsa*" and "*babinsa*" has power in the local community, the conservation team said that it is effective to do patrol with "*babinsa*" for enforcing the regulation. The "*babinsa*" also confirmed that if it is just the conservation team enforcing the rule in Ay Island, the community might not follow the regulation in MPA. Therefore, they must be involved.

#### ***Gender issue***

The women participants were concerned about the level of women participation in MPA. They indicated that the women community were less engaged in MPA than the man. A CTC staff also confirmed that they involved only a few women in discussion and public meetings; however, women still have a voice in the meetings. From the interview, I found that the less representative woman in MPA and strategic decision-making process due to some reasons including patriarchal culture. For example, the man participants of Ay Island feel that women's participation is important. However, they only see the role of the woman always associated with the domestic tasks such as prepare and serving food and meals for them. On the other hand, the lack of women representatives in CTC staff in Ay Island also influences the way women are involved in the MPA.

A woman informant also added that getting approval from the husband to be involved in such activity related to MPA also becomes the main concern to the lack of women's involvement. She emphasized that women should be involved in the MPA as the same as the man. She also suggested that a group of women should be established to support the program, such as MPA or another program in the village.

*"I personally think it would be better if all the women and men were involved. There are women and men. It's better that way. So that men's activities, women can be involved and vice versa, men in women's activities can also be involved. Actually, we can do the domestic task in the kitchen and do activities outside. I suggested that if we can make one group or two groups. Then we divide tasks for this group; this group due to this task, what kind of activities does this group do" [W1]*

### ***Trust issue***

The trust issue has become a big concern regarding the pro and cons of MPA and the conservation team to play the role on Ay Island. The vice "RT" neighborhood association, a member of the conservation team said that the local community is against MPA because they assumed that conservation (MPA) exists to prohibit and restrict them from accessing natural resources. Some of Ay island's conservation confirmed that they are suspected of being paid to engage in conservation by several local communities. Another local leader also said that the distrust and prejudice toward the conservation team also become an issue in the society to be involved or not in MPA.

*"Regarding those who are against the MPA. First, there is a suspicion that they (the conservation team) are paid by the central government or from certain foundations or*

*institutions. In fact, they are not paid. Second, there are some very small groups who are not happy with conservation (MPA). It's just a small group,, huh. it means that only how many percent want to destroy coral reefs or there are restrictions, then support the project and extract sand on the beach." [B1]*

### **3.2.Influencing factors**

This study identified the following factors that influence the sustainability of MPA based on the interviews:

#### ***The dilemma of the core zone***

Even while designing the zoning system of MPA in Ay Island, the local community collectively agreed with the core zone placement. However, the core zone becomes a dilemma for them. On the one hand, they feel that the purpose and the regulation of MPA, especially in the core zone, is good to protect the spawning area of fish, coral reefs, and another marine biota. On the other hand, they have no choice but to harvest marine resources in the core zone during wave season, and they cannot fish outside the area of MPA. The locals complain about the core zone because the community is highly dependent on the core zone in certain seasons and is located very close to residential areas.

*"For me, everything related to conservation is good. There is no problem with the community. But as I said that in the core zone is a source of livelihood for some local communities. Just it. For example, the transition season is outside the wave area, and only there is shade. So, if possible, the core zone can be moved from there and away from settlements." [LC1]*

Another local community who is also a fisherman hoped that the core zone could be moved to another area. He thinks that the core zone may be able to be relocated in the area behind the



island, which is far away from the community's settlements because they are highly resource-dependent on the current core zone. A conservation team member who works closely with the local community in patrol and monitoring the core zone also thinks that the current core zone could be shifted to another place if we are concerned about the community's welfare.

*"I think that at the time, the core zone was determined there through deliberation, and it was related to the local wisdom that was here, such as the sacredness of the sacred place there. Well..., I think because this is already done. We are waiting for the Decree of the Minister of Fisheries to be issued. Meanwhile, maybe the core zone was there first. Because if it's for the welfare of the community, then for the capture of the fishermen. I think it's seasonal here... well, if it's the western transition season, the eastern transition season is shady there. In other places, it's bumpy. So, the community tends to depend on that core zone. Since 2014, we are in the conservation team has been worried about this condition." [C4]*

### ***Violation and rules enforcement***

Some informants feel that the violation, especially in the core zone and sasi area, mostly occurred in the nighttime. An informant [BA] who is actively in patrol said that he found many people "balobi" taking seafood at night in the core zone. A CTC staff also confirmed that sometimes local people harvest octopus and catch fish in the core zone. Meanwhile, a teacher who is also a member of "BPN" village deliberation agency said that the lack of community awareness and law enforcement from related stakeholders, especially the village government, influences the rise of violation.

*"... many people are not aware. Meanwhile, most of the violations occurred at night, during the octopus harvesting season and so on. And the area that should have become a*

*protected area, they just damaged it. People want it easy. How good is this conservation (MPA) if people are not aware? It is impossible for the conservation team to patrol all the time. When they were just patrolling, there were still fish arrows there; there were still all kinds of activities. Even though it is a protected area, so, it's a bit difficult. Village regulations don't work if the community doesn't control this. Then the village government is also less assertive. So, the public must have awareness, then the involvement of the government in providing socialization to the community from time to time is important." [TB]*

A member of the conservation team [C3] also stated that in fact only the conservation who enforce the regulation, even they always coordinate with village government to enforcing the regulation. He suggested the village government should actively enforce the regulation because sometimes people think those regulations are designed only for conservation agenda, even though they were involved in establishing the regulation and collectively agreed on it.

