

The Practice of Local Wisdom of *Tobelo Dalam (Togutil)* Tribal Community in Forest Conservation in Halmahera, Indonesia

M. Nasir Tamalene^{1,*}, Mimien Henie Irawati Al Muhdhar², Endang Suarsini², Fatkhur Rochman²

¹Biology Education, Khairun University Jalan Bandara Babullah, Ternate, Indonesia

²Biology Education, State University of Malang Jalan Semarang 2, Malang, East Java, Indonesia

Abstract The *Tobelo Dalam (Togutil)* tribal community has inherited local wisdom in managing the forest resources from their ancestors. The loss of these local wisdom values have led to the ecological crisis which creates an imbalance situation in the ecosystem. The community is expected to realize that the ecological crisis can be saved back through local wisdom. To save the ecological crisis, the society ethics of the native tribes needs to be gained back. A participant observation and open interviews were done to investigate this issue. In the participant observation, the researchers were involved in the informants' daily activities. Open interviews were also conducted at this stage. There were 21 informants; 12 persons come from the area of river *Tayawi* and 9 persons come from river *Suwang*. The results of the research revealed the fact that the local wisdom possessed by the *Tobelo Dalam (Togutil)* tribal community has been manifested in their concept of philosophy of life, the knowledge of the physical environment, and the conservation of the forests. Local wisdom in the management of the forest resources can still survive despite the influence from outside. The local wisdom is eternal since the people maintain their philosophy of life, *Hidup Basudara* (live in harmony) which contains a belief that people and nature need to live side by side. The practice of local wisdom-based conservation that takes the form of the sacred forest of *Gosimo*, *Matakau*, *Pohon Kelahiran* (Tree of Birth) and *Pohon Kematian* (Tree of Death) is a part of local knowledge that continues to be taught to the next generation. It becomes an invaluable ancestral heritage in forest conservation.

Keywords Local Wisdom, *Tobelo Dalam (Togutil)*, Forest Conservation

1. Introduction

Indonesia has resources and biodiversity that are very important and strategic for the survival of the people. It is not solely because of its position as one of the world's richest countries in biodiversity (mega-biodiversity), but because of its close linkages with the richness of local culture diversity possessed by this nation (mega-cultural diversity). The founders of Republic of Indonesia have already realized that Indonesia is an archipelago country that has pluralist political system and laws and diverse socio-cultural condition. The "*Bhinneka Tunggal Ika*" philosophically indicates respect for that diversity [1]. It is further said that from the diversity of the local systems, there is some traditional wisdom that is respected and practiced by indigenous communities in Indonesia. They are: 1) the dependence of humans on nature that requires a

positive harmony, in which they become a part of the nature itself, which should be kept and preserved in balance; 2) mastery over the specific indigenous rights as exclusive and/or shared ownership communities (communal property resources) or collectively known as indigenous territory (in Maluku, known as the *petuanan*, in large parts of Sumatra are known for *ulayat* dan *tanahmarga*) that binds all citizens to maintain and manage it for justice and shared prosperity as well as to help avoid the exploitation by outside parties.

Many examples of cases showed that the persistence of communal or collective ownership system can prevent excessive exploitation of the local environment; 3) system knowledge and structure of cultural settings ('Government') which provides ability to solve the problems they face in the utilization of forest resources; 4) Allocation System and customary law enforcement resources to secure the resources from excessive use, either by the community itself or by the outside community; 5) Mechanism of equitable distribution of the results of the "harvest" of natural resource belonging together that could dampen social jealousy in the midst of the community. Local

* Corresponding author:

hannakhairunnisa2013@gmail.com (M. Nasir Tamalene)

Published online at <http://journal.sapub.org/plant>

Copyright © 2014 Scientific & Academic Publishing. All Rights Reserved

wisdom is a part of the cultural local knowledge that is formed through a process of learning by way of observation, testing, practice and its spread in people [2]. Local knowledge is stored in the minds of locals, either individually or in groups. The meaning of local knowledge is much broader than the term "traditional wisdom" a memorable static or less adapted to changes. Everything is 'traditional' is not always able to resolve the question of natural resources and the environment, or in tune with the aspects of preservation. Local knowledge is constantly evolving. It may be a result of a merger between the experiences in the community with the knowledge of an outsider [3]. Local traditional wisdom in accordance with its origin is one of the cultural heritages that exists in the society and is orally administered by community groups concerned. Local wisdom includes knowledge, whether it is obtained from the previous generation as well as from a wide range of experience in the present. Local wisdom could be interpreted as a set of knowledge, values and norms of a particular form of adaptation and life experience of a social group who lives in a certain location [4]. The environment and the life experiences have taught humans to develop patterns of thinking and patterns of a specific action; because that is the only way they can make peace with the environment, with themselves, with each other and with members of other groups.

