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Original article

Forest care, interconnectivity and maintenance of ecological resources among the

Manobo-Matigsalug people of the Southern Philippines

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ABSTRACT

This article discusses the knowledge of indigenous people about forest care, interconnectivity and maintenance of their ecological resources as well as the challenges they face among the Matigsalug-Manobo people of Marilog District, Davao City, Philippines. The researchers utilized a descriptive research design through qualitative methods such as in-depth interviews, focus-group discussions and photo-video documentation. To extract the data, the necessary permits and ethical compliance were provided by the respective parties of the Department of Environment and Natural Resources Region 11, the Local Government Unit of Marilog District and the Manobo-Matigsalug Tribal Council Incorporated. The data gathered were analyzed through thematic analysis focusing on the dominant themes from the respondents' narratives. The results revealed that these people's indigenous knowledge on biodiversity conservation has been challenged by changes in the natural landscape, forest deterioration and the unintended consequences of these such as cultural loss and economic well-being. Thus, this has led to major implications of how they conserve the forest and manage their ecological resources in the current times. This calls for building a sustainable and inclusive economic livelihood for the indigenous group and other stakeholders in the Marilog district. This is a vital step in order not to compromise their economic livelihood, to retain cultural practices and to maintain their rights to manage and sustain their ecological resources. Overall, the Matigsalug-Manobos are actively negotiating the cause and effects of these socio-economic factors and are able to devise ways to use the forest and its ecological resources for their survival.

KEY WORDS: biodiversity, Indigenous Knowledge Systems, local conservation, sustainable livelihoods

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1. Introduction

"The forest is life. The forest is our market place." This is how our respondents describe the importance of the forest. For many years, the indigenous groups are known to have relied on the forest and some of them still utilize these ecological resources for their day-to-day survival. More important is that their connection to the forest bears a cultural attachment which is seemingly affected by the overwhelming changes that have erupted for decades. So, what happens if these resources become scarce and when indigenous groups are faced with unprecedented problems relating to their traditional knowledge of forest management? Sadly, it has been noted that some of the indigenous knowledge and practices are slowly disappearing due to changing needs and interests (CAMANCHO ET

AL., 2015) driven by the socio-political and economic factors. What led to the conceptualization of this research was due to various reasons. We often passed through the area from Bukidnon going to Davao City and on those journeys, we observed that some of the local people were displaying ornamental plants or flowers for sale. This led to our asking questions such as: how and where do the locals get these plants? We recalled that during our inception meeting, Central Mindanao University had conducted a biodiversity assessment and inventory in 1990s. However, there had been no studies conducted about Indigenous Knowledge Systems from our institution. Inspired by that discussion, we decided to revisit the area and conduct a study that focused on the concept of forest care, maintenance and interconnectivity of the natural world among the Manobo-Matigsalugs, the indigenous people of Marilog Forest Reserve in Davao City, Philippines. We aimed to critically discuss these concepts by investigating their traditional ways of managing the forest, as well as understanding the prevailing challenges that affect the overall sustainability of these ecological resources.

To elaborate this case, we needed to look into the situation of indigenous people through time and space. Studies have shown that the Indigenous Peoples in the Philippines today still continue to face challenges about the preservation of their traditional knowledge, customs, beliefs and culture as well as sustaining their ecological resources. In fact, MAGNI (2016) emphasizes that the "indigenous communities around the world are constantly struggling to maintain their rights, their traditions and their knowledge, in a system still dominated by a western world view". Accordingly, they face the challenge of living in two worlds, the indigenous and the non-indigenous one, in constant tension with each other, with the latter having more power in shaping the former. Following HEIDER (2009), we see this as problematic because the indigenous people normally claim special ties to their lands and strive to maintain a way of life for survival. The natural resources found in the forest and ancestral lands supplement the day-to-day subsistence of these indigenous peoples. CHRISTIE (2007) relates the "indigenous knowledge" to the routine and performative practices of everyday life which are context-based, collective, responsive, active and constantly renewed and reconfigured. But this knowledge system varies from place to place and from time to time. Like CHRISTIE (2007), we argue that this system must be owned, protected and accounted for and governed by laws. We also believe that the study of indigenous knowledge systems about natural resources is key to defining order to sustain both their natural and cultural resources among the Manobo-Matigsalugs people

of the Marilog District.

1.1. Indigenous people and resource management: A review

Discussions in relation to resource management among indigenous groups point to their Indigenous Knowledge Systems (IKS). These are defined as 'holistic' knowledge in which humans, nature and the spirit world are all interconnected (SPRING, 2009 cited by MACKENZIE, 2014). They are also a product of human interaction and their adaptability to the environment (ARMSTRONG ET AL., (2006). BERKES ET AL. (2000) also developed a working definition of traditional ecological knowledge (TEK) that refers to an accumulated body of knowledge, practices, and belief, evolving by adaptive processes. This TEK is passed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment. He also emphasized that this knowledge system is culture-based (BERKES, 1999). So, as time has passed, these indigenous groups have been able to fully integrate their indigenous or traditional knowledge into their customary laws. Mostly, these are non-industrial or less technologically advanced societies, many but not all of them are indigenous or tribal.

