



Understanding of Local Function Values on Forest Processing

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ABSTRACT

Purpose: to find a deep understanding of the values of local wisdom related to forest management in Nagari Koto Malintang, Tanjung Raya District, Agam Regency, West Sumatera Province and to determine a forest management communication model based on environmental awareness **Design/Method:** This research used a descriptive-qualitative (exploratory) approach without hypotheses. An exploratory approach is a research approach aimed to build a science. This research was intended to find a model by looking at existing phenomena. The approach and method were adjusted to the research objective, that was to obtain a deep understanding of the flow of information and the role of communication in forest management so that the forest in Nagari Koto Malintang can be sustainable. This research was conducted in Nagari Koto Malintang, Tanjung Raya District, Agam Regency. **Finding:** the community and government of Nagari Koto Malintang have arranged the Nagari's space and land by dividing it into three: namely an upstream area converted into a catchment area, the middle area converted into a plantation and settlement area, and the downstream area converted into cultivation land. Ecologically, the existence of forests also benefits the people of Nagari Koto Malintang related to environmental management so that they are free from threats of floods and galodo, lack of water needs, bad air quality, and flora and fauna scarcity. **Originalty:** There have been many studies conducted in relation to forest management but the description related to information flows and communication patterns of indigenous people in conveying forest management local wisdom is still lacking. This is because each indigenous community has different customs and norms, so it is necessary to examine the characteristics of Nagari Koto Malintang's community in forest management.

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1. Introduction.

Tropical rainforests (lowland equatorial evergreen rainforests or tropical lowland evergreen rainforests) are biomes in the form of wet or humid forests, which can be found around the equatorial zone at 10⁰ North Latitude and 10⁰ South Latitude. Indonesia is one of the countries with the largest tropical forest in the world. Indonesia is estimated to have 120 million ha of tropical forest, which is the third largest in the world after Brazil and Congo (Purnomo, 2012). As for its biodiversity, Indonesia's forests are the second largest in the world with 10% of flowering plants, 12% of mammal species, 16% of reptile and amphibian species, 17% of bird species, and 25% of fish species (Hendry, 2013), and more than 10,000 of tree species (Purnomo, 2012).

Forest natural resources provide an important contribution to people's development and lives.). Forests have several benefits in terms of economy, social values, and ecosystem protection (Hendry, 2013). Ecologically, forests are also beneficial in supporting natural balance, protecting life, maintaining soil fertility, protecting watersheds, controlling erosion, storing water reserve, absorbing CO₂, and providing O₂.

In addition to ecological and economic benefits, forests also socially benefit people in carrying out traditional ceremonies, religious activities, or other activities related to the mystical world. Moreover, forests can also function as a place where people can get entertainment, pleasure, and peace (Fauzi, 2012). This is consistent with FAO (1995) in Rawat et al. (2010) stating that forest and land resources must be managed sustainably to obtain social, economic, ecological, cultural and spiritual benefits, and to maintain and enhance biodiversity. Position

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and strength of the existence of customary forests are legally recognized in line with the lawsuit of the Alliance of Indigenous Peoples of the Archipelago (AMAN) in the Constitutional Court related to Law No.41 of 1999 on Forestry. According to Law No. 41 of 1999, forests must be managed sustainably and accommodate the dynamics, aspirations and roles of cultures and customs as well as community value systems based on national legal norms. Communities need to be involved in forest management. According to Bolland et al. (2011), community-based forest management is effective in reducing the level of forest destruction.

Many studies have proven that most indigenous people in Indonesia still have local wisdom in managing forest resources. One group of the indigenous people who are well-known for their local wisdom in managing forests is the people of Nagari (Village) Koto Malintang, Tanjung Raya District, Agam Regency, West Sumatera Province. One of the local wisdom of Nagari Koto Malintang community in managing and conserving forests is the opening of parak (mixed plantations) as a buffer zone of protected forests with the community settlement and farming areas (Yanti, 2004; Suharianto, 2007). The community of Nagari Koto Malintang has very valuable resources, namely protected forests often called rimbo and mixed plantations called parak. The existence of rimbo and parak in Nagari Koto Malintang greatly benefit the surrounding community. Currently, the Nagari also has a Pamsimas program (Clean Water and Community Sanitation Program) so that the community now has a clean bathing, washing and latrine facility in their houses which was previously only provided in tabek. The water flows in Banda Koto and Banda Kurambik have become the main source for irrigating rice fields and fish ponds, even until reaching Lake Maninjau.

