



# Sustainable coastal resource co-management

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## Abstract

The purpose of this paper is to analyze collaborative coastal resource management (co-management). Gili Indah is a well-known tourism destination for the foreign traveler who goes to Lombok, Indonesia. It consists of three islands which are Gili Air, Gili Meno and Gili Trawangan. Gili Indah/Gili Matra has been established as a marine protected area since 2001. Tourism in Gili Indah has impacted the socio-economic conditions of the local community. The tourism has improved the local community's livelihood strategy and income levels but the most interesting thing is that local community's awareness of environmental sustainability has improved significantly. The local community also has an institution that has ruled their lives; they call it *awig-awig*. *Awig-awig* sets rules for the local people in areas like coral reef resource management, sustainable fishing gears, waste management and the construction of houses/buildings on the beach. The government who represent the work unit of the marine protected area have admitted the local institution of *awig-awig*. The admission is legalized through village regulation. The result of the research shows that co-management in Gili Indah Village runs successfully. The local community has actively participated in coral transplantation, creating a no-pollution island and managing mangroves as ecotourism. This paper concludes that collaborative management in a coastal tourism destination is the answer for sustainable tourism and a sustainable environment.

*Keywords: co-management, indigenous knowledge, marine protected area, tourism area.*

## 1 Introduction

The results of the 2020 Convention on Sustainable Development Rio 20+ mentioned that conservation areas total at least 10 percent of the total marine



area. The total area of the territorial sea waters of Indonesia, according to the Ministry of Marine and Fisheries and Local Government [1], amounted to 3.2 million km<sup>2</sup>. It can be concluded that the conservation areas in Indonesia should have amounted to 320 thousand km<sup>2</sup> or be equivalent to 32 million hectares. The conservation area of Indonesia at this time amounted to 15.78 million hectares with the details of the conservation area initiated by the Ministry of Forestry of 4.69 million hectares and the initiation of the Ministry of Marine and Fisheries and Local Government amounted to 11.09 million hectares (KKP [1]).

Conservation areas have great potential for the development of tourism in Indonesia. Indonesian biodiversity charm has made Indonesia one of the world's natural beauty tourism destinations and the number of foreign tourists coming to Indonesia is increasing every year. A total of 9,435,411 foreign tourists visited Indonesia in 2014 (BPS [2]). One third of the tourists came from ASEAN countries, one third came from Asia-Pacific and the rest were from Europe, Middle East, America and Africa.

A marine conservation area can be managed by governments, communities and collaboratively. Management of marine resources is not only based on natural resources (natural resource based development), but also must be based on the community (community based development). If it is only based on natural resources, the common tendency of utilization of marine resources is done to excess, is inefficient, concentrated in certain groups and oriented to short-term interests that result in uncontrolled depletion (Adisasmita [3]).

Gili Indah is the name of a village located in the northeast of Bali. Gili Indah consists of three islands, namely Gili Air, Gili Meno and Gili Trawangan. Gili Indah tourism has developed since 1980 and there are a lot of migrants who work in Gili Indah today due to the increasing tourist arrivals from year to year. Each island has its designation: Gili Trawangan obtained a designation as a party island, Gili Meno as a honeymoon island and Gili Air as a chill-out spot. These three islands have tourist facilities such as snorkeling, diving, lodging (bungalow, homestay and cottages), spa, karaoke bars, cafes and restaurants. Tourists usually enjoy snorkeling activities, seeing the beautiful coral reefs like Blue Coral and also the beauty of the green turtle (*Chelonia mydas*), Gili Indah village was designated as a water conservation area in 2001. Today, Gili Indah has a water conservation area by the name of Tourism Aquatic Park Gili Matra (TAP Gili Matra) which is under the jurisdiction of the Ministry of Maritime Affairs and Fisheries. The aim of this study was to analyze the management of coastal resources collaboratively in Gili Indah.

## 2 Co-management

Determination of Gili Indah as a water conservation area has made the area under the responsibility of the government. However, before the establishment of Gili Indah as a conservation area, the local community also had rules in managing coastal resources. The rules are named *awig-awig*. Both forms of management regimes in that region collaborated for sustainable resource management.