Although a considerable body of research has focused on indigenous and mixed-race communities in the northern part of the Philippines (ABE &

strategies and actions for the conservation or restoration of residual forests.

Marilog Forest Reserve plays a significant, yet crucial

role in the livelihoods of both non-indigenous and

indigenous communities. However, through time

we have observed that the natural resources of

this reserve are becoming increasingly degraded

due to biodiversity loss, rampant small-scale logging

activities, conversion of the forest land for

agricultural use, proliferation of residential mountain

resorts, and the over-harvesting and trading of ornamental plants. The loss of biodiversity from

environmental problems is also a loss for indigenous

people in general. To them, the forest exudes life

which is vital for their existence. Thus, as these

forests have been continually denuded, they are

in a constant battle for survival. This affects the

indigenous practices of the Manobo-Matigsalugs

and in the process of making sense of their survival,

they opt to adapt/resist or negotiate/re-negotiate

in these challenging times. Thus, this means there is a need to build a sustainable future for them in

To put this into context, we contend that the

OHTANI, 2013; ONG & YOUNG, 2014), there are, however, relatively few studies that investigate the southern part of the country. Some of these studies have examined the traditional uses of plants and animals in southern Philippines (ARNADO ET AL., 2014; SIMBORIO ET AL., 2016). Other studies have focused on the community-based natural resources management which have been initiated with the aim of managing the forest with the use of indigenous and traditional knowledge. Thus, they put forward an integrated approach that considers the technical and indigenous knowledge systems to natural resources management. However, there has been an on-going alliance between indigenous groups and organizations aiming for long-term effects and the sustainability of lands which are dependent on the indigenous understanding of the resources. The traditional indigenous institutions and recent social and cultural innovations may at times enable environmental gains and at other times may have jeopardized the sustainability of currently protected areas (SCHWARTZMAN & ZIMMERMAN, 2005).

On a positive note, it is worth emphasising that there has been a mandate on the inclusion of indigenous people within environmental conservation directives and the use of their knowledge in the management of global ecosystems worldwide (ENS ET AL., 2012). The study of RIST ET AL. (2011) supports this call for the inclusion of indigenous people in environmental conservation pursuits and must consider extant power imbalances as well as cultural differences in ways of knowing and doing. Thus, this leads to discussions between indigenous and non-indigenous people about culturally specific and more holistic development aspirations in relation to the environment is required to devise approaches that meet local needs as well as national and international obligations. In fact, the integration of traditional and local ecological knowledge to biodiversity conservation was recognized by the United Nations Convention on Biological Diversity (CHARNLEY ET AL., 2007). To specify, the MULTILATERAL AGREEMENT (1993) emphasized that it should be respected, preserved and applied. As an illustration, let us look into the case of Mzoghoti Village Forest Reserve. Their case revealed that "indigenous systems of forest management and bee-keeping practices are perceived, maintained and respected by communities around Mzoghoti Village Forest Reserve and needed to be scaled up in other communities of Tanzania" (PIMA, 2016: p 161). Like many Amazonian indigenous people, the Kayapo have halted the

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expansion of the agricultural frontier on their lands but allow selective logging and gold mining. Prospects for long-term conservation and sustainability in these lands depend on indigenous peoples' understandings of their resource base (TANYANYIWA & CHIKWANHA, 2011).

However, there are still gaps between traditional and scientific knowledge on forest management and protection from indigenous experiences. For example, the study of CHIKWANHA & TANYAYIYAWA (2011) also illustrates this situation and their findings reveal that there is neglect of the utilization of indigenous knowledge. While in the province of La Union, Philippines, local people have several indigenous practices related to forest management but unfortunately, these practices are not reflected in the Community-Based Forest Management Agreement (CBFMA) (GAVINA, 2010). Thus, the success of these community-based forestry programs with regard to the role of indigenous knowledge and practices needs further assessment (SERRA, 2003). Finally, as MAGNI (2016) stressed on a reflective action on the importance of having an integrated system of knowledge, in which indigenous peoples will have the opportunity not only to share their experiences to overcome future challenges, but also to become active agents of change by being involved in the decision making processes".

2. Study site

We conducted the study in the three tribal communities of Barangay Baganigan, Datu Salumay and Barangay Marahan surrounding the Marilog Forest Reserve in Marilog District, Davao City, Philippines (Fig. 1). With a total land area of 63, 800 hectares, Marilog District is situated between Davao City and Bukidnon. Surrounded by forest fragments that occupy a total area of 11,102 hectares it is cool and breezy and almost comparable to Baguio of Luzon, which has evenly distributed rainfall and is a virtually typhoon free area protected by its mountainous borders with forest fragments and is teeming with biodiversity. The wide ranges of topography and varied climate have much influence on the indigenous culture and the vegetation pattern of the area. The original inhabitants of the area comprise the Manobo and Matigsalug tribes who belong to the Federation of Manobo-Matigsalug tribal councils (FEMMATRICS) and the Manobo-Matigsalug Tribes City of Davao (MAMATRIPCEDI) which are holders of the certificate of ancestral domain title.