### ***Depending on the CTC***

The sustainable funding and community independence in managing MPA become the issue that the informant considered why the activity related to MPA and *sasi* in Ay Island highly relies on the CTC. For example, all informants of the "*adat*" traditional institution and Ay Island's conservation team showed that their involvement in MPA depends on the CTC's support in terms of financial support or other support. A CTC staff [S2] also realizes that the community feels unconfident not to depend on the CTC. He said this became a challenge for the CTC in the transition process to let the community independently manage the MPA. On the other hand, the head conservation team showed that the relying on the CTC to support them to do patrol because

it needs money for operating and maintaining the patrol boat. They also still need intensive accompaniment from the CTC.

*"Well, we need assistance, we need assistance. Moreover, the way we talk, and our education level is still below standard. So, there must be someone from the CTC who understands better and can continue to nurture us like that" [C2]*

Based on the interview and my observation when *covid-19* affected the intensive training and assistance of CTC in the Ay Island for the last two years, an informant [C2] proved that how highly the local community depends on the CTC, in which there are no activities there during the *covid-19*. On the other hand, it also shows the community efforts to independently contribute to MPA management.

*"Currently due to covid-19 there is no training, many activities are postponed. The community is also involved in picking up trash. That's right, we sometimes get financial support from the CTC. But now, the last 2 years it is no longer running. Yes, we also don't know, maybe because of the impact of covid-19 as well. And during this Covid-19 era, the CTC has not had any communication with us. What do you want to do? So how do we want to work, patrol, or pick up trash? Nothing at all. If it was before Covid, there was the implementation of the program almost all the time. Yeh... But one of the positives is that we can be independent, meaning that we are trying to work on our own little by little. [C2]*

Furthermore, some residents suggested that to address the financial support, which mainly depends on the CTC, the local government should allocate "*Anggaran Dana Desa*" or village fund to support MPA management cost.

#### **4. The impacts of MPA on ecology and the local community.**

Even though there are some factors issues explained in the previous section that influence sasi and MPA, the informants also highlighted some impacts of sasi and MPA on three aspects; natural resources management, ecology, and socio-economy. They also suggested that co-management as a solution to sustain both the role of community and MPA management to maintain these impacts.

##### **4.1.Natural Resource Management**

The local community feels that the establishment of MPA, village regulation, and revitalization of sasi greatly contribute to their natural resources management. The current head of Ay island's village [VG4] said that their village has achieved good natural resource management progress. The community does not exploit the natural resources freely since they manage them according to the village regulation sasi and MPA. Two informants of Ay Island [TB and E1] also said the conservation (MPA) not only assist the community manage the natural resource in the marine area, but also in the land area. On the other hand, the senior MPA specialist of CTC said that the MPA in Ay Island encourages the community to manage their resources sustainably to avoid commons' tragedy. He also emphasizes that if the resources are not regulated, then the resource recovery rate is not commensurate with the rate of utilization for the community. Additionally, he said that the community would understand that they will effectively benefit from the resource by protecting it.

*"The establishment of this conservation area is not only to protect the biodiversity that exists there but also to ensure the sustainability of the use of natural resources by the local community. Because of the resources are left alone without any management. There is a threat from the outside that is quite large, especially the threat of resource use from*

*outside and from the community itself. If it is not regulated, we know that we have experience in many places. If the marine area is left unregulated, it will usually lead to a tragedy of commons. Everyone uses it arbitrarily, regardless of sustainability, because everyone feels that the sea belongs to them together" [Senior MPA Specialist of CTC]*

#### **4.2.Ecology**

The informants said that the *sasi* and MPA have good impacts on ecology by protecting endangered species and recovering marine ecosystems in Ay Island.

##### ***Protecting endangered species***

A fisherman [F2] said that since the establishment of MPA, marine species such as turtles and sharks have been protected. Even they catch the shark; they would like to release it because they know it is under protection. Another fisherman who is a member of the conservation team describes that Ay Island's community consumed turtles and sharks before the MPA was established. However, after the establishment of MPA, the community just realized that these species are protected. A "*penatua*" elder [G1] in the church also describes how MPA influences community consumptions' behavior toward the turtle.

*"Before the establishment of MPA with those conservation rules. There were many people who destroyed "tete ruga (turtle), and they took them to eat. After the establishment of conservation (MPA), then it has been overcome." [G1]*

The secretary of the conservation team [C4] showed an interesting case regarding how the local community deals with protected species such as shark. He said even in the national regulation, only some specific shark species are protected, but in Ay Island, all the shark species are protected. The CTC staff [S1] confirmed that this case is also related to napoleon fish species.

The national regulation just protects some species of napoleon and lets the community catch the

specific species of a certain size. However, the Ay Island community banned fishing all species of napoleon.

### ***Recovering marine ecosystem***

The informants said that they see a significant change regarding the improvement marine ecosystem, specifically in the recovery of coral reefs. A church leader [G1] said that the coral reefs were damaged previously because it was unregulated and unmanaged; therefore, locals had damaged and took them freely. He added that now the recovery and growth of corals is pretty good under the MPA program. Another informant, fisherman [F2], explained that the recovery of coral reefs also improves the availability of fish nearby by the shore.

