Volume 13 Issue 11
Originally issued as B3

Global Journal of human social science
Geography, Geo-Sciences, Environmental & Disaster Management
Volume 13 Issue 3 Version 1.0 Year 2013
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-460X & Print ISSN: 0975-587X

Traditional Knowledge and Environmental Conservation among Indigenous People in Ranau, Sabah

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Abstract - Traditional knowledge is a form of continuation of the inherited knowledge of a race from its forefathers. This traditional knowledge represents a holistic understanding of an indigenous society towards its day-to-day practices and environment, based on their life experiences, interacting with nature over a span of countless centuries. The bulk of this traditional knowle-dge has been adapted by means of traditional songs, stories, legends, dreams, and also other methods and living practices of the indigenous societies. At times, it is translated in the form of customs that are inherited from father to son or from mother to daughter. This knowl-edge is disseminated first-hand from one individual to another. Indigenous societies are citizens in free countries who are considered as natives, who have their ancestry from inhabitants who had been residing in a certain country or geographical region of an indepen-dent country, at the time of colonial conquest.

Keywords : *traditional knowledge, environment, conser-vation, indigenous, sabah.*

GJHSS-B Classification : *FOR Code : 969999*



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Traditional Knowledge and Environmental Conservation among Indigenous People in Ranau, Sabah

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I. Introduction

Traditional knowledge is a form of continuation of the inherited knowledge of a race from its forefathers. This traditional knowledge represents a holistic understanding of an indigenous society towards its day-to-day practices and environment, based on their life experiences, interacting with nature over a span of countless centuries. The bulk of this traditional knowledge has been adapted by means of traditional songs, stories, legends, dreams, and also other methods and living practices of the indigenous societies. At times, it is translated in the form of customs that are inherited from father to son or from mother to daughter. This knowledge is disseminated first-hand from one individual to another. Indigenous societies are citizens in free countries who are considered as natives, who have their ancestry from inhabitants who had been residing in a certain country or geographical region of an independent country, at the time of colonial conquest [1]. Thus it Would be more accurate to say that indigenous communities are groups that have lived and settled in a certain area to the extent that they have forged their own racial identity, have rights (customary lands) in a certain area and possess a high level of traditional knowledge.

Indigenous people make up the largest population group in Sabah. However, when studying the Sabah population survey from the year 1891, it is shown that there is difficulty in ascertaining the races who are the permanent residents of Sabah. Even though this is the case, the term 'indigenous' has been defined with reference to the term 'native' or 'anak negeri'as found in Ordinance No. 12 1952-Interpretation (Definition of Native) which clarifies the meaning of the term 'native'. Based on this ordinance, indigenous people are grouped into three main groups; non-Muslim natives, natives who have embraced Islam from the first group and thirdly natives who are already Muslims [2]. The indigenous society in Sabah cannot be separated from the natural environment as far as their daily lives are concerned. This environmental factor has influenced many aspects that helped to form their traditional knowledge. For instance, indigenous people are often seen as interacting with environmental factors in evolving a certain form of traditional knowledge in farming. Agricultural activities carried out in hilly areas, as in the planting of hill padi for example, are designed to help safeguard the ecosystem of the agricultural land from pollution and erosion. To preserve the species of trees and reduce the incidence of soil erosion, indigenous farmers avoid cutting down trees in hilly areas. They also practise mixed farming through a system of crop rotation that enhances the fertility of the soil besides increasing their income [3]. In this regard, the traditional knowledge of the indigenous community, especially in farming and medicine, represents a form of knowledge that has been inherited from generation to generation by the indigenous society. It is hoped that an in-depth research into this aspect of traditional knowledge serves as a contribution to society at large, especially Malaysians. Therefore this paper will analyze the traditional knowledge aspect of the indigenous community in Sabah in two main areas, namely agriculture and medicine. This working paper is divided into six sections: introduction, literature review, research methodology, findings, suggestions and finally, conclusion.