There is one of the indigenous communities living in remote forests of Halmahera Island, namely the *Tobelo Dalam (Togutil)*. Remote indigenous community of *Togutil* is known to have had knowledge of the utilization and preservation of natural resources, biological diversity, including knowledge of the utilization of genetic resources in agriculture. However, knowledge systems, owned by community *Togutil* have not been well documented. The documentation of the *Togutil* knowledge system will be very meaningful for adding information about the diversity of genetic resources that are utilized by the community of *Togutil* that have the potential to be developed further in the program of agricultural cultivation as well as efforts to prevent the occurrence of erosion [5]. *Togutil* tribe lives are very dependent on hunts, sago, and simple agricultural systems [6]. The loss of forest resources means the destruction of most of the tribal life of the *Togutil* indigenous community because it was claimed as their habitat since long time ago.

Togutil tribal community's dependence on nature makes them have a nomadic life pattern. They will move to a new area if they have run out of fruit and animals to eat in that place. They were known as the owner of the forest in Halmahera because it was them who first explored it. *Togutil* tribal community live from hunting and gathering forest products. They eat sago (*Metroxylon sagu* Rottb) as the source of carbohydrate. At this time, most of them are farmers (*Togutil* non-nomaden residents) and some still depend on forest products, although they have been familiar with the farming system (the *Togutil* temporary residents). In addition, they hunt for food, look for rubber from damar

tree (*Agathis dammara* (Lamb.) Rich.), and collect Maleo eggs (*Macrocephalon maleo*) to be sold or exchanged with the residents in the village on the market days. *Togutil* people believe in the spirit of the ancestors that occupy the entire natural environment [7, 8]. *Togutil* community believes the existence of the supreme power and authority known as *Jou Ma Dutu*, the owner of the universe or is usually called *aso gikiri-moi* which means the soul or life. *Togutil* people, however, never do the rites of worship. They never mention the term or name specific to the original religion system. The original beliefs of the *Togutil* are centered on respect and worship to the ancestors which are depicted in various spirits occupying the whole environment in the form of a natural object (nature) as well as the objects of copyright works of man (culture) that have power to influence success and failure.

Togutil live in the remote areas of Halmahera. They are nomads and semi nomads grouped in a particular community. The other *Togutil* can be found in some areas such as *Tobelo*, *Dodaga*, *Kao* (near *Gunung Sembilan*), *Wasilei* (*Dodaga Village*, *Tukur-Tukur*, *Tutulung Jaya*, *Toboino (Totodoku)*, and at *Maba* and *Buli*. Every primitive tribe has claimed their own territory. The area is generally bounded by hills, rivers, or certain trees. The area is a region where they search for food through hunting and cultivating. There will be conflicts between communities if they have passed other tribe's territory. In general, people in North Maluku recognize *Togutil* as a primitive and there is only one group of the tribes inhabits the forests of Halmahera. This tribe lives in their respective communities such as *Togutil Tobelo*, *Togutil Kao*, *Togutil Dodaga*, *Togutil Wasilei*, *Togutil Suwang*, *Togutil Maba* and *Togutil Tayawi*. This means that by organizing small groups, they have tried to maintain their livings.

From the perspective of culture, the concept of biodiversity cannot be separated from the human factors which have a responsibility towards the sustainability of the diversity that exists on Earth. UNESCO and UNEP in the World Summit on sustainable development held in Johannesburg in 2002 stated that sustainable development covers both cultural diversity and biodiversity. It is to protect biodiversity and simultaneously appreciate and recognize the rights and role of the local people as the main agents that maintain and shape the biodiversity. UNESCO declared that we will not be able to understand and conserve our natural environment if we do not understand the culture of the human beings who make up the nature. Cultural diversity is a reflection of the biodiversity. The statement means that each culture builds on knowledge, practices, as well as other cultural representations in utilizing and maintaining environmental sustainability and natural resources [10]. Those things are reflected in the everyday life and local traditions that is local wisdom.