Gili Matra National Water Conservation Area Tourism Aquatic Park Hall (NWCAH TAP Gili Matra) is the central government representative in charge of the management of coastal resources in Gili Indah. There had been an evolution of the responsibility holder in Gili Matra since it was established as one of water conservation areas. Gili Matra Tourism Aquatic Park (TAP Gili Matra) was formerly named Gili Matra Marine Natural Park. TAP Gili Matra has been under the authority of the Ministry of Forestry since 2001. The management regime using TAP Gili Matra at that time was the government regime, which was a resource management where nearly all of the management decisions were centralized. During implementation of the regime, there were several conflicts between the TAP Gili Matra managers and the local community. Therefore, centralized resource management turned out to be a mistake when the government used to manage the conservation areas in Gili Indah. In 2009, there was a shifting of the policy holder of TAP Gili Matra from the Ministry of Forestry to the Ministry of Maritime Affairs and Fisheries. Coastal resource management models used in Gili Indah turned into being collaborative.

*Awig-awig* is one form of customary law and the law of life (living law) made by the community to regulate the relationship between humans, humans with the universe and regulates human relationship with the creator. *Awig-awig* is an indigenous wisdom of the Bali and Lombok people. Several types of *awig-awig* in Gili Indah are the rules regarding the security of the village, the rules regarding the restaurant tax, the rules of the urban planning of the buildings on the island and the rules of coastal resource management. *Awig-awig* supervision is carried out by the community. Sanctions are imposed on offenders in accordance with the *awig-awig* rules.

Regulations of coastal resource management in Gili Indah include a) North Lombok *awig-awig* fishermen by the North Lombok Fishers Association (*Lembaga Masyarakat Nelayan Lombok Utara*) (LMNLU), b) Gili Indah *awig-awig* regarding the nurture and management of the coral reef ecosystem and c) *awig-awig* regarding the operation of Muroami fishing gear. *Awig-awig* regarding the nurture and management of coral reef ecosystems regulates the zoning system of the three islands of Gili Indah. The zoning system is an engineering utilization of space through the establishment of functional boundaries in accordance with the resource potential (PERMEN KKP No. 30 of 2010). The zoning system which was created by the community in 2013 was discussed with NWCAH TAP Gili Matra. Results of these discussions led to village regulations containing a zoning system for TAP Gili Matra water conservation.

Each of these resource managers (government and community) has management authority of the marine territorial of Gili Indah. Figure 1 shows the collaborative coastal resources management in Gili Indah. Coastal resource management in TAP Gili Matra water conservation area overlaps with community-based resource management, *awig-awig*. Part A is the resource management regime (TAP Gili Matra). Part C is the community-based resource management (*awig-awig*). Part B is the collaboration between the two types of resource management.



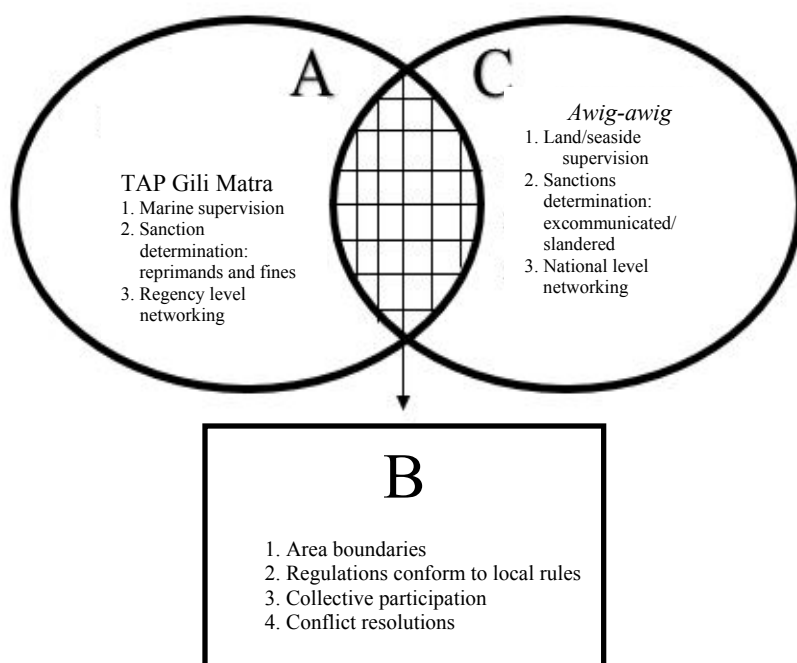


Figure 1: Collaborative coastal resources management at TAP Gili Matra.