II. Literature Review

The indigenous community in Sabah has for centuries developed a unique system encompassing social, economic, political, spiritual, and customs aspects among their community. This system has been safeguarded by the indigenous people to create peace, a stable way of life and also to preserve resources and their environment [4]. In Sabah, most of this traditional knowledge has been forgotten and lost because of inadequate understanding of its importance in conserving the environment and preserving the biodiversity of the local community. Regarding to Tuaran customs, agricultural customs hold an important place, and are included in the collection of laws relating to the customs of the Dusun tribe in Tuaran. These agricultural customs include land lease, wages, trespassing and

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livestock [5]. The flora and fauna in Sabah are obvious assets for the state. Although the number of species of wild plants in Sabah has not conclusively been determined, it is roughly estimated that there are more than 10,000 plant species in Sabah [6]. The terrain, soil, climate and variegated plant form have contributed to produce various agro-ecosystems for the indigenous people who are mostly farmers practicing traditional farming methods [7].

The bulk of the indigenous community are located in hinterland areas, due to the characteristics of the land, as they rely on the diversity of the flora from the jungle for food, medicine, oil, building materials and other daily needs. As for the indigenous people who live along the coastline and river mouths, the majority of them are fishermen and their income is derived from harvesting crops, jungle produce and by selling their catch of fish at the markets [8]. The Kadazandusun tribes mainly live in rural areas and involve themselves in farming especially padi cultivation, whereas those who live in the highlands mostly plant hill padi, sweet potato, maize, water melon, cucumber and tobacco for personal consumption. During the 19th Century in Penungah, the men would forage for jungle produce that was to be bartered for padi or sold to traders who conducted business at Sungai Penungah. In hilly places such as at the Crocker Range, Kudat and Bengkok, and at the valley areas such as at Sungai Sugut, Labuk, Kinabatangan and Segama, most of the inhabitants practised shifting agriculture and subsistence agriculture for their daily needs. Meanwhile, in the west coast of Sabah, in the interiors of Keningau, Tambunan, and Ranau, this tribe carried out farming and reared cattle, chicken and ducks [9].

Traditionally the Kadazandusun have dwelt at the fertile coastal plains along the west coast of Sabah (from Kudat in the north until the border of Sarawak in southern Sabah). The early settlements of Chinese migrants from China brought the Kadazandusun into contact with farming techniques such as the metal plough. The Kadazandusun are also well-known for their craftsmanship using natural materials such as cane, bamboo and wood to produce daily needed goods and also farming and hunting equipment. The men-folk are also skilled in building houses and this traditional knowledge has been handed down throughout the generations [10]. It can be seen through the customs of the Kadazandusun in the district of Putatan that farming was indeed important in their community. There are two parts that are found in the 'Dusun Customs' related to agriculture, namely 'Dusun Custom regarding Crops' and "Dusun Custom regarding rules of Farming'. Besides that, there are other sections that speak of 'Dusun Custom regarding Animals' [11]. The Dusun groups in Tuaran district are frontier farmers who are non-migratory [12]. The Dusun in Tuaran possess valuable padi-growing lands and own a large number of buffaloes and cattle. Compared to the other groups, the Dusun Lotud in Tuaran district are rich and prosperous. This is because they have large tracts of padi land. This proves that the Kadazandusun people are an indigenous society with extensive knowledge in the care of the environment in the hinterlands of Sabah. Furthermore, Kadazandusun is the largest indigenous ethnic community in the state and they are also known as Dusun tribes and live in separate areas and use different dialects but there is no communication problem among them, so the cultural traits that they share are based on a common inherited tradition [14].

The Dusun community has common social system denominators, such as oral history, social structure, heritage, belief system, farming, cultural materials, religion and practice of customs [15]. Prior to this, the Dusun community has generally been categorized as a closed society due to geographical factors. The Dusun community's regions, such as at Ranau, Kota Belud, Tambunan and Keningau are situated at remote areas that have a mountainous terrain and make it difficult to access by roads, let alone, bringing about other forms of development in those areas. For example, Kampung Himbaan Ranau was only connected by road in 1970 and electrical supply was available only in September 1991 [16]. This situation points towards a form of obstacle and dividing gap to the influence of external systems, or generally put, to the influences of globalization. Indeed national development has only been minimally enjoyed by the Dusun community. Seen from another angle, the divisive factor has caused traditional knowledge of the Dusun community at Ranau to be still maintained and practised due to the low incidence of external, disruptive factors that affect their traditional practices. As such, the Dusun have an exceptionally high level of knowledge with regards to traditional knowledge due to their interaction with the natural environment and the varied biodiversity around them for such a very long time.