The local wisdom of *Tobelo Dalam (Togutil)* tribal community is unique regarding the management of forest resources on the island of Halmahera. In many cases, local wisdom in managing forest resources has become extinct

along with the decimation of biodiversity, but early in the 21st century, the discourse on local wisdom has been a focus of government as an important part in development programs in the future. The existence of ecological crises lately has led to a new awareness that ecological crisis can be saved back through local wisdom in *Tobelo Dalam* tribal community (*Togutil*). To save the ecological crisis, it is necessary to review the native ethics, local wisdom and wealth, and to solve the ecological crisis which is mainly caused by errors of perspective and behavior of modern society.

2. Materials and Methods

The study was carried out in May to August 2014. The method of this research is in-depth observations and interviews. The interviews were used to obtain data about the local wisdom of *Tobelo Dalam (Togutil)* tribal community in the practice of forest conservation in Halmahera. The observation done was a participant observation meaning that the researchers were involved in the informants' daily activities. Open interviews were also conducted at this stage. Purposive sampling technique was employed to choose the informants who are regarded as experts in local wisdom of *Togutil*. Informants cannot speak *Bahasa Indonesia*. Thus, they were assisted by a translator.

The study was conducted in regions along the *Tayawi* in *Koli* and river *Suwang* in *Gita*, district *Oba*, *Tidore* Islands (Figure 1). There were 21 persons involved in this study, 12 people come from the region of the river *Tayawi* and 9 people come from the region of the river *Suwang*.

3. Results and Discussion

Local wisdom can still be found in the community of *Tobelo Dalam (Togutil)*. It includes the view of life; knowledge of the physical environment and conservation in the management of forest resources; Here are some form of local wisdom that has been practiced by the tribal community of *Tobelo Dalam (Togutil)*:

Kermat Gosimo Forest

The Sacred Forest of Gosimo is found in the community of *Tobelo Dalam (Togutil)*. Gosimo is derived from the Tidorelanguage which means older people (ancestors) while in Ternate called *Himo-himo*. There are two types of *Gosimo* forests, namely *Gosimo male* forest and *Gosimo female* forest. Both types of the forest are bounded by river *Tayawi* and the area is unknown because it is *pamali* (taboo) to be measured. Each person is not given permission to enter the forest.

