

# The Role of Local Wisdom in Protecting Mangrove Forest in Bali Province

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**Abstract—** One of the Provinces in Indonesia which has its own island and is famous for its special customs is the Province of Bali. Not only are their customs unique, Bali also has abundant natural wealth. One type of natural wealth is Mangrove Forest which is one of the largest mangrove forests in Indonesia as a supporting ecosystem. The Balinese customary law community has the philosophy of *Tri Hita Karana* as the basis of their reference to protect and manage natural wealth. The focus of this research is to find out how Balinese indigenous people protect mangrove forests in Bali Province in accordance with Balinese customs with the philosophy of *Tri Hita Karana* so that they can be used as an example for involving local communities to help protecting mangrove ecosystems in other areas. The Balinese customary law community has *Awig-awig* which is based on *Tri Hita Karana* as a foundation for indigenous people to act including in protecting mangroves. Not only is the law and the Provincial Government of Bali playing a role in protecting Mangroves, but also the surrounding community plays a full role in the presence of *Pecalang* and the activities of local Fishermen to protect Mangrove Forests.

**Keywords:** local wisdom, *Tri Hita Karana*, *Awig-awig*

## I. INTRODUCTION

Republic of Indonesia has 265 million inhabitants (Indonesia Ministry of National Development Planning, 2018), 17.504 islands, and is famous for its special customs is the Province of Bali. Geographically, Bali is located between Java and Lombok Island which is consist into eight Regencies namely Jembrana, Tabanan, Badung, Gianyar, Klungkung, Bangli, Karangasem and Buleleng and one city namely Denpasar, the island capital city.

The Province of Bali has a total population of 3,890,757 which is divided into 3,051,384 Non- Migrant Populations and 839,373 Migrant Populations (Bali Provincial Statistics Agency, February 2018). Of the total population in Bali, the majority adheres to Hindu religion 90% and the rest are Muslim, Christian, Catholic and Budha [1]. Therefore, Balinese people still uphold customs that are inspired by Hinduism. The concept of Balinese life does not only focus on the harmonious

relationship between humans and humans but Balinese people who embrace Hinduism hold the concept of cosmology *Tri Hita Karana* which contains three causes of harmony, which consists of harmonious relationship between humans and God; harmonious relationship between humans and each other; and harmonious relationship between humans and environment.

The basic concept of *Tri Hita Karana* has an understanding of the harmony between humans and each other, human harmony with nature, and human harmony with God is a true source of welfare. *Tri Hita Karana* is implemented by indigenous Balinese in the form of *awig-awig*. The meaning of *awig-awig* according to I Wayan Surpha is a provision that worries the karmic order of life in society to realize a steady life system in society [2]. The life of indigenous peoples in Bali is arranged in a traditional village unit or *pakraman* village which has its own law called *awig-awig* and each customary village has its own *awig-awig*, all of which are based on *Tri Hita Karana*.

Bali Province is not only rich in culture and customs but also rich in natural resources and environment. One of the forms of natural wealth in Bali Province is mangrove forest. Most of the mangrove forests in Bali Province grow in protected and conservation forest areas, with the widest distribution being in the Ngurah Rai Grand Forest Park (1,373.5 hectares), part of which is in the area of West Bali National Park covering 633.5 hectares and in Klungkung Regency (protected forest) covering an area of 202 hectares. Mangrove forest ecosystems have an important role in the sustainability of development. Conflict of interest in the protection and management of mangrove ecosystems cannot be avoided because mangrove forests have beneficial roles and functions both economically and socially. In the condition of a good mangrove forest, mangrove forests can contribute at least 1.5 billion USD from the marine sector to the national economy. Based on a study by The Nature Conservancy (TNC) and Wetlands International (WI) in 2012, it was revealed that mangroves with a minimum thickness of 100 meters to the land could reduce wave heights between 13% to 66%.

Mangrove forest growth can be said to be quite unique

because the position of mangrove forests grows in a transitional position between land and sea. Mangrove forests are very easily damaged due to intentions such as illegal logging or being used as garbage dumps or accidental activities such as water pollution due to erosion, oil pollution and conversion of coastal areas in development. Mangroves also have properties that are very vulnerable to environmental changes. Considering the importance of mangrove forests as a component of space in sustainable development, the protection of mangrove forests is not only carried out by the Central Government or the Regional Government but also direct protection by the community as parties that have direct contact with mangrove forests is very important to do. In fact, currently the protection of mangrove forests in Indonesia does not consider the involvement of the local communities. So far, there have been many regulations made by the government as an effort to protect mangrove forests, one of which is the Presidential Regulation of the Republic of Indonesia Number 73 of 2012 which regulates the national strategy for managing mangrove ecosystems. But in reality, the protection and management of mangrove forests has not been implemented properly. Therefore, the protection of mangrove forests that involve the participation of the local communities is very much needed.