*"With this conservation (MPA), the coral habitat becomes better, unlike before where many corals were damaged. The fish is now appearing up to the shore. If previously no fish appeared to the edge of the beach. But because the coral is good, so the fish play up to the beach." [F2]*

On the other hand, a conservation team member who is also a fisherman [C1] shares his experience regarding the improvement of the marine ecosystem, especially in the shrimp population. He said he used to dive into finding shrimp. There used to be a lot of shrimp on Ay Island, then it was decreased after they dived, and many people came to harvest it. Furthermore, he highlighted that when sasi is reimplemented and MPA is established, there are many shrimps lasts. In the "buka sasi" open sasi session, they dived and caught a lot of shrimp. Furthermore, a CTC staff [S3] who frequently visit Ay Island said that compared to the past; there is currently good progress in improving the marine ecosystem due to the integration of sasi in MPA.

*"With the existence of SASI, for example, sea cucumbers have increased at all, especially in protected zones. Previously, it was very rare to see sea cucumbers, but now there are*

*many. Then, because of the previous activities, the community did not care on coral. Now it's getting good even at the shore these corals started to grow well. Especially the type of acrophore (Acroporidae) is good. Then "Siput lola" (Trochus niloticus), although it was rare before, after opening SASI, it was found a lot. Then there were lots of lobsters (Nephropidea), so before that, we rarely found lobsters (Nephropidea), but now there are so many young seeds that we can find in front of the village." [S3]*

#### **4.1. Social economy benefits**

##### ***Tourism sector and social-economic benefits.***

Regarding the social-economic benefits, the "*atusan kampung*" or public relations in "*adat*" traditional institutions feel that Ay Island now has clean seas, clean beaches, and good coral reefs, so tourists are busy visiting Ay Island. A staff of the village government [VG1] also said that the community has gained the advantage of MPA in the marine tourism sector. The retribution fee has contributed to "*Pendapatan Asli Desa*" locally generated revenue in Ay Island. A conservation team member confirms that they share 50% of the retribution fee (500.000 IDR for cruise ship, 50.000 IDR/person for diving activities, and 5.000 IDR/person for snorkeling) from the visitor with the village government. They use their part retribution fee to support their activities such as patrol and waste management on the island. He also said that some money has been allocated to provide "*raskin*" rice to the local community involved in conservation efforts.

Regarding the tourism prospect in Ay Island, a tourist manager said that the existence of MPA has a good impact on tourism. He also believes that the future tourism prospects in Ay Island will be better.

*"Before and after conservation is established, the impact on the tourism market is different. After conservation was established, the first effect was on us villagers. When tourists came, we were appreciated. We are villagers here who are the managers. Then the marine ecosystem is maintained, such as coral reefs, sharks, turtles, and napoleon. Before this conservation was established, tourists came to anchor anywhere freely without any contribution to this village. Then, I see the potential for tourism in the future is good, especially for tourists or travelers who want to enjoy marine tourism that is calm and not too crowded." [PW]*

The senior MPA specialist said that when tourism has started to develop, the community will understand that by protecting their resources, they can benefit from fisheries and tourism. He also hopes that the Ay island's community must be the main actor in the tourism business.

### ***Livelihoods***

When the fisherman was asked how the MPA impacted their livelihoods in terms of catching fish, a fisherman who is also the head of "RT" neighborhood said that the MPA just forbids catching the fish in the small area which is the core zone. Therefore, he still feels that it is good for "*mancari*" marine livelihoods. Other informants [F1 and C3], A fisherman and member of conservation, said that there is deference in catching fish between before and after establishing MPA.

*"For fishing, I think more of that after conservation is established because the fish are protected a lot in the core zone. So... when a fish enters that zone, it lays an egg. He lays eggs there, then comes out" [Fisherman; F1]*

*"Related to fishing, previously we wanted to catch fish, like the type of fish that people call "Garopa" for grouper (*Epinephelus fuscoguttatus*) are barely to be seen and caught.*



*Some we get, sometimes we don't get this fish. But now these fish, sir, the population is increasing." [C3; member of the conservation team and fisherman]*

On the contrary, another informant [BA] said that basically, some of the local community think that MPA prohibits them from catching fish. For the sustainability of fishermen's livelihood, it is rather tricky. But, in the reality, MPA does not take the whole area of this island. MPA only regulates which area the community catches the fish and the area that cannot catch the fish (core or protected zone).

## CHAPTER FOUR: DISCUSSION

Understanding unique social, cultural, and ecological contexts that influence MPA implementation and impact (Mccay et al., 2003) is a crucial issue in establishing and managing MPA in Ay Island. Considering these contexts, the CTC has various approaches and efforts to integrate local knowledge and marine customary (sasi) and modern conservation approach and engage the local community and in MPA. This study aims to explore the integration of sasi into the MPA and describe the community engagement, the role of local communities, and CTC in establishing and managing MPA in Ay Island, Maluku, Indonesia. The study investigates how the process of integration sasi and community engagement in MPA, what mechanisms influence these processes, and the impact of MPA in Ay Island.

The research findings show that bridging local knowledge and science becomes the central perspective of incorporating local and traditional knowledge with scientific evidence and modern conservation practice in MPA design and establishment at Ay Island. We identified the response of informants and document analyzed in four main themes: the integration of sasi into MPA, community engagement in MPA, social dynamic and factors that influence community engagement and the sustainability of MPA, and the impacts of MPA on ecology and the local community.