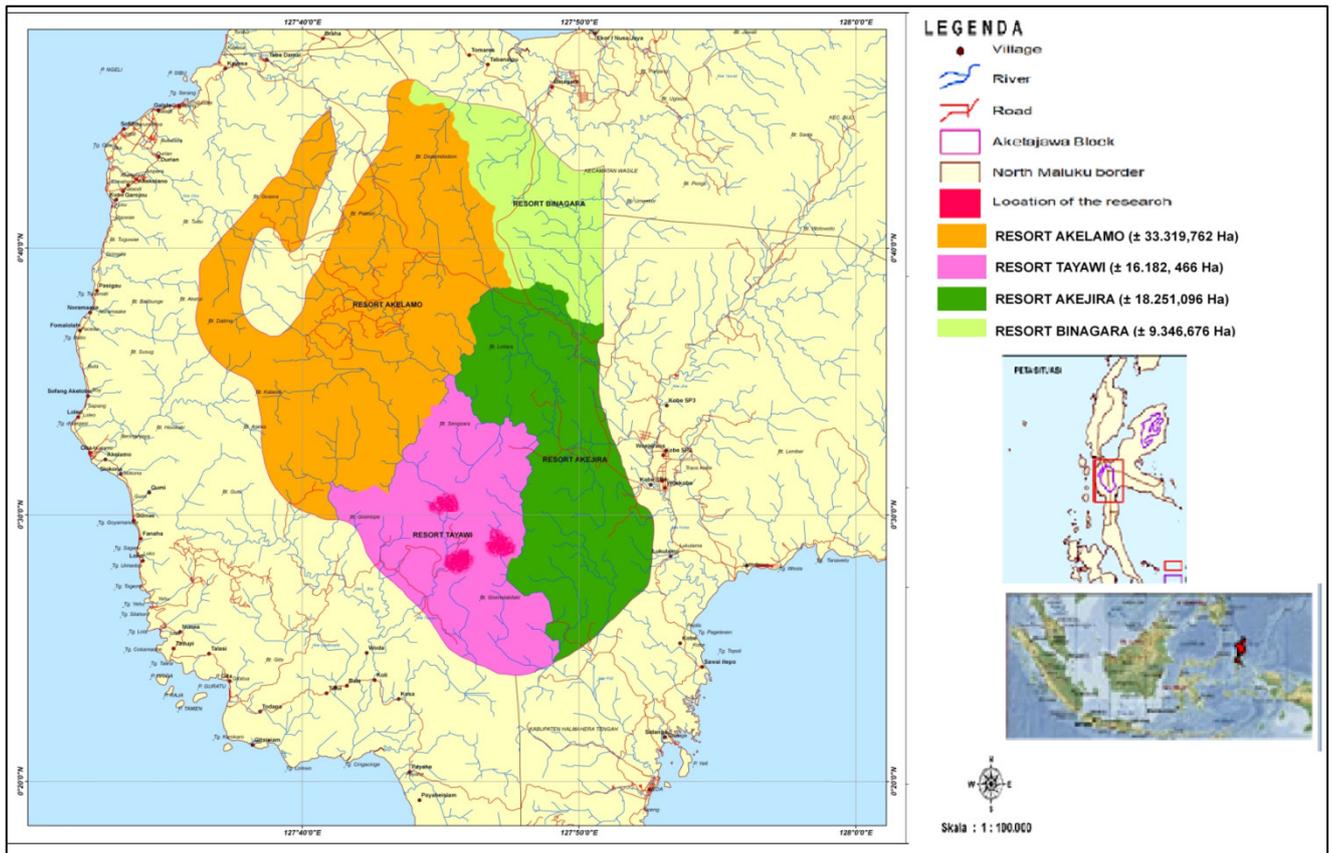


Figure 1. Location of the Research (Halmahera Island)

They are not allowed to cut and take timber or forest products from the forest. In principle, people can only enter the hallowed forest when there are specific ceremonial purposes, such as: community safety when there is a ceremony for the sick person. The ceremony is not performed by a tribal community *Tobelo Dalam (Togutil)* but done by people outside of this community, that is, certain people who have supernatural powers derived from the village of Gita. This ceremony is done to appease the ancestor (the owner of the forest). Spells will be read and some gifts will be delivered to the owner of the sacred *Gosimo* forest. Tribal Community *Tobelo Dalam (Togutil)* has the view that the forest is part of their belief structure. Prohibition to enter the *Gosimo forest* area has already become a tradition in the community of *Tobelo Dalam (Togutil)*. There is an early warning informed orally to their children, the communities surrounding the forest, and guests from various cities in Indonesia, even abroad. Everyone is forbidden to cut and take timber or other forest potential because it will pose a danger to one's own as well as his family. The forests are sacred to the people in *Tobelo Dalam (Togutil)*; therefore, they need to protect them.

Although the local wisdom is not familiar with the term conservation, local community have been practicing plants and animals conservation. They determine a community forest areas or sites that are sacred to be protected together. Such local wisdom has been proven to save a region along with their contents with various forms of restrictions for those who break them [11,12]. Local wisdom will guarantee the success because it contains norms and social values that show how they should establish a balance between resource carrying capacity of the natural environment with the lifestyle and needs of mankind as an illustration from a social point of view about poverty. By digging and developing local wisdom, poverty can be prevented because the natural resources have been maintained for the next generation.

Results of other studies have proven that traditional religions and local cultural practices have contributed to forest conservation [13]. Traditional belief against something taboo helps enforce the rules for the preservation of the environment, for any person has to refrain from the use of resources in vain, mainly related to the Holy places. In particular, the important role of these practices in the conservation of biodiversity is essential for the protection of forests and other natural resources. The practice of local wisdom traditions strengthens the emotional relationship between *Tobelo Dalam* tribal communities (*Togutil*) and their environment. The combination of the physical and psychological aspects form an emotional attachment to the environment so as to establish the attitude of caring for the environment. Tribal community *Tobelo Dalam (Togutil)* has long been settled and cultivating along the river *Tayawi* and river *Suwang*, although some families still live as semi nomadic. This community believes that living close to the

water and forests will provide benefits to their lives and their families. Indigenous communities of *Tobelo Dalam (Togutil)* have a philosophy of life, namely; *Basudara*. This principle prioritizes life that is based on the principle of unity and togetherness among fellow community as well as with nature. For instance, hunting results or the results of the forest will be shared collectively in communities that live side by side. They view the forests as a friend and a home for them so the forests need to be protected.