The positive impact of these two Banda is that the farmer community can harvest regularly (twice a year) in the rainy and dry seasons. That is, they have no difficulties in obtaining rice and can even increase their income by selling it. The success of the community of Nagari Koto Malintang in maintaining sustainable forests so as to positively impact and greatly benefit the community is inseparable from the ongoing communication built from generation to generation on how to use forests without neglecting its sustainability. Thus, the community's success in building a sustainable forest proves that the community has high knowledge and awareness in managing the forest and environment.

Communication is an important instrument to hand on cultural values from one generation to the next. Culture is part of communication behavior, and communication, in turn, also determines, maintains, develops or inherits culture (Mulyana, 2010) because culture is communication and communication is culture (Edward T Hall in Mulyana, 2010). Through communication, information exchanges can be carried out between fellow members of indigenous people or even with other parties. With the information exchanges, the people can know the existing opportunities to be utilized and maintained as well as avoid threats in the surrounding environment.

Forest function as a hydrological regulator is felt by the community from the presence of large trees in the forest area.

Besides, the community can significantly perceive the ecological benefits of the forest as an erosion and flood controller. Therefore, Nagari Koto Malintang was the only area spared from flood and galodo when the other Nagari (villages) in the Tanjung Raya District, including Jorong Kampung Dadok, Nagari Sungai Batang Maninjau, were hit by a flood some time ago (Kliksumbar, 2013). Regarding natural resources and environmental management, which in this case include forests, there are four important things needed to be considered, namely change, complexity, uncertainty, and conflict (Mitchell et al., 2014). These four things will bring opportunities and threats at the same time for planners, decision makers, and other community members. Likewise, in forest management, one important thing that is always related to these four things is the communication factor.

The community has developed agreements aimed at maintaining forest sustainability. Awareness to plant, maintain, and protect is inherent in each individual of the community as an effort to maintain forest sustainability and improve the welfare of people living in the area. People's positive interaction with forest ecosystems is very important to notice. In establishing an agreement, the community of Nagari Koto Malintang has carried out various interactions, either with customary leaders, community leaders, the government and relevant stakeholders.

In this case, communication plays an important role. Without communication or information exchanges from generation to generation, it becomes impossible for the community of Nagari Koto Malintang to preserve the forest around their settlement. This is because one of the determinants affecting the success rate of natural resource and environmental management is communication and interaction between the components involved in it (Soetopo, 2006).

This research aimed to find a deep understanding of the values of local wisdom related to forest management in Nagari Koto Malintang, Tanjung Raya District, Agam Regency, West Sumatera Province and to determine a forest management communication model based on environmental awareness. There have been many studies conducted in relation to forest management but the description related to information flows and communication patterns of indigenous people in conveying forest management local wisdom is still lacking. This is because each indigenous community has different customs and norms, so it is necessary to examine the characteristics of Nagari Koto Malintang's community in forest management. This research was done to obtain a complete picture of how the indigenous people of Nagari Koto Malintang build communication and disseminate information of local wisdom so as to bring out mutual awareness in managing forests sustainably, ultimately leading to a forest management communication model.

2. Literature Review.

Communication is a process in which several participants exchange information signs at a time. That is, communication is aimed to equalize the meaning or message between the sender and recipient of information. Communication can explain infor-

mation exchanges causing behavioral changes and mutual understanding between the people involved in it.

Interpersonal communication is a face-to-face communication between people, allowing each participant to directly capture other people's reactions both verbally and non-verbally (Mulyana, 2010) with the aim to (1) learn, (2) get in touch, (3) influence, (4) have fun, and (5) help. In interpersonal communication, the relationship aspect is very prominent because this communication is a more touching form of communication on the personal side of the individuals involved in it.