### ***How is sasi integrated into MPA?***

Harkes & Novaczek, (2002) highlighted that the practice of *sasi* was decline in 1970s due to the introduction of new formal government structure, rapid economic growth, poverty alleviation programs, and political instability and dysfunctional of *adat* institution. Then *sasi* in some villages was suffering rapid loses (as happened in Ay Island context) in 1990s (I. Harkes & Novaczek, 2002). The lack of *adat* institution and village government's role, the degradation of

customary values and sacred places contributed to the unfunctional practice of *sasi* for the last four decades in Ay Island. The social factors such as the influence of ceremony and religion and political factors such as the legitimacy of local authorities, support from government and non-government influence the evolution of *sasi* in Tomolol and Fafanlap, Indonesia (McLeod et al., 2009). Novaczek et al., (2001) pointed that the implementation of *sasi* is nested in the "adat" traditional institution.

The resilience of *sasi* become the central consideration in the way CTC integrate *sasi* into MPA by focusing on revitalizing *sasi*. The local community might be not involved in the revitalization of *sasi*, if they do not expect to gain benefits directly (I. Harkes & Novaczek, 2002). The CTC sees the potential value of *sasi* as a traditional conservation concept contributing to the sustainability of natural resources and various benefits for the community in Ay Island. Interestingly, the conservation issue and environmental degradation become a main trigger for the Ay Island community to revitalize *sasi*.

Since the "*adat*" institution plays a vital role in enforcing *sasi* rules as village natural resources management (Novaczek et al., 2001), the CTC firstly strengthens the role of "*adat*" institution in local community through various approaches. The lack of legitimacy of *sasi* rules in the village community become a crucial issue in reviving *sasi* after it was almost disappeared for the last 40-50 years. Therefore, the CTC supports and facilitates the elders and residents to reregulate the rules of *sasi* from unwritten law to formal and legal regulation under village regulation *Peraturan Negeri Administratif Pulau Nomor 1 2014*. Educational and community approaches are applied by the CTC in developing and designing the legal regulation to legitimate the practice of *sasi*. Then the existence of *sasi* in Ay Island become stronger than before the intervention of the CTC. The legitimacy is identified as a another key factor of reviving *sasi*

successfully (I. Harkes & Novaczek, 2002). A case study conducted in Vanuatu by (Caillaud et al., 2004) showed that merging traditional resource management with a formal legal system can contribute to an appropriate resource management system. (Vaughan et al., 2017) highlighted that it is pivotal to consider that creating formal regulations based on customary practice is not the end goal. In the context of Ay Island, it still needs other approaches to strengthen the practice of *sasi* by educating young generation and people toward the value of *sasi* and sustainably strengthening the role of *adat* institution.

The implementation of *sasi* under formal regulation (village regulation) in Ay Island regulates the accessibility of marine resources to enable sustainable natural resources management and support the establishment and sustainability of MPA. Referring to the terms of "reallocation" from Mascia & Claus, (2009) , it indicated that the *sasi* practice is part of reallocating the rights governing marine resource access and use. Schlager & Ostrom, (1992) emphasized the right of access as the fundamental thing in the property of rights. The revitalization process on *sasi* defines what marine resources are maybe exploited or not, and when ("*buka sasi*" opening harvest session), where (the area of *sasi* and MPA), who (local community), and how to get access to harvest the marine resources.

Marine *sasi* is operationalized and integrated into the establishment and management of MPA. This process of can strengthen the conservation efforts of MPA in Ay Island, which aligns with the study of (Lejano et al., 2007) , showing that respecting local traditions can shape the regulatory strength approaches in conservation efforts. Previous research also conducted in Ay Island supported that involving the local community and incorporating *sasi* can be effective in integrating the traditional conservation modern practices or MPA (Rossi, 2016). When *sasi* is incorporated into modern conservation practice can protect and sustain marine biological

resources (Boli et al., 2014). In another research, Lam, (1998) revealed that in the establishment of MPA in South Pacific, the marine tenure system was effectively incorporated into the MPA system. As a customary norm and management, *sasi* can restrict over resource use in the marine conservation area at Ay Island. A study conducted by (Cinner & Aswani, 2007) has shown that integrating customary management into marine conservation can regulate and limit coastal resources exploitation.

### ***How the CTC engages community in MPA?***

Accommodating the community's interests, including local knowledge, local stakeholder, economic benefits, diverse social-economic, and perception, can support the success of community engagement in MPA (Pollnac et al., 2001; Gurney et al., 2016; Twichell et al., 2018). The study showed that by considering these community interests, the CTC deeply involved Ay Island community in designing, establishing, and managing MPA through engaging the community with different approaches, involving the community in zoning system, and facilitating the local community to develop village regulation and conservation team.

The local people and the CTC staff might perceive MPA differently. The local community mainly sees marine ecology as a resource for sustaining their livelihood and their culture. Meanwhile, in general, the MPA program emphasized the area as a priority for conservation in the level of species, ecosystem, and habitat. The study found that the local community's perception toward MPA influences the way they are being engaged or not in MPA. Some Ay Island communities engage in MPA because they are interested in environmental issues and efforts to manage and protect their local resources (Twichell et al., 2018). They see any potential positive impact of MPA on their social-economic condition (Islam et al., 2017).

Meanwhile, some community members initially reject to be involved in MPA since they see the MPA as a prohibition rather than a conservation effort. Bennett & Dearden, (2014) also highlighted that when people feel the MPA area is only prohibiting and limiting them in accessing marine resources, they tend not to support the MPA.