The Kadazandusun community's traditional knowledge can be broken up into a few aspects such as agricultural and medicinal aspects. With regards to agriculture, some of the aspects are choosing of the farmland and observing the physical geographical features, among others, before developing a new farmland. For the Kadazandusun, Murut and Rungus in Sabah, there are taboos and certain rituals during the choosing and clearing of jungle, besides certain observances of the environment before opening up a certain piece of farmland. Their approach involves looking for certain signs that surround the area, such as birds, insects, animals, rocks, plants and also water elements. The signs that are taken into account include barking sounds made by a bird called 'lokiu kopio toki' or the detecting of certain animals such as foxes, bats, deer, mice, or reptiles such as iguana, snakes, and centipede, all of which indicate that the particular plot of

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land is not suitable for farming [17]. These signs are indicative of the presence of predators and prey and it will be highly risky and detrimental to the farmers if they were to open up that land for cultivation. Physical geographical signs too can be determining factors for suitability with regards to opening up of a certain piece of land [18]. For example, if there are large rocks and trees or presence of reddish-coloured water, then that area is not suitable for agriculture. Dreams are also a main determining factor. For instance, if there were to be a bad dream before the opening up of a certain piece of land, then they would have to move on to look for another farming area. Kadazandusun farmers will stop farming work for the day if their machetes (parang) were to break or be damaged suddenly or unexpectedly.

The indigenous community not only preserve their environmental system but they also benefit from the resources found in it by means of their traditional knowledge, especially for medicinal purposes. Because of the safeguarding of the ecosystem, the indigenous community has obtained benefits by means of the use of various plants, animal products and minerals that have served as medicine to them for thousands of years. Today, the contribution from this medicinal practice and knowledge is of great potential towards modern medicine as more than 40% of general pharmaceutical drugs are in fact derived, directly or indirectly, from plant and animal extracts. These include many life-saving drugs such as reserpine, atropine, quabin, vinblastine, vincristine and taxol [19]. According to World Health Organization (WHO) estimates, about 80% of citizens in developing countries rely on traditional medicine for healthcare and a large portion of this involves using plant extracts. In most places in Borneo, plant extracts continue to be used in its raw form to treat ailments, for example dissolved Atropabeladonna is used as antispasmodic, the root Rauvolfiaserpentina is used for high blood pressure and the extracts of somniferum tranquiliser and Papaver are used as pain killers [20].

Besides that, indigenous traditional knowledge, especially that of the Kadazandusun, has been responsible for the discovery of many jungle plant species that have great value medicinally. A total of 50 plant species that are commonly used by the Kadazandusun living around the Crocker Range have been identified and recorded as being extremely valuable. In scientific terms, some of the plants that are commonly used are Blumeabalsamifera for fever, Cassiaalata for skin diseases, Centella asiatica for abdominal pain, Tabacum Nicotiana as insect-repellant, Psidiumguajava for diarrhea, Phyllanthusniruri for malaria, Tinosporacrispa for high blood pressure and many more [21]. The Kadazandusun have in fact developed their own traditionnal medicine system which they obtained from nature and have categorized them before using them. For example, rusap tribau is used for non-critical illnesses and is normally prepared for colds, cough, diarrhea, minor wounds and skin diseases, while rusap taralom is a prescription that is made from more complex substances and used for life-threatening diseases including prolonged illnesses that cannot be diagnosed by even the village medicine man [22].

III. Research Methodology

This study made use of the qualitative approach as its method of research. In-depth interview sessions and participative observations were carried out in selected areas. Six respondents and two villages in Ranau district were chosen. Sampling method, namely purposive sampling, was conducted whereby respondents' criteria and location were determined to fulfil research objectives. Each village was represented by three respondents. The respondents consisted of the village headman and two villagers who were well-versed in traditional knowledge of the indigenous community in Ranau district. The two villages involved were situated in remote parts of the district and its residents were Kadazandusun natives.

