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The Practice of Biodiversity –related Indigenous Knowledge in Kota Belud, Sabah: A Preliminary Study

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ABSTRACT

Indigenous knowledge is a set of principles, skills, practices, rituals, and customs developed by a particular race, inherited from generation to generation. Indigenous knowledge offers a unique and holistic understanding towards every aspect of life. In biodiversity conservation, integrating indigenous knowledge has become a trend. In many studies, indigenous knowledge has been proven to present a more human ecological approach to manage biodiversity loss. This paper aims to explore the practice of indigenous knowledge by looking at three components of indigenous knowledge system viz. agriculture, traditional medicine, and river management. A preliminary study was conducted in Kota Belud. Data was collected through a focus group discussion through purposively sampled informants consisting of Bajau, Dusun, and Iranun. The findings of the study revealed that the indigenous peoples in Kota Belud still practiced their knowledge. This study also emerges some issues related to indigenous knowledge mainly in knowledge degradation.

Keywords: Biodiversity, indigenous knowledge, indigenous peoples

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INTRODUCTION

Western science may have invested the words 'nature', 'biodiversity' and

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'sustainability' but it certainly did not initiate the concepts. Indigenous, traditional and local communities have sustainably utilised and conserved a vast diversity of plants, animals and ecosystems since the dawn of homo-sapiens. Furthermore, human beings have moulded environments through their conscious and unconscious activities for millennia - to the extent that it is so often impossible to separate nature from culture.» (Possey, 1998, p. 95).

Being located in the equatorial line and having a tropical climate, Malaysia is blessed with richness of flora and fauna species. Malaysia is also ranked at fourth in Megadiverse Countries (Anonymous, 2015). It is not exactly known the total number of species throughout the country, but it is estimated to be more than 170,000 species.

The Bornean state of Sabah is among the highest in biological diversity. It has a total area of 7,362,000 ha and approximately 60% is still forested. It is where the highest mountain, Mount Kinabalu, is located. The species diversity is not only concentrated in the forested areas but in some other ecosystems such as floodplain, nipah swamp, coasts and mountains. To the current estimations, there are 3,000 species of trees, 1,500 species of orchids, 650 species of ferns, 100,000 species of invertebrates, 221 species of mammals, 587 species of birds, 197 species of reptiles, 98 species of amphibians, 155 species of freshwater fishes and 819 species of marine fishes. Among the most notable flora and fauna in Sabah include Rafflesia (the biggest flower in the world), orchids, orang-utans, two-horned rhinoceros, sun bears and clouded leopards. Not to forget the avian species, coral reefs and marine life (Ministry of Environment and Natural Resources [MNRE], 2006; Tongkul, 2002).

The abundant resources on biodiversity in Sabah are the treasures of the indigenous people. The communities of indigenous people in Sabah makes up approximately 60% of the population consist of 30 ethnic groups speaking more than 50 languages and dialects. Among the ethnic majority in Sabah are: Kadazan, Bajau; Murut, Bisaya, Kadayun, Dusun; Orang Sungai; Suang Laut; and Orang Brunei (Tongkul, 2002). These communities are widely distributed at an area with a high genetic resources. They have been utilising the land and the natural resources to thrive for thousand years in a sustainable manner. The various forms of landscapes, soil types and vegetation covers enable the indigenous people in Sabah to carry out their indigenous community-based activities (Tongkul, 2002; United Nations Development Program [UNDP], 2011).

Linking Biodiversity Conservation with Indigenous Knowledge

Indigenous people have been occupying and controlling large areas of natural resources. The evidence of indigenous people, indigenous knowledge and indigenous territories to biodiversity conservation is significant (Toledo, 2001). It can be said that they are the ecosystem people, implying their way of life of depending upon the resources available to them and the ones

relied on. Through the indigenous belief system, they have a deep cultural, spiritual and material attachment to and dependency to the livelihood on the natural resources found therein (Cariño & Colchester, 2010; Ulluwishewa et al., 2008).

In the context of indigenous communities in Sabah, the systems practised in biodiversity conservation is based on the belief system which is perceived as central system that inter-connects with other social systems. Similar to the rest of indigenous groups throughout the world, the indigenous peoples in Sabah are still performing the traditional occupations such farming, hunting and fishing.