To build a conservation program fit with the local context (Lejano et al., 2007), the CTC involves the local community at the beginning of process design and establishing MPA. Initially, the CTC was concerned with the distribution of information about MPA (Elliott et al., 2001) as a crucial stage for encouraging the community to participate by initiating dialogue and socialization, mapping and engaging stakeholders, participation, and building community awareness. Then the CTC focus on the key stakeholder engagement such as village government, village Deliberation Agency (BPN), elders, traditional "*adat*" institution, religion's leaders, fisherman, youth leader, tourism manager, and Ay Island as the main concern in engaging the community. The research found strong support from a case study of Rodríguez-Martínez, (2008) revealed that it is easy to obtain the local community support if the key community leaders are involved in the project.

Since the CTC considers that local communities are the marine resource owners and decision-makers, therefore all the process of the zoning system, the local community are fully engaged in discussing and designing the MPA zone. This strategy aligns with a previous study of A. Green et al., (2009) primarily recognized the local community in designing a resilient network of marine protected areas for Kimbe Bay, Papua New Guinea as the resources owner deciding where and how their resources are protected. In the zoning system, the CTC integrate local knowledge into MPA designation (Aswani & Lauer, 2006; St. Martin et al., 2007; Weeks et al., 2014) through participative mapping (Krueck et al., 2019), "*Musyawah*" public consultation

and meetings to have collective consensus and stakeholders engagement (Weeks et al., 2014). The collaboration among individuals (CTC staff and local community), the frequent meetings could increase social capital (Ostrom, 1997). In this process, the local community has the power to decide which area should be protected or not. In MPA design, the CTC accommodates the local community's view in deciding their "*tempat keramat or pamali*" taboo area as core zone or protected zone based on the scientific justification of the CTC's baseline data this area identified as spawning areas and high biodiversity. To avoid the conflict of resource use that would arise in MPA, the CTC and the local community design multiple-use zoning (Weeks et al., 2014), including core zone, restricted use zone, sasi zone, use zone, and tourism zone. In addition, Roberts & Jones, (2013) suggested that to anticipate conflicts between fishing and conservation plans, the CTC and management of MPA should build a strong relationship with fisherman groups who highly depend on marine resources.

The study shows that governance approaches of CTC in Ay Island through the decision-making process, regulation establishment, and enforcement in the MPA zone significantly contribute to community engagement. Engaging the local community to create their village regulation was an effective intervention of the CTC. This process enables locals not only to agree upon rules that considered fair and effective for solving specific problems (in Ay Island and MPA) but develop sense of community (Ostrom, 1992). The village regulation or "*Peraturan Negeri Admistratif Pulau Nomor 1 2014*" also legitimates the establishment of Ay Island conservation team, strengthens sasi, supports the zonation system and MPA management. This study confirms how effectively CTC encourages the local community participation through the existence of Ay Island conservation team as a key actor in grassroots directly working with the CTC and Ay Island community to do patrol and monitoring regularly for control the area of Ay MPA and

enforce the regulation. To support the role of the conservation team, the CTC provides training and capacity-building capacity development and the creation of social cohesion.

### **What are mechanisms that influences the integration of *sasi* and community engagement in MPA?**

The social dynamics such as conflict of interest, gender issue, and power relation influence how Ay island's community is being engaged in MPA. These findings agree with the previous research that showed ignoring the social context, conflict, and controversy related to MPA design and implementation can impact the success of MPA (Patrick Christie et al., 2009) and if the social dynamics are not managed well, would influence the sustainability of biological resources (Christie, 2004). Interestingly, in the Ay Island setting, the conflict of interests is not driven by highly community-resources dependence on marine resources, but also how latent conflict and trust issues between and among communities' groups regarding local political interest shape the local community's participation in MPA.

Dalton et al., (2012) showed that in the Caribbean, particularly men were more likely to become involved in MPA initiatives because they tend to be employed directly related to MPA, such as fishing-related activities and tourism management. This study finds that men are more engaged by CTC in establishing and designing MPA because of gender issues, including power relation and exclusion in the decision-making process and women engagement in MPA. By investigating how local community participants see women's participation in establishing MPA as consistently associated with domestic tasks rather than the decision-making process, it seems how patriarchy, masculine culture, and local norms construct the lack of women participation. de la Torre-Castro et al., (2017) suggested the gendered structure and traditional gender role embedded the social construction placing the man are more involved in natural resource management.



Baker-Médard, (2017) also found that the local norms contribute to the lack of women participation in conservation projects in Madagascar. On the other hand, since there are no women in CTC staff who closely work with the community, it might also influence the lack of Ay island's women community engaged and involved in MPA.

Furthermore, the local community collectively agrees to decide the core zone as a protected and limited area for communities' activities in MPA zonation; however, they currently rely on the core zone as marine livelihoods resources in certain sessions. This dilemma tends to influence their engagement on MPA, which might align with a similar case showed by (Christie, 2004) that there was the controversy of a new zonation scheme for some fisheries in Bunaken National Park. In this case, the community might feel that fishing and harvesting livelihoods might negatively impact (Bennett & Dearden, 2014b) the establishment of MPA in Ay Island. This study suggested that the CTC and MPA management could listen to the community's negative response regarding the core zone and educate them about the crucial role of the core zone in MPA and their sustainable livelihoods. In addition, the study indicates that this negative response also leads to the violation, even the community has collectively established the village regulation and agreed on the establishment of MPA. On the other hand, it seems that the community follows the regulation in the protected area in the first few years. However, when the regulation is poorly enforced, some violations still exist in both the sasi zone and MPA zone to sustain the community's life. Hind et al., (2010) showed that the community end to break the regulation for prohibited areas for their live sustainability. The highly dependent (local stakeholders including "*adat*" customary institution, Ay Island conservation team, and local government) on the CTC might influence the sustainability of community engagement, the practice of sasi, and MPA. Finally, considering diverse community perception based on gender,

community's role, and marine resource dependency, this study suggests that initiating a community survey to capture the community's perception is essential as baseline data for designing a community engagement in MPA program