The protection of mangrove forests in the Bali Province is inseparable from the participation of the Balinese indigenous people who inspired *Tri Hita Karana* as a Hindu philosophy. The people of Bali Province want the management of their environment in accordance with the surrounding local wisdom that contains the social and cultural conditions of the Hindu community. The wishes of the Balinese people are in accordance with Article 18B The Constitution of the Republic of Indonesia of 1945 that The State shall recognize and respect, to be regulated by law, the homogeneity of societies with customary law along with their traditional rights for as long as they remain in existence and in agreement with societal development and with the principle of the Unitary State of the Republic of Indonesia.

The focus of the study is to find out how indigenous Balinese protect mangrove forests in Bali Province in accordance with Balinese customs that imbue the philosophy of *Tri Hita Karana* so that it can be used as an example for other regions that protect mangrove forests that involve local communities is very helpful for protecting mangrove ecosystem.

## II. METHODOLOGY

This study uses empirical normative legal research methods with descriptive and analytical research specifications, which describe the object or subject under study in accordance with existing conditions, with the aim of systematically describing the facts and characteristics of objects or subjects that are precisely examined. Research with this processing technique describes the symptoms in the community towards a case under study, and with qualitative data analysis which is a research procedure that produces descriptive data [3].

The type of data in this study are primary and secondary data. Primary data is research data obtained directly from the original source of research with data collection techniques both

interviews, or by observing (observation). This study also uses secondary data, namely data that can provide an explanation of primary data, which can be in the form of legislation, textbooks, and scientific journals. In this study, the technique used was interview, in the form of In-Depth Interview. In-Depth Interview is the process of obtaining information for research purposes by way of question and answer face-to-face between interviewers and respondents or people interviewed, with or without using interview guidelines where informants are involved in relatively long social life [4]. This research also uses observation techniques, which focus to produce specific images or deep descriptions of the object of research [5].

In this study, the researchers conducted research on agencies that have data and information from parties who have the authority and expertise in answering the complexity of this research, namely, Bali Provincial Forestry Service, Bali Province Environmental Agency, Bali Province Land Agency, The Legal Bureau of the Regional Government of Bali Province, and Conservation International.

This study uses descriptive and analytical data processing techniques which are research methods that describe the object or subject under study in accordance with existing conditions, with the aim of systematically describing the facts and characteristics of objects or subjects that are precisely examined. Research with this processing technique describes the symptoms in the community towards a situation under study, and with qualitative data analysis which is the procedure of research that produces descriptive data [5].

## III. RESULTS

According to the anthropology science, culture is the whole system of ideas and taste, actions, and works produced by humans in the life of society, which is his own in learning [6]. Basically, local wisdom or traditional culture can be defined as the knowledge of a cultural knowledge that is owned or adopted by a community in a particular area that contains a description of the behavior of the people concerned in the area regarding matters relating to attitudes among the local communities, structure of living environment that must be achieved, the function of a particular environment, natural reactions to human actions, and relationships that should be created between human beings and their environment. The form of local wisdom that exists in society can be in the form of: values, norms, beliefs, and special rules. These various forms result in various functions of local wisdom. These functions include [7]:

1. Local wisdom functions for conservation and conservation of natural resources.
2. Local wisdom serves to develop human resources.
3. Serves as the development of culture and science.
4. Serves as advice, trust, literature and taboos.

In order to environmental protection and management in Province of Bali, the Regional Government of Bali Province has stated in Article 48 of the Regional Regulation of Bali Province concerning Environmental Protection and Management that the Community has equal and broad

opportunities to play an active role in environmental protection and management social supervision, giving advice or complaints, and submitting information or reports solely to raise awareness in protecting and managing the environment, increasing community independence and empowerment, fostering community capabilities and pioneering activities, fostering community responsiveness in carrying out social supervision, and developing and maintain local culture and wisdom in the context of environmental conservation. The existence of customary law communities, local wisdom, and the rights of indigenous peoples in the protection and management of the environment are recognized by giving environmental management rights to *Pakraman* village as outlined in *awig-awig* as a form of customary law that is made by indigenous peoples as guide to social behavior.