Fig. 1. Location map of the research area in Marilog District, Davao City, Philippines

3. Methodology

For this research study, we employed a descriptive research design utilizing qualitative methods like key-informants, in-depth interviews, focus-group discussion, participant observation and photo-video documentation. For in-depth interviews, we interviewed purposively selected respondents key-informants who were knowledgeable in the process of conservation and utilization of their forest resources. The interviews were audiorecorded and their narratives were transcribed for thematic analysis. As to focus-groups discussion, we were able to capture how our respondents were able to practice their traditional practices of farming and conserving the forest resources. Finally, the photo-video documentation method was utilized to capture some indigenous practices in relation to how the respondents conserve and use their natural resources. We have also documented their ways of collection and preparation for handicraft making.

The respondents of our study were selected through a convenient sampling method as they were already identified by the Matigsalug-Manobo Tribal Council of Elders (MAMATREPCEDI). Our key informants were members of the tribal council. This was done when we presented our research proposal with them. The Barangay Captains and Indigenous Peoples Mandatory Representatives (IPMR) of the respective barangays were the ones facilitating our research inquiries. Likewise, Datu Pepe, one of the Barangay councilors who was also indigenous, guided us in the research process and collection. In order to extract our data, we interviewed those respondents who had sufficient knowledge on ecological and forest management in their communities. We then enriched our data through the use of their personal narratives and by utilizing a photo-video documentation to capture indigenous practices of farming and the processes of extracting resources from the forest. We collected the data from the following informants and keyparticipants within a period of 8 months: 10 of them served as key informants and 25 were interviewed as respondents. This comprised of 6 tribal chieftains, 2 barangay counselors, 1 Indigenous Peoples Mandatory Representative (IPMR), 3 healers and 23 members of their respective indigenous communities of the Manobo-Matigsalug. There were a total of 35 participants in the research study that was composed of 18 males and 17 females coming from the age bracket of 25-89 years old. The interview process lasted 30-60 minutes. In addition, we also conducted three sessions of Focus Group Discussions (FGD). Some of our participants were members of their respective tribal council respectively.

To analyze the data, we utilized a thematic analysis. The analysis of this sort of data can be accomplished by setting information down in field notes and then applying the interpretive style of treating this information as a text. This analytic process required the analysis of multiple sources of data such as observations, interviews, photographs, and videos. Researchers employing this analysis were interested in the day-to-day behavioral interactions of people such as ways of life, rituals and relationships (BERG, 2004). BRAUN & CLARKE (2006) define thematic analysis as a method for identifying and analyzing patterns within data. In this context, we identified and analyzed (but was not limited to) the indigenous knowledge and practices of managing the forest among the Matigsalug-Manobo group in the study area.

3.1. Research ethics

In order to conduct this research, a Gratuitous Permit (GP) was issued by the Department of the Natural Resources of Region XI. Likewise, a Prior Informed Consent (PIC) was made which was signed by the tribal leaders and officials of the indigenous community. This is an important document signifying that the community affirmed our intentions and had given us permission to conduct our research. After conducting the Prior Informed Consent, a Memorandum of Agreement was drafted and signed by the tribal council leaders, members of Matigsalug-Manobo Tribal Council of Elders (MAMATRIPCEDI) and the researchers. The findings of the research were presented to the tribal council and the members of the Barangays of Marilog District, Davao City for validation purposes.

4. Results and discussion

Our discussion is in three parts: First, we present the socio-demographic profile of our respondents. Second, we elaborate the indigenous knowledge focusing on the practices of sustaining their ecological resources. Finally, we discuss the challenges that our respondents encountered in the process of utilizing and sustaining their ecological resources taken from the forest.

4.1. The Manobo-Matigsalugs of Marilog District

The National Commission on Indigenous People recorded that there were about 23 Manobo ethnic groups who have their own dialects and some similarities in terms and tones. The term Manobo simply means "people" or "person"; other names include Manuvu and Minuvu. The term may have originated from "Mansuba" a combination of man (people) and *suba* (river). They mostly live the hinterlands of Bukidnon specifically on the boundaries of Agusan, Bukidnon, Cotabato, Davao and Misamis Oriental (NCIP, 2003). Most of them are still relied on a subsistence economy and reside in the mountains practicing slash and burn agriculture (MASENDO, 2015). Our respondents are called Matigsalug-Manobo people who are living along the Salug River, which is also known as the Davao River. Our findings reveal that they live at a subsistence level with a minimum income of Php3,000 - 5000.00 per month. Most of them still rely on farming as the main source of their subsistence income. These farming activities are usually situated inside the forest or mountainous areas of the Marilog Forest Reserve. They sell a portion of their production and some of them are used for personal consumption. We also found out that some of the respondents have been influenced by two major religions: Baptist and Seventh Day Adventist. Also there were those who claimed that their religious practice was "Panubaran" which was considered to be the religion in the olden times. The practice of "Panubaran" is still articulated in their religious ritual called "panubad". This ritual is a form of prayer to appease the Supreme Being and other spiritual entities. This ritualistic act is always associated with how they conserve, protect and use their ecological resources.