### **How the establishment MPA impacts on Ay Island?**

Existing studies showed that MPA impacts biophysical improvement and the increased number of marine populations (Edgar et al., 2014). This study finds that the participants described that MPA has a positive impact on ecological aspects by recovering marine ecosystems and protecting endangered species. Evidence of empirical study proved that after Ay and Rhun island designed as MPA, it has a positive impact on the reef fish resources with the good and high percentage of abundance and biomass of reef fish (Welly et al., 2020). However, referring to the suggestion of Dalton et al., (2012), these perceptions of ecological conditions might not represent actual conditions. Therefore, it still requires a comprehensive ecological assessment to see how MPA in Ay Island contributes to the ecological aspects.

The study indicates that the local communities directly engaged in MPA, such as the conservation team, tourism manager, and fisherman in Ay Island perceive that MPA has positive impacts on social-economic, tourism, and livelihoods. Christie, (2004) suggested this positive trend can be sustained if functioning social management systems are well managed. It appears that the level of awareness and understanding of the local community toward the ecological impacts of MPA in Ay Island would increase their involvement and support to MPA. This study is in line with a previous study of Kusumawati & Huang, (2015), If the community has a better understanding of the benefits of MPA, it will encourage their engagement.

Designing an appropriate livelihood approach might addressing the livelihoods issue of local community and the sustainability of MPA. Some approaches show that it is essential to involve

local people to reduce the dominant decision through top-down or external agencies (Brocklesby & Fisher, 2003) in addressing livelihoods issue and strengthening community engagement. Focusing on conceptual approaches proposed by external organizations or Non-Government Organization with their agenda (Pandey et al., 2017) in MPA context, it might contribute the lack attention of local community dependency on MPA regarding the marine livelihoods. This study suggests two specific sustainable livelihoods approaches to address the livelihoods issue in Ay Island context by diversifying livelihoods and increasing human capital. In diversification of livelihoods, the local community can rely on multivarious income sources (ecotourism, agroforestry, nutmeg plantation, and another type of combination practices) to maintain their livelihoods without violating the rules of MPA, sasi and village regulation. Meanwhile, human capital is essential asset that the CTC should consider through providing training and mentoring. Strengthening the community's capacity and improving their skill might have positives associated with the increasing income or outcomes of livelihoods.

### **Implications**

In managerial implications, the study provides some insights on MPA establishment and management. Integrating local knowledge and marine tenure system such as sasi effectively develops an MPA design fit with the local context. The study shows that if the MPA managers or any conservation project recognize the uniqueness of local knowledge as an effective way to deeply engage the local community at the beginning of the process. The local community support and legitimacy of local knowledge could strengthen the process of MPA establishment and its sustainability. Bridging science with local knowledge effectively builds community awareness and involvement in the MPA, in which this transfer knowledge process indicates a high level of community engagement in MPA. However, learning from the Ay Island context,

this process takes years to incorporate the local knowledge and community engagement in establishing MPA. It needs various approaches to increase community engagement and stakeholders' involvement in decision-making process, and to avoid the potential emerging conflict of marine resource use of MPA in the future

In MPA or another conservation program, the zoning system is crucial for MPA design. Therefore, the local community should be involved through participative mapping and frequent public meetings and consultation to have a collective consensus deciding zonation in MPA. The legal standing of village regulation established by the local community is significant to support the establishment of MPA. Encouraging the local community to establish a conservation team is considered a strategic approach to building a community engagement continuum in conservation project or natural resource management.

Regarding the theoretical and applied implications, this study might contribute to the large body of existing literature related to community engagement in MPA, community-based natural resources management, the integration of local knowledge in establishing MPA, and other conservation projects. This study also might provide new knowledge regarding the process of revitalizing a local cultural practice and traditional conservation concepts such as *sasi*. It seems that most existing studies focusing on the management of MPA with an associated topic such as community engagement and management of MPA, community-based marine protected area, community perception, and participation in MPA (P. Christie et al., 2002; Ferse et al., 2010; Glaser et al., 2010; Bennett & Dearden, 2014b; Kusumawati & Huang, 2015; Gurney et al., 2016). However, there is a lack of study regarding the establishment process of MPA (Lam, 1998) . Therefore, the study might contribute to the specific issue regarding the process of establishment of MPA. Some studies might have been conducted in the process of integrating

local knowledge in conservation programs and coastal management (Lam, 1998; Harkes, 1999; Boli et al., 2014; Vaughan et al., 2017)). This study might provide insights regarding this context by viewing community engagement, integrating local knowledge, and the associated dynamics tied to establishing MPA.

### **Limitations**

The results of this study may not be generalizable to other MPAs in the region. Considering Ay Island as the focus of this study and other previous studies (Rossi, 2016; Sifrit 2017), future research should investigate the establishment of MPA in both Ay Island and Rhun Island. Future research should consider the gender issue and the role of religious, educational, and youth institutions. Understanding the effectiveness of community engagement and the integration of *sasi* into the Ay Island MPA requires in-depth study on the impact of the MPA on marine ecosystems, residents' livelihoods, and tourism.