Matakau

Matakau is a concept of forests or land protection for social, economic, and ecological community conducted by the tribe of *Tobelo Dalam (Togutil)*. This concept is a part of the traditional knowledge that is constantly kept up to now. *Matakau* in practice is that if a forest area or land owned by the community of *Tobelo Dalam (Togutil)* is taken secretly without the knowledge of the owner of the land, it will be exposed to *Matakau*. *Matakau* is placed next to or inside the forest/land that has the potential for economic (Figure 2). Someone affected by *Matakau* will not be able to walk and stand at the location where the person is taking the resources from the forest or area belonging to the tribal community of *Tobelo Dalam (Togutil)*. Someone affected by *Matakau* can be cured if they are discovered by the owner of the land. The extreme impact of the *Matakau* on people is causing pain and even death. The forest or land protection established by the *Tobelo Dalam* tribal community (*Togutil*) is actually the real form of local wisdom-based forest conservation practice which combines the main principle of traditional knowledge that is the relationship with nature and the relationship with other human beings.

Matakau is made from used liquor bottles, for example a bottle of syrup and bottles of beer then tied with a red cloth and spells. The meaning of red cloth was the prohibition to take any kind of potential that exists in the forest. When it is seen from a social point of view, the person is forbidden to steal/take possession of someone else without permission from the owner. As a result, the presence of *Matakau* protects the forest from harmful activities.



Figure 2. *Matakau* to protect the plants (A) *Matakau* Plant Conservation house (B)



Figure 3. Trees of birth *Lansium domesticum* (A) *Sida rhombifolia* (B), Trees of death *Bambusa glaucescens* (C) *Artocarpus heterophyllus* (D)

The principles of local wisdom practice have evolutionary developed as an accumulation of findings from the experience of indigenous peoples for hundreds of years. Therefore, these principles are also multi dimensional and integrated in the system of social structure, religion, laws and the institutions of the indigenous people concerned. The indigenous communities, in fact, are able to prove that they can survive in such local systems. Local communities in rural areas that no longer define and label themselves as indigenous peoples still keep on applying this wisdom (knowledge and procedures) in their life, including the leveraging of resources and biodiversity to meet needs such as medical treatment, provision of food, and so on. A wealth of resources and biodiversity of indigenous owned and protected by the indigenous wisdom and management practices of natural resources have been supporting life and their safety as a community and at the same time supporting the ecological service function of nature to fulfill the needs of other living creatures as [14]. Alignments of traditional wisdom in every social institution are initial to the devotion of the sustainability of indigenous communities living in Indonesia.

Philosophy of forest management practiced by the tribal communities is a form of intellectual/cultural wealth of knowledge which should be maintained. The UN Convention on biological diversity which has also been ratified by Indonesia is pushing the protection of natural resource management and intellectual property contained therein. In fact, the forest management practice takes into account the power of the natural resources support and the principles of sustainability to continue its utility [15]. Protection and utilization of forests are focused to improve diversity in the forest ecosystems, appreciate and preserve the natural damage in forests, protect, maintain and repair the structure, composition and function of the community. The *Tobelo Dalam* tribal communities (*Togutil*) have an understanding that the concept of landscape is very dependent on all the bodies and processes within [16]. The treatment of wood or plant must be balanced in the aspects of ecological, social and economic. Most indigenous communities still practice the local wisdom through traditional ecological ethics. A series of investigation shows

that there is a large number of local biodiversity elements protected by local cultural practices [17]. Certain cultural elements may not have consequences, but still reflect the conservation, understanding and appreciation of the intrinsic value or the existence of collective forms of life and love and respect for nature. Studies show that traditional conservation ethic is still able to protect many biodiversity provided as long as the local community retains the natural resource management based on local culture.

