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**A Pattern of Local Community in Protecting Marine Biodiversity**  
**Lessons from Gili Indah, Lombok, Indonesia**

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LOCAL GOVERNANCE OF CORAL REEF ECOSYSTEMS  
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Lessons from Gili Indah, Lombok, Indonesia

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## Abstracts

The great majority of centralized management of coral reef ecosystem in Indonesia has failed to meet its management objective. The marine protected areas (MPAs) serving as the main way of protecting the ecosystems could not be an effective tool to halt blast-fishing and other activities regarded as the main factor for reef degradation. As many parties have been facing a frustration the community of Gili Indah has successfully applied a local governance approach. This paper aims at describing and analyzing the mechanism of local governance, the process of institutional change, the influential factors of the success of the governance while looking at the lacks that should likely be still improved.

Keywords: Local governance, property right, operational level, institutional level, transactions

## 1. Introduction

Indonesia is considered as one of the tropical coral reef center in the world. Around 18 % of all coral reef ecosystems exist in the Indonesian marine regions. According to a reliable study, Indonesia owns 60,000–75,000 km<sup>2</sup> of coral reef ecosystems (Burke et al., 2002). These ecosystems yield valuable products and services, which are useful for humankind. The livelihood of many coastal inhabitants depends on the ecosystems, for example, as fishermen, limestone miners, handicraft makers or tourism business managers. This is plausible because nearly all components of the ecosystems are economically useful. The coral reefs serve as a bank of biodiversity, a habitat for many kinds of fish, sources for potential chemical and bioactive products, attractive tourist destinations and a coastal barrier (Bryan et al., 1998).

Unfortunately, those valuable ecosystems are at risk. About 85 % of them are threatened by human activities and may be close to extinction. The 1997 COREMAP project reported that only about 6 % of the ecosystems are in excellent status, 22 % good, 32 % fairly and 40 % very poor. Experts assume that Indonesian coral reefs will disappear within ten year from now if no protective measures are taken immediately.

There are many reasons why the coral reefs are approaching the point of extinction. Destructive fishing, limestone mining, live coral trading, coastal development are regarded as the causes for this development (Burke et al., 2002).

In managing the problems, the Indonesian government applies a conservation approach, ranging from absolute conservation where all use activities absolutely forbidden to a varied use purpose. Up to now, Indonesia has established 131 marine conservation areas (Burke et al, 2002), nine of which are marine national parks with a total area of 41,129 km<sup>2</sup> (Clifton, 2003). Some of the nine are Kepulauan Seribu, Karimun Jawa, Taka Bone Rate, Wakatobi, Teluk Cendrawasih and Bunaken. According to the study of Burke et al., of the 131 marine protected areas are only three rated as good management, 36 partial, 35 inadequate and 57 unknown.

Conceptually, in Indonesia there are three approaches that might be applied to manage conservation areas, that is, centralized, community-based and collaborative management. In a centralized management scheme, the authority is placed at one hand, usually the national government. Community-based management has a bottom-up canal by which decision can be made at local level. Collaborative management shares the authority among several actors, particularly the community, government agencies, universities and non-government organization.

In line with the centralized political situation of New Order regime, Indonesia has applied a centralized marine conservation management, where the national government bears a total authority. As a consequence, rules and regulations governing the use of resources within the marine conservation areas are centrally formulated by the Ministry of Forestry in Jakarta and apply nationally. This means that whole region of Indonesia which is various in culture, values and ecological situation must apply the same rules that tend to disobey their uniqueness and varieties. Many experts consider that this is the main reason

why the marine conservation management in Indonesia fails in protecting the resources from any kind of destructive activities.

The Indonesia's government chooses this type of management because it is relative cheap and easy in the planning stage. Nevertheless, as Kuperan (1999) said centralized management is costly in its implementation. This results from the government that must provide a budget for law enforcement, covering monitoring and penalizing. This matter has encouraged some local community who concern with marine resource sustainability to do self conservation. Regardless of its lacks, Gili Indah is an example of the success one. This paper aims at describing and analyzing the mechanism of the local governance, the process of institutional change, the factors influential the success while looking at the lacks that should be still improved.

## 2. Selected Theoretical Framework

Given their characteristics, coral reef ecosystems can be regarded as common pool resources (CPRs). Referring to Ostrom (1990), CPR is a natural or man-made resource system that is sufficiently large as to make it costly to exclude potential beneficiaries from obtaining benefits from its use. Stein and Edwards (1998) defined it as a resource used by multiple user groups so that difficult to make exclusion and to avoid subtractibility. The way the CPR managed has resulted in a serious debate as Hardin (1968) published an influential paper of 'The Tragedy of the Common' which predicted the overexploitation and ruin of any collectively used resources as a result of each user's rational incentive to maximize utility (Stein and Edwards, 1998).

To avoid a mismanagement result from improper definition, it is necessary to clearly differentiate CPR from open access and common property resources. Open access is a management regime of CPR that refers to a free for all situations as a consequence of lawless governance. Common property resource is a management regime characterized by a set of decision-making arrangement that controls the benefits arising from the CPR (Stein and Edwards 1998). According to Ostrom (1990), the sustainable use of CPR depends on the users' capability of devising and implementing rule regulating rights, access and resource system use pattern.

Ostrom (1990) summarized three main alternatives presumably possible to resolve common pool dilemma. The alternatives have been debated in scientific forum not long after Hardin published the influential article. First, CPR problems which follows "the tragedy of the common model" could only be overcome with centralized government. It is based on an assumption that common dilemma will not be able to be resolved through cooperation. This contention is recommended by Heilbroner (1974) cited in Ostrom (1990) who said that overcoming environmental problem which rose from common dilemma situation is required an iron government or perhaps military government, by which the government could control ecological problems. This argumentation is supported by Ehrenfeld (1972) cited in Ostrom (1990) who emphasized the importance of government roles. Ehrenfeld suggested that if private interest can not be expected to protect the public domain then external regulation by public agencies, government or even international authorities is needed. The similar opinion with various argumentation and evidence could be found in (Hardin, 1978 cited also in Ostrom, 1990). He said that privatization or centralized government was necessary to stop environmental degradation that result from common dilemmas. Ostrom called this way as a Leviathan, that means an outside coercive force.

The second possible way to overcome common dilemmas of CPR is to impose private property rights. Those who support this opinion are Demsetz (1967), Johnson (1972) and Sin 1984 cited in Ostrom (1990). They argued that privatization of the commons was the optimal solution for all commons problems. According to them, as long as CPR is under common property regimes, the tragedy of the common problem would not be resolvable. They think that the common resources need to be private ownership in order the actors can use them efficiently and protect them from continually degradation.

Ostrom does not accuse that the two alternatives above are wrong. Instead of blaming them and claiming that there is only a single way to a single problem she prefers to say that there are many alternative solutions to cope with many different problems (Ostrom, 1990). One point to be noticed is that getting the right institution is a difficult, time consuming and conflict invoking process.

According to Ostrom, the third alternative possible to be employed is self-governance approach. This alternative is based on empirical experiences demonstrating that individual can cooperate to resolve the common problems as long as they can meet the condition required.

### 3. Research Methodology and Analytical framework.

Information was collected using a varied technique, covering observation, unstructured interview and document analysis. Interviews were conducted with representative of each stakeholder at different administrative levels, including Natural Resource Conservation Agency (BKSDA)<sup>1</sup>, Village Government<sup>2</sup>, fishermen, SATGAS and tourism business managers represented by ECOTRUST and APGA as presented in Table 1. All interviews with local communities were conducted in informal setting, using Indonesian language and with several certain respondents using local language with local resident help as translator.

Table 1: List of Actors as Sources of Data, Research Techniques and Issues

Actor	Administrative Level	Research Technique	Issue addressed
Fishermen	Village	Unstructured interviews	Awareness on coral reefs, fishing methods, reef protection, resolution conflict and share of coral spaces, need for conservation.
Village government	Village	Unstructured interviews, document analysis	Role of village government on reef protection, conflict resolution, operational rules making, need of conservation
ECOTRUST and APGA	Village	Unstructured interviews	Conservation fee collection and allocation
SATGAS	Village	Unstructured interviews	Law enforcement, monitoring, regulation creation, punishment
BKSDA	Province	Unstructured interviews, document analysis	Conservation, management issues, monitoring, share of authority with local actors

The data is collected principally based on analytical framework of Ostrom (1990) and Oakerson (1992). Since their publication, both frameworks have been applied by many researchers and practitioners to analyze different CPRs situation. Hagedorn et al., (2002) lately developed a different framework which is relevant for the study of institutional sustainability of agri-environment. They stated that the change of institution and collective action in CPR management is influenced by four determinants, i.e., the properties of transaction between actors and natural resources, characteristic of actors,

<sup>1</sup> Balai Konservasi Sumberdaya Alam (BKSDA)

<sup>2</sup> Pemerintah Desa

property rights to nature component and governance structure for natural resource relation. More or less I analyze the governance of the coral reef management at local level based on these analytical frameworks.

#### 4. The Gili Indah Islands

Gili Indah is an archipelago village (*desa*), consisting of three small islands (*gili*) located northwest of Lombok Bay, between S 8°21'- 8°23' and E 116°00'- 116°23'. It is flanked by Java Sea on the west and north, by Lombok Island on the south and by *Tanjung Sira* on the east (see Figure 1). Administratively, it belongs to Pemenang Subdistrict (*kecamatan*)<sup>3</sup>, West Lombok District (*kabupaten*), West Nusa Tenggara (NTB) province. The village occupies a total area of 2,954 hectares, approximately 665 hectares of which is mainland. The coastal areas of the islands are surrounded by conserved coral reef ecosystems. Around 2,818 persons inhabit the islands, whose livelihood depends strongly on the reef ecosystems. Recently, the livelihood is divided into two main groups, fishermen and tourism managers.

#### 5. Awig-awig as Local Institutions

Awig-awig is a common name of local institution such as norm, customary law and local restriction that live in Lombok and Bali. It is commonly unwritten agreements among community's members. Because of having strong roots in tradition, awig-awig has become a very tight norm. People more worry about violating such institution than disobeying the state law. For the Balinese people and some community of Lombok, having awig-awig in order to be able to live peacefully is compulsory. They consider it as a rule of a game among human interaction (Suradisastra et al., 2002).