## CHAPTER FIVE: CONCLUSIONS AND RECOMENDATIONS

### Conclusions

In conclusion, bridging science and local knowledge is the central perspective of CTC integrating sasi and engaging community in establishing MPA on Ay Island. In integrating sasi into the establishment of MPA, the CTC facilitates the local community through the following approaches:

- Assessing the existence of sasi.
- Defining sasi as local traditional conservation practices.
- Reviving and reregulating sasi.
- Practicing sasi.
- Integrating sasi zone in MPA design

Then, the CTC empowers “*adat*” institution and strengthens their role to enforce the practice of sasi. When sasi is revived, other cultural traditions are maintained to support the conservation efforts of MPA and the sustainability of natural resources in Ay Island.

In engaging local communities, initially, the CTC conducted public socialization to introduce the CTC and the purpose of MPA. Then the CTC accommodates the local’s interests and perceptions, identifies the local knowledge of natural resources management and key stakeholders. After that, the CTC educates local communities through regular key stakeholders meeting before encouraging the local stakeholders to establish “*Tim Pengelola Sumberdaya Alam*” or Natural Resource Management team, which become a key actor at the beginning of the establishment MPA process. The CTC facilitate this team to establish village regulation of natural resources management regulating the practice of sasi, natural resources use, and including zonation system in MPA. The CTC involves the community and integrates local

knowledge and data science into designing the zoning system of MPA. In 2014, the local community officially declared a marine protected area under village regulation and sasi. The local community establishes conservation to patrol, monitor, and enforce the rules on the MPA. The CTC regularly provides the capacity building, training, and support system for the conservation team to sustain their role in MPA.

The study shows that some social dynamics issues such as conflict of interest, gender issue, power relation, and trust issue influence the process of community and integrating sasi in establishing MPA. Other identified factors such as community feel dilemma toward core zone, enforcement, and violation in MPA, and high depending on the CTC might influence the sustainability of MPA in Ay Island. Since MPA was established in Ay Island, the participants showed that this MPA positively impacts ecology (protecting endangered species and recovering marine ecosystems), social economy benefits (tourism sector), and livelihoods. In livelihoods, the study found that some local communities feel they lose their access to livelihoods due to the restriction in the core zone.

### **Recommendations:**

The CTC might have succeeded in engaging the community and integrating sasi into establishing MPA. However, based on the findings, we provided the following recommendations:

- 1. Engagement and contextualization:** The ability to build a sense of ownership and a sense of pride of the community towards the natural resources they have is the key to establishing MPA sustainably. This process can be achieved by appreciating the values of local knowledge in the village and building equal relationships with all stakeholders involved in the decision-making process, from the initiation stage to the management of the MPA.

- 2. The sustainability of MPA Management:** The CTC should consider and address all the factors that influence the sustainability of MPA. For example, the high level depending on the CTC from key stakeholders such as the conservation team, "*adat*" Institution, and village government might become an alarm regarding the sustainability of these stakeholders' role and participation in the MPA. Therefore, we suggested the CTC should encourage these stakeholders to become more independent. In additions, it still needs more efforts to engage women, enforce regulation in MPA and sasi.
- 3. Livelihoods issues:** the CTC and local government provide alternative sustainable livelihoods strategies to avoid the conflict of resources used in the core zone.
- 4. The sasi resistance and sustainability:** *Adat* institution and village government should more consider on the practice of sasi sustainability by enforcing the village regulation, strengthening the customary value, and educating the local community.



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## APPENDIX

### Appendix A: Interview Protocol for The CTC Staff

#### Intro Script:

- Thank you for participating in this research.
- My name is Zulfirman Rahyantel and I am a master student from University of Missouri's Human Dimension of Natural Resources Graduate Emphasis Area.
- I have questions related to a) The integration of sasi into the management of Ay MPA; b) Community engagement; c) the role of regulation (Peraturan Negeri) shaping the practice of sasi and local community activities in Ay island MPA. That should take about an hour to interview.
- I have an informed consent form from my university that tells you about the research project and how we plan to use this interview. (pass out informed consent sheet). It says that you will not be identified by name in any publication or report and has contact information for and about this study.
- Before we start, please introduce yourself.

#### Interview's questions:

1. Background of MPA and the CTC staff's role
  - a. I know you're (Position in Ay Island MPA project), and you've been involved in this MPA. We'd love to learn more about you and the CTC role in Ay MPA.
  - b. How long have you worked at the CTC?
  - c. What is your role in Ay MPA? Tell me about what you do
  - d. Can you give me some background of AY MPA? What is its purpose?
2. Community Involvement
  - a. In what ways is the Ay Island Community engaged in (working/involved with) the Ay MPA currently? (if needed) What mechanisms do you use to engage the community?
  - b. What are your goals for engaging Ay island's community?
  - c. Who are some specific people involved within the Ay Island Communities? How they are involved?
  - d. What are some examples of community engagement activities in Ay MPA?
3. The Integration of Sasi in Ay MPA
  - a. What do you think about sasi ?
  - b. Does sasi could be implemented in Ay MPA? Why?
  - c. Does the CTC integrate sasi in Ay MPA? What kind of sasi is applied?
  - d. In what ways the CTC apply it? How the CTC involve the Ay Community in this process?
  - e. How does the village regulation influence the implementation of sasi?



- f. How the impact sasi in Ay MPA area?