Part A is resource management by TAP Gili Matra that has different resource management from the community. Parts A and C include monitoring, sanctions and networking with the outside world. There are differences in the monitoring systems of TAP Gili Matra and the *awig-awig* institution. NWCAH TAP the Gili Matra work unit tends to do sea patrol by using the boat facilities along with the Gili Eco Trust. The community does not have a regular monitoring schedule and tends to oversee violations of the seaside. Different sanctions also occur in both institutions. Sanction violators obtained by TAP Gili Matra are in the form of reprimands and fines while offenders from the community not only obtain sanctions in the form of reprimands and fines but also via social sanctions (being excommunicated/slandered). Networking with the outside world that currently exists is the result of the collaboration of two institutions. TAP Gili Matra provides a wider network compared to the *awig-awig* institution. *Awig-awig* institution which locally strengthens its network at the regency/provincial level while TAP Gili Matra institution extends its network to a national level.

Part B of the shaded section is the collaboration part between the two institutions. The shaded section includes similarities of boundary management, conformity with the local rules, community collective participation, conflict resolution mechanism and government recognition; delimitation of the territory carried out with the community. Regulations are also adapted to the local rule which is *awig-awig*. Formation of fishers associations in Gili Meno hamlet and

Gili Air hamlet can increase collective participation. The conflict in the Gili Indah village does not occur and still is in dissent. Through the association of fishermen, the fishermen voiced their disapproval and then communicated it to TAP Gili Matra. Government recognition of *awig-awig* is high (50%) based on a survey conducted in Gili Meno hamlet.

## 2.1 Co-management performances

Co-management performance can be analyzed based on Ostrom [4] by comparing two institutions namely NWCAH TAP Gili Matra and *awig-awig*. *Awig-awig* indicators include: 1) clarity of boundaries; 2) conformity with the local rules; 3) community collective participation; 4) monitoring; 5) implementation of the sanctions; 6) conflict resolution mechanism; 7) government recognition and 8) network with the outside world. The performance of collaborative management institutions between NWCAH TAP Gili Matra and the *awig-awig* institution is at a moderate level. The *awig-awig* institution survives because of the encouragement of NWCAH TAP Gili Matra. Government recognition of *awig-awig* increases the sense of ownership and responsibility of the community to coastal resources. Community participation is centralized collectively. Critical community will increase participation for the sustainability and success of co-management. Government in this case represented by NWCAH TAP Gili Matra supports the implementation of the *awig-awig* institution. Table 1 shows the performance level of co-management in Gili Indah.

### 2.1.1 Co-management reinforcing factors

Based on analyses using Ostrom [4], there are co-management reinforcing factors in Gili Indah. These factors are as follows:

#### a. Clarity of boundaries

Boundaries of collaborative coastal resource management are distinguished by two factors, namely NWCAH TAP Gili Matra and *awig-awig*. The boundaries management of both institutions has been very clearly defined. The boundaries management by NWCAH TAP Gili Matra has been clear, using detailed coordinates. *Awig-awig* boundaries' management has also been quite clear and use the same boundaries as NWCAH TAP Gili Matra. The zoning is contained in Perdes Gili Indah No. 3 Year 2014. *Awig-awig* and NWCAH TAP Gili Matra zoning use buildings on the beach and are punctuated by coordinate points. Buildings on the beach as the physical form of boundaries zoning benchmark make it easier for people to identify a particular zone, mainly the core zone.

#### b. Conformity with the local rules

The local community in Gili Indah has local wisdom, *awig-awig*. The rule has lasted for decades. Without losing the cultural values of the local community, the government put *awig-awig* into village regulations. Perdes Gili Indah No. 3 2014 which was approved was the result of planning between NWCAH TAP Gili



Table 1: Indicators of co-management performance in Gili Indah.