4.2. Indigenous knowledge of forest care: Interconnectivity and maintenance

For this subsection, we present two dominant themes in relation to their indigenous practices of sustaining their ecological resources. These dominant themes are the following (but are not limited to): a. relationship to the environment and b. their ways in utilizing the forest.

4.2.1. Interconnectivity to the environment

What is the relationship of our respondents to their environment? To understand the importance of the forest from our respondents' perspectives, it is necessary to look into their own concept of conservation as well as their relationship with their natural environment. What does the forest mean to our respondents? To them, the Manobo term for forest is "puwalas" which means that the mountain is covered by thick layers of trees. It is believed that inside the "puwalas" or forest, different beings and creatures are found to be living in the trees which are viewed to be sacred. Because it is considered sacred, one must show respect and care for the forest. In their own language, this term is "ay-ayaran" or care for the forest. According to them, this can be articulated by showing compassion, love and respect. To quote from one of our respondents' narratives "Kailangan nato alimahan ang lasang kay diha nabuhi ang tawo" (We need to take good care of our forest because we depend on it). This is also supplemented by another respondent "Ato gyud respetohan si Manama-Magbabaya kay siya man ang tag-iya sa

lasang" (We have to respect Magbabaya because He owns the forest). They believe that these beings are said to be created by "Manama-Magbabaya" (a Manobo God/Supreme Being) in order to keep the balance and harmony in the environment. In addition, they said that "Manama-Magbabaya" has sent guards who govern and protect his creations. They are believed to be *Mahomanoy*, who dwells in the trees; *Alimugkat* who governs the water and *Yakan* who dwells in the forest. They show respect to these creatures and most importantly to their Supreme Being. This means that they hold spiritual connection with the forest by acknowledging their Supreme Being who owns everything in the forest.

Aside from these spiritual guards, the forest is believed to be a dwelling place for the "dayuhan", "busaw", "bal-bal" or enchanted beings. This dayuhan is also believed to be categorized into good or evil. One respondent lamented, (Respondent No. 9): "Bantayan sa mga dayuhan ang lasang" (The spirits guard the forest). So, to appease these spiritual beings, they will perform the "panubad" ritual. This ritual is performed before doing any activities inside the forest such as hunting and farming. This is to ask permission from the spirits living in the forest. In the ritual process, a native chicken, betel nut, a coin and a roll of tobacco are offered to the spirits. Depending on the purpose, the Manobos will sacrifice red or black native chickens to acquire what they need. A "panubad" as a form of prayer is only performed by someone who has an "abyan" or spiritual being who guards him or her. In other cultures, these are shamans who can converse with the spiritual world allowing them to connect to enchanted and other spiritual beings (TANYANYIWA & CHIKWANHA, 2011). As enumerated, some of these activities like hunting wild pigs, gathering fire wood, planting crops, etc. must undergo "panubad". This is to ensure that Manama-Magbabaya and other spirits would grant their request. If activities are done without performing a ritual, it is believed that the spirits will inflict on them any form of illness, pain or misery. In a story shared by our key-informant, he narrated that there was once a visitor who went to the forest without engaging with the ritual. Days later, the visitor was inflicted with an unknown illness. The visitor went to see the doctor but no treatment was found to be effective to cure his illness. His last resort was to go back to the mountain and asked for help from one of the tribal members for healing. So, they went back to the forest and offered a white chicken and performed a "panubad" asking for forgiveness from the spirits. After conducting the ritual, the

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visitor was healed and he finally paid his respects to the spirits.

Our respondents also use the sounds of the birds as a guide for their day-today activities like farming and hunting. The sounds of these birds are interpreted to help navigate weather conditions by giving them warning signs about natural occurrences like drought, heavy rains, typhoons and even omens in relation to their farming. To illustrate, one of our key-informants lamented: Informant No. 3: Kung mutingog ang alimokon nga gahagbas, dili mupadayon kay gibadlong ka ana. Sumala sa katiguwangan, mao na ang sign nga gipaminaw nila. Hangtud karun gisubay ra gihapon sa katiguwangan ang mga tinuhuan (The sound of the white-eared brown dove is a warning to postpone our farming activities. In the olden times, our ancestors really rely on this sound. Even today, most of the indigenous farmers still follow this belief).