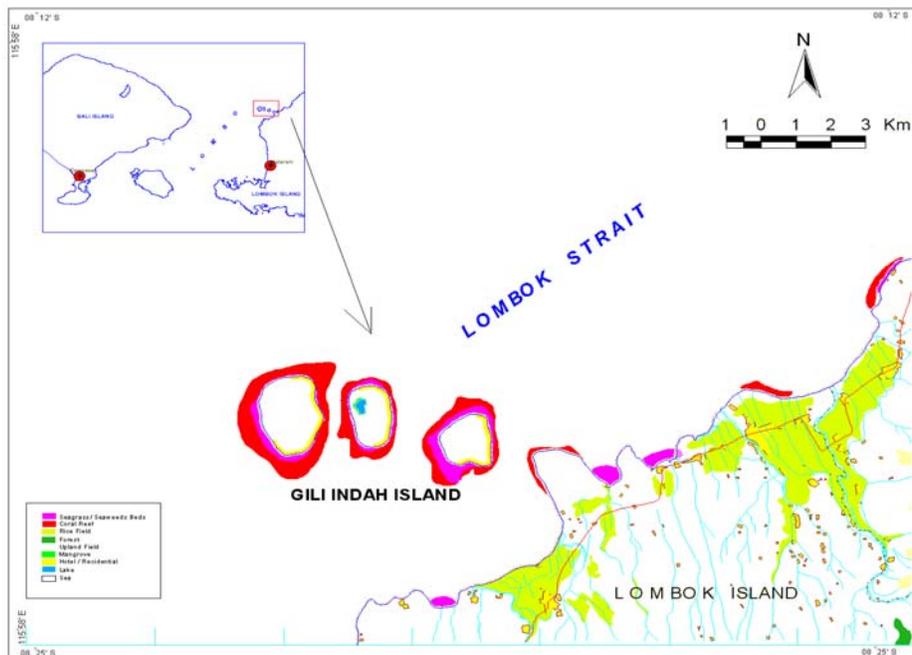
In some parts of Lombok regions, awig-awig is an effective norm that restricts human interaction. The disobedience of it is potential to be considered as a difficult social violation and will surely receive a heavy social penalty, ranging from monetary one to social isolation, depending on the heaviness of the violation. Because of the seriousness, the community provides a special force unit or nightwatchman (*langlang*, local name) to enforce the rule. In addition, village government also has a special organ whose task is to

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<sup>3</sup> *Kecamatan* is sub-district administration under District or Municipality (*Kabupaten or Kota*). It is administered by Camat

create awig-awig, which is in local language called Krama Desa (Monografi Daerah NTB, 1977)<sup>4</sup>.

Figure 1: Map of Location of Gili Indah



The awig-awig is varied according to the needs. Principally, Gili Indah village has two kinds of the local rule. One relates to regulation of public order and security and ones else is on environmental and natural resources management and protection. The first consists of establishments and sanction on looting, fighting, man's wife molestation and girl kidnapping. The sanction of these violations is varied, ranging from the lightest to the heaviest. It could be in the form of material penalty, isolation from social activities up to the exile from the region that may come back after five year in exile. The latest is the heaviest sanction that may be graduated to those who engage in illicit sex with one's wife. Another example, those who kidnap girl must pay a monetary penalty of Rp 3000,000 (three million rupiah). The money is not given to the girls instead for the use of public facility development, such as road renovation, public toilet construction and so on. So far,

<sup>4</sup> Proyek Pengembangan Media Kebudayaan, Dirjen Kebudayaan, Departemen Pendidikan dan Kebudayaan Republik Indonesia Tahun 1977. Jakarta.

those rules still work effectively. The community members respect the norm and are very worry about offending against it due to its very heavy sanctions. What should be underlined is that these rules are only unwritten agreements and public knowledge which work not only for native residents but for outsiders or impermanent resident as well.

In other parts of Lombok, such as in Kayangan village, I find a unique rule that does not allow a boy visiting his girlfriend after 10:00 p.m. It is considered a taboo and its violators will receive a sanction of having to go home without shirt and shoes and not allowing visiting her again. In Gili Trawangan, one of island composing Gili Indah village is found a local rule on looting prohibition. The thief arrested will receive a sanction that necessitates him to return the thing stolen. Besides, he must also wear a necklace made from cartoon which contains a sentence “I am a thief of this...this...and this...” and then will be paraded around the islands being watched by all the island residents. In Gili Meno, the smallest island in the village, the cow owners must tight their cow. If the cows become free and eat plants of others, the residents have right to capture, to kill and eat it together.

Apart from local rules on social order, there has also been ones related to regulation of environment and natural resources management and protection. These are relative new which lately rise to respond the environmental issues. They include prohibitions of making any environmentally destructive activities and threatening the sustainability of natural resources. Some of them are prohibition of shooting birds, riding motor-bicycle, constructing permanent building, mining coral stones and fishing with bomb or poisonous material. Such restrictions are fond in Gili Indah. Gili Indah people will arrest whomever who shoot birds and punish them by seizing their gun and necessitating them pay for monetary penalty amount to Rp 100,000 (one hundred thousand rupiah). Beyond those, they will also not be permitted to revisit the village for many years.

The prohibition of riding motor-bicycle is still in effect. Those who violate must send it to Lombok. If not, the residents will put it in waters. It is effective not only for native resident but also for visitors. The consideration of implementing this is to protect Gili Indah from air pollution and the livelihood of Cidomo's drivers, as the only inland

transportation facility allowed operating on these islands. Because of these prohibitions, it will never be found one riding motor-bicycle in the village.

In the matter of prohibition of constructing permanent buildings is seemingly no longer so strict. Since, in some location, such buildings have been many found, either hotels or houses, including the office of Gili Indah village itself. But, many think that necessitate keeping alive the prohibition, because it is sure that the construction of permanent building is not relevant with the geological and topographical condition of the islands. They argue that the traditional building with high pile and roof made from sago palm leaf is much better and more recommended than the modern ones. The flood that recently often happens in Gili Indah is the evidence of the inappropriateness of this kind of construction. Meanwhile, before these exist, during rainy season flood has almost never occurred. The backwater happens because the permanent buildings block the water that must flow to the sea or infiltrate into the land.

Beyond Gili Indah, I also find several local rules on natural resource protection typically on marine resources. In Kayangan and Sukadana, some coastal village located at North Lombok, are found two rules on marine resource protection. The fishermen community of Kayangan applies a Sawenan concept, i.e., a close season of fishing during a certain period of time, usually from the first of July or August to the 31st of July or August every year. The exact schedule is usually determined through a convention of all fisherman members of the village, led by Mangku (the leader of traditional fishermen). The beginning of Sawenan is signed by hanging out the flag at the border of the village.

The Sawenan is effective not only for Kayangan fishermen but also for those who stem from other village. Therefore, as the restriction begins the Mangku will send letters to other village leaders, informing that during a certain period the fishing activities within Kayangan water region is closed. So, they will have no reasons to offend against the restriction.

The end of the period will be signed by a big traditional ceremony called Sawenan. On that day, the fishermen are allowed capturing fish again after a month being prohibited. However, all fish gained must be dedicated to the ceremony's need. No fisherman is allowed taking the fish home. The other needs of foods like rice, spices, vegetables and

cakes will be provided by fisherman families. In addition to the eating party, at the moment the community member will present any kinds of traditional shows, such as dances, singings etc.

The prohibition of fishing during the Sawenan can be effective due to the heavy sanction graduated to the violators. Those who offend against the restriction will be asked to stay in beach waters for one hour while being watched by all villagers. Not only that, he must also conduct a party dedicated to the villagers for which he needs to slaughter a goat, provide rice and other food necessary. This is considered as ceremonial meals as consequence of the violation. The party should take place at beach and followed by all fisherman families. The sanction is so effective that no fisherman has bravery of fishing during the period. All restriction is established in an awig-awig which they respect to.

In addition to the prohibition of fishing during Sawenan period, the community of the village has also a prohibition of application of destructive fishing method. According to this local rule, bombs, poisons, Muroami and whatever fishing method considered resulting in marine and coral reef degradation are not allowed. The rule also forbids cutting down mangrove and any kinds of coastal tress and taking away reefs, either dead reef or moreover a live one. The sanction of this restriction varies, ranging from the necessity of putting the reef back to the sea to social sanction and handover the violators to the police, particularly those who apply destructive fishing method.

In Sukadana village, 10 km northern Kayangan, is also found an awig-awig prohibiting destructive fishing method application. The violation of this rule will also bring about a heavy sanction. They must pay for the penalty ranging from Rp 5,000,000 (five million rupiah) to Rp 10,000,000 (teen million rupiah), according to the violation quality. Indeed, the bomb and poison users will be graduated the heaviest punishment. Besides, they must also hand the boat, motor and other fishing supporting facilities to the fisherman association. If doing the second violation they will receive a traditional punishment in the form of undead hitting. The third violation will bring them to the police to follow the prevailing formal laws. This rule as the others is effective to halt destructive fishing activities.

The awig-awig applied in the management of irrigation systems is much more advance than those of others. The traditional water management (subak) is of the example. Subak as an autonomous organization, reserves the right to take care of its internal matters and formulate awig-awig. It contains the main provisions meanwhile the specific regulations are contained in the *pararem* (an agreement made through a convention) as the implementation of Subak regulation. The main content regulates *parhyangan* (connected with worship), *pawongan* (related to human interaction) and *palemahan* (related to the environment). The awig-awig contains rights, duties and sanctions (*pemidanda*) system against violations of rights and duties (Suradisatra et al., 2002).

The emergence of these awig-awig as well as other local rules related to the management of natural resources according to Koentjaraningrat (1990) cited in Satria (2002) constituted a form of community's attitude that is willing to be harmonic with the nature. In other words, those are a form of local wisdom signing the existence of community awareness on the importance of sustainable natural resources management.

## 6. Determinant Factors of Institutional Change in Coral Reef Management

### 6.1 Attributes of Transaction

The features of transaction between actors and coral reefs ecosystems found in Gili indah are referred to those elaborated in detailed by Hagedorn et al (2002), Ostrom (1999) and Oakerson (1992). They have characterized the attribute of the transaction regarded affecting governance of common pool resources and collective action among user groups.

Table 2: Characteristic of Transaction between User and Coral Reef Ecosystems

Empirical level	Theoretical level
<ul style="list-style-type: none"> <li>The fish captured by a fisherman family is not available for other fishermen</li> <li>Each user groups, both fishermen and TBO, can not exclude each other from benefiting the resource systems</li> <li>Coral reef produces various kind of services which attract many actors and stakeholder to come into</li> <li>The users or appropriators of coral reefs have uncertainty. The fishing output of fishermen is very strongly determined by weather condition, fish seasons, fishing technology used and water conditions. The price of fish is also uncertain due to the low bargaining power of fishermen. The TBO is depended strongly on political situation. The terror issues attack Indonesia several time ago has collapsed a large number of tourism business in the study location.</li> <li>There is different perception and interest between TBO and fishermen. In order to get income for meeting daily need fishermen want to take fish considered as resource unit from the resource systems, meanwhile in order to attract tourist's visit which finally will generate income TBO want to totally</li> </ul>	<ul style="list-style-type: none"> <li>Subtractibility</li> <li>Low excludability</li> <li>Heterogeneity in product and users</li> <li>Uncertainty</li> <li>Complex systems</li> </ul>

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conserve the ecosystems and halt whatever appropriation activities.

- After being managed properly and destructive activities could be halted the resources themselves have demonstrated a better performance.
  - From the point of view of BKSDA the activities of TBO is much closer and relevant with conservation objective of the government so that they are thought of more legitimate, meanwhile the activities of fishermen, in particular who apply muroami are considered illegitimate. In another side, local fishermen agency views those fisherman activities are also legitimate because they hold a fishing permission letter from the local government
  - possibility of improvement
  - legitimacy and complexity
- 

The transaction, according to Hagedorn et al, is determined or affected by physical characteristics of the common pool resources themselves which includes excludability, rivalry, asset specificity, separability, frequency of transactions, uncertainty, complexity, heterogeneity and variability and legitimacy. Ostrom adds that self governance and collective action are influenced by the feasibility improvement of the resources, the availability of reliable and valid information on the resources, resource unit predictability and size of the resources. Meanwhile what Ostrom said have been covered by both Ostrom and Hagedorn et al. Based on these references, this research sought to find characteristic assumed to affect collective action and institutional change in coral reef management. Those characteristics are presented in the Table 2.