Persuasive communication is the process of influencing other people's attitudes, opinions and behavior, both verbally and non-verbally (Soemirat, 2011). Persuasion carried out emotionally usually touches the affective aspect (related one's emotional life). The effect of persuasive communication is a change occurring in the persuadee as a result of the acceptance of messages through the communication process, which can be in the form of changes in attitudes and behavior.

A communication model is an ideal description of what is needed for communication to occur. Communication occurs when there is a message delivered verbally or non-verbally and understood by the recipient of the message. A communication is said effective when the message delivered is understood and acted upon by the recipient of the message or both parties. Experts have put forward several communication models. The first is S-R Model, referring to a communication model that shows communication as a simple reaction action. The second is Aristoteles Model, referring to the most classical communication model (also often called a rhetorical model). The third is Lasswell Model, referring to a communication model that depicts a communication process and the function it carries out in the community. The fourth is Shannon and Weaver Model which is often called a mathematical model or information theory model. Compared to other communication models and theories, this model likely has the strongest effect. The fifth is Scramm Model, referring to a communication model that always requires at least three elements, namely source, message and destination. The sixth is Berlo Model, known as SMCR (Source, Message, Channel, Receiver) model. The seventh is Tubbs Model in which the communication process takes place spontaneously and simultaneously. In this communication model, there are two communicators who act as the sender and recipient of messages.

A customary forest is a forest area within an indigenous territory. In general, the indigenous community living around a forest considers that humans are part of nature that must maintain and raise balance and harmony (Wibowo et al., 2012). Local wisdom generally contains teachings about natural resource maintenance and utilization (forests, land and water) on an ongoing basis (Pawarti et al., 2012) that are beneficial both directly and indirectly since it has a high positive impact in preventing environmental damage (Lampe, 2006).

One preserved forest in Indonesia, especially in West Sumatera, is the forest in Nagari Koto Malintang, Tanjung Raya District, Agam Regency. The people of Nagari Koto Malintang are able to preserve the forest around their settlement. This forest conservation has been carried out from generation to gener-

ation since many years ago. The people of Nagari Koto Malintang still maintain their customs and traditions related to sustainable forest management. They are able to protect the forest so as to provide multiple benefits, including ecological, economic, and social benefits. This success is caused by the community participation and awareness of the importance of forests for their lives. Above all, this success is a manifestation of the efforts of the customary leaders and community leaders in preserving the cultural values inherited from generation to generation.

In inheriting cultural values, especially values related to natural resource management, communication plays a very important role. Communication is an instrument used by customary leaders to approach, invite, guide and direct members of the community in maintaining cultural values in the form of local wisdom and actively getting involved in managing natural resources, especially customary forests. Viewed from the development paradigm, the importance of community participation and communication role as exemplified by customary leaders is a manifestation of a community-based development paradigm in which the community is the subject of development who plans, implements, enjoys and controls natural resource management.

Based on Law of the Republic of Indonesia Number 32 of 2009 concerning Environmental Protection and Management suggests that the activities of environmental protection and management include six elements, namely a) planning, b) utilization, c) control, d) maintenance, e) supervision, and f) law enforcement. In managing the forest in Nagari Koto Malintang, the pattern of communication and the flow of information on environmental wisdom values will be seen from the six elements so that the community has knowledge of customary norms in managing the environment and become aware of the importance of a sustainable forest environment. With the communication process and the flow of information on the environmental wisdom of forest management, the community is hoped to have more awareness of protecting the forest so as to be sustainable.

3. Methodology.

This research used a descriptive-qualitative (exploratory) approach without hypotheses. An exploratory approach is a research approach aimed to build a science (Syahza, 2014). This research was intended to find a model by looking at existing phenomena. The designs used in this research were case study and field research. The type of case study applied was a single intrinsic case – a research conducted with the aim at studying a specific case without any purpose of putting the case to represent other cases but rather studying its specificity and uniqueness (Yin, 2011). This research used a qualitative approach with a case study method. The approach and method were adjusted to the research objective, that was to obtain a deep understanding of the flow of information and the role of communication in forest management so that the forest in Nagari Koto Malintang can be sustainable. This research was conducted in Nagari Koto Malintang, Tanjung Raya District, Agam Regency. The

research location was selected purposively based on the consideration that the existing forest conditions in Koto Malintang are still well-maintained while most of the current forest conditions in Indonesia are damaged. The forest sustainability in Nagari Koto Malintang is marked by a large number of trees with a diameter of 2 to 3 meters left to grow for hundreds of years to protect the people from the danger of landslides.

