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Local Knowledge of Coastal Communities in North Sumatra on Identification and Types of Mangrove Utilization on a Sustainable Basis

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Abstract: This study purposes to identify local communitie's knowledge of mangrove ecosystems and mangrove utilization analysis based on local knowledge of the community. The method used was descriptive qualitative by using a cultural ecological approach by Steward as an analysis unit. Knowledge to identify the number and type of mangrove vegetation that has become part of the cultural adaptation they receive from generation to generation with different cultural forms. The community in Jaring Halus called plant vegetation in two main categories, namely Wood and tree. Wood and tree are the local terminology of the community in Jaring Halus village to refer to all plants that produce fruit nor to harvest. The community in Nagalawan village, however, has substantial knowledge of the vegetation variation that forms the mangroves in Sei Nagalawan village, slightly different from what the community has in the Jaring Halus village. The mention of mangrove is a collection of plants that cannot hold itself. Therefore, in a mangrove area will usually be found at least four types of plants. This condition as a direct impact of the experience of mangrove deforestation areas in Sei Nagalawan village is much higher.

INTRODUCTION

North Sumatra Province has potential coastal and marine resources. The mangrove ecosystems are one of the most important resources in the coastal areas when viewed from a biological, economic, physical-chemical perspective. Mangrove ecosystems serve as buffer ecosystems that are located in unique areas/zones as this area is a transition between sea and land components containing sea and fishery (coastal) vegetation. Growing up in coastal areas and around the estuary (apart from coastal forest formations) that are regularly and regularly seized by sea water and influenced by tides. The existence of mangrove ecosystems in recent years has been shrinking due to the susceptibility of mangrove forest conversion activity which continues to increase into agricultural land or fish/shrimp ponds, resulting in decreased productivity of the ecosystem.

The prior study by Onrizal states a similar description where there has been a widespread change in mangrove forests in the coastal area of North Sumatra. These measurements began in 1977, 1988/1989, 1997 and 2006 continued to decline. Compared to the area of mangrove forest in 1977, in 1988/1989, 1997 and 2006, mangrove forest in the East coast of North Sumatra decreased by 14.01% (left to 88.931 Ha), 48.56% (left to 53,198 ha) and 59.68% (only 41,700 ha left) from the initial area of 103,415 ha in 1977.

The depletion of mangrove ecosystems in the coastal area of North Sumatra creates the interest of the researchers to work with an emphasis on the study of local knowledge built in managing the fulfilment of the life necessities of local communities living in the coast of Langkat and Serdang Bedagai Regencies. Local knowledge is part of a managed management strategy through cultural values, knowledge and experience that is the entity of a community group used by people in managing the interaction between human beings and between humans and nature[1]. Such local knowledge is part of the dynamics of managing mangrove ecosystems in Jaring Halus and Sei Nagalawan village to take conservative measures to make mangrove a source of life that must be managed sustainably.

Various parties participated in supporting the management of mangrove ecosystems in many places with various interests. The two regions have been introduced in developing and strengthening the knowledge of sustainable mangrove management.

MATERIALS AND METHODS

This study used a qualitative approach with a case study to explain comprehensively on variations mangrove management based on local wisdom in both regions (Jaring Halus village, Secanggang Subdistrict, Langkat Regency and Sei Nagalawan village, Perbaungan Subdistrict, Serdang Bedagai Regency) with the questions "how" and "why".

The advantages of such case studies are the primary means of emic research, which presents a view of the subject under study, in this case, the coastal communities in managing mangrove[2]. Suharjito explains that emic analysis aims to state what the thinking, known, done which the informant expects to conform to what the informants conveyed themselves. The emic analysis is combined with ethical analysis which is an explanation of the phenomenon or phenomenon of local wisdom renewal provided by researchers based on the community's experience or understanding of the elements of knowledge and technology acquired through the introductory process undertaken by various government and non-government agencies on mangrove management in sustainable.

The research is located in the coastal community region on the east coast of North Sumatra Province, by setting the village of Jaring Halus, Secanggang Subdistrict, Langkat Regency and Sei Nagalawan village, Perbaungan Subdistrict, Serdang Bedagai Regency as a research site. Determining the location of the research is based on previous research findings, both institutional and individual researchers also discuss with stakeholders in managing mangrove on a sustainable basis. To analyze local knowledge in managing the mangrove ecosystems as qualitative descriptive, to analyze the relationship between humans and their physical environment, technology and social organization and how they influence each other in the process of community adaptation in realizing environmental changes in the mangrove forest, based management of local wisdom with undergoing cultural modifications over time.