## 6.2 Actors, their characteristics and functions

As previously mentioned, characteristic of actors constitutes determinant factors of collective action and institutional change. In the management of Gili Indah coral reef are found five actors which play important role.

### 6.2.1 Natural Resources Conservation Agency (BKSDA)

BKSDA is a technical organizer of the natural resource conservation tasks. The agency is led by one who must be responsible to the Director General of Forest Protection and Natural Conservation (PKA), Department of Forestry Indonesia. It is a representative of national government whose office lies in the provincial region. The existence in a province region does not mean that BKSDA belongs to the provincial government. Right now, Indonesia has 32 BKSDA spread throughout the Indonesian region, from the westernmost of Indonesia, Banda Aceh to the easternmost one, Irian Jaya. Gili Indah Marine Tourism Park belongs to the BKSDA NTB located in Mataram.

According to the Forestry Minister Decree No. 6187/Kpts-II/2002 on the organization structure and working arrangement of BKSDA, the agency has main tasks to carry out the

protection and management activities of conserved areas. In the frame of executing the tasks, BKSDA has a following functions: 1) making plan and program and evaluating the implementation of the conservation actions; 2) carrying out management of conserve areas; 3) conducting protection, safeguard and quarantine of living natural resource; 4) making a promotion and providing information of the natural resource conservation; 5) conducting a building of nature tourism and an extension on natural resources and living ecosystems conservation.

So far, BKSDA is the only official governmental organization authorized to conduct the management to conservation areas. The authority is based on the President Decree of Indonesia No. 102/2001 on position, tasks, function, authority and structure of organization of the Department of Forestry as well as President Decree No. 109/2001 on the organization unit and tasks of the top echelon within the internal department of forestry. With that authority, BKSDA can be considered as the property rights bearer over the whole conservation areas by which it has rights to carry out management tasks, ranging from planning, implementation, law enforcement and monitoring. The Gili Indah conservation area was established through a Forestry Minister Decree No. 85/Kpts-II/1993. Accordingly, the management of the area becomes responsibility of the BKSDA. Table 3 summarizes important characteristics of this actor assumed affecting collective action and institutional change.

Table 3: Characteristic of Natural Conservation Agency (BKSDA)

Empirical level	Theoretical level
<ul style="list-style-type: none"> <li>• It has organized the monitoring and patrol of the conserved coral reef ecosystems</li> <li>• It also bears property rights to the resources, control access and management</li> <li>• It believes that coral destroyers, such as fish bomber, poison users and lime stone miner, if left without control will cheat</li> <li>• The villagers, particularly fishermen, do not respect the agency</li> </ul>	<ul style="list-style-type: none"> <li>• Good organization skill</li> <li>• Strong bargaining position</li> <li>• Lack of trust</li> <li>• Bad reputation</li> </ul>

### 6.2.2 SATGAS

Yayasan Front Pemuda Satgas, well-known as SATGAS, was established on 16 January 2000 by several young people of Gili Trawangan who was deeply concerned with the massive fish bombing and poisoning within the region of Gili Indah. The concern emerged given at the moment the destructive fishing practices had been threatening the

existence and sustainability of the reef ecosystems on which almost all Gili indah residents' livelihood is dependent. The concern became stronger as at the same time the police, mariner force and BKSDA did not do much. They are really incapable of defeating the bombers that become working so massively that as if they are the only ruler group of Gili Indah waters region. That situation made some young people was motivated to form SATGAS whose principal aim is to assist government official in safeguarding marine resources, typically coral reef ecosystems. The important features of this local organization are presented in Table 4.

Table 4: Characteristic of SATGAS

Empirical level	Theoretical level
<ul style="list-style-type: none"> <li>• Those identified as SATGAS elite commonly have a relative good education and active in village youth organization</li> <li>• It is responsible for the monitoring and patrol of marine waters around Gili Indah</li> <li>• It has a good partnership with natural resources conservation unit (BKSDA) and Local Tourism Agency and ever become partner of local government to handle some project in the village</li> <li>• It also often get mandates from local community to handle other social problem like looting, fighting and so on.</li> <li>• It can carry out the task of monitoring and arrest whomever suspected as the violator fairly</li> <li>• They commonly know that the purpose of tourist visits the region is to enjoy coral reef and other marine resources</li> <li>• They believe that without control and monitoring fishermen will again apply destructive fishing method</li> </ul>	<ul style="list-style-type: none"> <li>• Good organization skill</li> <li>• Strong bargaining position</li> <li>• Resources for influencing strategy</li> <li>• Sufficient trust</li> <li>• Good reputation</li> <li>• Good environmental awareness</li> <li>• Lack of trust</li> </ul>

According the interviews with the elite SATGAS, in executing the tasks they initially faced three obstacles, i.e., monetary, law and physiologic. The monetary obstacle could be overcome by the establishment of ECOTRUST whose task is to raise fund. Meanwhile, the law and psychological problem could be coped with by making local rule which gives SATGAS authority to take necessary action against the reef destroyers. So, SATGAS play a role as marine and coral guarder.

### 6.2.3 Fishermen

Before the tourism industry entered Gili Indah region, fishing was a principal livelihood of the village people. But, since early 1980eg it has shifted into ones related to the tourism industry, either as tourism managers or tourism workers. The change is a necessity given the fishing has become more difficult in line with the decrease of fish

resource and increase of fishing cost as a result of necessity to move from one fishing ground to another otherwise the fishermen will not obtain a satisfied fish catch. Meanwhile, the tourism industry that has lately developed offers a more certain hope. Thus, Gili Indah has change from fisherman village to tourism one.

Even though there has been a change in livelihood pattern, however, not all Gili Indah residents can adapt with the new livelihood. Some parts of them remains keep fishing as their main life sources. From 693 families occupying Gili Indah, 150 of which are fisherman families<sup>5</sup>, either as share holders or workers. Looking at the number they are the minority, nevertheless they are very influential in coral reef management at local level. Without their involvement in decision making process the local governance of the reefs would be labile.

In this action situation, fishermen play an important role, affecting institutional change and formation of collective action. Therefore, it is necessary to find dominant features of the actors. From the investigation a number of characteristic were found as listed in the Table 5.

Table 5: Characteristics of Fishermen

Empirical level	Theoretical level
<ul style="list-style-type: none"> <li>• Fishermen rarely or almost never directly participate in monitoring process as other groups get involved in</li> <li>• They are also unwilling to spend money for law enforcement and monitoring once others are willing to</li> <li>• They have just made a fisherman association and had not joined with association for a long time and only grouped according to the similarity of fishing devices</li> <li>• They apply a traditional fishing devices which can only be applied within a restricted fishing ground</li> <li>• Some of them still tend to apply destructive fishing method like bombs, poisons and Muroami</li> <li>• They are unwilling to invest in protecting coral reef ecosystems</li> <li>• The majority of them think that fishing stock abundance does not relate to the degree of coral reef quality</li> <li>• They have no access to affect process of policy making at local government as well as can not defends their interest as they should face with other external interest</li> </ul>	<ul style="list-style-type: none"> <li>• Opportunistic behavior (free riders)</li> <li>• Opportunistic behaviors</li> <li>• Lack of organization skill</li> <li>• Lack of technology skill with high uncertainty</li> <li>• Low environmental awareness</li> <li>• Short planning horizon</li> <li>• Misperception</li> <li>• Weak bargaining position</li> </ul>

*Weak bargaining position.* All Gili Indah fishermen are categorized as traditional ones which apply many kinds of simple fishing technologies. Generally they operate small

<sup>5</sup> Up to 2002, based on monograph of Gili Indah village, there have been 100 fisherman families, however the survey found that 150 fisherman families have stayed in the islands.

boats whose size less than 5 GT and using small size outboard motors. Up to the middle of 2002 all fishermen grouped according to the name of fishing devices used. Those applying Muroami call themselves as Muroami groups. Likewise, the users of Sret (mini pure seine) name themselves Sret groups. Due to this situation, it is found different groups of fishermen. The study held within May-July 2003 found 47 fisherman groups, 68 anglers and 81 archers.

The fishermen spread over a small group have caused their bargaining position to public policy weak. Their voice was distributed everywhere. They are unable to affect public policy that will defend their interest. Even, to make negotiation at local level in frame of resolving local problems, such as conflict with tourism managers, is very difficult. Many get difficulties when they must make a contact with Gili Indah fishermen due to the absence of organization which can provide an umbrella for all these fishermen.

The description describes how weak the bargaining position of the fishermen. The weakness appears from their powerlessness in affecting public policy. According to Goodwin (1990) this constituted a dominant characteristic of fisherman community. Further Goodwin said the weakness of bargaining position of fishermen result from the lack of their control over capital sources. They also have no strong connection with banking institute. This matter is in line with the result finding in Gili Indah where no bank is willing to lend money to them. So that why, generally they rely on a private monetary institute which, of course, must pay for a higher interest. As well, they can rely on governmental project that often last intermittently. This is that make fishermen continually dependent and marginalized.

The powerlessness of fishermen is also seen when the coral reef areas, as a potential fishing ground, was established as a conserved area. The change of status contributes significantly to the decrease of their fishing space, which eventually affects their economy difficulties. Although the resistant to the policy is strong however they remain become powerless. This means that their resistant can not change the policy that has been made. Beyond the Gili Indah there have been many other examples demonstrating the weakness of fishermen position. The case of sand mining in the Karimun islands is one of the examples. To the fishermen the mining within fishing ground has caused a decrease

of their income by 50 %. However, they again do not have canal to present their voice (Satria, 2002).

The conflict between fishermen and tourism manager occurred on 17 August 2001 had motivated Gili Indah fishermen to form an association which can provide a shelter for all fishermen. They conceive that without gathering in an organization they will always face difficult overcoming each conflict appears. Finally, in December 2002, an association of Gili Indah fishermen was formed even though its member is still limited to those who get involved in the conflict, i.e., Muroami and Mogong user groups.

*Short planning horizon.* Gili Indah fishermen earn a low income from fishing. Muroami, the main fishing devices, is only able to generate net income averagely of Rp 15,000 (fifteen thousand rupiah) per week or equal to US \$ 1.5. Indeed, it is very difficult to allocate the very limited income for meeting the daily needs. Even though their income is very low however they remain can not do anything to change their life pattern. Their dependence on nature is very high.

According to Ostrom (1990) the high dependence on a natural resource necessarily generates a high discount rate on it, which can be realized in a big contribution to the management of the natural resources which can guarantee their future life. However, it is not so with those fishermen. It could likely result from several reasons. First, the Gili Indah fishermen encounter a crisis of future economy certainty. This related to the open access regime applied to the reefs by which there is no guarantee that all actors are willing to maintain the resources. They are aware that the capital invested could not guarantee their future and the future of their generation. Accordingly, they give a low discount rate. Second, the fishermen of Gili Indah have a wrong perception on coral reefs. They consider that fish abundance has no relation to the quality or even the existence of coral reef ecosystems. Third, their jealousy to the success of tourism managers makes them not so care about the resources. They regard the reef maintenance will only be beneficial for the tourism industry. Fourth, majority of them behave opportunistically. They have a principal, as long as some body else have done a management of coral reefs why they should get involved.

