Cultural Capital Of The Communities In The Mangrove Conservation In The Coastal areas Of Ambon Dalam Bay, Moluccas, Indonesia

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Abstract

Mangroves have an important role to the conservation of the ecosystem continues to experience damage due to land conversion activities. But on the other hand there are still people who attempted to preserve and maintain the mangroves in their area. This research aims to describe the efforts of the communities by using the cultural capital concept that they have. The method used is a case study, in which data collection was conducted through in-depth interviews and participant observation. The data were analysed using the theory of cultural capital. The results showed that people were able to adapt and modify the environment as a form of cultural capital possessed. The communities applying traditional ecological knowledge and establish institutions so that mangrove conservation is maintained. The government may accommodate the cultural capital in development policy and coastal areas conservation.

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1. Introduction

Mangroves are found along coastlines in tropical areas and supporting ecosystem services, including fisheries production and nutrient cycle. Rapid loss of vegetated coastal ecosystems through land-use change has
occurred for centuries, and has accelerated in recent decades. Causes of habitat conversion vary globally and include conversion to aquaculture, agriculture, forest over-exploitation, industrial use, upstream dams, dredging, eutrophication of overlying waters, urban development, and conversion to open water due to accelerated sea-level rise and subsidence [1]. The role of mangrove ecosystems are not only limited to the physical and biological functions but also are critical to the social and economic functioning of the communities surrounding them.

In 1983, UNDP and UNESCO established a regional project concerned with the value of mangrove ecosystems in Asia and the Pacific. This international initiative led to an increased appreciation of the value of mangroves and a subsequent upsurge of mangrove restoration efforts [2, 3]. The rationale for mangrove restoration has changed very slowly over the years from just silviculture to recognition of mangroves as a diverse resource. The term ‘restore’ is taken to mean the creation of a sustainable functioning mangrove ecosystem that may or may not resemble its precursor at the very same site [4].

There are many numbers of previous studies on the importance of mangrove restoration and conservation of mangrove management with many diverse perspectives and goals. [4, 5], this proves that the restoration efforts and the existence of coastal communities utilizes the mangrove as a botany resource and the ecological knowledge from the forests have an important role.

The mangrove area in Ambon Dalam Bay in the coastal areas of Ambon is not spared from damage due to great sedimentation coming from the surrounding hills that erosion. Erosion occurs because the hills were converted into housing residents. In addition, mangrove destruction is also made possible by oil pollution from the disposal of the rest of the ship sanchored in the surrounding area. The area of mangrove in Ambon Dalam Bay has decreased, where the data of LIPI in 1995 showed the total of the area are 49.5 ha and in 1997 left over 37.6 ha. However, based on the data of Pattimura University in 2010, the area of mangrove has increased significantly by 52.22 ha which were in the villages of Passo 26.74 ha, Nania16.98 ha, Negeri Lama 3,90 and Waiheru 4,60 ha [6].

The wide addition of this area is strongly influenced by the active role in the communities in four villages adjacent to the mangrove area. The Communities, both individually and in groups, planted mangrove spontaneously motivated since 1977. The Communities awareness appeared based on the desire to get the catch of better fish if the mangrove ecosystem that had been damaged recovers. The ability of the communities to make the natural environment back to a natural state after damaged caused by exploitation called by [7] as cultural capital. In the context of natural resource management (ecological economics), the term of cultural capital are factors that provide human communities with the means and adaptations to deal with the natural environment and to actively modify it. Comprehension of a cultural capital of a society can be an important lesson in natural resources conservation efforts, including mangroves. For this reason this study aims to explain the culture capital of mangrove conservationist communities in Ambon Dalam Bay in the coastal areas of Ambon City.

2. Methodology

This research was conducted in Ambon Dalam Bay in the coastal area of Ambon City, which includes the villages of Passo, Nania, Negeri Lama and Waiheru. To understand why the communities preserve the mangroves, this study uses a case study, in which data collection was conducted through in-depth interviews and participant observation. Key informants consisted of community leaders who got “Kalpataru awards”, a top environmental prize (2 persons) and “Kewang”, chief of the local customary laws/attendant environmental (4 persons).