RESULTS AND DISCUSSION

Identification of knowledge based on local wisdom towards mangrove: The key element in this research is the condition of local knowledge based on local wisdom and renewal efforts that have taken place. Ahimsa-Putra describes local wisdom as a set of knowledge and good practices derived from previous generations and from experience in relation to the environment and other societies belonging to a community somewhere, which is used to settle properly and real issues and/or difficulty encountered. Referring to the definition of local wisdom, the narrative of various knowledge of the fishermen community about the mangroves for later use in addressing the problems of life experienced has become important.

A set of knowledge of the fishing community in Langkat regency related to the management of the mangrove ecosystem began with the narration of their knowledge of the conditions of vegetation and fauna that made the mangrove area a habitat. In emic, the fishing community in Langkat has a local categorization of the vegetation used. The communities in Jaring Halus called plant vegetation in two main categories, namely: Woods and trees wood is the local terminology of the community in the Village of Jaring Halus to mention all plants or plants that do not produce fruit for harvest.

Although, the plant or plant is fruitful, the fruit produced by the plant cannot be consumed. In other words, wood is a conception of Jaring Halus community to refer to plants that are only utilized for a need. On the basis of this conception, then the plants only take stems or branches will be utilized for something included in this category. Data mining on this indicates that the types of plants which belong to large groups of wood that can be found in the mangrove ecosystem in Langkat are:

- Api-api woods (*Avicennia*)
- Bakau Bangka woods (*Rhizophora mucronata*)
- Lenggadai woods (*Bruguiera parviflora*)
- Buta-buta woods (*Excoecaria agallocha*)
- Mata Buaya woods (*Bruguiera hainesii*)
- Cemara Pantai woods (Only in some parts)
- Nere

The names and types of plants that can be categorized as trees by the local community in Jaring Halus are Berembang (Sonneratia caseolaris), Rapid (*Sonneratia alba*) and Nipah (Nypa). The tree name of Berambang by some local communities is also called Berombang. Plants "Berembang/Berombang" is a kind of plant whose morphology is not different from some types of plants that fall into the category of wood. It's just the fruit "Berembang/Berombang" including the type of plants that produce round fruit that has a petal with fruit diameter about 3-4 cm.

Nipah plant is a kind of plant plug with the physical morphology of its leaves resembling coconut. During this time, the part of the Nipah most often used by the fishermen community is the leaves of Nipah. The leaves of the Nipah have been used as a raw material for roofing. Meanwhile, the shape of the fruit produced by the Nipah plant slightly resembles the Kecombrang flower bunch but with the form of palm fruit with white flesh like coconut. The natural taste of Nipah fruit is acid-smooth with a rather gummy texture. By the local community "Jaring Halus" Nipah fruit often in consumption as a snack.

Outside the classification of wood and trees, there is still a classification of plants that can not be included in large groups of plants based on their utilization by the community. There are species of ferns, small plants and grasses that are also found in the mangrove ecosystem around Jaring Halus. Some types of plants that can not be included in the group of Wood or Trees are Jeruju.

It is not much different from the knowledge of the community in Jaring Halus village, the local community's knowledge of plants that make up the mangrove ecosystem in Serdang Bedagai, especially in the village of Sei Nagalawan is also important to narrate. Although, culturally the two communities have similarities, however, the substance of knowledge about various forms of vegetation from the mangrove area in Sei Nagalawan village is slightly different from what the community has in Jaring Halus village. This is possible as a direct impact from the experience of deforestation rates in the mangrove area in Serdang Bedagai.

Even nowadays, the condition of some mangrove forests in Sei Nagalawan village has started to recover, but in quantity, the vegetation variation is much less. Data excavation to the community at Sei Nagalawan shows that plant classification in mangroves is much simpler and it has led to standardization in biological methods. Generally, the community of Nagalawan know some mangrove forest planters:

Api api trees: Which is divided into two types, namely:

Api Api Hitam trees (*Apicenia alba*): To plant it, abrasion will accelerate deposition to make it turn into the land as the soil yields more and can accelerate sedimentation of the soil and from the process of sedimentation, it mixes with mud, soil and others that can eventually become land.