Determination of informants in this research was done by a purposive sampling method. The main actor was the Government, in this case referring to the Forestry Service of West Sumatera Province, the Extension Center of Agriculture, Fishery, Forestry, and Food Security (BP4K2P) of Agam Regency, the Technical Implementing Unit (UPT) of the Extension Center of Agriculture, Fishery, Forestry, and Food Security Counseling (BP4K2P) of Tanjung Raya District, the Wali Nagari along with its officials, the customary leaders, and the community of Nagari Koto Malintang, Tanjung Raya District, Agam Regency. The data were collected through observation, in-depth interview, documents, and recordings. The data validity in this research was examined using several criteria, namely: credibility (internal validity), transferability (external validity), dependability (reliability), and confirmation (objectivity). To test the validity of data obtained from the informants, the researchers re-confirmed the results of interviews that had been done.

4. Result and Discussion.

4.1. Forest Benefits.

Based on the knowledge value obtained from the interview results, the ecological benefit of the forest felt by the community is their stronger environmental awareness as the messages on environmental management are continuously inherited from generation to generation. Coupled with the strong customary norms and rules, especially regarding forest behavior, the existing forest is managed well so as to prevent Koto Malintang from floods and landslides. Some water sources (*sarasah*) in the upstream of the forest in Nagari Koto Malintang become the main source of water needs for the community. The policy of Wali Nagari (Village Head) Koto Malintang in water source utilization is more effectively realized through the Pamsimas Program so that the flowing water can be directed to water storages to be then channelled to people's houses and public places such as *mushalla* (mosque) and customary meeting places. The Nagari gives permission to shoot pest animals if they can no longer be evicted and dealt with. On one side, durian is recognized as a *prima donna* commodity in Koto Malintang which should be prevented from pest animals while on another side, killing forest pest animals can destroy biodiversity. Thus, as long as the pest animals can still be overcome, shooting or killing them must be avoided. In addition to the beautiful natural conditions around Lake Maninjau, the main environmental benefit obtained by the community of Nagari Koto Malintang from the forest is the availability of oxygen, producing a clean and fresh air.

The existence of sustainable forests is greatly beneficial in terms of the community economy both directly and indirectly.

The people depend on forests and they are aware that if forests are not preserved well, it will negatively affect every side of their lives, one of which is the agricultural land sustainability. From the forest (covering *rimbo* and *parak*), water is utilized by the community, one of which is for agriculture. In addition to farming, the people of Nagari Koto Malintang also do plantations. The main plantations of the community are in the *parak*. Various plants are cultivated by the community in the *parak*. In addition to fulfilling daily needs, the yields of the *parak* are also sold to add income. Besides irrigating rice fields, the water sources in Nagari Koto Malintang are also utilized by the community for fish breeding ponds of which the results are going to be sold to cage fish farmers in Lake Maninjau. The fish breeding location is in the ponds around the houses (*tabek*). Some others even utilize their rice fields for breeding fish. The forest in Nagari Koto Malintang has very beautiful natural potential. Besides the beautiful nature, the diversity of flora and fauna in the forest is also potentially developed as an ecotourism object. One of Koto Malintang's mainstay commodity is durian fruit. Currently, the Wali Nagari and the community is converting the *parak* location to be a durian tourism area in which the tourists can enjoy durian fruit directly from the tree.