Agricultural System. Each family has their own plot for cultivation and it is done in a small scale using traditional tools. Shifting cultivation is a common practice among indigenous people in which a land is cleared from a vegetation for a shorter time than it is allowed to fallow (Fenigan & Nasi, 2004). The system is highly particular from the start to the end of farming through particular practices and rituals. To commence the planting season, the indigenous peoples refer to their own traditional calendar based on the phase and shape of the moon which is believed to influence the agricultural, cultural and social practices. The main reason of following the traditional calendar is to avoid and minimise the unwanted and unwelcomed pests and diseases, hence the yield of crops is maximised. This indigenous practice was validated by Vaishampayan (1982), Nag and Nath (1991), Mishra et al. (1999) and Bhagawati et al. (2015) who showed the lunar phase on the insect flight activity. Hence, the indigenous communities ensure the critical stages of crop growth do not coincide with the active insect activity.

In hill rice cultivation, most ethnic groups share the similar rituals and regulations. The basic stages in cultivation of hill rice including field selection, felling, burning, dibbling, tendering/weeding and harvesting. Special ceremonies are being performed at each stage of cultivation by a bobohizan or priestess. The practice of shifting cultivation somehow alters the natural vegetation of the land (Erni, 2015), the indigenous peoples naturally restore and maintain the soil through a fallow period; the field is left for 7-10 years until trees are grown back to certain sizes. Soil restoration is accelerated by planting some leguminous crops once the paddy harvested. The indigenous peoples also practice selective weeding; only certain type of weeds are pulled out and spread on the ground and left to rot as humus. Through this mechanism, soil moisture, fertility and productivity can be retained (Craswell & Lefroy, 2001).

The indigenous peoples prevent and reduce pest and disease manifestation using the selected plants, not harmful artificial pesticide. Murut use a sour fruit called liposu, pound and scatter in the field. They also use leaves from a tree called babas (curry leaf), soaked and sprinkled to the paddy plants infested by maggots. Kadazandusun treat the area affected by fungal red disease using red palm leaves.

It is also a common practice to burn the tree roots to keep off rats and insects. In addition, burning and hanging of buffalo skin and shell of king crabs is to ward off the insects from the rice. While Bajau use frog and shell of crayfish for the same purpose (Tongkul, 2002).

Natural Resource Management System. The main principle in natural resource management among indigenous peoples is sustainability and inter-relationship of all things (Abdul Halim et al., 2012). The communities are firmly obeying the concept of taking only resources needed for sustenance and no over-exploitation on the natural environment. Indigenous peoples utilize the natural resources through traditional activities such as hunting and fishing.

The ceremony of *managal* is a proclamation of the decline of fish in the rivers. To observe this ritual, fishing is banned for a period of time usually between six months to one year. It is a communal understanding and collective responsibility of the indigenous peoples to maintain the sustainability of the aquatic resources (Abdul Halim et al., 2012; Tongkul, 2002). In hunting, the indigenous peoples commit to the practice of *meminting*. It is a one-way technique to only choose mature animals using their traditional hunting methods including blowpipe, trap and spear. To hunt smaller animals, traditional devices like snare, sling and net are used. The hunting activities are constricted to particular taboos and principles pertaining to utilization of natural resources. The indigenous peoples have regulated the principles into «Community Hunting Protocol». Some communities regard the taboos as *sogit* which is a customary law which allows the wrongdoer to ask forgiveness from the aggrieved party and the whole community. The ritual requires serving meals (rice, pigs, chickens), symbolically avoiding the wrath of spirits and restoring the harmony and integrity of the village (Abdul Halim et al., 2012).

Health System. People generally have been using plants since the dawn of civilization. Plants are resources for food, medicine and construction and manufacture of crafts and tools. Some plants are often associated to a ritual attachment due to the hallucinogenic feature (Gerique, 2006). Simply put, plants are highly integral in human survival (Kulip, 2014). The indigenous knowledge in utilizing the plants is pivotal remarkable that three quarters prescription drugs manufactured today are based on it (MNRE, 2006).