This practice falls under the level of ethnoscience as emphasized by VALDEZ & HANSEL (2015). They observed that most indigenous people engaged in ethno-farming or "native" science. For example, most indigenous people in Mindanao often use celestial bodies, or the stars, as their basis or guide for their farming, hunting, fishing and other livelihood activities, beliefs, practices and traditions. Our respondents, however, are said to use the mystical sounds of the birds for farming activities. As ASCHER (2002) and EGLASH (2002) stressed, these indigenous people have had their own unique ways of looking at and connecting to the world, the universe, and to each other. However, they lamented that this practice has been slowly disappearing because some of them have relied on the new ways of farming activities brought by modernization. Despite this factor, our respondents stressed that they still engage in this kind of practices. Thus, our findings suggest that the Matigsalug-Manobos still have a strong emotional relationship with their environment. This is articulated by showing respect and valuing nature's beauty, spirituality and emotional power. Finally, this act of respect is viewed as a way of conserving or protecting the forest which is related to how they sustain or maintain their resources.

4.2.2. Practices of forest maintenance

Following PEREZ (2018), it is also very important to ask how do indigenous people relate with nature in a contemporary environment that includes the local and global markets? In this context, how do the Manobo-Matigsalugs utilize their ecological resources and what are the processes involved? For the collection process, the respondents emphasized that they do not thoroughly harvest them. They emphasized that they only gather enough resources for their day-to-day subsistence. That has been their practice since the olden times up to this day. Most of them perceive that the forest is the market place where they could gather resources for food, medicine, etc. There are also several reasons why our respondents utilize resources from the forest. These activities refer to their farming, hunting, handicraft making and the use of ethnomedical practices for economic purposes. Table 1 shows a summary of these activities.

Ways of utilizing	Key persons	Schedule for the	Purpose of the	Factors affecting	Changes observed
the forest	involved	activity	activity	the activity	
Farming	Men and	Jan-May (farming;	Subsistence	Climate; Topology;	Adaptation to new
	women	planting);		Forest degradation	farming technologies
		August (harvest)			
Hunting	Men	Occasionally	Subsistence	Forest	Hunting is seldom done.
				degradation;	Other engaged in illegal
				formal laws	trading of animals
Ethnomedicinal	Healer; Tribal	Often	Health;	Change of natural	Adaptation to new
	chieftain		Well-being	landscape; Forest	medicine prescribed
				degradation	by medical doctors
Handicraft	Men, women	Monthly	Personal	Forest degradation;	The products are sold
making	and children		consumption;	Decreasing of	in the market
			Economic	resources	

Table 1. Summary of the activities used	l for forest utilization
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Farming activities. For most of our respondents, farming was still considered to be one of their main subsistence strategies for everyday survival. What is interesting about their farming practice is the utilization of a piece of land within the forest. Our respondents call this area a *lati* (see Fig. 2). According to our respondents, a *lati* is an area that has become desolate. One respondent said, *"Kung malati, walay kahoy, didto mi mag uma, mag tanom ug mais, kamote, balangahoy/karlan ug gulay"* (If the area becomes desolate, we clean the area and plant corn, sweet potatoes, cassava and vegetables). Before

they clean the area, they perform the "panubad" or ritual to ask permission from the spirits and *Magbabaya to* bless their farming activity for the entire year. They usually perform the ritual every Friday afternoon because of the belief that this is an auspicious day for farming and other activities. Furthermore, a ritual is done for a good harvest (CELESTE, 2017). It is usually their men who clean the *lati* area using *limpisa* (an indigenous farming knife) while the women are responsible for planting the crops, rice and vegetables. During our fieldwork, one of our female respondents in Barangay



Fig. 2. This area used to be a "lati" (barren) but has been converted into a farming area by the respondents

Fig. 3. A Manobo-Matigsalug woman showing her upland rice called "dinorado" (rice for subsistence)

Fig. 4. An indigenous storage for harvested rice but has already gone a modification in these contemporary times

Baganihan showed us her farm and the varieties of *palay* or rice planted in the area (see Fig. 3). We remember vividly that our data gathering experience at that time was challenging, tiring yet worthwhile.

In order for us to see her farm, we needed to walk for kilometers inside the forest. When we reached the area, she showed us the following: *dinorado*, *tudak*, *malagkit*, *saloy*, *lubang*, and *asuzena*. According

to her, these rice seedlings only grow in upland areas of the mountains which do not require water or an irrigation system. They said that the planting of rice is done only once a year which falls within the months of January-May. Within these months, the weather conditions are perceived to be good for planting rice, thus ensuring the quality of their harvest. In order to protect their harvest, they place them in storage called *lalapong*. Traditionally, lalapong is built on the branches of a tree. As shown in Figure 4, there has been a modification. Their *lalapong* today are placed on the ground behind their houses. When asked about the reason, one of our respondents stressed that setting up a storage like *lalapong* requires a huge tree. Unfortunately, they lamented that there are no big trees nearby, so, they decided to build the *lalapong* behind their houses.