*Awig-awig* ensoul the philosophy of *Tri Hita Karana* which teaches about balance or harmonization which are *parahyangan*, *pawongan*, and *palemahan* [8]. The concept of the *Tri Hita Karana* philosophy emphasizes three human relationships in life. *Parahyangan* means a harmonious relationship between humans and *Ida Sang Hyang Widi Wasa* God Almighty; *Pawongan* is a harmonious relationship between humans and each other, including family, friends and society; and *Palemahan* is a harmonious relationship between humanity and its environment [8]. These three concepts are used as benchmarks in assessing the success of a sustainable development. The aim of *Tri Hita Karana* is to achieve harmony as part of inner and outer happiness which is the ultimate goal of Hindu religion. *Awig-awig* contains a set of custom rules, both written and unwritten, along with the rules of implementation, which are a benchmark for indigenous peoples to behave in the form of restrictions or prohibitions and obligations, which are equipped by sanctions with traditional legal sanctions.

As a means of social control, *awig-awig* serves to preserve existing rules or terms and patterns of relationships. Preventively it can be done by preventing the possibility of misbehavior of community behavior or preventing situations that may causes irregularities. In addition, efforts to maintain the prevailing rules and patterns of relationships can also be taken repressively if such deviant behavior has occurred [9]. In order to protect mangrove forests in Bali Province, Balinese indigenous people believe that mangroves as a part of the environment must be protected, preserved and in its use must not be excessive to maintain a balance between the environment and humans and maintain a balance between God as the creator of the environment and universe with humans.

The high dependence of the community on mangrove forests as a counterweight to the ecosystem makes the local community want to be involved in the protection and management of Mangrove Forests. Indigenous people try to apply the principle of sustainability in the use of mangroves, that is, the environment is not a heritage of ancestors, but a 'deposit' for posterity. In shape of protection for mangrove forests as a unit of forest that is carried out specifically by indigenous peoples who are associated with indigenous peoples who become customary police or commonly called *Pecalang*, Rangers who work specifically in forest areas. *Pecalang* has the main duty of maintaining the security and smoothness of various activities and ceremonies of religion and custom in their area [10]. *Pecalang* is usually chosen by citizens by considering that the person has physical and spiritual health, good mentality, can be friendly to the community, not arrogance or even pretentious. They must master the area or area where they work, have the

courage to defend the right, have the intelligence to think, be fast and agile in handling problems, are expected to always do good and be devoted to *Ida the Hyang Widi*, also must have an educative attitude, be fair and be an example the good one. *Pecalang* has its own obligations is as follows [11]:

1. *Ngupadesa, Pecalang* must always be close to the village of *Pakraman* and its citizens. With close and stay in the village, this is more assured of communication in order to direct the village community.
2. *Atitikarma, Pecalang* should always give the correct instructions to the village manners. The instructions can be either direct or exemplary. *Pecalang* must provide a good example for the villagers because it has charisma and dignity.
3. *Jaga Baya Desa, Pecalang* must maintain the security of the village by doing the village mandate, do patrolling or around the village so that there is no danger.

In The 1945 Constitution of the Republic of Indonesia there are no provisions that explicitly regulate the existence of regulating the existence of *Pecalang*. However, in fact *Pecalang* is one of the institutions in the customary community, therefore recognition of *Pecalang*, which is part of the organs of indigenous people has been recognized by the Constitution of the Republic of Indonesia as stated in Article 18B Paragraph (2) The State shall recognize and respect, to be regulated by law, the homogeneity of societies with customary law along with their traditional rights for as long as they remain in existence and in agreement with societal development and with the principle of the Unitary State of the Republic of Indonesia.

The definition of *Pecalang*, formulated in the Regional Regulation of Bali Province Act No. 3 of 2001 concerning *Pakraman Village* as amended by Regional Regulation of Bali Province Act No. 3 of 2003. In Article 1 Number 17 states *Pecalang* is a traditional security task force of Balinese people who have the authority to guard regional security and order, both at the *Banjar Pakraman* level and or the area of *Pakraman Village*. Then in Article 3 of Act No. 2 of 2002 concerning the National Police of the Republic of Indonesia, it is explained that the carrying out of police functions is assisted by special police, civil servant investigators, as well as self-supporting forms of security and those referred to as self-defense are explained in the explanation safeguards that are carried out on the basis of willingness, awareness and interests of the people themselves which then receive recognition from the Indonesian National Police. Therefore *Pecalang* as part of the organs of indigenous people who carry out security functions that are carried out over the interests, awareness and interests of indigenous peoples is recognized by the Republic of Indonesia.