The selected research area of Ranau is a hilly region. Among its features are the Crocker Range and Pinousuk Peak in the northern part, Ranau Valley in the east with the Trus Madi range and Labuk highlands in the south. The main waterway here is the Liwagu River. Briefly stated, Ranau district is an undulating area, made up of valley plains, sloping terrain and mountains in most areas. Having wet and cool climate facilitates agricultural activities in Ranau. Next, in terms of ethnicity, almost the whole of Ranau is populated and dominated by the Dusun community. About 350,000, or one third of its population, consists of the Dusun, who mostly live in Keningau and Ranau and have formed a dynamic culture in Sabah [23]. Two villages were selected as research areas, namely the villages of Bayag and Tiang Lama. These locations were selected as research locations based on a number of factors such as being located in the interior, being Kadazandusun settlements and due to traditional practices still being practised by the people here.

Bayag is a village located in the centre of Ranau district and is among one of the settlements situated in the interior part of this district. With an area of about 120 acres, the estimated population of Bayag village is about 102 residents with the majority being Dusun and of Christian faith. The chief occupation of villagers here is that of being farmers. The journey to Bayag takes approximately two hours by motor vehicle from Ranau town. Tiang Lama Village, meanwhile, is located in the southern Ranau district and is close to the border with Tambunan district. With an approximate area of 100 acres, the villagers in Tiang Lama are estimated to be 150 in number with the majority being Dusun Christians. Their principal occupations are also farming. The trip to

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Tiang Lama village takes about two and a half hours from Ranau town. As in Bayag village, the terrain in Tiang Lama Village is hilly and its forest area borders the Trus Madi gazetted forest reserve land, which occupies an area of approximately 10,000 hectares. A portion of the villagers here have migrated and opened up new villages in Ranau town due to the need for greater convenience and transport difficulties, especially due to the lack of a secondary school in Tiang Lama Village. Even so, the other portion of villagers still live and practise a traditional way of life at Tiang Lama village.

IV. Findings and Discussions

Throughout the duration of this study, there were several types of traditional knowledge that had been identified especially knowledge of agricultural products and medicine that fulfilled the requirement of this research literature. Based on initial findings, the major economic activity of indigenous settlers here was farming. However it was more of subsistence farming and not commercially orientated. Occasionally, the people here would take certain types of agricultural produce to Ranau town where these produce would be sent to tamu (market) and sold at low prices. The tamu at Ranau town normally is on Wednesdays and Saturdays. The villagers also carry out fishing in rivers, hunting and foraging for jungle produce.

V. Traditional Knowledge in Agriculture

There exist various forms of traditional practices that can be seen in this district. The traditional practices in farming that are still found include hill padi planting, growing fruits, Kasou (tapioca) and vegetables and all these crops make up the traditional food of the community in this village. Besides that the indigenous society also practises shifting cultivation for hill rice in order to maintain the fertility of the soil and this avoids having to depend on fertilizers. As the padi is normally planted on hill slopes, they plant other plants as cover crops such as kasou (sweet potato) and legumes. There are also certain prohibitions while carrying out farming such as observing dreams before the opening up of farmland and listening for omens from certain bird species before and while working on the farmland. The signs and messages in dreams are used to determine the suitability of a certain piece of land for cultivation. If there is a good dream the day before the farmland is about to be opened up, then this denotes that that place will be fertile and good for farming. Conversely, if there is a bad dream, then they would need to find an alternative site as it is believed that the place is not suited for cultivation. However, this belief is being increasingly forgotten and not being practised due to the factors of change in religious belief and also because of the fact that individuals who know about this phenomenon are becoming scarcer.

In order to focus this research for greater clarity, the researcher was more interested in exploring agricultural traditional knowledge that centred oncharacteristics of plants and their potentials. There are several types of indigenous agricultural products that have the potential to be developed commercially such as red rice, pangi fruit, and kederei. Red rice is well-known among all indigenous people in Sabah. The way it is prepared among the Dusun community is quite unique. Once cooked, it is wrapped using leaves of forest trees that give aroma to the rice. In addition, the water extracted from rice has medicinal values and it is extremely efficacious for women who have just given birth. Besides that, it also has other health uses such as to increase blood content in the body. The medicinal value of these leaves has been verified by local medical practitioners.