The practice is also done by *Dayak* society which inhabits the island of Borneo. *Dayak* tribe consists of; *Dayak Warukin*, *Dayak Upau*, and *Dayak Loksado*. Associated with the natural resource management, *Dayak* tribal community also implements a pattern similar to other tribes do. This pattern is revealed in the interaction of three groups of *Dayak* society which is based on the same understanding in a similar way to protect forests and people. The universe is regarded as a manifestation of *Datu Alam* and *Datu Tihawa*. *Dayak* people's confidence is reflected in the form of their life, their social values revealed on the next generation, as well as knowledge of the tools that support their work. *Dayak Warukin*, *Dayak Upau*, and *Dayak Loksado* live from agriculture, rubber tapping, and food found in the forest [18]. The forest becomes a place to make a living, so they must protect it.

Tree of Birth and Tree of Death

Tobelo Dalam tribal community (*Togutil*) has a knowledge of the conservation of plants, namely; tree of birth and death (Figure 2). The concept of conservation was discovered in people living along river *Tayawi* and river *Suwang*. This concept is put into practice with the aim of preserving the plants, because they argue that plants are capable of providing food for them. Every child born will plant one tree of birth and for everyone who dies, the families left behind will plant one tree of death. These communities live together because they were born from the same father named *Kahoho*. The role of *Kahoho* is very important and he is highly respected in his generation. The tree of birth and death is a message that is deposited to his sons, but this concept has been lost and is not conducted by the *Kahoho* generation because trees planted mostly die because they did not get appropriate treatment.

The meaning of the message that is contained in the concept of conservation through tree of birth and tree of death is that every generation must maintain and protect vegetation because plants are capable of delivering food to the *Tobelo Dalam* community (*Togutil*). The tree of birth was marked by food hanging on it as the gifts for the ancestors spirit. This is done with the intention of keeping the plants from extinction. While the tree of death was planted to be to be cared for and protected by a family whose one of the members has passed away. This means that by planting trees for the dead, the living family commemorate the spirit and give respect to him/her. Tree of Death is tied with black cloth; the cloth wrapping is taken from corpses. According to *Tobelo Dalam* community

(*Togutil*), the purpose of giving a symbol of black cloths in plants is that even though their family members have died, they still live as the tree grows. If the trees produces fruit, the spirit has already been 'settled' in another realm, and when the tree does not bear fruit or die then it is believed that the spirit is not yet calm.

The utilization of the natural resources controlled by the local wisdom protects the forest from being exploited. Therefore, damaging the forest ecosystem means violating the value of local wisdom of *Tobelo Dalam* tribal community (*Togutil*). Traditional society has gathered a wealth of local knowledge, transmitted for generations. Experience has taught them how water, trees, and other natural resources shall be used in accordance with needs and managed to help them survive for a long time. Local knowledge can also be correlated with the curriculum in the schools through formal science, thus will help people cope with the problem of global warming as well as to manage the risks of damage to local resources [19]. Local knowledge and culture is very important for biodiversity conservation because both serve as a repository of alternative choice that maintains cultural diversity and biology [20]. As a scientific focus, both of which have been instrumental in the tradition of the local community. People's conservation based on local wisdom can increase community awareness regarding the value, meaning and importance of forests for life. A model of local wisdom based conservation consists of three parts; a) network community formation; b) knowledge creation; c) creation of local wisdom [21]. Trust through religious ceremonies is the mechanism for creating social groups and creating symbols and the identity of the specific community [22]. This creates harmony within the group and the role of collective action in the community with the goal of creating harmony in the family, the local community and friends of nature. Local wisdom is also practiced by Aboriginal communities in British Columbia and Canada called Traditional Ecological Knowledge and Wisdom (TEKW). TEKW consists of: knowledge of ecological principles, such as the succession of all components of the environment, the use of ecological indicators, strategies for monitoring and conservation of resources, effective systems of knowledge, and attitude of respect for ancestral lands as well as the belief to recognize the power of nature and spirituality. These characteristics allow many Aboriginal groups to live sustainably within the local environment [23]. The practice of local wisdom is also carried out by society in Thailand. Local traditional society still has a good knowledge to live independently, in their own way and have dependence on nature, so the preservation of nature through the concept of local wisdom has been preserved continuously [24]. In Indonesia there are also forms of local wisdom, owned by local communities: one community of *Dayak* in Kalimantan. *Dayak* people have knowledge of agricultural management system called *Kaleka*. For many centuries *Kaleka* has had a wide variety of plants collections that are arranged on the upper floor, middle

floor and walks downstairs. Many of the species that existed on the premises of *Kaleka* is a species endemic to the island of Borneo. The diversity and complexity provides a positive contribution to the conservation of biological diversity [25]. *Kaleka* has plants diversity and ecosystems that benefit the community.