The collected data were then analyzed using the theory of cultural capital by [8] by examining the traditional ecological knowledge and institutions that exist in the local communities. Map of location of the study are presented in Figure1.
3. Results and discussions

Mangrove forest in Ambon Dalam Bay is a coastal ecosystem that is essential to support the development of the city of Ambon. Some of the main functions and the benefits of mangrove forests are 1) as the protector of the sea and mainland protection; 2) to reduce the sea damage due to various effects such as destruction of terrestrial sedimentation and pollution; 3) as a fortress to protect residential and other terrestrial environments from abrasion, seawater intrusion, strong wind, storm and minimize the tsunami waves [9]. Therefore, mangrove forest ecosystems need to be managed wisely in order to the function and its use able to sustainable. Many people believe that there has been an increase in destruction of mangrove forests Ambon Dalam Bay during the last decade after the riots in Ambon that occurred in 1999-2000. This is related to the government's efforts in enhancing the development of the Ambon city post-riot that less attention to the aspect of mangrove forest conservation. Many residential developments, office buildings, farms, and other physical development is generally concentrated in the coastal areas not only have an impact on the decrease of mangrove forest area but also impact on its qualities. The increasing of marine traffic flow which is based Ambon Dalam Bay and a number of silt, waste and rubbish trapped in mangrove forests also accelerate the destruction of mangrove forests.

The Province of Moluccas is an island province. Geomorphological conditions which was composed of the island groups presents its own exotica and has given strong influence on the cultural development of communities in Moluccas. Sea has become an inseparable part and also is the main support of the society economic activities which the majority of their livelihood as a fisherman.

The main marine products which utilized by the people of Moluccas is fish, either consumed directly or
processed into other food. Besides fish, other results are no less important is obtained from the transition zone or the mangrove forest which known as *mangge-mangge*. The results which exploited from mangrove forest such as woods, crabs (Kraka) and shells (bia). The function of Mangrove forests as a buffer of marine ecosystems directly put mangrove forests as an integral part in conserving marine resources.

The Population growth increase and other socio-economic complexity of recent decades have put the mangrove forest area in the province of Moluccas, particularly Ambon Dalam Bay in a vulnerable condition. Population growth increase directly requires the addition of space both for residential as well as other socio-economic activities. Surface conditions which majority of hills and valleys further worsened the pressure on forests in sloping areas, including mangrove forests. The high of it pressure can be indicated by the increasing degradation and deforestation of mangrove forests.

Population growth pressure is the biggest typical for coastal areas where human influence for the existence of the mangrove forest itself. [10]. Mangrove remain an important source of wood and food products and provide vitally important environmental services for coastal communities throughout the tropics [11].

The extensive mangrove area which ever reduced in 1997 covering an area of 37.6 ha up to recent data that the mangrove area is increased to 52.22 ha. This illustrates the important role of communities who attempt to preserve and maintain the mangroves in their area. Most of the coastal communities which work as fishermen whereas the extractive maritime effort is largely determined by the availability and sustainability of marine resources, including mangrove forests as spawning sites (nursery grounds) various types of marine life.

The communities develop cultural capital as a form of participation to preserve the mangrove areas. An understanding of cultural capital (Traditional Ecological Knowledge and Institutional) from communities group Ambon Dalam Bay could be an important study in the efforts of mangrove forests conservation.

3.1. Traditional Ecological Knowledge

Traditional ecological knowledge (traditional ecological knowledge) is defined by [12] as follows “a cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment”. So in short, traditional ecological knowledge (TEK) is a complex knowledge-practice-belief. TEK according to [12] are ways of understanding, dynamic, built by experience and adapt to change.

The Moluccas communities from generation to generation have had a pattern that governs harmonious relationship between man and nature. The Communities in four villages have a view of belief/culture where mangrove is a “tree of life” which is the primary food source for the presence of fish, shrimps and snails which they are harnessing. In order fish is always abundantly available then the existence of mangroves as a source of food must be maintained. For that reason, then the efforts to engage individually or in groups to preserve forests is carried out voluntarily. Fish, shrimp and snails which harvested will be sold or as a family consumer for the fulfillment of the family economy. It seemed that the communities not directly receive compensation from an economic point against conservation efforts.