No.	Institutional performance indicators	Level of indicators			Descriptions
		Low	Medium	High	
1.	Clarity of boundaries			✓	Boundaries management is very clear, using coordinate points and seaside buildings also used as a zoning system benchmark.
2.	Conformity with local rules			✓	The rules that apply in accordance with local wisdom, <i>awig awig</i> .
3.	Collective participation		✓		Participation of community groups, especially fishers associations participated in decision-making both in planning, management and evaluation/monitoring stage.
4.	Monitoring		✓		Governments and communities have zoning control methods, however the monitoring of both institutions have not run optimally.
5.	The implementation of sanctions	✓			Sanctions have not run well. Offenders who are reprimanded have not been deterrent in zoning system violation.
6.	Conflict resolution			✓	The conflict in the past resolved properly this time.
7.	Government recognition			✓	Government since the beginning has carried collaborative management so that the traditional community values are intact.
8.	Network		✓		There are plenty networking with the outside world but it has not been utilized optimally to improve the effectiveness and efficiency of the coastal resources management.

Matra with the community. Regulations were formulated with the community so the applicable regulations are common rules adjusting to the conditions of the local community. Gili Meno core zone is one of the proofs that the zoning system planning involves the community. People understand the applicable zoning system and regulations made and agreed mutually are designed to protect the Gili Indah coastal ecosystem. Figure 2 is the zoning map as a result of discussion between TAP Gili Matra and the local community in Gili Indah. Determination of the core zone was formulated together with the community.

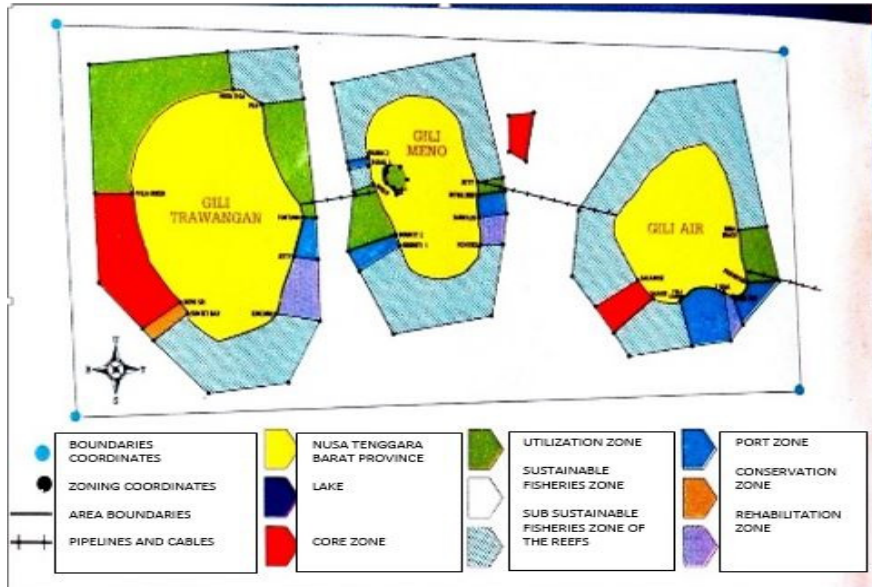


Figure 2: Zoning map in Gili Indah.

### c. Conflict resolution mechanism

Conflicts that had occurred during the implementation of co-management were 1) conflicts between seaside fishermen and central fishermen, 2) conflicts between local fishermen and outsider fishermen, and 3) conflicts between fishermen and tourism businessmen.

Seaside fishermen is a designation for fishermen who catch fish from the seaside – they just use a canoe to move a bit away from the land while the central fishermen use boats/ships to go to the middle of the ocean. Social jealousy has occurred because of the fish aggregating devices (FADs) aids from the government. But the hidden conflict resolved itself due to the runoff of the FADs.

Local fishermen are from Gili Indah village. Outsider fishermen are from the area around the conflict recriminations as the destroyers of coastal ecosystems in Gili Indah village. NWCAH needs to investigate so that these conflicts do not

drag on and on. NWCAH will create a notice board of zoning and the use of fishing gears in several places in the Pemenang district, particularly in ports towards Gili Indah village.