"*Pangi*" is used in the preservation process of fish and raw meat to make them last longer. It is unlike common salt. Pangi can only be used to preserve fish and raw meat and cannot be eaten when it is raw because its contents are poisonous. Pangi is small in size like that of a rubber seed. It can be processed and packaged for commercial purposes. Based on its application for the preservation of raw meat, further studies using modern technology can be carried out to assess the extent to which the use of Pangi can contribute to a form of new discovery in modern preservation methods. The potential of Pangi usage, if it can possibly be developed, can be tapped for commercial purposes for locally produced products. "Kederei" is leaf used as a substitute for betel leaves. However, kederei is only used as supplementary food to strengthen teeth. With further scientific studies, kederei has the potential to be a research sample because according to the observation of researchers, kederei is usually eaten by the elderly, and it has been found that their health was not affected by eating it, but to the contrary, they did not have any chronic diseases such as cancer. The people here consume kederei which is found in abundance in the nearby forests. They also sell kederei at the local market. Besides these three traditional products, the people here still possess many other traditional products which hold much potential.

VI. Traditional Knowledge in Medicine

The Dusun society also still practices traditional medicine such as the use of wonod or sukut liquid to treat several minor ailments. Wonod is a liquid found in several types of plants such as bamboo and vines found in the forest. The use of wonod as traditional medicine is very popular amongst the Kadazandusun tribes. It has been practically used through various means and taboos according to the experience of

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generations of ancestors. The method of taking this liquid also has some very unique ways and taboos. Wonod can only be taken at dawn before the sun rises. The extraction techniques of wonod from bamboo trees are practically described by respondents who still have knowledge of this traditional medicine. Those who still have knowledge in the methods of extraction usually consist of the elderly among the indigenous population here. When extracting wonod, it should be done by slicing the bamboo branch slightly until the needed fluid is obtained. A downward incision must be made for the wonod to flow and the liquid should be caught in a receptacle before it drips to the ground. Wonod is commonly used to cure stomach aches and eye diseases that affect children. The liquid should be drunk three times a day.

Apart from *wonod,* there are several other types of traditional medicinal products that are very useful and easy to obtain in the surrounding forests such as tawawo leaves used to cure itchy skin and fever. Tawawo leaves should be boiled and drunk to treat fever, while for itchy skin; the tawawo leaves must be crushed and placed on the affected area. Also, the crushed lagup leaves can be used for the treatment of purulent sores. Interestingly, at the natives' homes, we can see many traditional plants with medicinal values such as misai kucing and many more being grown. Besides traditional medicinal knowledge as stated above, this study has looked into other traditional methods used by these indigenous people, such as fishing activity in rivers. There was one method observed that reflected the traditional style of fishing activity in rivers i.e. the use of bamboo stems which are designed as a trap and placed in prepared waterways. The bamboo stems are placed in the middle of the waterway as fish traps.

VII. Threats to Traditional Knowledge and Environment

It was found that the types of traditional practices in this area were detected to have decreased from previous times. Nevertheless, there are still many types of traditional agricultural crops that are grown such as lesun, pepper and mundok (tapioca). In traditional medicine, there are still a few products or herbs that are being used, for example, herbs for fever, stomach aches and others. However, according to estimates by the respondents, biodiversity resources of the forest still remained at about 70 percent and had also been threatened by logging activities in the 90's. Rapid growth and development can damage many forest products that can be exploited and commercialized. For the purpose of conserving the environment and preserving natural biodiversity resources, the indigenous people here have adopted a system called the tagal system. Tagal is a Kadazan-dusun word which means 'prohibition'. This system is a traditional system that has been used by the Dusun community for a long time to protect and preserve an area from a variety of threats through certain agreed regulations, before an area undergoes tagal. The forest tagal system has been practised once again in Tiang Lama Village to protect the forests around it from being encroached and destroyed. This method is also practised for river care. The rivers here were once somewhat threatened by upstream logging activities. However, presently some nearby rivers have been protected by the traditional river care system (tagal system). Forest clearing for commercial activities and traditional development of agricultural sector were the major causes of siltation occurring in rivers in Sabah. The geological condition in Sabah is still young and rivers in Sabah are expected to go through natural erosion processes in the years to come. Other causes are sewarage water from municipal councils and sewage waste from the industrial sector.