*Environmental awareness.* The community perception on natural resources depends on the type of the community itself. Redfield (1941) cited in (Satria, 2002) divided the community into four types, i.e., city, town, peasant village and tribal village that each has a unique culture. Following the Redfield's classification, coastal community exists on each type (Satria, 2002). In other words, Redfield want to say that fisherman communities can exist in cities, towns, peasant village and tribal village or on remote islands. Satria however emphasized that the majority of Indonesia's fishermen representative of peasant village and tribal village communities.

According to Kuntjaraningrat (1990) cited in Satria (2002), coastal communities are identified by the attitude and perception to nature and human being. There exist three attitude on the natural, that is, surrender to nature, endeavor to be harmonic with nature and subject to nature. The last is often realized with destructive actions. The compliance with the nature is based on a belief that nature has magic power. Marine ceremonies often found a long coastal region of Java see are realization of the compliance attitude to the natures. They believe that these ceremonies will protect them from the natural disaster or will bring about benefits (Satria, 2002).

Further Satria says the form of the willingness to be harmonic with the nature is characterized by the efforts to harmonize the human life with the nature they use. It is realized with the existence of local institutions. Awig-awig in Lombok, Sasi in Maluku and Panglima Laot in Aceh are the evidence of community's attitude that are willing to be harmonic with the nature.

In spite of possessing awig-awig as realization of human willingness to harmonize the life with coral reef ecosystems, however, the Gili Indah community's awareness level to the resource itself still varies. By the awareness level, the community could be classified into three groups. First, the group that is very aware that their livelihood and future life are dependent on the reef ecosystems. They are tourism business managers or those whose livelihood either directly or indirectly are dependant on the tourism industry. Second, the group that has knowledge of the importance of the reef for fish habitat, however, the awareness does not lead them to the real safeguarding action. For instance, as witnessing fishermen applying destructive fishing method they would not inform it to

the marine security officer. Third, the group that has no awareness at all to the environment. They are fish bomber, poison users or other destructive fishing method users that claim themselves as main marine resource beneficiaries. Motivated by the claim they feel possessing rights to do whatever actions in order to meet their life needs.

*Opportunistic behavior.* Ostrom classifies opportunistic behavior into three types, i.e., free riding, rent seeking and corruption. The three behaviors are often found in the CPR management, such as irrigation systems, forest, grazing land and fishing grounds (Ostrom, 1990 and 1992). She defines free riding as behavior of people who are willing to enjoy benefits of an investment which themselves do not have any contributions in generating the benefits.

The second category of opportunistic behavior is rent seeking. That is, an effort to influence decision making, both government organization and organization at local level or donor level so that the decision made is beneficial for the rent seekers. As the effort is success they will expand their effort so that each decision will not be able to be separated from their influence which indeed is beneficial to them. Corruption is the third form of opportunistic behavior. In Indonesia it has entered such an advance stadium that is very difficult to find a space free from corruption.

According to this study, the corruption and rent seeking are not found among Gili Indah fisherman community. This is because they may not have opportunities. However, it does not mean that fisherman community is free from opportunistic behavior. Free riding is one of those often found. The fishermen are not involved in coral reef protection actions, whereas almost all community elements have given respective contribution that is beneficial not only for tourism industry but for fisheries as well.

*Reciprocity and Trust.* Oxford advance Learner's Dictionary defines reciprocity as a situation in which two people, countries, etc. provide the same help or advantages to each other. In sociological discourses, these terms are used referring to an attitude or social characteristic influential collective action and social dilemma resolution. So, Ostrom (1997) considered it as one of social capital.

Further, Ostrom said that reciprocity actually an individual strategy in facing social dilemma situation. She names five strategies that individual often use in facing social

dilemma, i.e., (1) an effort to identify who else is involved; (2) an assessment of likelihood that others are conditional cooperators; (3) a decision to cooperate initially with others if others are trusted to be conditional cooperators; (4) refusal to cooperate with others who do not reciprocate; and (5) punishment of those who betray trust. In a simpler sentence, Ostrom would likely say that reciprocity is an individual reaction to other individual actions, either negative or positive. The most often found reciprocity is tit-for-tat action which in Gili Indah has been a community inherent behavior. It can be found in daily life. For example, if family x invites family y in wedding ceremony of one of family x member, the latter family will feel necessary to invite family x as they have the same party or ones else.

Kreps (1990), Miller (1992), Keohane (1984) and Milgrom, North, and Weingats (1990) cited in Ostrom (1997) said reciprocity was an important element to the individual that want to have a good reputation as person who can be belief and considered can work in collective action without corruption. Therefore, many individuals that make use of reciprocity as a short term investment in order to obtain a long term benefit. The Gili Indah community actually possesses the good reputation as cooperative and trusted community.

#### 6.2.4 Tourism Business Organizers (TBO)

The tourism activities are spread over three islands, i.e., Gili Air, Gili Meno dan Gili Trawangan. They generally offer the same services, that is, the clean beach, the coral reef pristine and beauty and water sports offered to the international tourism market. To support the activities many people open business of tourism facilities provision, such as diving companies, hotel, bungalow, restaurant, ticket counter, bicycle rent, internet cafe, telecommunication cafe, traditional handicraft and traditional transportation (cidomo).

The tourism business managers principally have different characteristics from fishermen. They generally have a long time horizon, better leadership skill, a much stronger bargaining power, better access to decision maker and higher environmental awareness. More detailed features both empirically and theoretically can be found in the Table 6.

Table 6: Characteristics of TBO

Empirical level	Theoretical level
<ul style="list-style-type: none"> <li>• TBO actively participates in the process of decision making and monitoring</li> <li>• They are also willing to spend money for law enforcement and monitoring</li> <li>• They have established association and joint with for a relative long time</li> <li>• They are willing to invest to protect coral reef</li> <li>• They fight against whatever destructive fishing method which potentially cause coral reef degradation</li> <li>• Even though, they have no access to affect process of policy making at local government however can defends their interest as they should face with other external interest</li> </ul>	<ul style="list-style-type: none"> <li>• Non-opportunistic behavior</li> <li>• Non-opportunistic behaviors</li> <li>• Good organization skill</li> <li>• Short planning horizon</li> <li>• High environmental awareness</li> <li>• Strong bargaining position</li> </ul>

*Long time horizon.* The tourism managers have a high expectation to the coral reef resources. They make this ecosystem the only livelihood source which must be kept alive and inherited to the next generation. Accordingly, they seek as much as possible to maintain and protect it from any kinds of activities which potentially bring about destruction. This is in line with Ostrom argument, that the short or long time horizon of the common user actors was determined by their hopes to the common itself.

The success of reef management of the Gili Indah community is identified by the disappearance of destructive fishing which have brought about a new hope for the tourism business managers. Even though they can not control the resources exclusively, however, the on going governance have given them a certainty of the future economy expectation. There has been a belief that what recently made would be beneficial for and enjoyable by their generation. Because of this, they are willing to make sacrifices in order to realizing the hope and will oppose each action potentially causing coral reef destruction.

*Bargaining Power and Access to Decision Maker.* The tourism business managers through ECOTRUST and APGA have a better relationship with BKSDA than those of fishermen. The closeness is caused the same interest between tourism managers and BKSDA. It could likely be regarded as a simple collaborative management. That is, a natural resources management concept that advance share of responsibility and authority among stakeholders, both NGO and government organization (Pomeroy, 1998). In this case, there is a share of authority among ECOTRUST, APGA, BKSDA and SATGAS.

*Environmental awareness.* The efforts done by APGA and ECOTRUST is an evidence of how strong their commitment to protect the reefs. It results from environmental awareness and strong dependence on the ecosystems.

#### 6.2.5 Village Administration (Desa)

Desa in the New Order regime era was the lowest level organ of the central government. The old Regional Government Act No. 5/1979<sup>6</sup> clearly defined village as a certain region occupied by a number of occupants as a law community united, serving as the lowest level government organ under *kecamatan*, which possess a right to organize their own domestic affair within a tight of the Unitary State of Republic of Indonesia. In spite of possessing a right to manage their region, however, in the same time the Act also said that desa was the lowest level government organ under kecamatan. It means that desa constituted a representative of central government. As consequences, they only become the executor of central government program without having a freedom to refuse or suggest alternative programs, different from being offered. The systems had actually eliminated the rights of democratization at village level, which generally have uniqueness and varieties from one village to another. During the period, the government had attempted to generalize the villages and eliminated the varieties (Lapera, 2001). At that moment the village had not nearly possessed rights at all to create their own rules, including ones for conducting the management of natural resources.

Another section says that Indonesia's government as much as possible tried to make uniform village government with remaining pay attention to the heterogeneity of village situation and living culture to strengthen the village in mobilizing community participation in village development. In response to this statement, Lapera (2001) considered that what Indonesia's government during the New Order regime did was not only making the village as the lowest level organ but also making the village or local community within the same scheme. Even though there is a statement of remaining give attention to the heterogonous village condition and its varied culture, however, in fact it is only a political rhetoric.

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<sup>6</sup> Undang-undang Pemerintah Daerah (UUPD) 5/1979

Since 1999 Indonesia has possessed a new local government act No. 22/1999. Under this act, local governments (district and municipality) and village government are autonomous. The governor has no right to order Bupati or other kind of local government head. The same status is also held by village government. According to the act, villages are not representative of central government but a lowest level autonomous government unit. In spite of structurally being available directly under kecamatan, however, the later serves merely as coordinator of village governments.

The autonomy of village level is also signed by the presence of BPD<sup>7</sup> that serves as a legislative body. The head of this body places the same high level as kades. One important point to be noticed is that there is a separation of legislative and executive function, of which during the new order regime was impossible. In short, under the new act, village government consist of kades (or other name according to regions) and its staffs serving as executive board and BPD as legislative board.

According to Lopera (2001), there are five types relationship between village government and BPD. First, responsibility relationship which necessitate kades to give a responsibility report to the BPD when he terminates his duty. Second, a consultation and cooperation, where in executing governmental duties kades must consult and cooperate with BPD. Third, working relationship where both can cooperate in making up working programs and village regulations. Fourth, control relationship where BPD can control the work performance of kades. In addition, BPD may have a right to canal aspirations and suggestions of grass root to the kades.

Since 2000, Gili Indah village has change its government structure following the new effective Act. Apart from kades and his staffs Gili Indah has BPD as well, which must be a partner of kades in making village development plans and regulations. However, it has not functioned yet as should be, so far. Its important attributes regarded to influence collective actions and institutional changes are presented in the Table 7.

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<sup>7</sup> Village House of Representative

Table 7: Characteristic of Village Government

Empirical level	Theoretical level
<ul style="list-style-type: none"> <li>• The staffs of the village government generally have a relative higher education and work organizing different types of activities.</li> <li>• They are elected by community member and acknowledged and established formally by head of local government (district)</li> <li>• They also have direct and close relationship to the local government and its agencies</li> <li>• Many villager in particular those organizing tourism business consider that the village government do not have sufficient concern to the reef by which they do not fight against the blast fishermen</li> <li>• They also consider the village government leader and staff are corrupt</li> </ul>	<ul style="list-style-type: none"> <li>• Good organization skill</li> <li>• Strong bargaining position</li> <li>• Resources for influencing strategy</li> <li>• Lack of trust</li> <li>• Bad reputation</li> </ul>

Regarding to reef management, Gili Indah village so far functions itself as 1) mediator of conflict resolution, 2) facilitator in making village regulations, 3) a legality guarantor of a community decision collectively made and 4) implementers of village decisions. Due to its roles it is grouped as one of the important actors.