Wisdom and local culture is carried out wisely, for example; a tree has its benefits as a good source for the purposes of firewood, to boil water, to cook food, even certain plants contain a drug substance, food, dyes, etc. Elsewhere, a certain species of trees can be used as shade for a family picnic. This means that the plant is the source of life, and then continues to be preserved through local wisdom [26]. The pattern of forest conservation in Indonesia especially in Halmahera Island needs to give attention to the rights of indigenous people. This is done to avoid the conflict [27]. Government policy changes before and after the reformation led to the transformation of the pattern of forest management from a centralized to a decentralized [28]. A change in this pattern allows each party (the State and indigenous peoples) to develop a mechanism that controls the system balance and integration. As a result, the risk of over exploitation of forest resources by each party can be avoided.

4. Conclusions

The community of *Tobelo Dalam (Togutil)* has local wisdom that is realized through the concept of philosophy of life, the knowledge of the physical environment, and the conservation of forests. Local wisdom in the management of forest resources can still survive despite the influence from outside the culture, due to some constituents which come from tribal community itself, namely the relationship between the factors of the local community with nature that is transmitted through the philosophy of *hid up Basudara* (live in harmony). This philosophy is believed to be a guideline for living with nature. The practice of local wisdom based conservation that takes the form of the sacred forest of *Gosimo, Matakau*, tree of birth and tree of death is local knowledge that continues to be shared with the next generation because the local wisdom is an ancestral heritage which has conservative meaning to preserve the forest.

REFERENCES

- [1] Nababan, Pengelolaan Sumberdaya Alam Berbasis Masyarakat Adat (Kearifan Tradisional: Awal bagi Pengabdian pada Keberlanjutan Kehidupan). Ulayat Foudation Community Development Enviromental Advokation, Indonesia, 2003.
- [2] Forgie, V.E, Horsley, P.J, Johnston, J, *Facilitating Community Based Conservation Initiatives. Science for Conservation*, Department of Conservation, Wellington, New Zealand, 2001.