Forestry and mangrove ecosystems protection with the help of *Pecalang* who plays an active role in securing and supervising forest areas including mangrove forests can prevent illegal logging or breakthroughs by surrounding communities more quickly because *Pecalang* actively enters the forest area to monitor and prevent acts - actions that damage the forest and violate the law. *Pecalang* is also known as the supervisor of the existence of *Awig-awig* in anticipation of environmental destruction. For example in the *Selat Awig-awig*, Buleleng Regency, in *Sargah VI* (Part 6), *Pawos 71*, Regarding Forest expressly stated that the indigenous people of the village are obliged to preserve the forest and its contents in the *Pakraman*

Village environment, then when residents the community found people or residents who were damaging the forest to report to *Prajuru* and related to preserving the forest and in this case *Prajuru* as the Village Leader was assisted by *Pecalang*.

The existence of a Mangrove Forest is very important for the life of the community both in present time and in the future as part of the ecosystem. The high dependence of the surrounding community on the existence of mangroves requires the management of mangrove forests by involving the community. The community realizes that they have a role in protecting and preserving the Mangrove Forest. The community strives to implement sustainable development in the activities of mangrove utilization. The Mangrove Forest Area in Bali Province is divided into three types based on its function, mangrove forest which is in the status of Conservation forest, mangrove forest which is in the status of protected forest and Mangrove Forest which is in the status of production forest. Mangrove forests that is in the status of conservation forest is only The Ngurah Rai Forest Park, while the other mangrove forests are in the status of protected forests and production forests.

Act No. 5 of 1990 concerning Conservation of Biological Resources and its Ecosystem has explained that the management of Forest Park is limited to research, science, education, cultivation, culture, tourism and recreation activities. Ngurah Rai Forest Park is state land with ownership status owned by the Ministry of Environment and Forestry. The protection of Ngurah Rai Forest Park is not only carried out by the Regional Government of Bali Province, but also the people around it. The active involvement of the community in managing mangrove forests in Ngurah Rai Forest Park is carried out by fishermen groups. The following is a Fisherman Group that plays an active role in preserving mangroves in the Ngurah Rai Forest Park area:

1) Wanasari Fishermen Group in Tuban Village,  
Badung Regency

The life of the local community in Tuban Village is strongly influenced by the presence of mangrove forests which ensures the availability of marine biota as a source of income for fishermen. Since 2011, the ecosystem in Benoa Bay has continued to suffer damage due to the construction of the Bali Mandara toll road including the mangrove forest ecosystem in Tuban Village. Lime piles carry waste materials left behind to damage the mud. However, the Fishermen Group can build a mangrove ecotourism next to the toll road. Wanasari fishermen build bridges made of bamboo next to the Ngurah Rai Airport toll road which belongs to the Tuban Village area. This bamboo bridge crosses mangrove forests, including stepped cages belonging to fishermen, which results in visitors being able to see mangrove ecosystems including crab cultivation through mangrove forests using jukung or canoes. The Wanasari Fishermen also develop the function of mangrove forests not only as coastal protectors but also as learning media that educate visitors about mangroves. Besides education, Wanasari Fishermen also make *Kampung*

*Kepiting* restaurant with views of mangrove forests and airport toll roads. Crab is the main menu of the restaurant belonging to the Wanasari fishermen group.

The Wanasari Fishermen Group has a rule that fishermen are not allowed to cut mangroves and if caught cutting down, fishermen must return to planting thirty mangrove trees. Residents and visitors of ecotourism who walk through the forest using canoes are required to take every plastic waste they encounter. Plastic waste collected can be exchanged for mangrove juice. In managing crab cages, fishermen must make cages by following the structure of the forest so as not to damage the mangroves. The Wanasari Fishermen Group has a Community Monitoring Group whose task is to monitor mangrove forests, protect the forest from logging and hunting activities. This activity is carried out by alternating patrols. With all these rules, the mangrove forests that enter in the Tuban area are still maintained.

2) Batu Lumbang Fisherman Group in Pemogan Village, Denpasar City

In the beginning, the mangrove area in Pemogan Village was managed by the community as a traditional pond and then the fishermen rented mangrove areas to the private sector that used the Mangrove Forest as an intensive pond. As a result of changes in the pattern of utilization of mangrove areas into intensive ponds, the income of the people of Pemogan Village, of which 60 percent of the people have a livelihood as fishermen, has declined dramatically. This proves that the existence of mangrove forests is more beneficial than mangrove forests converted into ponds because the presence of mangrove forests guarantees the availability of fish and other biota.