Api Api Putih Trees (*Apicenia marina*): To manage it into food such as "Dodol," then it can also make pastries taken from grains in the Api Api Putih plant.

Bakau trees: Which is divided into 3 types, namely:

- Bakau Merah trees (*Rhizophora apiculata*)
- Bakau Bangka trees (*Rhizophora mucronata*)
- Bakau Hijau trees (*Rhizophora stylosa*)

Tancang trees (*Bruguiera*): Which is divided into 3 types, namely:

- Tancang Sukun trees (*Bruguiera sexangula*)
- Lenggadai trees (*Bruguiera cylindrica*)
- Matabuaya trees (*Bruguiera gymnorrhiza*)
- Nipah trees (Nypah)

During this time the Nipah tree is used to take the population to take the leaves and then become the raw material for roofing and or taken the centre of the leaves to later become a ruby. Nipah itself is a living plant and grows well in brackish waters which are mixed between seawater and fresh water.

Another thing described by residents in Sei Nagalawan is that mangrove is a collection of plants that can not control themselves. Therefore, in a mangrove area, it is usually found at least four types of plants. In addition, in one mangrove forest area according to population also usually find other plants such as Jeruju and or shrubs. It is still according to the residents it is ideally a small mangrove area formed from 13 species of trees. Given the mangrove area in Sei Nagalawan Village, a large number of new plantations are deliberately restored, so far only four types of plants make up. Even if there are mangroves outside the mangroves that can also be found around Mangrove ecosystems in Sei Naga Lawan are Cemara, Ketapang and Coconut.

Analysis of mangrove utilization in local knowledge: After the component of local knowledge that should be described is a pattern of utilization of knowledge to

address life problems. In other words, the use of local knowledge through the management of natural resources which is the case focuses on mangrove ecosystems is important. In accordance with economic principles, the later challenges of life to overcome them are dependent on the ability to utilize natural resources are more identical to the needs of boards, food and clothing. The same condition is also seen in community management in the study site on the potential of natural resources in the mangroves.

In this study, it was seen that basically, the people in the two study locations had understood the importance of the mangrove ecosystem. Moreover, the coastal community in Jaring Halus village. The emphasis of the coastal community in Jaring Halus village in understanding ecological, economic and biological benefits is more due to the long-standing efforts to maintain the naturalness of mangrove forests. However, the more scientific dissemination of knowledge and values about the importance of mangrove ecosystems needs to be more optimal, because some members of the coastal community in Jaring Halus village do not have similar skills in explaining mangrove relations and the lives of their communities.

Armed with the knowledge that is scattered and possessed by the community, they then also build a mechanism of respect for nature, protection or conservation for the mangrove ecosystems around them. Such mechanisms are necessarily based on the knowledge gained from the accumulation of experience in the past regarding the condition of mangrove ecosystems and the things that affect them.

The tribute to nature that researchers found in Jaring Halus village in Steward[3] are part of the process of adaptation to the environment. Elements in human culture are influenced by the basic self-adjustment of human efforts to make the use of the environment. Observe cultural ecology as an integrated entity and has distinct characteristics found in ecological environments. A culture is a different form because it adapts to different environmental conditions.

The ability of individuals to adapt has value for their survival. Human adaptability is demonstrated by its efforts to manage existing natural conditions and survives under these conditions[4, 5]. The greater the ability of adaptation, the greater the survival. In other words, adaptation is an individual process to maximize the chances of life.

Adaptation to the environment is not only seen from the ability of society to maintain sustainability in order to make a living in the sea but adaptation has also taken place when the community keeps the mangrove forests. Even when the village of Jaring Halus is opened, mangrove plants are considered sacred plants are known as local term Ketapang tree. Until now, local people are believed to be part of mangrove ecosystem management that is considered important to be protected. They have realized that mangroves are important to protect and manage properly because protecting mangroves automatically protect their lives from the influx of waves and storms that are occurring in their livelihoods. The consciousness of the society has been since the existence of Jaring Halus village but the frequency of awareness level of the value is still low. They still cut mangroves for their personal needs and also allow people to take mangroves in the area of Jaring Halus village.