Furthermore, the forest also socially benefits the community. The existence of the customary forest (*parak*) in Nagari Koto Malintang socially functions and regulates kinship closeness in the community. The *parak* creates a solidarity of the people living around the forest, avoids social gaps among the community groups, and maintain local knowledge and institutions. Similarly, the "*balangge*" tradition which is the characteristic of Koto Malintang everytime the durian season comes also preserves and socializes the importance of socializing to the younger generation. The other benefits are the increased community participation in forest management and the creation of employment because planting and harvesting activities in the forest take a lot of energy. Besides, the secondary impact of forest sustainability, such as water abundance, also create jobs for the people. With the abundant water supply, the fish ponds, *tabek*, and the lake will get adequate water so that the fish breeding and cage business in the lake can run smoothly. Moreover, the fish harvesting activity also requires a lot of energy.

4.2. Local Wisdom Values of Forest Management.

The local wisdom-based forest management system regulated according to the local customary law provisions have long been in Nagari Koto Malintang. The wisdom values are local knowledge owned by the community of Nagari Koto Malintang in forest management activities. The concept of forest management concerning natural preservation has become the community habit inherited from generation to generation. The forms of local wisdom examined in this research were grouped accordingly to the six environmental management points mentioned in Law Number 32 of 2009 as follows:

a. Wisdom Values in Planning Activity

The community of Koto Malintang applies local wisdom in regulating the use of the owned territory, that is by converting the upstream part (protected area) into a catchment area, the lower part into a *parak* area, the middle part into a settlement

and plantation area, and the downstream part into a cultivation area such as rice fields and fish ponds. Through this program, the water from the spring sources on the hill is accommodated in several shelters and then distributed to the community houses with the aim that the flowing water is properly utilized. Another policy of water management and utilization in Nagari Koto Malintang is to oblige each house to install a water usage meter to realize good utilization of flowing water. By using this meter, it can be known how much water a household uses every day. Each cubic of water usage is charged by Rp. 500,-. The collected fund is used for installation repair costs. In selecting the plants to be planted, the people of Nagari Koto Malintang also pay attention to the land slope and contours. The bottom part which is relatively flat is planted with daily plants (eggplant, chilli, banana, etc.). The slightly sloping part is planted with coffee and cinnamon plants. Meanwhile, the uppermost and more steep area which is prone to land movements is planted with durian plants and other forest plants that are better able to bind the soil and resist erosion. In this regard, the community's knowledge about the nature of plants is used in utilizing different land conditions without damaging the environment and endangering the people in the lower area. There are 4 main tribes in Nagari Koto Malintang, namely Tanjung, Koto, Sikumbang and Pili. Besides, there are also minority tribes such as Caniago and Malay. Each tribe has its own land (parak, rice field or house land) whose area is different and not definite because their lands are not in one stretch.

b. Wisdom Values in Utilization Activity

Various forestry plants growing in the parak of the community of Nagari Koto Malintang are useful to meet the community's need for wood. There is no prohibition for the people to do logging as long as it is in accordance with the determined conditions. Every after cutting down trees in the parak, the people are required to replant it with new seeds. In this way, the existence of protected forest on the upper part will not be disturbed by the community and can still serve as a catchment area so that the ecological function of the parak is still well-maintained. The wisdom of the community of Koto Malintang in parak management, especially in durian plantations, is applied in the *balangge* activity done at the set time (04.00 – 06.00 a.m). In this activity, anyone can take durian fruit that is not theirs. This is a manifestation of humanity and togetherness values of Nagari Koto Malintang's community to share with those who do not have durian trees. Another characteristic of land management in Nagari Koto Malintang is the right given to those who have a rice field directly adjacent to the lake. They have the right to manage the lake as wide as the rice field owned. Not all the people have a rice field near the lake. However, this has never triggered a conflict between the people since it has been a hereditary tradition and known by all the people. The opportunity to manage the lake can be obtained if those who have a rice field on the lakeside does not want to manage the lake land. The owner of the rice field on the lakeside can rent the lake land at a price per year is Rp. 2,000,000 per plot (14 meters).

c. Wisdom Values in Maintenance Activity

The environment that has been preserved in Nagari Koto

Malintang does not encourage the community to utilize the existing forests and nature to fulfil their needs without concerning on the sustainability. The community is allowed to use the forestry products such as cutting down trees as long as it is replaced with the new one. One of the peculiarities of the forest management in Koto Malintang, especially in terms of maintenance, is that the obligation for newlyweds to plant at least 10 tree seeds before they get letters needed in the marriage process issued by the Nagari.