Mangrove ecosystem describes the richness and the diversity of natural resources. Mangrove forests have been recognized as the main protection for the environment, coastal/coast. The role of coastal communities is crucial for its sustainability efforts. As an effort to organize communities for mangrove conservation and protection of the human settlements from disaster mitigation then in the four villages have formed community groups which supported by the role of nongovernmental organizations (Arman & Biodiversity Foundation). Communities are organized through Coastal Community Empowerment program, they fostered in fishery resources enhancement and mangrove ecosystems conservation where are routinely every year conduct cultivation of mangrove sapling and periodic planting. The existence of these groups (Ambon Lestari Conservation Group) indirectly help people to be more actively involved for the preservation of mangroves that provide value to the increase of the economic business productivity performed. The community argued that mangroves are fish feed sources, in the presence of mangrove, fish is found abundantly. Each group was initially accompanied intensively by NGOs and given intensive for each seedling were planted and managed to grow well. The group started planting from1996-2004. The Results of this group began to seem where the mangrove stand density level has reached 5%, with a height of 5 m and with a thickness of 20-50 m until their residential neighborhoods awake from tsunami hazard [9]. From the four villages,
there have formed 4 groups that still actively involved and nowadays there is one initiator group that formed for the development of the waste bank in the village of Negeri Lama. This group aims to accommodate waste in the coastal area and involve the entire village community to collect the waste in which the value of waste collected will be compensated for waivers paying the electricity. The fishermen were empowered to use the solar energy lantern as an attempt to replace the kerosene that often wasteful used by fisherman for fishing. The role of conservation is not only carried out in groups but there was also other individual role being run by a man named Dominggus Sinanu. He is known as the savior of the mangrove forest in Ambon Dalam Bay. According to him mangrove is the tree of life. His role started from 1977 as a fisherman where he was decided to plant the mangrove, fish catches continued to decline and to handle it he argues that mangrove forests should be conserved. All this he did with his own expense where partly of the sale of the fish he had set aside to buy polybag for the nursery. Throughout the years 1977-1979 he has planted ±10,000 seedlings until mid-2006. He always provides a variety of mangrove seedlings to various parties that require both individuals (researchers and students) or various government agencies and NGOs engaged in conservation the coastal environment.

Sinanu has 2 (two) traditional ecological knowledge which very helpful efforts of mangrove sustainability, namely:

1. Identification of mangrove plant species according its habitat

   Sinanu has the knowledge to identify mangrove plant species according to its habitat and its relationship with certain species of snails. For example, for Teluk Dalam area in Ambon according to him, it is better planted with mangrove species such as *Ryzophora apiculata* and *Soneratia alba*, where when tiram oyster (*Casutra elinata*) found in certain areas of the coastal area should be planted with *Soneratia alba.*, and when a shell/biadara (*Pitara maxima*) should be planted with *Ryzophora apiculata.*

2. Making traditional fishcages (Gagona)

   He pioneered the in making of fish cages with a size of 3 x 3 m which used the stem of sago palm, where the making of these cages provide savings in terms of cost (the cost of making is only 1 million Rupiahs compared to regular cages that will cost up to 150 million Rupiahs), environmentally friendly product and facilitate the people of Moluccas to use sago palm tree that are abundant. He then modifies the cages in 3 bulkhead/classes that help classify the fish to be harvested so that there are sustainable outcomes.

   Based on this description it seems obvious how the environmental aspects describes the assimilation of the public awareness surrounding the mangrove Ambon Dalam Bay and how the culture of the communities believed mangrove as a tree of life implicates to the conservation of mangroves and the practical embodies the communities protection to its environment.

   This is consistent with the concept of cultural capital developed by [13] that one of the functions of natural capital is a provision for environmental services in which the functions of natural capital can be viewed from three aspects of sustainability, namely economic aspects (how culture can be trusted and practically gives an impact on the economic sustainability of the production of materials used), the environment (assimilation of the environmental awareness and how the culture can be trusted and practically embody a protection for the environment) and social (how culture can be trusted which gives the effect of ethnic culture and the value of honor to the local concern).

3.2. Local Institutional

[14], confirms that the institutional could be simultaneously as an organization and vice versa. Institutional in the sense of organization that form in groups of communities that have good rules to regulate the relationship between the fellow and the rules relating to the management of forest resources in the vicinity. But it is obvious that the institutional is a set of norms and behaviors that persist over time to meet the needs of the collective, while the organization is a structure from the recognized and accepted roles.

Kewang Institution since first has been known in Ambon and surrounding islands, which acts to organize the values and norms that apply to the communities as natural resource managers and the public economy, as well as the supervisor of implementation of the customary rules. The provisions and the legal norms both written and
unwritten, which govern the lives and livelihood in a village one of it is to regulate the management system and the utilization of natural resources around it [15].