### 6.3 Property Right Systems

Property rights is one of determinant factors which contributes in determining collective action and institutional change. The others are physical characteristic, actor characteristic and governance structure (Hagedorn et al., 2002).

Ostrom and Schlager (1999) considered that there are some parties which liken the term of property rights with common property resources. It not only makes confused but also blur its original sense. There are three terms that should be well understood, namely property, property rights and common property. Property is defined as a bundle of rights and responsibility concerning a thing, often stated as rights on a thing or a thing itself (Bruce, 1998) and a triadic social relation involving benefit streams, rights holder and duty of bearer (Hallowell, 1943 as cited by Bromley, 1992).

Bromley (1992) differentiated property from property rights. He defined property as a claim to a benefit stream, and property rights as a claim to a benefit stream that some higher body usually the state will agree to protect through assignment of duty to other who may covet or somehow interfere with the benefit stream. According to him, property is not an object instead a social relationship that defines the property holders with respect to something of value against all others. Thus, they involve a relationship between the holders, others and institution to back up the claim. Furubotn and Richter (2000) offered

two meanings for the term of property rights. First only relates to physical or tangible objects and second covers both tangible and intangible ones. The intangibles include patents, copy rights and contracts rights. North (1990) considered property rights as the rights of individual to appropriate over labors, goods and services they have. He also said property rights are a function of rules, organization forms and norms of behavior, which is called institutional arrangement or institutional governance.

According to its bearer, property rights on land and other natural resources are often classified as private, state (public), common property and open access. Private property rights, also called private ownership, are property rights held by individuals, including corporation or partnership (Bruce, 1998). The rights are sanctioned and transferable. State property rights are the rights over resources held by the state. Common property is rights over resources held, defended and controlled by resource user group (Schlager and Ostrom, 1999). It is also differentiated from open access. A resource may be described as an open access when no one controls it. Bruce (1998) said that the terms of common property and open access are used in combination, depending on its use whether free of control or not. To differentiate it from open access, Furubotn and Richter call common property resource as closed access resource.

### 6.3.1 Property rights of Local Community (de facto)

The sense of local community as property right bearer refers to the rights local community of Gili Indah to the coral reef ecosystems. In spite of being controlled by open access regime, however the local community remains bear the rights of access and use whose existence must be protected. For ease of analysis, the right bearers are divided into fishermen and tourism business manager. If referring to both it is used the term of local community

The local community gets the rights through an inheriting process from their ancestors who had occupied Gili Indah region since several centuries ago, even though it is not clearly established in a rule or a contract. They made marine as source for life and inherited it to their generation. The inheriting does not mean that they allow selling the resources instead of just transferring the rights to benefit from it. Schlager and Ostrom (1999) called it the fact property right. This means that even though the state does not

formally admit it however the fact demonstrates that the right exists and lives among community members. The disturbance on it would result in social disorder.

If Ostrom and Schlager based on the bundle of right classified the property rights into owner, proprietor, claimant and authorized user, the fishermen of Gili indah can not be one of them. They are classified as unauthorized users. This is because of their claim on reef does not get acknowledgment from the formal property right bearer, BKSDA. Even, they are considered as parties that make damage so that their behavior and activities must be guarded. Of course, such treatment brings about a strong resistance given the shifting of Gili Indah become conserved area just occurred in 1993. Meanwhile, fishermen have made them as source for life since several centuries ago.

The fishermen consider themselves as authorized users given they also bear a permission letter of fishing issued by the Marine and Fisheries Agency. At this point, the fishermen claim is right, however, that letter is not an evidence of rights to enter conserved coral reef areas. To enter the area needs to have a permission letter from BKSDA. This is so because there are two authorized agency holding the rights to marine ecosystems. BKSDA is authorized on marine conservation areas and Marine and Fisheries Agency is authorized to fish resources. This dualism authority has not been resolved and the fishermen of Gili Indah remains become the victim.

Different from fishermen, the tourism managers have a privilege treatment. Even though not yet formally having got an acknowledgment as property right bears from the BKSDA, however, their de facto rights on the reef resources are better. Not only do they have rights to the access and use, but also to the management, even within a certain zone they may prohibit fishermen of conducting fishing activities. Following the classification of Schlager and Ostrom (1999) they can be classified as proprietors. The only right they do not have is only alienation, i.e., right to transfer the rights. This different treatment is actually a source of social jealousy and to potentially trigger conflict. Table 8 presents rights of actors to coral reef ecosystems.

Table 8: Property Rights on Coral Reef Ecosystems

Empirical level	Theoretical level
<ul style="list-style-type: none"> <li>• Coral reef resources in Gili indah are formally owned by state represented by BKSDA</li> <li>• The BKSDA allows fishermen to benefit from the resources as long as they do not apply destructive moreover prohibited fishing devices. They may access the resources without any permission even are theoretically provided a certain block for fishing</li> <li>• In addition to the rights to the access and benefit from the resource, the TBO also holds a share of authority and from the BKSDA to participate in the management</li> <li>• BKSDA as representative of central government is responsible for managing the resources, ranging from making plan and program to executing and evaluating the program. It is also authorized to carry out monitoring and law enforcement.</li> </ul>	<ul style="list-style-type: none"> <li>• State property rights on the entire aspects of the resources</li> <li>• Right to access and withdrawal of fishermen without formal recognition</li> <li>• TBO holds rights to access and management</li> <li>• State property rights</li> </ul>

### 6.3.2 State Property Rights

A conservation area is a conserved natural resource where its use and management is done wisely by which can guarantee the sustainability of value, quality and diversity<sup>8</sup>. In Indonesia, all conservation areas are under control of state technically implemented by BKSDA. In line with the function, the agency constitutes a state representative to bear property rights on conserved natural resource area.

As a property right bearer, BKSDA possesses several rights. First, right to enter conserved areas. Second, rights to carry out management, from planning stage to implementation and law enforcement. Third, rights to exclude other users from benefiting the resources and fourth, the rights to transfers part of its responsibility and authority of both utilization and management to other parties.

According to the Forestry Minister Decree No. 85/kpts-II/1993, the Gili Indah areas established as conserved marine tourism park covers 2,954 hectares. With this status the use of the area is prioritized for tourism purpose. Nevertheless, it remains provide a use block for traditional fishermen. Within this block fishermen can benefit from the resources as long as not apply destructive fishing method. Until now, the area as well as among the blocks, however, has not yet been completed with physical boundaries for the ease of fishermen or other resource users to recognize it. BKSDA only installs reference lamps as base for determining the area. The absence of borders has made resource users difficult to decide whether they have entered prohibited area or not.

<sup>8</sup> See Act No. 5/1990, Article 1.

As a consequence of a property right bearer, BKSDA is authoritative to exclude other users or those who have interest to enter the area. Those who want to enter must have permission letter and pay retribution fee whose amount is determined by Government Regulation (PP) No. 59/1999 on tariff for non-tax income that is effective at the circle of forestry department and Forestry Minister Decree No. 441/Kpts-II/1990 on the retribution fee for exploitation effort in tourism forest, national park, and marine tourism park and the decree No. 878/Kpts-II/1992 on tariff of entry of tourism forest, national park and marine tourism park. The basic law of those regulations is Act No. 5/1990 on living natural resources conservation and its ecosystems.

To guarantee the effectiveness of the conservation, BKSDA possesses a monitoring and law enforcement mechanism. It tries to employ field officers in the location that are ready to take safeguard action against activities potentially threatening the sustainability of the resource or the activities considered violating the effective restriction. In performing the function, BKSDA makes cooperation with SATGAS. Those arrested for violating the restriction will be graduated sanction according to the effective rules, both formal and informal or local rules (awig-awig).

## 7. Governance Mechanism of Coral Reef Management

Coleman (1987) as cited by Robin Mearns defined governance as the exercise of legitimate authority in transacting affairs and is broadly understood to refer to the maintenance of social order through endogenously evolve sets of rules or authority structure, or some combination of locally evolved and externally impose rule sets (Mearns, 1997). According to its structure Williamson (1996) classified it into markets, hierarchies or organization, and hybrid forms or contractual relation.

In response to the Williamson (1996)'s classification, Hagedorn et al. (2002) said that the concepts can be derived from the following reasons. First, the categories of governance structure reflect the relationship between actors involved in the transaction. Secondly, action selection of actors is obviously considered the relevant subject of this relationship. In markets, action selection is based on voluntary individual agreement between individuals, in hierarchies action is compulsory selected by an authority on higher level. However, in practice, this selection of action is not restricted on the two choices, instead

of involving many activities which represent either prerequisites or consequences of action selection. These could be gathering and processing knowledge and information, measuring and monitoring, and bargaining and conflict resolution. Based on observation and referring to the above possible classification of selection of action among actors I find several forms of governance structure as summarized in the Table 9.

Table 9: Governance Structure of Coral Reef Management

Empirical level	Theoretical level
<b>Restriction of Coral Management</b>	
<ul style="list-style-type: none"> <li>• Principally, the management of coral reef ecosystems in this region is determined by BKSDA serving as a representative of central government</li> <li>• BKSDA is also responsible for the implementation of the rules including monitoring, sanction graduation or sending the violators to the police, however, it could not work effectively</li> <li>• This agency serving as a representative of central government should basically coordinate with other agencies at local government such as local fisheries agency, local tourism agency etc in order to implement the good reef management form, however, unfortunately it can not carry out this role adequately</li> <li>• At village level this management is voluntarily executed by SATGAS, ECOTRUST, APGA and village government</li> <li>• They also make rules agreed by all without any intervention from a higher level authorized institution</li> <li>• The local community initiated by village government and some social figure have ever made a rule of banning destructive fishing methods, however unfortunately was ineffective</li> <li>• Local community, particularly TBO and other groups concerned with reef condition (LMNLU), initiated to form a new local rule on prohibition of destructive fishing method application.</li> <li>• SATGAS receives a mandate from community to carry out monitoring and law enforcement, ECOTRUST and APGA get an obligation to raise fund to be used for SATGAS activities and others related to the management of the regions and the islands</li> <li>• The local government through BAPPEDA have ever made a rule on coastal and coral reef zoning whose aim was to address spatial use conflict often occur between fishermen and TBO, but failed in its implementation</li> <li>• The rule has ever been revised whose process involved village government and some groups of users, but again failed in its implementation</li> <li>• Finally, local community initiated by SATGAS, ECOTRUST, APGA facilitated by village government made some new agreement regarding the coastal zoning rule and sanctions</li> </ul>	<ul style="list-style-type: none"> <li>• Hierarchy and compulsory: the rules are set by the state</li> <li>• Ineffectiveness of state governance</li> <li>• Poor coordination at local government level</li> <li>• voluntary and compulsory</li> <li>• voluntary and compulsory</li> <li>• hierarchy and voluntary</li> <li>• voluntary and compulsory</li> <li>• voluntary and compulsory</li> <li>• hierarchy and compulsory</li> <li>• hierarchy, compulsory and imperfect voluntary</li> <li>• voluntary and compulsory</li> </ul>

### 7.1 Awig-awig for Halting Destructive Fishing Practice

Nobody thinks if awig-awig for halting destructive fishing practice is very simple. It merely consists of three stipulations, e.g., (1) fishermen or whoever who capture fish using bomb, potassium and or other poisonous substances will be arrested and sent to the police. In front of the police and fishermen society, the arrested violator will be requested to write and sign an agreement of not repeating the same activities and will pay penalty in the form of money maximum amount to Rp 10,000,000 (ten million rupiah); (2) when

the same persons are rearrested and approved of repeating the same activities, the fishermen society will burn or devastate the fishing devices along with other fishing supporting facilities used in the activities. Additionally, they must also perform the first sanction; and (3) if after experiencing the first and second punishment, the persons remain repeat the same violation for the third they will be traditionally punished by graduating undead hitting.