Hunting practices. Aside from farming, our respondents said that they also use the forest for their hunting activities. They narrated that before they hunt, they perform a ritual asking for guidance to enter the forest. They strongly believed that the ritual will appease the spiritual beings and that Manama-Magbabaya will grant them a good hunt. This belief is supported by one of our respondents' narrative, "Kung makadakop ka ug baboy-ihalas, boot pasabot naay pagtugot ni Magbabaya" (If you are able to catch a wild pig, that means Magbabaya granted your request). How do our respondents hunt these animals? They still use a bow and arrow made by *uway* or *bagtek* (an ecological resource which can be used in handicraft making). Likewise, they also make use of indigenous-made traps to catch wild pigs and other animals. When asked if these animal resources are depleting, most of the respondents in Barangay Marahan emphasized that they have not been depleted because of the belief that Manama-Magbabaya will continue to create them. On the contrary, other Manobo-Matigsalug respondents lamented that some of these resources are already depleting. They seldom see these animals inside the forest today. Because of these scenarios, governmental interventions, policies and laws as regulated by the Department of Environment and Natural Resources (DENR) prohibiting the hunting of these endangered animals are implemented. As one respondent said, "Bawal na manguha ug hayop sa *lasang*" (It is prohibited to hunt wild animals inside the forest). However, there are still groups of individuals who hunt animals illegally through secret trading.

Ethnomedicinal practice. The Manobo-Matigsalugs also utilized the forest for their ethnomedicinal purposes. It has been emphasized that they get

some of their herbal medicines from the leaves and barks of the different species of plants and trees. Our respondents emphasized that some of their trees are linked to spiritual and healing properties. When we interviewed a tribal healer, he enumerated the following: balete (*Ficus balete*), karingag (Cinnamomum), alingatong (Dendronide spp.), abaca (*Musa textiles*), buyo-buyo (*Piper*) aduncum), katii-olayan (Lithocorpus sp.), sagimsim (Syzygium sp.), tubog (Ficus sp.), lawi-lawi (Podocarpos sp.), almasiga (Agathis philippinensis), tipuros (Palaquim sp.) and nato (Palaquim sp.). For many years, they still rely on these herbal medicines as they are perceived to have no side effects to their body. At the same time, they have been accustomed to use these ethnomedicinal treatments. However, they also mentioned that if the herbal treatment is not effective, they go to a German hospital nearby to see a medical doctor for a prescription. Moreover, our respondents use different species of plants to treat wounds, allergies, coughs and other human and animal diseases. They also utilize these plants to cure their animals. In one instance, we observed our Manobo local guide cut the abaca tree and extracted its resin to treat the dog's wound. They are perceived to be effective in curing cuts.

Handicraft making. The making of handicrafts has always been culturally embedded in the lives of the Manobo-Matigsalugs. To them, these handicrafts are representations of their cultural identity. This practice, as emphasized by our respondents, has been handed down from generations to generations. In order to create them, they have to collect some ferns and shrubs from the forest. These are the following: *agsam/nito* ferns (*Lygodium circinnatum*) and shrubs like *bagtek*, *rattan*, *uway*, *sagpang* and olango. Figure 5 shows the processes of scraping a *bagtek* (indigenous bamboo) for making handicrafts. Some of these crafts are following: tikos, pulsiras (bracelet), sipit (tongs), bayong (bag), lusong and alho (mortar and pestle), bukag (basket), bosog (arrow) (see Fig. 6). In a narrative, one respondent expressed, "Manguha ug uway para himoong basket. Mga Bawa ang gahimu ug basket" (Some indigenous people cut some *uway* for basket making). Some of these crafts are used as part of their body adornments. For example, we had observed that most of our respondents wear the *tikos* because of the belief that it protects them from evil spirits and harm. We even bought some of their *tikos* so that we will be protected during the course of our research. Surprisingly, they have lamented that traditionally some of their accessories are not really for sale because they have a religious attachment to them. However, as time passes by, they have come to sell their handicraft products in the market for their dayto-day subsistence. Unfortunately, some of the ecological resources in the forest have become scarce and that affects the production of these handicrafts. Thus, this leads to an unsustainable livelihood among some of the indigenous groups in the district.

Overall, our respondents emphasized that they still rely on indigenous knowledge and practices in managing their ecological resources from the forest. Through their constant interaction with the environment, they have come to develop specific knowledge systems as their guide to everyday survival. They have been able to manage, or conserve, their forest based on their indigenous ways. PEREZ (2018) contends that indigenous peoples are considered to be stewards of nature. As stewards, they are to protect and conserve the forest. PAWAR & ROTHKAR (2015) emphasize that forest conservation is the practice of planting and maintaining the forested area for the benefit and sustainability of future generations.



Fig. 5. The process of scraping a native bamboo called "bagtek" which will be used for handicrafts



Winnowing basket "nihu" made of Calamus sp. and Bambusa sp.



Basket **"binabay"** made of Pandanos sp., Bambusa sp. and Drycanopteris linearis (Burm.f.) Underw.





Comb made of Bambusa vulgaris



Sleeping mat **"banig"** made of *Pandanos* sp.



Bracelet **"pulsiras"** made of Drycanopteris linearis (Burm.f.) Underw.



Leglet **"tikus"** made of *Lygodium circinatum* (Burm. f.) Sw.