Communal consciousness for managing mangroves is continuously reinforced by the many non-governmental organizations to deal with environmental problems and to provide knowledge and protection for their mangrove forest areas. Institutions that have ever been to Jaring Halus Village are JALA (Fishermen Advocacy Network), YAGASU (Sumatran Elephant Foundation), PARAS (Development of Rural People) and SNSU (North Sumatera Fishermen's Union) and several governments and non-governmental institutions. The arrival of these institutions greatly influenced the village's mindset towards mangrove. They are increasingly understanding how the role of mangrove for the coastal environment. In addition, they also have an awareness of preserving and protecting mangrove forests.

The mangrove forest in the vicinity of Jaring Halus village is quite extensive which impacts them, it does not to replant mangrove in the forest as mangrove can develop naturally and rapidly. However, there are some areas in the need to grow for mangrove forests wider. The process of mangrove cultivation has been done several years ago by the village community assisted by the institution there. In their cultivation process, it is not difficult to get mangrove seeds, mangrove forest already provides a lot of seeds. While in-villagers are allowed to cut down trees for reasonable purposes such as home masts and nets in the sea.

The utilization of coastal communities in Sei Nagalawan village began with persistence from environmental volunteers incorporated into non-governmental organizations. The knowledge and experience began to be spread by inviting people to participate in planting mangrove. The inclusion of various institutions brings changes to the way the people view the management of coastal areas in particular, the introduction of sustainable mangrove management procedures. Various non-governmental organizations support them by conducting awareness-raising activities, organizing and advocacy to some individuals who are part of the community group Sei Nagalawan.

Knowledge-based on local wisdom in the management of mangrove ecosystems is built on the

ability of local communities to understand and internalize new values simultaneously being introduced into various forms of learning about conservation. However, for the community, these learning efforts are also continued by making mangrove forests as a source of livelihood that has the economic benefits to their survival. One of them makes mangrove as a commodity for making syrups and crackers through mangrove raw materials. The knowledge and skills acquired in mangrove processing became the syrups and the crackers undergo modifications that eventually can be seen in production until now. The product of mangrove crackers from Nagalawan village is one of the leading commodities in the market.

This local knowledge is undergoing renewal in the form of local wisdom-based mangrove management that has undergone modifications within a certain period of time in two different areas, namely: Jaring Halus village and Sei Nagalawan. Thus, the empirical fact according to Harris is increasingly emphasizing that the material condition determines human consciousness. The change in the form of mangrove management was realized with the human consciousness that was modified by the evolution of times.

CONCLUSION

There is a variation of local knowledge on the identification and utilization of mangroves, each of which has a unique two different areas. The motivation for managing mangrove has led to renewed local knowledge based on local wisdom with different forms.

The local knowledge of the coastal community of Jaring Halus village can be seen from the conservative behaviour of mangroves. Jaring Halus village has a growing tradition of trust in the conservation of coastal ecosystems.

The local knowledge of coastal communities of Sei Nagalawan village can be seen from the changing environment that goes through learning about mangrove that is accomplished through the process of synthesis of conservation values of several non-governmental organizations that organize local communities. Awareness of the management of mangroves is good for coastal communities of the Jaring Halus village is judged to relate to the awareness that mangrove can automatically protect their lives from the influx of waves and storms that are occurring in their livelihoods. The awareness of the community, since, the existence of Jaring Halus village.

Awareness of the management of mangroves is good for the coastal community of Sei Nagalawan considered that the function is not just a protector but its function as a productive commodity such as mangrove processing into syrup, tea and crackers.

SUGGESTION

Improve local knowledge based on local knowledge of coastal communities in Jaring Halus and Sei Nagalawan village by providing awareness and knowledge to all coastal policy stakeholders on the importance of managing mangrove ecosystems by multiplying the mangrove education training followed by, resulting in local community knowledge on mangrove management increasingly.

Improve the socio-economic conditions of the community by enhancing training on conservation and management of mangrove. Combine local knowledge of existing coastal communities into forms of local knowledge-based local wisdom in managing mangrove ecosystems more productively and sustainably.

Enhancing local knowledge based on local wisdom of coastal communities in Jaring Halus and Sei Nagalawan village by providing awareness and knowledge to all coastal policy stakeholders on the importance of mangrove ecosystem management by multiplying the mangrove education training which is followed by resulting in local community knowledge on mangrove management to become more increase.

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