d. Wisdom Values in Control Activity

The wisdom values in terms of forest management in Koto Malintang can be seen from the regulations issued by the Nagari regarding the procedures and requirements for logging. This is one way to control forest conditions so that illegal logging does not occur. The regulation in Koto Malintang stipulates that those who want to cut down trees should first report their identity and the tool used. It is also permissible to use logging services from outside the Nagari, provided that the identity of the owner is included in the permit. The principle of "planting new ones, maintaining what is available" makes the forest in Koto Malintang remain sustainable until now.

e. Wisdom Values in Supervision Activity

Besides issuing several decisions and regulations regarding forest management in Nagari koto Malintang, the Wali Nagari also appointed Irzal Kari Marajo as the parak guard called Tuo Rimbo to supervise and protect the customary forest (parak) from all disturbances. Tuo Rimbo lives in a cabin in the customary forest every day and usually returns home once a week. Forest guarding and supervision are usually also carried out by the Forestry Police, assisted by the community specifically for protected forest supervision. As for the customary forest (parak), the supervision and guarding are usually done by Tuo Rimbo, customary leaders, Nagari apparatuses, and the whole community without any interference from the government. All the people have the right to report violations occurring in parak management to the Wali Nagari, of course with significant evidence. After receiving violation reports from the people, the Wali Nagari will conduct a review in the site and then proceed it based on the customary law.

f. Wisdom Values in Law Enforcement Activities

Sanctions or punishments given tend to be in the form of social sanctions, such as being ostracized, not being accosted or not included in any traditional activities. The forms of law enforcement in Nagari Koto Malintang related to forest management are catching and prosecuting loggers who do not have logging permits. If there are people cutting down trees without permission, they will be called and then brought on levelled-trials starting from the tribal level and community level. If the case is still not resolved at the tribal and community level, it will proceed to the Nagari level using the customary law, and if the case is not settled at the Nagari level, the case shall be reported to the police and tried using the state law.

4.3. Communication Role in Forest Management.

Point-type buoy absorbers normally transfer energy directly, with linear electric generators, or through a hydraulic or pneumatic system. In the first case, these are unconventional and

very expensive generators and, on the other hand, since they cannot easily dispose of an intermediate stage with accumulation of energy, they do not allow a continuous electrical supply (Grimwade, 2012) and in the other two cases the viscous forces are unavoidable. (approximately proportional to the speed) that apart from the loss of performance give rise to forces in opposition that slow the displacement preventing high accelerations. As previously mentioned, if a high acceleration of the buoy is not achieved, it is not possible to transfer a high energy to the converter. Accordingly, in order to avoid these drawbacks, a converter is proposed that employs only low-inertia mechanical elements in the primary conversion stage. In the secondary conversion stage (PTO) the energy from the first stage, accumulated in the form of mechanical energy for example, is transformed into another form of energy, such as electric power, the most usual way.

Communication processes involve several elements, namely communicators, messages, channels, communicants, and effects. Communicators and communicants perform three activities or actions, namely encoding (forming message codes), decoding (analyzing message codes), and interpreting (interpreting message meanings). In the management of Nagari Koto Malintang's forest, communication patterns of the indigenous people play roles in passing down the local wisdom values (planning, utilization, maintenance, control, supervision, and law enforcement) hereditarily to maintain sustainable forest conditions. Message delivery processes from one generation to the next regarding forest management have existed for hundreds of years. Therefore, the forestry and environmental conditions in Nagari Koto Malintang are sustainable as all the community elements have agreed and known the importance and ways of forest management in the Nagari. This common perception unifies the knowledge, attitudes and actions of the community.