Previous enthnobotanical studies among indigenous people in Sabah determined there are hundreds of plant species with different benefits and applications (Andersen et al., 2003; Foo et al., 2016; Kulip, 2014; Kulip et al., 2005; Kulip, 2003). Studies conducted by Jin et al. (1999), Luoga et al. (2000), Bussman (2002) and Gemedo-Dalle et al. (2005) emphasized that the documentation of indigenous knowledge in ethnobotany was important for biodiversity and cultural conservation as well as sustainable resource utilization. The dynamics of the ecosystems

and the indigenous peoples possessing the detailed knowledge of the components of biodiversity are the important components in the relationship of ethnobotany and biodiversity conservation (Ubom, 2010).

MATERIAS AND METHODS

This preliminary study applied qualitative approach as its method of research. Data were collected through a focus group discussion and observation. FGD deemed appropriate in this case as it offered the researcher to "…learn through discussion about conscious, semi-conscious, and unconscious psychological and socio-cultural characteristics and processes among various groups" (Berg, 2004, p. 23). Besides, as reported by Berg (2004), FGD is a dynamic data collection technique as the interactions made among informants in a group can stimulate the discussions. Six informants from Kota Belud were chosen. Purposive sampling was made use and informants' criteria were decided as to accomplish the study objectives. The informants were the villagers of the said area and consisted of three ethnics namely Dusun, Bajau, and Iranun.

Kota Belud is located in the western end of Sabah. It lies approximately 70km from state capital Kota Kinabalu. Based on consensus in 2010, Kota Belud has a total population of 91, 272 people. Kadazandusun makes up around 41% of total population, followed by Bajau at 34%.

RESULTS AND DISCUSSIONS

Throughout this preliminary study, there found some ongoingly practised indigenous knowledge. During the FGD session, the informants were asked mainly on three aspects of environmentally-related indigenous knowledge; agriculture, river management, and traditional medicine.

Agriculture

From the initial observation, it can be said that agriculture is one of the main economic activities of natives in Kota Belud. Nevertheless, the agriculture is not merely for subsistence but conventional production. From the finding, modern agricultural practices especially in paddy farming are being adopted. The use of tractors, chemical fertilisers and pesticides has becoming the standard in agriculture. Paddy farming is more common among Iranuns and Bajaus. According to informants, traditional agriculture no longer seems viable in the modern days. A possible explanation for this finding may be the lack human labour.

> *"Sekarang ini zaman moden, kalau ada pun bertani sudah lari daripada zaman dahulu [Now it's a modern time, the practice of agriculture is not as the same in the past time]".*

Younger generations are now more interested in settling down in cities and working regular nine-to-five jobs. In the past days, buffalos were used to plough to the land, nowadays it is difficult to get the buffalos with addition to fear of it being

stolen. The increase of paddy planting area also makes it dauntingly impossible to control the pests and optimise the paddy production at the same time. Profit wise, it is agreed that traditional paddy farming would bring greater economic gains to the farmers as they needed not spend on machines, pesticides, seeds or fertilisers.

Among the features of traditional farming is independence from the application of chemical fertilisers and pesticides. One unanticipated finding is that, some indigenous practices in farming are still embedded in the mind of indigenous peoples, though practically traditional paddy planting has demised. Iranuns apply a technique called *teknik buit* in pest control. This method implies of planting bamboo leaves in the farming area. The skin of jackfruit is believed to control the presence of leeches among the Bajaus. They also make use of cow manure and cut grass that act as a natural fertiliser. The cow manure and grass are left to decay for approximately three months in the soil. The Bajaus also use rice straws as a composite fertiliser.

Small-scale farming is still being practised in many households. Common crop plants like bananas, tapiocas, and sweet potatoes are planted for subsistence.

Traditional Medicine

Indigenous peoples are known for their extensive knowledge in utilising the plants to cure ailments. The finding from this study shows that the informants can identify some plants from their surrounding used to treat common illnesses.

The bark of *sepang* tree is used to treat minor body aches. The bark has to be boiled and drank. The leaves of *kela jawa* tree are believed to treat bloating. The leaves should be crushed into paste form and apply on the bloated area. Some plants are used during postpartum confinement. The root

Figure 1. Paddy field in Kota Belud (Field study, 2018)

of s*intatabau* tree is boiled and consumed by women after giving birth. It is believed to help in postpartum recovery.