Given the simplicity the awig-awig is far from operational rule as Ostrom (1990) and Ostrom et al., (1994) meant. Because, it has no stipulations regulating rights and obligation of those who get involved in coral reef use, no clear boundaries determining user rights of withdrawing a resource unit from resource systems as well as boundaries where the rule should be implemented. What make the local rule can effectively work are the clearness of sanction and its executors, monitoring mechanism, law enforcer, recognition from the government and support from local community. Nevertheless, the financial support is also important without which it can not work well.

#### 7.1.1 SATGAS as Law Enforcer

Following Ostrom's theory on long enduring common pool resources (Ostrom, 1990), the SATGAS role resembles a monitor whose works is to audit a CPR condition and to watch behavior of CPR user where itself is responsible to those who finance its activity. The difference is the monitor according to Ostrom watch and implement rule prevailing to a limited appropriator which get involved in the rule making process. Otherwise, SATGAS implements a rule to users or watch user behavior where not all of the users get involved in making the rule. Thus, it is much closer to Leviathan concept of Garret Hardin that recommends the use of external coercive to avoid the tragedy of the common (Hardin, 1978 in Ostrom 1990).

#### 7.1.2 Role of APGA and ECOTRUST in Raising Conservation Fees

APGA is an organization of tourism business managers of Gili Air. Its members are all Gili Air tourism entrepreneurs. It was built in April 2001 with three principal aims. First, to canal the voice of Gili Air entrepreneurs. Second, to help promoting the tourism of Gili Indah, particularly Gili Air. Tird, to facilitate raising conservation moneys. Nevertheless, the main objective being effective is the third function.

In the frame of raising fund for coral reef conservation, APGA has determined several stipulations or rules that principally burden the conservation fee to the tourists. According to the rule, a tourist who stays in a hotel or bungalow will be charged a conservation fee amount to Rp 5000 (five thousand rupiah) per once visit. It means that the tourist visiting Gili Air for one week must pay Rp 5000. If the tourists are willing to dive they must pay additional charge of Rp 20,000 (twenty thousand) per being a visitor of a diving company. As moving to another they must pay another Rp 20,000.

The APGA also draws conservation money from small entrepreneurs in the form of obligatory donation. Monthly, kiosk, ticket counter, bike rent, telecommunication and internet cafes must pay Rp 3,000 (three thousand rupiah), traveling traders of local handicrafts Rp 1,000 (one thousand rupiah) and Cidomo Driver Association only Rp 5000 (five thousand rupiah). The interview with visitors demonstrated that they have no objection to the conservation fees as long as used for the reef conservation. The fee is collected at hotel or diving company staff that at every end of month the APGA officer will pick it up.

If APGA provides an umbrella for all Gili Air entrepreneurs, ECOTRUST restrict its member to only diving companies of Gili Trawangan. The main function is to collect conservation fee from tourist which is willing to dive. The idea stems from the stagnation of SATGAS's marine safeguard operation due to limited budget.

The organization initiated by young people who concern with coral reef sustainability was established in April 2000. Since then, it has demonstrated a good progress. The raising fund activity can go smoothly. It can not be separated from the tourism of Gili Trawangan that develops better than those of two other islands.

The money collection pattern is similar to what occur in Gili Air. The difference is ECOTRUST only focuses on diving company's visitors. Each visitor must pay conservation fee amount to Rp 20,000 (twenty thousand rupiah) once being visitor for a diving company. This means that ones who visit, for instance, the Indonesian Dive, only need to pay Rp 20,000 regardless how often they dive with the company. But, when moving to other company they must pay for another conservation fee through the new diving company.

The diving companies that collect the fees will directly transfer them to the account of ECOTRUST. The ECOTRUST does not need to pick it up from the diving companies as done by APGA. Nevertheless, both has no mechanism of control and remain apply the trust principle. They believe that diving companies will not do corruption.

The exact amount of how much conservation fees successfully collected monthly through the organization is not found. It could be, however, guessed through the monthly spending. Every month, it must spend Rp 2,400,000 (two million four hundred thousand rupiah) on incentive of SATGAS staffs, patrol guarantor and its member. It must also spend Rp 3,200,000 (three million two hundred thousand rupiah) on fuel, Rp 3000,000 (three million rupiah) on compensation fee to fishermen association and Rp 1,600,000 (one million six hundred thousand) on incentive for beach cleaning officer. Therefore, it could receive conservation fee monthly minimum Rp 10,200,000 (teen million two hundred rupiah).

The above description shows how serious the tourism managers in protecting the reef ecosystems. They continually seek to find a solution to cope with coral reef problems. They are willing to do this matter because of a strong awareness of how important the reefs to their future. They are quite aware that their livelihood is dependent on how good the quality of the ecosystems. They also understand that the extinction of coral reef means a serious threat to their economy life.

### 7.1.3 Monitoring and Penalizing Mechanism

As mentioned that the implementation of daily management actions of coral reefs is identified by a clear division of work among SATGAS, ECOTRUST and APGA. As we know, the first is responsible for the reef safeguard and the last two are responsible for making money in order to finance the first.

In performing the mandate SATGAS can do two kinds of activities. Firstly, they do a monitoring at land. It can be done everyday and every time by helping telescopes installed at beach. The watch aims to see whether there exists a suspect activity of fishermen or it could be regarded as an early detection. As finding some suspicions they will immediately go to the sea pursuing the suspected. To facilitate communication among SATGAS officers they equip themselves with handy talky radio.

Secondly, they conduct a marine patrol. Given the limited budget they can not patrol everyday, more over every time. The SATGAS Gili Trawangan patrols the island waters only within 20 days in a month and twice in a day. Thus, they patrol 40 times in a month. Meanwhile, the SATGAS Gili Air only can make patrol 12 times in a month. Compared to the first the patrol of SATGAS Gili Air is not so intensive. It is due to the low capability of APGA in raising money.

Penalization of the violators can be conducted in two ways. First, following the awig-awig. The violators must pay a penalty maximum to amount Rp 10,000,000 (teen million rupiah) and hand their boat, motor and other supporting fishing devices. Secondly, the arrested violators will be sent to the police to get sentence in line with the formal laws. This would be graduated to the violators who can not afford the monetary penalty. However, the local community prefers implementing local rule to the formal ones. Thus, the community will attempt as much as possible to apply the awig-awig. It is caused by the deep distrust to the state law system, poor reputation of the police and by technical difficulties. By giving bribery money the police would easily free the violator from demanding sentence.

## 7.2 Awig-awig for Conflict Resolution

Awig-awig for halting conflict between fishermen and tourism business managers is the first formal one issued by Gili Indah village. It is regarded formal because of its establishment through a mechanism of making decision as usually go on at district government level. The awig-awig published on 28 September 1998 has number of 12/Pem.1.1/06/1998. Then, on 1 September 2001 it experienced a change in some part of its content. The revised edition has number 12/Pem.1.1/06/2001.

The revised awig-awig consists of teen sections and 33 articles. The section one is on general definitions, section two to the section four are respectively on zoning of Gili Air, Gili Meno, Gili Trawangan, the section five is on zone for diving and fishing, the section six is on stipulation on marine biota collection and pearls calm culture, the section seven is on institution and financial sources for the management, the section eight is on sanction stipulation, the section nine is on transitional stipulation and the last is close section. Based on the awig-awig, as stated in the section two to the section four, the use of coastal

region of Gili Indah is divided into six zones<sup>9</sup>, consisting of zone A, B, D, E, F and G which among zone is bordered by mooring buoys.

Out of the articles regulating the zoning as described above, there has been article that firmly establishes several locations specially intended for diving activities, where the others particularly catching fish using Muroami are not allowed<sup>10</sup>. Besides, there have been also articles on sanction, prohibition of fishing using bomb and potassium, prohibition of mining coral stone and collection of big shellfish and turtle, neither for commercial nor personal purpose.

The violation to the stipulation determined within this awig-awig will be monetary sanctioned. The violators must pay Rp 15,000 (fifteen thousand rupiah) for violation of throwing away anchor within forbidden location, Rp 1000,000 (one million rupiah) for fishing using Muroami and Rp 100,000 (one hundred thousand rupiah) for using Mogong and Rp 5000,000 (five million rupiah) for diving within a prohibited location. The collected moneys will be deposit of village government to be used for public facilities construction.

In March 2003 this rules experienced a change in the stipulation of zoning and sanction. The additional sanctions say: 1) the association of fishermen has a right to earn money from ECOTRUST amount to Rp 3000,000 (three million rupiah) per month as a compensation of not allowing fishing with certain zone; 2) if the ECOTRUST does not pay the money for three months the association of fishermen consider that the agreement become invalid and may fish as prior to the existence of the agreement; 3) If the association member fish within a forbidden zone SATGAS has right to arrest them and seize their fishing for one month, nevertheless they still have right to receive the compensation; 4) If the second violation occurs the association member will get the same sanction as the first but the compensation will not be paid.

The change of institution done after a conflict between fishermen and tourism managers occurred on 17 August 2002. The conflict erupted because fishermen still consider that the coastal zoning as stated in the rule damaged their interest. Although the change in the

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<sup>9</sup> See Articles 2-17 of Awig-awig Gili Indah

<sup>10</sup> Ibid, Article 18

zoning and other additional stipulation have not yet been formally established as a village decree however that could be considered as the change in the rule.

One of the weaknesses of the awig-awig is the absence of stipulation on who is responsible for the implementation. SATGAS which bears authority of conducting marine safeguard activities initially regard itself has no right to handle this task. This occurs because it has not got involved intensively and completely in the decision making process.

After completely getting involved in the change process of the rule, SATGAS now has been authoritative to implement the rule. Nevertheless, the authority is still limited at safeguarding the no Muroami application zone within the Gili Trawangan waters. Within this area it can arrest whoever suspected applying Muroami.