Individually, the process of delivering messages is carried out by all parties. There is no primary communicator or first communicator. Nuclear families greatly play roles in spreading wisdom messages of forest management in Nagari Koto Malintang. These messages are distributed to families through forest-related activities carried out by family members every day. Because the inheritance of knowledge (on how to manage the forest and land belonging to one family generation to the next) run continuously, there is no misunderstanding or conflict between one family to another. Each Mamak (tungganai or warih) – mother's brother (uncle) – always remind his relatives at any time to obey the customary rules, including the rules on forest management. This is a mamak obligation. Whenever a problem occurs, the very first one responsible for solving it is mamak before being taken to the tribe and Nagari level. As the highest leader of the Nagari government, Wali Nagari is also obliged to deliver environmental messages. Wali Nagari is a bridge connecting the government with the customary leaders and community leaders. If there are new regulations issued by the government, the first party getting the information is Wali Nagari. After getting the latest information and regulations from the government regarding forest management, Wali Nagari is responsible for socializing it to the community through the Wali Jorong and customary leaders.

Information on the environmentally friendly forest management is obtained by the community in each customary or tribal meetings. All tribes in Nagari Koto Malintang routinely hold a meeting every three months, discussing everything related to daily life such as how to get along, how to dress, and how to manage the environment properly. As the central government of kanagarian, the Wali Nagari office has a role in socializing knowledge to the community, including the knowledge about environmental management. The Wali Nagari office has officers who serve all community affairs. Regarding forest management, all the latest information of the government programs is distributed by the Wali Nagari who serves as the bridge between the government and the community. As a government organizer in the Nagari Koto Malintang, the Wali Nagari which is also a pangulu (headman) of Pili tribe becomes a person of trust for the community in selecting and adopting information and innovation related to anything. Pangulu is a community trustee who is in charge of caring for the community's family physically and spiritually.

The second element in the communication process of forest management is messages. In the forest management activities in Nagari Koto Malintang, environmental messages delivered to and between communities have been effective. This is evidenced by the community's understanding of the message, indicated by the attitudes and actions of the community that support and follow up on the message as expected by the message sender.

4.4. *Communication Model of Forest Management in Nagari Koto Malintang.*

The process of communication in Nagari Koto Malintang has been going well since a long time ago. From the very first opening of the land there, the predecessors in Nagari Koto Malintang have established good communication with each other. The division of cleared land to be used for farming was also already communicated well. The land in Nagari Koto Malintang is not divided or intended for certain tribes or families. There is no definite information about the land area per tribe because the land location is not in one stretch. This division of land has been set that way since the previous ancestors first came to Koto Malintang. For the indigenous people in Nagari Koto Malintang, forests and nature are the sources of life. They get benefits from nature both economically, ecologically, or socially. Therefore, they are more aware of how to manage and utilize the forest without neglecting its sustainability.

In essence, the study of forest benefits suggests that the main benefit felt by the community is the adequate water needs for all activities. The community realizes that the water availability depends on the forest on which trees are overgrown to store water and restrain the erosion rate during the rainy season and drain the water during the dry season, thus the community's water needs remain fulfilled throughout the year.

The community awareness is inseparable from the roles of various parties, beginning with the customary agreements of their predecessors in managing the environment wisely. The agreements are then passed down from generation to generation so that the natural conditions in Nagari Koto Malintang are

still maintained to date. The geographical condition of the Nagari land which is relatively inclined is one of the reasons why the people maintain the forest. If the forest in the upstream is damaged, landslides will threaten the Nagari.

Community compliance with the customary rules, directives, and rules made by the customary leaders accompanied by causal evidence and examples (such as, if the forest is damaged, there will be natural disasters, lack of water, and so on) becomes an important factor in raising the community's environmental awareness. The continuous flow of information from one generation to the next forms a uniform perception and knowledge in people's thinking about how forests are managed. This is supported by the attitude of respecting the rules and customary leaders, coupled with the commitment of all levels of society in carrying out all the rules properly so as to create sustainable environmental conditions. The continuation of information on forest and natural management from generation to generation is still ongoing. Some communication is carried out by the community to manage the forest in Koto Malintang. In communication, communicators are the main element in conveying information to communicants. Besides, the indigenous people of Nagari Koto Malintang always notice each other to adhere to their customary rules. The strong social relationship between people makes them very sensitive to others' problems and feelings.