VIII. Suggestions and Measures for Preservation of Traditional Knowledge

Several proposals have been identified to protect the importance of traditional knowledge, especially in the medical and agricultural aspects. Among them is the effort and cooperation from the state government to gazette a number of traditional villages of indigenous people as 'customary land'. This customary land includes the gazetting of several areas as areas for preservation of herbs and wild animal breeding in forests and preservation of aquatic life in rivers. The government too should review and plan in more detail each development that is going to be carried out such as large-scale plantation ventures, logging and forest clearing, and so forth. This includes taking into account the views and opinions of the indigenous population in the surrounding area. One measure that has been taken to maintain traditional knowledge and preserve nature was gathering older people (practitioners of traditional knowledge) to discuss their traditional knowledge. However, this discussion had only been held at the Kaamatan festival which was organized 3 years ago. Furthermore, the discussion that was carried out was not in-depth and this effort was no longer continued. This initial step had only been conducted at Bayag village. However, according to respondents at Tiang Lama Village, there had been no form of measures taken to maintain their traditional knowledge. Still, traditional knowledge is seen to be decreasingly preserved due to the indigenous settlers' migration activities that have influenced the life-style changes of the indigenous community.

Only a handful of villagers are serious in preserving this knowledge. The younger generation too

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is less sensitive to the importance and practice of many of the traditional knowledge acquired through conversation with the older generation. The risk of losing this knowledge will continue if the present generation ignores this knowledge and does not preserve it. Nevertheless, something interesting that was obtained from this study was the existence of a local tourism resort establishment that was newly developed in this area. It is called Widu resort, named after a river known as Widu River. Remarkably, this resort is conceptualised on the natural environment and cultural traditions of the local community. Although newly opened, this resort has attracted many visitors, especially students who wish to undertake various activities including forest and river activities. There are also activities that engage the local population whereby they are involved in cultural events and telling various cultural tales of the indigenous community here. Enterprises such as this resort is another step that can be applied in helping to maintain cultural traditions of the indigenous community in general and traditional knowledge will also to some extent are preserved. The respondent's suggestion was also for an undertaking of a form of cooperation and assistance from the State Government to maintain or document their traditional knowledge. Assistance, especially advice and the right way of doing things should be conveyed to the people, particularly the method to safely preserve traditional knowledge. Another suggestion is to not plant commercial crops like rubber by clearing the land or stripping the forest bare. Villagers are also reminded to not destroy the forest products containing medicinal values to avoid their extinction. To maintain the traditional knowledge of indigenous people here, steps needed to be taken are to preserve natural forests and encourage the villagers to preserve their knowledge, and document them. Efforts to maintain and preserve this traditional knowledge should be undertaken immediately and aggressively, starting now due to the fear of it being gradually lost as a result of the explosive influence of globalization. Efforts in the form of education, especially for the indigenous population and the younger generation towards the awareness of preserving the traditional knowledge must be inculcated.

IX. Conclusion

Most of the traditional knowledge in Bayag, Tiang Lama, and other villages, in Ranau district is still available and there are a few who still practice it, especially the elderly. There are a variety of agricultural and medicinal products that are very useful which are found around the Ranau district, and they need to be preserved. Some examples are kederei, pangi fruit, red rice that is used in agricultural products, while wonod, lagup, tawawo and others have uses in medicine. However, the risk of loss will definitely occur if preservation efforts are not carried out. Although many people here are ready to preserve their traditional knowledge through documentation, yet they do not know how to do so. There are several traditional villages located nearby that have valuable traditional products, but they are not preserved properly and only serve for common daily use. For researchers, it is important that these valuable traditional products are recorded in detail and systematically labeled. Efforts for patent rights must also be immediately undertaken so that their rights to the knowledge are assured. It is also recommended that these traditional practices be recorded live through video recording and graphics. Besides that, efforts to preserve this traditional knowledge require collaboration and support from State and Local governments. However awareness of preserving the importance of this traditional knowledge needs to be fostered among the indigenous community itself so that these efforts will be more effective.

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