There was a marine territorial conflict between the fishermen and the tourism businessmen. Fishermen use the sea as the area to catch fish while the tourism businessmen use the sea for snorkeling, diving and other water sports activity areas. The resolution of the conflict is that one of the parties must shift the fishing or diving area. There has not been any violence in this conflict so communication needs to be built between the two parties and with the third party which is NWCAH TAP Gili Matra.

#### d. Government recognition

Ratification of North Lombok Regency Decree No. 114/3S.F/BAPPEDA/2013 is a written acknowledgment from the government at the district level to the collaborative management of TAP Gili Matra. Coordination forum for collaboration among stakeholders in TAP Gili Matra provides space for coordination, consultation and facilitation among the stakeholders. The Coordination Forum for Collaborative Management of the National Water Conservation TAP Gili Matra (CFCM NWC TAP Gili Matra) also functions to organize programs and activities in an integrated management, mutual harmony and in sync with each other. Dispersed stakeholders range from a national level to fishermen associations. Other stakeholders such as the Wildlife Conservation Society NGO and tourism businessmen were included in this management forum.

### 2.1.2 Debilitating factors

Based on analyzes using Ostrom [4], there are co-management debilitating factors in Gili Indah. These factors are as follows:

#### a. Community collective participation

Collective participation channeled through fishermen associations is available on each island in Gili Indah. Community participation can be divided into three types, namely the planning stage, the management stage and the evaluation/monitoring stage. A good management scheme will create adaptive management. The manager has two roles that ensure the involvement of the community through space provision and community involvement are also able to monitor, steer and ensure dynamism in order to remain in accordance with the principle of enactment of the water conservation area.

#### b. Monitoring

TAP Gili Matra monitor coastal areas conducted from land and sea. This monitoring is conducted by a NWCAH work unit and also by the community. The NWCAH work unit along with Gili Eco Trust monitoring coastal areas in the sea by using boat patrol. People who have limited funds supervise and monitor the zoning area from the land. Cafes on the seaside will reprimand the perpetrators, either fishermen or tourism service providers (snorkeling and





diving), who violate zoning or are anchored in areas of the sea that have abundant coral reefs. Monitoring offenses are committed and perpetrators are the tourism service providers (snorkeling and diving) and fishermen. However, the monitoring which had been done was less effective because there were still undetected zoning violations by NWCAH. There are outsiders who get into the water conservation area of Gili Indah village and use fishing gear that actually can damage the reefs.

c. The implementation of sanctions

Applicable sanctions from NWCAH TAP Gili Matra management and *awig-awig* in the form of fines and reprimands. But the *awig-awig* fines have changed now and adjustment of the fines is applied by NWCAH TAP Gili Matra. The community still has the authority to exclude the violators of regulations. Violations are still charged in the form of a reprimand and a warning letter. The provision is due to an agreement that the violation perpetrators will be fined if three warnings from NWCAH are ignored. Serious violation will also be brought by the community into the custom assembly. Unfortunately, these sanctions are less firmly enforced by the community. NWCAH TAP Gili Matra party itself has difficulties in imposing sanctions because tolerance warnings occur three times before the NWCAH work unit actually impose sanctions.

d. Networking with the outside world

The collaboration forum (CFCM) implementation is bridging communication with other stakeholders, such as the Department of Agriculture, Department of Marine and Fisheries, BAPPEDA North Lombok Regency, the Wildlife Conservation Society NGO (WCS), Coastal and Air police (Polairud), Navy, Gili Eco Trust, P3L University of Mataram, North Lombok Fishers Association (LMNLU), Gili Tourism Businessmen Association, Karya Bahari Union and Groups of Fishers. *Awig-awig* provides an opportunity to collaborate with external parties such as NWCAH, LMNLU, Gili Eco Trust and other associations. However, since the adoption of decisions concerning a regent decree in Gili Indah, there are some stakeholders who have not completed their tasks those stated in the regent decree.

### 3 Conclusion

The preservation of the environment and sustainable tourism can be formed through collaborative resource management. Collaborative coastal resource management in Gili Indah already runs well. The existence of tourism business benefits and improves the welfare of the local community. Tourism management in accordance with the zoning system will reduce the negative impacts of tourism itself. Determination conservation in Gili Indah and also local wisdom (*awig-awig*) are examples of successful co-management. Sustainable co-management creates a balance in economy, ecology and social factors.



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