## **Appendix B: Interview Protocol for the Ay Island's conservation team**

### **Intro Script:**

- Thank you for participating in this research.
- My name is Zulfirman Rahyantel and I am a master student from University of Missouri's Human Dimension of Natural Resources Graduate Emphasis Area.
- I have questions related to a) The integration of sasi into the management of Ay MPA; b) Community engagement; c) the role of regulation (Peraturan Negeri) shaping the practice of sasi and local community activities in Ay island MPA. That should take about an hour to interview.
- I have an informed consent form from my university that tells you about the research project and how we plan to use this interview. (Pass out informed consent sheet). It says that you will not be identified by name in any publication or report and has contact information for and about this study.
- Before we start, please introduce yourself.

### **Interview's questions:**

1. The role of community members
  - a. Background: Who are you, what is your role in Ay MPA? How are you involved with the Ay MPA?
  - b. How do you interact with the the Ay MPA? How long have you interacted with Ay MPA?
2. The involvement of community members
  - a. What motivated you to get involved with the Ay MPA?
  - b. How do you interact with Ay MPA managers (the CTC)? How often? How would you describe your relationship with the Ay MPA managers (the CTC)?
  - c. Do you feel that the MPA has impacted Ay island community? How?
  - d. Do you feel that the Community has impacted the Ay MPA? How?
3. The Integration of sasi in Ay MPA
  - a. What do you think about sasi ? is sasi important for protecting Ay Island resources and areas?
  - b. Do you know that the CTC integrate sasi in Ay MPA? How the CTC apply sasi in MPA management?
  - c. Do you involve in the process of sasi integration in Ay MPA? How?
  - d. How does the village regulation influence the implementation of sasi?
  - e. What are the impacts of sasi in Ay MPA area?

## **Appendix C: Interview Protocol for the Ay Island's conservation team**

### **Intro Script:**

- Thank you for participating in this research.
- My name is Zulfirman Rahyantel and I am a master student from University of Missouri's Human Dimension of Natural Resources Graduate Emphasis Area.
- I have questions related to a) The integration of sasi into the management of Ay MPA; b) Community engagement; c) the role of regulation (Peraturan Negeri) shaping the practice of sasi and local community activities in Ay island MPA. That should take about an hour to interview.
- I have an informed consent form from my university that tells you about the research project and how we plan to use this interview. (pass out informed consent sheet). It says that you will not be identified by name in any publication or report and has contact information for and about this study.
- Before we start, please introduce yourself.

### **Interview's questions:**

1. Ay island's community background
  - a. Who are you and what is your role (position, job) in Ay Island ?
  - b. How long have you lived here?
  - c. What do you think about Ay Island (Including the social-cultural live and natural resources)?
2. Ay Island Community Engagement in Ay MPA
  - a. What do you think about the the CTC and Ay MPA?
  - b. Are you involved in Ay MPA? (If Yes) Why are you involved in the Ay MPA? What motivated you to get involved with Ay MPA?
  - c. How the CTC involve you in the Ay MPA?
  - d. What are examples of activities in Ay MPA that you are involved?
  - e. Do you feel that the Ay MPA is has impacted Ay island community? How?
  - f. Do you feel that the Community has impacted the Ay MPA? How?
3. The role of Sasi in Ay Island
  - a. What do you think about Sasi? is it still exist in Ay Island? How is important sasi in Ay Island? What are value associated with sasi?
  - b. How Ay Island community generate the sasi? When? Who is in charge for manage it?
  - c. Does any written regulation support the implementation of sasi?
  - d. Does the CTC integrate Sasi in Ay MPA Management? How they do that?
  - e. Do Ay Island communities are involved in this process? How the CTC engage Ay Island Community in this process?
  - f. How does the village regulation influence the implementation of sasi?

## Appendix D: Informed Consent Form

Thank you for participating in this research, Sasi and community engagement at marine protected area in Ay Island, Maluku, Indonesia. The goal of this research is to describe the role of local communities and the CTC in conservation efforts and management of Ay Island MPA and explore the integration of sasi into the implementation of community based MPA in Ay Island, Maluku, Indonesia.

By participating in this research, you agree that

1. My participation in this research is completely voluntary with no risks.
2. My participation is confidential. My name and record of participation in this project is known only by researchers. All records of my participation including interview recordings and transcripts will be maintained on a password protected computer in a locked office.
3. The researcher will ask me question about: a) The integration of sasi into the management of Ay MPA.  
b) Community engagement; c) the role of regulation (Peraturan Negeri) shaping the practice of sasi and local community activities in Ay Island MPA.
4. I may refuse to answer any questions.
5. I may choose to withdraw or not to participate at any time.
6. I may participate even if I choose not to be audio-recorded. If so, the researcher will only take handwritten notes during the interview. If the permission is granted for the audio-tapping, this interview will be transcribed.
7. I understand that I will not be identified by name in any publication or report.
8. YES or NO: . I agree to allow the researcher to take a few photos today.

If participant has questions about this interview, please contact Zulfirman Rahyantel at 573-554-4622 or emailing [rahyantel@mail.missouri.edu](mailto:rahyantel@mail.missouri.edu). If you want to talk privately about your rights or any issues related to your participation in this study, you can contact University of Missouri Research Participant Advocacy by calling 888-280-5002 (a free call), or emailing [MUResearchRPA@missouri.edu](mailto:MUResearchRPA@missouri.edu). This study is supported by a scholarship to Zulfirman Rahyantel from Indonesia Endowment Fund for Education, abbreviated as LPDP (Lembaga Pengelola Dana Pendidikan).

I have read this consent form and my questions have been answered. By participating in this interview, I acknowledge that I am a voluntary participant and that I can end my participation in the study at any time.