The indigenous communities here also consume some plants in their daily diet. Some plants such as *pegaga*, cashew shoots, beetle leaves eaten as *ulam*, are believed to deliver health benefits to those who consume them. Nipa palm fruits are believed to help treat hypertension and diabetes.

Fishing and River Management

Indigenous peoples in Kota Belud have a unique river management system called *tagal*. It is one of most documented indigenous practices (Abdul Halim et al., 2012; Tongkul, 2002). *Tagal* is a ceremony that proclaims the decline of fish in rivers. It is usually observed by banning any fishing for a period of time usually between six months to one year.

There exist various ways of fishing among Iranuns, Bajaus, and Dusuns, but the ceremony of *tagal* is mainly observed by Dusuns in mainly observed by Dusuns in many parts of Kota Belud. Iranuns use different traditional tools depending on types of fish caught. Nets, bamboo fishing rods, bamboo fishing traps are among the common tools used in fishing. Bajaus use similar methods as Iranuns as well; sometimes they incorporate the use of natural poison (*tuba*) to catch fish.

The Dusuns also identify *tagal* as *bonbon* which means "do not". With regards of this practice, the principle of *sogit* is integrated. Simply put *sogit* refers to punishment or penalty if one breaks the custom that offends the community. In the case of *tagal*, if one is found to catch the fish during the banning period, he or she is entitled to *sogit*. The offence will be judged by the village headman and brought to the Native Court (*Mahkamah Anak Negeri*).

In the practice of *tagal* at two different villages viz Kampung Nahaba and Kampung Tegudon in Kota Belud, it is important to note the villagers take their own initiatives in reliving and maintaining *tagal*. From the study, the practice of *tagal* shows that both younger and older folks put the efforts in conserving their rivers. More interestingly, the rivers conserved through *tagal* turn into ecotourism sites that attract local and foreign tourists. This generates economic gains to the Dusuns.

Limitation

Researchers would like to emphasise that this is a preliminary study; hence the findings are subject to some limitations that could not be overcome. First this study did not adopt the ethnographic approach which could help researchers better understand the indigenous knowledge system of different ethnic groups in Kota Belud. Secondly, this study was limited to a small number of informants. Data collection was carried through one FGD session and observation at limited sites in Kota Belud.

Therefore, future study should observe measurements stated above. Next research is needed to be done in a longer period of time at different areas in Kota Belud. It would definitely produce more in-depth and interesting findings.

Figure 2. Tagal in Kampung Tegudon facing the view of Mount Kinabalu. The site has become an ecotourism attraction (Field study, 2018)

Figure 3. Newly developed *tagal* site in Kampung Nahaba (Field study, 2018)

CONCLUSION

One of the issues that emerges from the findings above is the degradation of indigenous knowledge among the indigenous communities. As can be deduced from the opinion of informant, modernisation and urbanisation have taken away some important indigenous knowledge from their life. Change of belief has contributed greatly to the practice of indigenous knowledge. The teaching for Islam and Christianity substantially prohibits the act of worshipping of spirits or ghosts. We believe that there are many more threats inflicting indigenous knowledge directly or indirectly as reported by Tang and Gavin (2016).

As mentioned earlier, this paper aims to show the contribution of indigenous knowledge towards biodiversity conservation. However, if there is a lack of practice of knowledge itself, conservation might seem possible. Another issue from the finding reveals the need for indigenous knowledge documentation. To this extent, no efforts in documentation have been reported in the case of Kota Belud. Indigenous knowledge documentation in other parts of Sabah has been highlighted in the work of Tongkul (2002), Kulip (2014), and Kulip et al. (2010).

Given the importance of indigenous knowledge in biodiversity conservation, it is imperative to foster the awareness of indigenous knowledge among indigenous communities in Kota Belud. Such efforts would be welcomed by them. Documentation should involve indigenous peoples directly with the support and collaboration of state government, local authority as well as other concerning organisations. Relieving and protecting indigenous knowledge can be empowering to the indigenous communities in economic, social and environmental aspects.

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