Soft broom **"silhig paypay"** made of *Thysanolaena* maxima



Bow **"busug"** made of Bambusa vulgaris and arrow made of Thysanolaena maxima



"andu" made of Lead tree

Bamboo toy gun "lutheng"

made of Bambusa vulgaris



Knife handle **"suheng"** and case **"sakuban"** made of Malibatu and Banuayan tree

Fig. 6. Collection of traditional handicrafts made by the Manobo-Matigsalugs

4.3. Challenges in sustaining ecological resources

This section presents some of the challenges that the Manobo-Matigsalugs have encountered in relation to the use of ecological resources. We focus on discussing two challenging aspects that the Manobo-Matigsalugs faced. First, we put emphasis on the economic livelihood of the indigenous people that have somehow compromised their cultural practices. Second, the discussion revolves around issues of power relations and dynamics in the context of forest governance.

4.3.1. The changing natural landscape leads to economic insecurity

In many parts of the world, the indigenous forest landscapes have been modified, altered and degraded. According to our respondents, they have observed that an estimated 80% of the Marilog Forest Reserve has already been lost. Based on their narratives, the cutting of trees within the forest is found to be the main reason for the deforestation. They lamented that these forests have been abused and exploited. So, how does the changing landscape affect the indigenous practices on resources maintenance? Studies have shown that forest degradation points to the loss of the indigenous knowledge of forest management (PAROTTA ET AL., 2016). Likewise, this phenomenon somewhat challenges indigenous groups in terms of economically sustaining their resources. For example, the development of human settlements, conversion of ancestral lands to resorts, tourism activities and other infrastructure for better mobility can affect their economic activities. MOLINTAS (2004) stressed that the influence of colonial rule has led to the unabated influx of migrants into ancestral domains which leads to the cascading changes on their local practices and beliefs. The introduction of tourism activities and conversion of ancestral lands to mountain resorts partially affects their customary ways and practices. Our findings reveal that there are about ten resorts operating in Marilog District. The emergence of these resorts has led to construction of roads. When asked about these alterations, our respondents have different responses as some of them agree to certain purposes of development while others do not necessarily agree. Some of them stressed that change is inevitable, so, in order to survive, they have come to engage or accept these new ways of strategizing their economic well-being. Thus, these resorts have allowed our respondents to earn money in jobs as caretakers so that they can feed their families. In addition, in order to economically survive, some ancestral lands are sold to business people. This transaction is called *usufruct* which means that each resort owner is given a legal right to utilize a piece of land within the bounds of ancestral domains, but they are only given a contract for 25 years. If they wish to renew the contract, they can do so provided that they have properly utilized the land based on their negotiated contracts.

Moreover, the loss of the forest caused by soil erosion and landslides to the environment also affects their indigenous ways of making a living like handicraft making, farming and hunting practices. In order to continue their farming, they have learned to plant root crops during the dry season. Most of the vulnerable communities are barely able to cope with the changes to address immediate threats (KARKI & ADHIKARI, 2015), CHAKMA (2012), on the other hand emphasized that indigenous peoples can rely on their accumulated experiences in order to be ecologically adaptive to the current situation. Thus, Manobos of Marilog District have learned to adapt and resist these changes when deemed necessary. This creative process refers to a "sense of agency" because some of our respondents have devised strategies in utilizing their ecological resources. Following CORONEL (2003), the Manobos have been selectively processing these changes in relation to their survival through consultative meetings with the tribal chieftains and members of the indigenous communities. However, in the process of adaptation, there are unintended consequences such us cultural loss and disintegration of indigenous knowledge on forest care and resource maintenance.

4.3.2. Issues of power dynamics and forest governance

Many conflicts in society are struggles over power, because how much power and individual or group is able to achieve governs how far they are able to put their wishes into practice (GIDDENS ET AL., 2011). We analyzed that there is an issue of power dynamics between the indigenous people and other key-players in the process of governing the forest. In a historical narrative, it has been found out that there was bloodshed during the 1970s because of illegal logging activities made by different entities. The respondents emphasized that they had protected the forest from this encroachment. One respondent said, "Padugo gyud sa una" (There was bloodshed before). During the Marcos regime, they stressed that his administration gave back the ancestral lands to the indigenous groups so as to cease the killing of loggers within the area. Furthermore, this was to return their legal rights as the rightful managers of the ancestral forest.

In recent years, the Manobo Matigasalug Tribal Council of Elders (MAMATRIPCEDI) has been given the responsibility to govern the forests which are within the confines of their ancestral domains. In fact the Indigenous Peoples Rights Act (IPRA) stipulates their rights over territories and the right to develop, manage and conserve their lands and natural resources for the next generations (PEREZ, 2018). Furthermore, Section 9 of the IPRA provides a responsibility to maintain the ecological balance and to restore denuded forest in ancestral domains. One key informant stressed: Key Informant No. 3: "Kay mao man gyud nag balaod sa Ancestral Domain nga protektahan ang kalasangan. So kung nay problema, naa man tay gitawag nga labaw pa sa chairman, labaw sa among tribu, amu isang-at namu didto arun mataagan ug silot ang nisupak sa balaod (The protection of the forest is under the provision of the Ancestral Domain. If there are problems, there is a tribal council who will give out punishment to those who violate the law)".