The existence of mangroves for Batu Lumbang fishermen cannot be valued with money because of its very important function and role for fishermen's source of income. Most of the Batu Lumbang fishermen who embrace Hinduism hold the concept of *Tri Hita Karana* closely. This *Tri Hita Karana* philosophy is used as a benchmark in assessing the success of a development. The Lumbang Batu Fishermen do not want drastic changes as a result of development activities. The impact of development activities is not only considered for short term but also long term.

The Benoa Bay reclamation activity was strongly opposed by the Batu Lumbang Fishermen group because the reclamation activities limited the livelihood area of the Batu Lumbang Fishermen Group, disrupted worship activities and damaged the balance of the mangrove ecosystem. To compensate for the activities of utilizing the mangrove area, members of the Lumbang Batu Fishermen Group planted deforested mangrove areas by involving elementary school students and Scouts to increase the awareness of the younger generation

regarding mangrove rehabilitation. Skills for how to plant and plant mangroves of the Lumbang Batu Fishermen Group were obtained from coaching conducted by the Climate Change Control Center and Forest and Land Fires

### 3) Deluang Sari Fisherman Group, Tanjung Bena

The Deluang Sari Fishermen Group is a turtle breeder in Tanjung Bena, Bali Province. Over the past few years, water tourism activities around the coast of Tanjung Bena have continued to grow. But this water tourism activity has resulted in a decline in the income of the surrounding community, most of whom work as fishermen. Then some fishermen in Tanjung Bena formed a group of fishermen with the aim of finding alternative activities that could increase income through developing joint activities. Members of the Deluang Sari Fishermen group are very concerned about the growing extinction of turtles in the Tanjung Bena mangrove area. This inspired the Fishermen Group to develop turtle breeding tours to protect turtles from extinction as well as tourist attractions.

Turtle breeding activities have a positive impact both on the conservation and economic side. In terms of conservation, with captive breeding activities, the preservation of turtle animals can be maintained. There are three types of turtles that are bred at Turtle Farm Deluang, namely Green Turtle (*Chelonia mydas*), Hawksbill Turtle (*Eretmochelys imbricata*) and Lekang Turtle (*Lepidochelys olivacea*). The three types of sea turtles are sea turtle species which are protected by applicable laws and regulations based on Government Regulation Number 7 of 1999 concerning Preservation of Plants and Animals.

These fishing groups use mangroves and maintain and rehabilitate mangrove forests independently. The community's active participation is based on awareness of the importance of mangrove conservation. The participation was a group initiative even though it had not been accommodated by Ngurah Rai Forest Park Technical Implementation Unit.

## IV. CONCLUSIONS

This study shows that the protection and management of mangrove forests in Bali Province by local communities around the mangrove forest area is a manifestation of local wisdom. Local wisdom makes people live in harmony with the ecology of the forest. The majority of Balinese people are adherents of Hindu religion and still highly uphold the philosophy of *Tri Hita Karana*, especially its indigenous people, and for this reason Balinese indigenous people strongly maintain harmony and balance with nature in order to achieve sustainable development goals. By adhering to *Tri Hita Karana*, Balinese indigenous people assume that exploiting nature excessively, including mangrove forests, will only provide benefits in the short term but not in the long term.

The existence of customary law communities, which is local wisdom, and the rights of indigenous peoples in the protection and management of the environment are recognized by giving environmental management rights to *Pakraman* village as outlined in *awig-awig* as a form of customary law

that is made by indigenous peoples as guide to social behavior. *Awig-awig* is used as a reference as the social control of indigenous people behavior. In *awig-awig* there are also regulations along with the implementing regulations as the foundation of Balinese indigenous people in protecting the environment including mangrove forests. In *awig-awig* there are customary sanctions for anyone who violates customary rules. In the *awig-awig* there is a special chapter about the environment and how to protect and manage the environment equipped with customary sanctions for those who violate the provisions in *awig-awig*.

Protection for mangrove forests is also carried by *Pecalang* as a unit of forest that is carried out specifically by indigenous peoples who are associated with indigenous peoples who become customary police or commonly. Rangers who work specifically in forest areas. Forestry and mangrove ecosystems protection with the help of *Pecalang* who plays an active role in securing and supervising forest areas including mangrove forests by surrounding communities more quickly because *Pecalang* actively enters the forest area to monitor and prevent actions that could damage the forest.

For the Protection of Ngurah Rai Forest Park as the only conservation forest in Bali, is not only carried out by the Regional Government of Bali Province, but also the local communities. The active involvement of the community in managing mangrove forests in Ngurah Rai Forest Park is also carried out by fishermen groups. These fishing groups rehabilitate mangrove forests independently. The community's active participation is based on awareness of the importance of mangrove conservation.

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