### 7.3 Analysis of Institutional Change

The institutional analysis at local level refers to theoretical framework of Ostrom (1990) and Ostrom et al., (1994). Following this theory, Ostrom divided analysis governance into three levels, i.e., operational choice, collective choice and constitutional choice level. The analysis at operational choice is focused on operational rules. That is, a rule which directly affects the day-to-day decision made by appropriator concerning when, where, and how to withdraw resource unit, who should monitor the action of others and how, and what rewards or sanctions will be assigned to different combination of action and outcome. At collective choice level analysis is focused on collective choice rules, that is, rules used by appropriators, their official or external authorities in making operational rule of how to manage a common pool resource. At this level the policy of common pool resource management is determined. The highest level analysis is done at constitutional choice level that aims at seeing the process of formulation, governance, adjudication and modification of decision occur at the constitutional level (Ostrom, 1990).

According to Ostrom, the analysis at operational choice level is the simplest analysis. It is done with assumption that the operational rule is permanent. Meanwhile, analysis at constitutional choice is one of the most complicated. In analyzing the action situation in Gili Indah I attempt to do it at both collective choice level.

### 7.3.1 The Change of Local Rule for Halting Destructive Fishing

As described at the previous subchapter, in Lombok particularly in Gili Indah, awig-awig has a strong root. It grows as a value that has become familiar for the community there. Although at the beginning, it regulated social order however the existence in handling environmental problems is not regarded out of norm. The thing important is that the mechanism must follow the principles prevailing within the community, i.e., from, by and for the community. If it is disobeyed, the rules will surely never be effective.

The analysis of institutional change in the management of coral reef ecosystems in Gili Indah is carried out through an extensive fieldwork. I read memoranda, some document and interview with participant to obtain information about the process and strategy of how coral reef users to organize voluntary association, to create local rule and raise fund for supporting rule's implementation. In addition, the motivation which encourages local community to create institution is also revealed. This is the way used by Ostrom et al., in analyzing institutional change of water basin governance located beneath Los Angeles metropolitan area (Ostrom, 1990).

The appearance of awig-awig originated from the massive fish bombing and poisoning that at the moment were a very common fishing methods among Gili Indah fishermen. It has made some community members become anxiety. For the tourism managers and part of fishermen it is a serious threat for their life and livelihood.

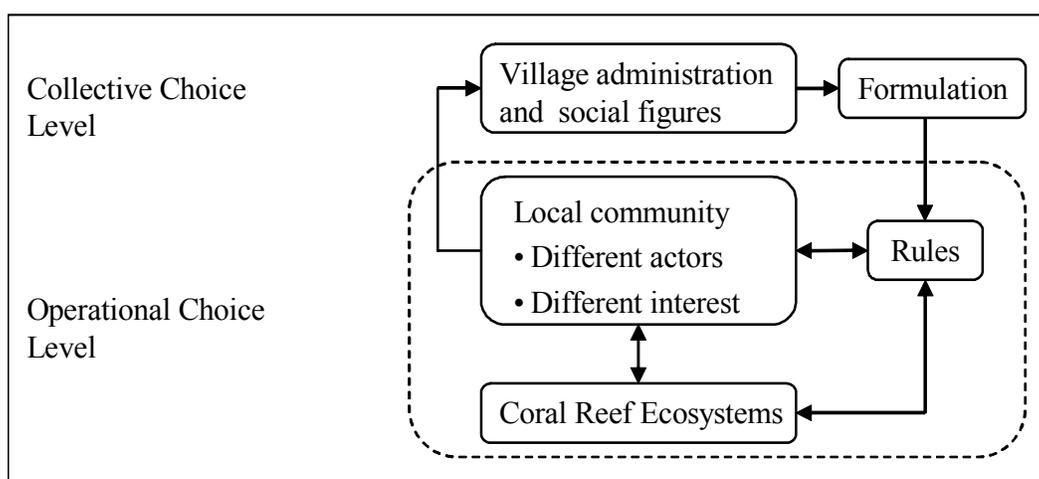
The anxiety has encouraged some of community members to make awig-awig on anti destructive fishing practice. In 1999 the first awig-awig with publishing number of 33/I:1/06/1999 was issued. It is on the prohibition of applying destructive fishing methods with two kind of social sanction. First, nobody is allowed to attend the blast-fisherman party or any other invitation and second, no blast-fishermen will receive administration service from the village. This sanction worked very well on the first few months. In January 2000, one blast-fisherman gave up his job because of this sanction. The other blast-fishermen, however, show off their bravery to other community members that they did not afraid of the social sanction. Blast-fishermen living outside the Gili Indah also did not show their respect to the awig-awig. As social condition was labile due to the 17th January 2000 riots in Mataram, blast-fishermen had "parties" bombing coral

reef fishes around the islands. The "parties" raised many complains from diving tourists (Bachtiar, 2000).

The ineffectiveness of the awig-awig is due to several reasons. First, the absence of party authorized to implement and conduct monitoring task. The self monitoring by the community expected to work can not work because the community members tend to hide the actors given those could be their family members or at least have blood relationship. Second, the awig-awig has not got a complete support from the community. Third, it also did not obtain a support from the government. If figured in a scheme, the process of institutional change at local level is like presented at Figure 2.

The scheme describes a process of institutional change at local level. The community consists of actors who have a varied interest in coral reef ecosystems. They can be fishermen and tourism business managers. One of their interests is to halt blast-fishing of some irresponsible fishermen. The village government, its staff and some social figures that played a role at collective choice level captured the aspiration of the actors and sought to formulate an operational rule expected to be able to be operated by local community. In fact, however the village could not operate the rule because it has no an element necessary for the rule's implementation. Besides, its function that must shelter all residents make it unable to implement the rules freely.

Figure 2: A Model of Governance of Coral Reef Ecosystems

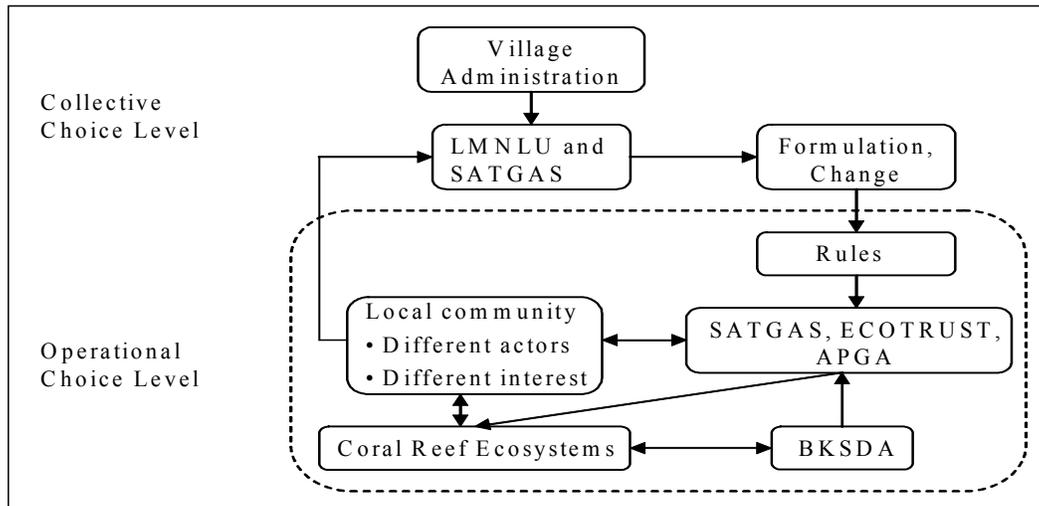


The tourism business managers, in particular those who resided Gili Trawangan, reacted strongly the failure of the awig-awig implementation. In a village meeting with

community members that went on 1 January 2000 they presented a willingness to create their own local task force by which they themselves can monitor the reef ecosystems. However, at that moment the village did not give a good response. Strongly motivated by the willingness to make a real action to secure reef ecosystems eventually on 16 January 2000 some of Gili Trawangan people successfully built a task-force unit (SATGAS). On 1 February 2000 SATGAS Gili Meno unit was built and followed by SATGAS Gili Air on 15 March 2000.

At the beginning, the SATGAS could not work effectively due to the institutional and financial problems. To overcome the institutional problems, SATGAS collaborated with north Lombok fisherman community that also was facing fishing problems result from blast fishing practice. On 16 March 2000 the Association of North Lombok Fishermen (LMNLU) was built whose principle task was to facilitate making awig-awig of anti blast-fishing practice. The building process of the association were attended by head of whole coastal village located along coastal region of north Lombok, Camat of Tanjung, Gangga, Gondang and Bayan and BKSDA. The presence of village officials and government element is very important as an evidence of government support to the existence of the association. On 19 March 2000, the LMNLU run its first task. It together with SATGAS formulated an awig-awig on anti blast-fishing which gave SATGAS a complete authority for the implementation. The awig-awig itself was signed by the head of LMNLU, SATGAS, heads of whole village government located a long coastal region of Lombok. Then, in April 2000 ECOTRUST was built. It is a machine for raising conservation moneys to be used for funding SATGAS. In April 2001, association of Gili Air entrepreneur (APGA) was also built that has the same purpose. Following Ostrom's theories, the phenomena of the change of institution can be explained in the following scheme.

Figure 3: Another Model of Governance in Coral Reef



The change in institution as described at Figure 3 principally is similar to the first one. That make different is at collective choice level rises LMNLU and SATGAS serving as representative of local community. Their appearance is robust because of the total support from the village government. Besides, the collective choice also gives an authority to SATGAS to run the operational rule. In running its task SATGAS is financially supported by APGA and ECOTRUST. It also obtains a political support from BKSDA bearing the real authority to conduct conservation task.

Compared to the first one the changed operational rule can work more effectively. It has been successful in halting blast-fishing practice and secured coral reef from degradation. Many parties consider that is an enormous success. It results from several reasons. First, the appearance LMNLU and SATGAS at collective choice level. Both appear from the local community so that they can make a policy free from the necessity of giving a protection to the all element of community. In addition, the support from village government and BKSDA also strengthens their position. Following Ostrom's requirements for a long enduring CPR institution, the way the local community of Gili Indah manages the reef ecosystems is more or less relevant with what Ostrom determined. There exist a clearness of sanction graduation way, monitoring authority, recognition of rights to organize and collective choice arrangement (Ostrom, 1990).

### 7.3.2 The Change of Local Rule for Conflict Resolution

The appearance of awig-awig on zoning of coastal areas of Gili Indah was motivated by chronic conflict of space use between fishermen (muroami users) and tourism business managers (diving companies). Principally, the potential conflict has existed since the presence of tourism industries in the region. Nevertheless, at the early stadium it could be still manageable.