The communication process that has been established from generation to generation in Nagari Koto Malintang involves all layers of community. The customary leaders' roles in the community life greatly contribute in changing and maintaining positive behaviors in managing the forest. Besides customary leaders, parents also play an important role in regenerating knowledge of how to maintain forests. The Wali Nagari, who plays a dual role as a customary leader and government leader of the Nagari has a key role by whom all the information and policies are decided.

The messages of local wisdom in forest management have been very patterned and the information sustainability to the next generation is well maintained so that the community's forest utilization behavior always pay attention to the carrying capacity. The messages include information on how to choose plants to be planted on a particular land, how to maintain and conserve existing forests, how to utilize existing resources without neglecting its sustainability, and how the community agrees to the customary rules of forest management up to the process of supervision and law enforcement carried out together.

These message of local wisdom are conveyed through various kinds of socio-religious activities, such as doing Shubah prayers together, reading the whole Al-Qur'an, commemorating the month of Muharram, commemorating Friday, and so forth. Of the many activities, doing joint Shubah prayers considerably contributes to changing the community behavior, considering that this activity is carried out routinely every day. Every time a joint Shubah prayer is already done, there will be a religious sermon interspersed with environmental management messages, such as the prohibition of cutting trees carelessly and littering, the calling for always planting vacant land. In the religious sermon, there will be also an explanation of the benefits

of preserving forests, among which the most important is for fulfilling the community's water needs.

The messages conveyed on an ongoing basis form a perspective in the community that forests are a source of life. If forests are not maintained, water availability will be in trouble. This knowledge is formed because the people strongly believe in the message conveyed by the customary leaders since ancient times so that their forests are sustainably maintained. The determinant of the forest sustainability is the community respect to the customary leaders coupled with a commitment to carry out all the agreed rules.

Conclusions

ased on the analysis results, it can be concluded that the community and government of Nagari Koto Malintang have arranged the Nagari's space and land by dividing it into three: namely an upstream area converted into a catchment area, the middle area converted into a plantation and settlement area, and the downstream area converted into cultivation land. Ecologically, the existence of forests also benefits the people of Nagari Koto Malintang related to environmental management so that they are free from threats of floods and galodo, lack of water needs, bad air quality, and flora and fauna scarcity. Meanwhile, economically, the benefits of forests felt by the community are the adequate water for irrigating agriculture, plantations, tabek and ponds from which the yields provide economic benefits to the community. As for the social benefits, forests can tighten the community kinship, increase the community participation in forest management, create employment opportunities, and maintain local knowledge and institutions. In the local wisdom utilization activities, the community obeys the logging rules, such as getting logging and transport permits (by obtaining 7 levels of permits from the customary and community leaders) and reporting the data of the list of cutting tools used. In utilizing non-timber forest products, several local wisdom of Nagari Koto Malintang include carrying out "balangge" activity and harvesting ambalau, rattan, honey, and manau. Communication greatly contributes to passing down the local wisdom values in forest management activities in Nagari Koto Malintang. The communication can start from the smallest group, such as a father/ mother to their children, a mamak to his nephews/nieces, ninik mamak (customary leader) to the same tribal community, and Wali Nagari and the Nagari apparatuses to the community. Forest management and conservation messages are conveyed through formal and informal meetings and the Nagari regulations. Another important factor is that the people really respect their customary rules and leaders, and carry out anything that has been agreed jointly.

The description of the results above indicates that with the knowledge owned, the community, so far, has successfully created an environment that provides great benefits for their lives without neglecting the environmental carrying capacity. To maintain this success, the government is suggested to provide a clear legal strengthening and protection for the indigenous people in forest management so that the government programs can be done by empowering the community around the forest in Koto

Malintang. Furthermore, some local wisdom owned by Nagari Koto Malintang are expected to be adopted by other community forests in Indonesia, such as the obligation to replace the cut plant or tree with the new one and the obligation for new-lyweds to plant 10 trees. The local wisdom can be adapted accordingly to the local community's norms and customs. This is considered effective in reducing forest damages, given that many indigenous people living around forests. The role of the government here is to make special rules for community-based forest management which is, of course, coupled with sanctions for those who violate.

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