However, there are still problems in relation to how the Manobo-Matigsalugs govern the forest. Here is one of the narratives: Respondent No. 33: *"Kung dili gyud mag pabadlong tong mga tawo nga nag putol ug kahoy, muabot jud ang problema tungod kay mao nag gipadayon nga balaod sa DENR karun sa pagprotekta sa mga kalasangan. Kung dili maminaw i-report namo sa DENR" (If these loggers do not want to be reprimanded, there will be bigger problems as their acts clearly violate the law regarding the protection of the forest. If they don't listen, we will report them to the DENR).*

This narrative shows the power dynamics over the dominion of natural resources. To define "Power is the ability of individuals, or the members of the group, to achieve aims or further the interests they hold. Power is a pervasive element in all human relationships" (GIDDENS ET AL., 2011). However, the indigenous people are at a disadvantage because of their status quo, thus, they become powerless because of the situation. But why did these loggers not consider these indigenous people as forest agents? This is because they have been accused of denuding their forest. In one of the narratives, the respondent said, "Kami daw ang nag-guba sa kinaiyahan. Dili baya kay amo man gani na gi protektahan (We are accused of destroying nature. It is not true, in fact, we protect our forest)". They have emphasized that they do not excessively cut these trees. Accordingly, they only use them as materials for building their houses. They also stressed that they were able to protect the forest. One respondent shared, *"Kung wala nay kahoy nga dagko, minos na ang tubig* (If there are no more big trees, there will be water scarcity)*"*.

As presented in the previous discussion, they must provision enough ecological resources from the forest for their subsistence as well as earning a living. However, PEREZ (2018) contends that if their livelihood is no longer sustainable, they are condemned as destroyers of nature and called betrayers of their own traditions. Aside from this pressing issue, there are various reasons for the decline of forest resources. Our respondents emphasized that people's attitudes towards the environment contribute to this problem. According to them, no concern or love for nature, lack of education, greediness and capitalism are also the main reasons why the resources in the forest reserve are being depleted. They also stressed that people's dependence on the forest for their economic livelihood and dire needs pushed them to extract these resources. This draws parallels with the case of indigenous Indonesian people who have expressed concerns regarding deforestation and the ensuing loss of biodiversity (PEREZ, 2018). This scenario challenges the capacity of indigenous peoples in the process of governing their forests because of the negative views towards them. Thus, the problem relating to indigenous forest governance delves into the intersectionality of power and authority by the different stakeholders in the district.

5. Conclusions

The deployment of the Indigenous Knowledge System (IKS) to manage biodiversity resources is key to the integration of policies and frameworks for establishing a Local Conservation Area and capability building among indigenous people of Marilog District. We contend that acknowledging the role of government agencies and other organizations is seen as a vital action in the promotion of the sustainable use of the natural resources by using the indigenous peoples' knowledge and practices. Whilst other agencies engaged in community-based resource management and found that these frameworks are continually challenged because of changing needs and interests. Our study has revealed that the indigenous knowledge and practice of forest care and interconnectivity among the Matigsalug-Manobos are slowly disappearing. This may have implications on the overall integration of their knowledge system to governmental policies. This is due to

modernization that has caused changes to the natural landscape resulting in a need for adaptation for their cultural and economic survival. However, in the process of adaptation, there have been unintended consequences which point to the social engagement and adaptation of new ways of making a living that have somehow compromised their indigenous knowledge and cultural practices. Amidst these pressing times, the respondents still create an opportunity to perform their rituals but these are no longer embedded as everyday practices. Some may opt to engage the ritual while others have come to use them only for special purposes like planting and harvesting seasons. Although, they have been continually challenged, their spiritual and emotional interconnectivity to the forest are still internalized and articulated in their personal activities. The continued loss of their ecological resources has also undermined the economic well-being, livelihood and cultural practices of the Manobo-Matigsalugs. This also has implications on the way they care for the forest. However, they are confronted with intersectionality of power, class and authority, therefore, this is not just an issue of sustaining biological resources and promoting an economic livelihood but also maintaining their rights to forest governance.

However, the Manobo-Matigsalug Tribal Council, Incorporated (MAMATREPCEDI) of Marilog District has been given the opportunity to govern their ancestral forest but their capacity and authority to manage the forest is continually challenged by other socio-political factors. To address this, the researchers suggest the requirement for a community needs-assessment, the institutionalization of the Protected Management Board and the establishment of the Local Conservation Area involving the different stakeholders in the Marilog District. We also contend that building a sustainable and inclusive economic livelihood for the indigenous group in the district are essential in order not to compromise their knowledge systems and cultural practices. Finally, we hope that this article has put forward a discourse to strengthen and capacitate indigenous groups in the management of their ancestral forests.

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