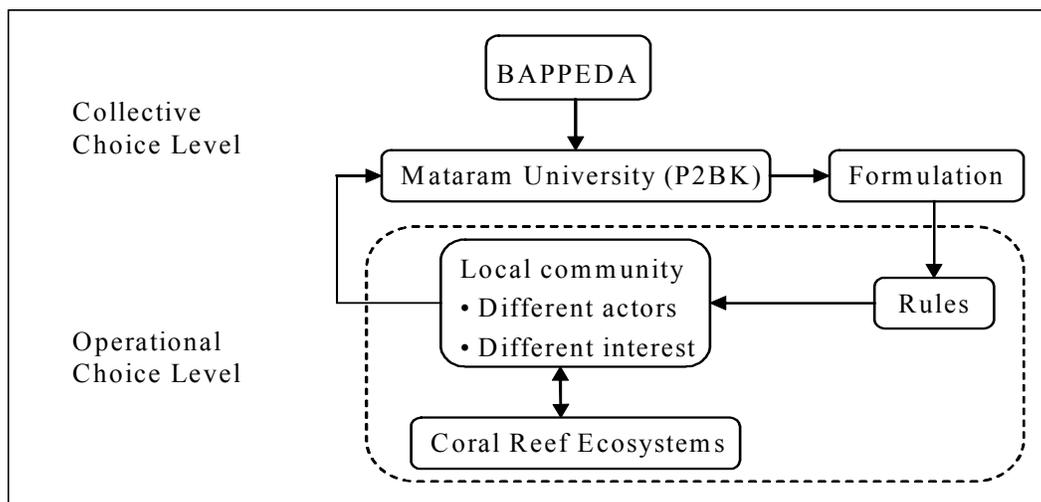
As the tourism industries rapidly developed into a dominant economy sector the existence of fishermen become under threat. They accused the tourism has robbed their livelihood. For these reasons village government and some local social figures thought about creating an awig-awig on zoning of coastal areas. It occurred around 1997.

The idea of local community to have awig-awig matched with Coral Reef Rehabilitation and Management Plan (COREMAP) Project program whose part of the activities was to build local community capacity of conducting resource management. Regional Planning and Development Board (BAPPEDA) that at the moment became a local partner of the COREMAP project offered the village government to make an awig-awig on coastal zoning. The BAPPEDA then asked the research center for language and culture (P2BK) of Mataram University to facilitate local community in making the awig-awig. Then, the work of making the awig-awig became responsibility of P2BK.

In executing the works P2BK did a survey about the coastal zoning wished by local community. Unfortunately, the survey got a bad response. The first meeting between local community and facilitator was only attended by a few local representatives of fishermen and none of tourism business managers. According to Bachtiar (2000) the aim of fishermen coming to the meeting is also not to participate in the awig-awig making instead of expecting to gain a soft loan or any kind of financial support from the government. At the second and next meeting the attendance were only village staffs and some social figures. But because of a project whatever happened the development of awig-awig had to go on. Finally, on 28 September 1998 Gili Indah village issued an awig-awig as the first formal written one in the village. Even though gaining a complete support from the BAPPEDA, representative of district government and elite village government, however, because of lack of support from local community the awig-awig

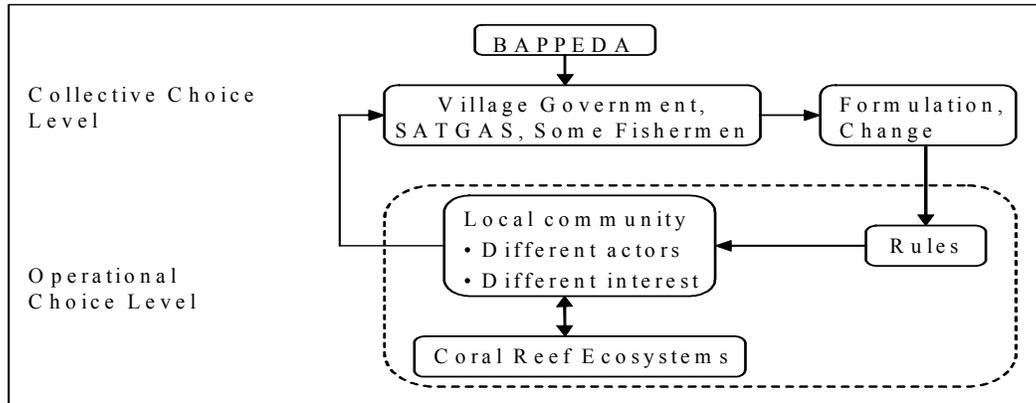
could not work at all. This may be an evidence that the local community support is more important than those of government's. In addition, the ineffectiveness could also be caused the missing of an element acting as the rule enforcer that can handle monitoring and punishment graduation task. Referring to the Ostrom schematically the process of the change of the institution can be seen in Figure 4.

Figure 4: A Governance Model for Conflict Resolution in Coral Reef Management



The making of the awig-awig was considered fail. The BAPPEDA as a project initiator was not satisfied with the P2BK work. And it knows that the failure is due to the lack of local community support. Accordingly, the BAPPEDA was willing to make a change through giving opportunity to the local community to get involved. The change process of the awig-awig successfully drew many element of local community to participate. However, one of the most important elements that get involved in conflict, i.e., Muroami users did not completely take participation. Both village government and BAPPEDA have failed approaching them that were a priority to whatever programs of the government.

Figure 5: A Changed Governance Model for Conflict Resolution in Coral Reef Management

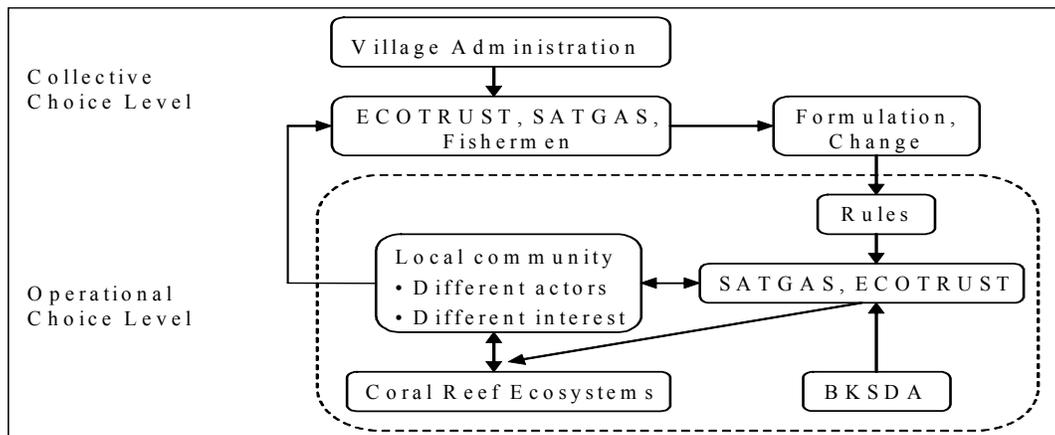


They should actually be more patient to convince them that the awig-awig would be beneficial for them and themselves will not be the victim of it. Besides, the unclearness of who was authorized for the implementation remain become the main reason why the awig-awig could be again ineffective. Therefore, as the revised awig-awig was published on 1 September 2001 many were unsure that it could work as expected even though at the publication ceremony the head of district government (bupati) and other local elite were present. And, what becomes the anxiety of many circles came true when the physical conflict between Muroami users and tourism managers erupted on 17 August 2002. The conflict has moved all parties' conscience to change the rule become a real one for conflict resolution.

For those who get involved in conflict or have interest in finding conflict resolution the period of time between 17 August 2002 and 5 March 2003 constituted a time of negotiation. In the range of this period many meetings, discussions and negotiations on coastal zoning were held. Village government staffs, ECOTRUST, SATGAS and fishermen participated in those negotiations whose principal aim was to change the local rule in order to meet all interest and be a solution way for the chronic conflict. After an eight month tough negotiation finally on 5 March 2003 a new agreement was signed by head of fishermen association on behalf fishermen and head of ECOTRUST on behalf diving companies. Joint in signing the agreement is the head of village and SATGAS. The agreement is concerning a new coastal zoning for diving free from Muroami, compensation fee for the fishermen (Muroami users) and authority of SATGAS to

conduct monitoring and take necessary actions against the violators of the agreement. The process of the institutional change can be seen at Figure 5.

Figure 6: The Final Change of Governance for Conflict Resolution in Coral Reef Management



According to my study all parties feel satisfied with the local rule change. They consider that there is a significant advance. The satisfaction is due to the involvement of representative that so far gets involved in the conflict. The fishermen who at the former process of making and changing the rules had no roles also feel satisfied with the involvement. They feel that their voice and interest are noticed. In addition, SATGAS that was never completely involved in the process of decision making feel satisfied as well. They also conceive the delegation of authority and responsibility to protect marine resources within Gili Indah areas according to a new rule is considered as a total trust delegation of community to handle the task. Thus, they have no doubt to implement it.

#### 7.4 Discussion and Conclusion

Kenneth Ruddle, a scientist who pays much attention on traditional coastal resource management, says that the Asia-Pacific region is rich in traditional community-based management for coastal and inshore fisheries management. These are spread over in the Caribbean, Southeast Asia, East Asia and the Middle East. The exact origin of this management is unknown however, it has played an important role in coastal resource conservation practices and its conflict resolution (Ruddle, 1996). Some of the systems are

found in Indonesia, such as Sasi in Maluku, Panglima Laot in Aceh and Awig-awig in Lombok. Sasi and Panglima Laot have possessed a strong root and has been successfully implemented for a long time as local institutions living in society.

However, in the last three decades the existence of those traditional institutions has been under threat. The economic development in third world countries often believed has contributed to the environmental destruction and natural resource depletion also undermined the roles of local institution (Berkes, 1989 cited in Thorburn, 2000). This is worsened by the centralized concept of natural resource management that disobeys those local institution and traditional knowledge systems.

The environmental destruction and natural resource depletion occurring in the last decade has moved a conscience of people to look again at traditional institution that in the past period of time has ever played an important role. It is motivated by some research finding and fact demonstrating that centralized concept on resource management has brought about a failure in maintaining its sustainability. Studies of Posey (1992) and Berkes (1989) and Ostrom in her many publications reminded and reviewed the importance of roles of traditional institution in protecting natural resource sustainability. This research finding which is in line with decentralization process occurring in some third countries has triggered reactivating, regaining and reactualizing such traditional systems. The emergence of awig-awig system in Gili Indah, in particular, and Lombok, in general, could not be separated from these phenomena.

Regardless of its lacks, the success of local governance of coral reef ecosystems in Gili Indah, shows that local community has ability of conducting resource management when given a proper responsibility, authority and trust. The success of Gili Indah could likely be the first successful local governance in Indonesia applied in a open access regime. It is based on research finding that local governance of coastal and marine fisheries were commonly control under common property regimes.

After conducting empirical study and analyzing it based on relevant theories I can find some reasons for the success of the local governance. First, the Gili Indah community, in particular, tourism business managers, are very dependent on coral reef resources. It has emerged a strong incentive and motivation to protect the resource. Beside that, their the

attitude, awareness and perception on it have also helped the actor to obey rules, to be willing to act collectively and to change institutions (see Hagedorn et al., 2002). On the contrary, fishermen who have contrast attitude and wrong perception have no incentive to safeguard the resource even though having the same dependence.

Second, the clear rule also plays the main role in governing coral reef ecosystems. The clearness of sanctions, implementer, law enforcer, sanction graduation way and monitoring system are required precondition for the success. These are close to the requirements of robust institution set by Ostrom (see Ostrom, 1990).

Third, the success of the governance is also affected by the willingness of stakeholders to share authority. In this case, share among BKSDA, SATGAS, ECOTRUST and APGA is very influential. Fourth, the grass root aspiration accommodation also plays an important role. It is surely that its disobedience will make rules of game, policy, agreement and contract will not work effectively. The interrupted implementation of awig-awig of coastal zoning at its beginning stage has proved it. Fifth, a strong financial support is also very important. A rule will not be able to work without monitoring and sanction systems and the last will not be effective without financial support. Therefore, raising fund as going on in Gili Indah is a good example. It can be model for others.

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