- [3] PNPM Lingkungan Mandiri Perdesaan (PNPM-LMP), Pengelolaan Sumber Daya Alam untuk Masyarakat Perdesaan. International Development Cooperation. Jakarta Indonesia, 2012.
- [4] Mathias, E, Recording and Using Indigenous Knowledge: A Manual. International Institute of rural reconstruction, Cavite, Manila Thailand, 1995.
- [5] Kartini Abd. Karim, Mahmud Thohari, Sumardjo, 2006, Pemanfaatan Keanekaragaman Genetik Tumbuhan oleh Masyarakat Togutil di Sekitar Taman Nasional Aketajawe Lolobata. *Jurnal Media Konservasi*, 10 (3): 1-12.
- [6] Lis Nurrani dan Supratman Tabba, 2013, Persepsi dan Tingkat Ketergantungan Masyarakat Terhadap sumberdaya Alam Taman Nasional Aketajawe Lolobata di Provinsi Maluku Utara. *Jurnal Penelitian Sosial dan Ekonomi Kehutanan*, 10 (1): 61-73.
- [7] Martodirdjo, H.S, *Orang Togutil di Halmahera*. Disertasi tidak diterbitkan. Bandung. PPS Universitas Padjajaran Bandung Indonesia, 1996.
- [8] Martodirdjo, H.S. 1996. A Changing Tugutil of Halmahera, Indonesia. *Journal of Asian and African Studies*. 5 (2): 153-165.
- [9] M. N. Tamalene, 2014, Pendidikan Kearifan Lokal, Kerusakan Hutan, dan Kepunahan Spesies Burung Endemik. *Jurnal Pendidikan Biologi*. UM Malang, 8 (5): 131-139.
- [10] Unesco, International Implementation Scheme for DESD, Paris: Unesco, 2005.
- [11] Paramita Atmodiwirjo, 2013, School Ground as Environmental Learning Resources: Teachers' and Pupils' Perspectives n Its Potentials, Uses and Accessibility Department of Architecture, University of Indonesia. *International Electronic Journal of Environmental Education*, 11 (3): 101-119.
- [12] Selleres and Lee, Can We, 2012, Teach Proactive Turtle Conservation Our Classrooms. *Interational Journal The American Biology Teacher*, 7 (2): 159-163.
- [13] A. Rim-Rukeh, G. Irehievwie² and I. E. Agbozu, 2013, Traditional Beliefs and Conservation of Natural Resources: *International Journal of Biodiversity and Conservation*, 5 (7): 426-432.
- [14] Alexander Ramodoss and Gopalsamy Poyya, 2011, Biodiversity Conservation Through Enviromental Education for Sustainable Development: A Case Study from Puducherry, India. *International Journal of Enviromental Education*, (2): 12-21.
- [15] Pusat Konservasi Alam Direktorat Jenderal Perlindungan Hutan dan Konservasi Alam Departemen Kehutanan Republik Indonesia. 50 Taman Nasional Indonesia. Bogor, 2006.
- [16] Van, T E, Kittredge, David B; Butler, Brett J Catanzaro, Paul F, 2012, Reimagining Family Forest Conservation: Estimating Landowner Awareness and Their Preparedness to Act with the Conservation Awareness Index. *International Journal of Forestry*, (20): 215-224.
- [17] Debel Deb & K. C. Malhotra, 2001, Conservation Ethos in Local Traditions: The West Bengal Heritage. *Society & Natural Resources: An International Journal*. (14): 711-724.
- [18] Fahria Noor, Tri Windari, Taharuddin, Rusli Mar'i, and Maryono, 2013, The Practice of Local Wisdom of Dayak People in Forest Conservation in South Kalimantan. *Indonesian Journal of Wetlands Environmental Management*, (1): 2354-5844.
- [19] Shaik Khaleel Basha, Gudivada Sudarsanam, Dalazak Parveen & Ammnish Verma, 2012, Conserving Biodiversity of Yerramalais of Kurnool District, Andhra Pradesh, India, through People's Biodiversity Registers Program. *Biodiversity Journal*, 3 (2): 111-118.
- [20] Virginia D. Nazarea, 2006, Local Knowledge and Memory in Biodiversity Conservation. *The Annual Review of Anthropology*, Department of Anthropology, University of Georgia, Athens, Georgia, (35): 317-35.
- [21] Rattiya Pongsiri¹, Songkoon Chantachon¹ & Noipranorm Kiantong, 2013, Conservation and Promotion Model for Local Wisdom Related to Bai-Sri-Su-Kwan Traditions, Beliefs and Ceremonies in the Isan Region, *Asian Social Science*; (9): 11-23.
- [22] Ginger Potter, 2010, Environmental Education for the 21st Century: Where Do We Go Now? *THE Journal Of Environmental Education*, (41): 22-33.
- [23] Nancy J. Turner, Marianne Boelscher ignace, and Ronald Ignace, 2000, Traditional Ecological Knowledge and Wisdom of Aboriginal Peoples in British Columbia. *Ecological Applicationis*. By the Ecological Society of America, 10 (5): 1275-1287.
- [24] Miss Roikhwanphut Mungmachon, 2012, Knowledge and Local Wisdom: Community Treasure. *International Journal of Humanities and Social Science*, (13): 174-181.
- [25] Anggie Abban Rahu¹, Kliwon Hidayat, Mahrus Ariyadi, Luchman Hakim, 2014, Management of Kaleka (Traditional Gardens) in Dayak Community in Kapuas, Central Kalimantan. *International Journal of Science and Research*, 3 (3): 205-210.
- [26] United Nations University Institute of Advanced Studies (UNU-IAS), 2013, Traditional Knowledge and Biodiversity. International Organizations Center, Pacifico-Yokohama. Japan. Minato Mirai, Nishi-ku Yokohama (1): 220-8502.
- [27] Abidah, Billah Setyowati, Agoes Sriyanto, Konservasi Indonesia; Sebuah Potret Pngelolaan dan Kebijakan, Perpustakaan Nasional, Bogor Indonesia, 2008.
- [28] Edi Muhammad Jayadi, Soemarno, Bagyo Yanuwadi dan Mangku Purnomo, 2014, Local Wisdom Transformation of *Wetu Telu* Community on Bayan Forest Management, North Lombok, West Nusa Tenggara. *Research on Humanities and Social Sciences*, 4 (2): 109-118.