Kewang in Moluccas divided into 2, namely 1). Customs Kewang (formed by the village government/local custom villages) and 2). Environmental Kewang (this organization formed by the Decree of the Mayor of Ambon No. 753 of 2012 of the Environmental Kewang Appointment of Ambon City and constituted by the Regulation of Ambon mayor No. 52 of 2009). This organization membership are 120 people who representing conservation leaders from each villages and sub-village. Where these four villages are represented by 1 kewang attendant. The Function of environmental Kewang which formed by the Government of Ambon City, namely:

(1) As the spearhead of Ambon city government, in order to make aware the citizens in the efforts of protection and management of natural resources and the environment in a sustainable manner.

(2) As a motivator and dynamist started from the human settlements environment in order to create a clean and calm environment.

(3) As the activator of the realization of people's economy through waste banks at the home environmental.

In carrying out its functions, the conservation leader informally be able to suggest to the government related to the conversion of mangrove areas for various purposes.

As one of the institution custom structure of chief of the local customary laws is "Kewang". Kewang has a role in maintaining and overseeing the village environment both on land and at the sea as well as maintain the village borders that include forests and plantation for well maintained. The duty of Kewang is controlling the forest so that the citizens could not do any destruction and theft in the forest.

The presence of both Kewang institutions both custom and environment are complementary in the conservation efforts of mangrove areas. The carried role is very helpful in forming rules within the communities. As for some of the rules which made and approved by the communities in the coastal mangrove areas, namely:

(1) Prohibition cutting down mangrove trees

The communities believe and trust that the mangrove forest is their source of life where in the forest is available of natural resources for the conservation of the results of the surrounding sea and the protection of marine abrasion threats against their settlements so that prohibition such as cutting down the trees is apt to implemented to support their survival. The tree which could be felled is a damaged tree or broken due to the brunt of the wind. The Communities are very obedient to this prohibition.

(2) To retrieve the results of the sea around the mangroves, the community should not interfere the existence of mangrove trees in the surrounding

For people who live in the surrounding the mangrove area, They are permitted by the Kewang to take marine products such as fish, sea cucumbers, snails, clams and shrimp, with a note not to disturb the surrounding mangrove conditions especially avoid damage to the roots. There are at least 19 mangrove species that thrives Teluk Ambon Dalam Bay, most are *Rhizophora apiculata* and *Sonneratia alba*, both types of mangroves are widely found in the village of Passo and Waiheru.

The communities believe that both the rules written and unwritten have the function to preserve the natural sustainability, especially the mangrove areas both in terms of authority and also the exploitation. The involvement of each conservation leader from the four of these villages and the role of the conservation leaders are very concerned and assists to the conservation efforts of these mangrove areas. The role which carried is very helpful in forming rules within the communities namely organize the communities in the cultivation and preserve of mangrove forests and supervision of forest areas from various forms of community activities that disturb the ecosystems. This is consistent with the concept of cultural capital which was developed by Berkes and Folke that cultural capital as the "rules of society" where as a factor of community support and its adaptation against the deal with the natural environment is described on the role of the conservation leaders and the communities participation as well as the social institutions namely Kewang that accommodate the role in order to run more effectively. The important value of social roles performed by the communities around the mangroves in addition to concern for the areas conservation also to perform the protection of human settlements from the effects of natural disasters such as tsunamis and coastal erosion and strong winds due to the extreme climatic conditions which often occur during the
rainy season in the city of Ambon. This illustrates that the cultural capital gives good contribute and sustainable for
the environmental stability and welfare of society.

It has been proven that mangroves provide a variety of products and services that are useful to support the
needs of life of coastal communities and various economic activities and also as a support system of people’s lives
around the forest [16]. The existence and sustainability mangrove Ambon Dalam Bay can take up currently is
certainly supported by the important role of these two factors as a form of a community cultural capital are
traditional ecological knowledge of the communities and the establishment of local institutions (Kewang). Both of
these factors clearly give an overview that the mangrove is an expectation for the future. Expectations for the
sustainability of the environment surrounding it and for the well-being of coastal communities.

4. Conclusions and future directions

This article explores the cultural capital in the coastal communities Ambon Dalam Bay, in the conservation
efforts of mangrove areas. We found, on the importance of understanding the cultural capital of a community that
could be an important lesson as the efforts to conserve natural resources, especially mangrove. The conservation of
mangroves in Ambon Dalam Bay highly influenced by the important role of the traditional ecological knowledge of
the communities and the establishment of local institutions (Kewang). As a form of cultural capital this role needs to
be continuously improved and supported by the Government of the city of Ambon.

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References


