

# **Indigenous Environmental Knowledge in Formal Education**

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## **ABSTRACT**

*As our country actively supports and is signatory to various International Environmental Declarations, the educationist has to further develop the curriculum in accordance with our nation's aspiration. Chapters 26 and 36 in Agenda 21 (UN Division for Sustainable Development) document the world community's recognition of the importance of Indigenous Knowledge and the need to do further research on this knowledge for sustainable development planning. Malaysia has 95 subgroups of Indigenous communities with 19 in Peninsular Malaysia, 39 in the state of Sabah and 37 in the state of Sarawak. They make up a total population of 2.1 million or 10.2% of the total population. Documenting their knowledge in a formal education system is a necessity as they are examples of communities living in a sustainable way. Their knowledge in pharmaceuticals, agriculture, watershed conservation, sustainable harvesting of natural resources is an asset in sustainable development planning. This paper proposes the incorporation of indigenous knowledge and wisdom in formal environmental education.*

## **Introduction**

In 1992, developed and developing countries around the world adopted a blueprint for 'Sustainable Development' referred to as Agenda 21 which cover issues associated with Indigenous Knowledge (IK) in two chapters; Chapter 26 and 36. Chapter 26 promotes the recognition and strengthening of the role of indigenous people and their communities in promoting sustainable development; Chapter 36 focuses on the promotion of education, public awareness and training for environment. The relationship between culture, IK and sustainable development is further captured in the principles for equitable and sustainable societies developed and adopted by the non governmental organizations (NGO) forum at the Earth Summit in Rio in 1992 (Lynette & Neluvhalani, 2004). IK is the local knowledge that is unique to a culture or society. Also known as folk knowledge, traditional wisdom passed from generation to generation by word, cultural rituals,

which has been the basis for survival such as hunting, agriculture, health care, education and other sustainable practices in their daily livelihood.

According to International Labor Organization, there are about 5,000 different indigenous people living in 70 countries. At present the total population is estimated about 300 million, mostly in Asia (Emery et al., 1997: p 2). In Malaysia there are 19 ethnic groups in Peninsular, 39 in the state of Sabah and 37 in Sarawak classified as Indigenous People. (Nicholas, 1999:158). The total population of Indigenous community in Malaysia is 2.1million or 10.2 percent of the total population. Their wide knowledge of the ecosystems in which they live and ways of using natural resources in sustainable manner are yet to be researched and documented for the educational purposes. Our education system that was inherited from the colonial education system had replaced the practical everyday life aspects of indigenous knowledge. Since IK has been widely recognized by International Organizations such as United Nations Educational, Scientific and Cultural Organization (UNESCO) in formal education system, it is important to develop our present Curriculum of Environmental Education in Teacher's Colleges (TC) and other institutions that incorporate our local knowledge.

### **Incorporating Indigenous Knowledge in Environmental Education**

My proposal is that IK be incorporated in formal education through environmental education in Teacher's Colleges. Teaching and learning through environmental education is often expected to include the activities of indigenous people, their environments, and the people's relations to the living and non-living things around them. Such an approach can be traced to philosophical rather than pedagogical 'first principles' of environmental education, as promoted by UNESCO, the Agenda 21 process, and Bowers. (Reid et al., 2004). Corsiglia and Snively (1997) cited in Reid et al. (2004), have mentioned indigenous knowledge as forming part of the richer knowledge and wisdom of ancient and contemporary long-resident peoples. While recognizing its intrinsic value, such knowledge has been portrayed as '*a treasure-trove*' of important, field-tested, but historically neglected environmental knowledge and wisdom.

World Wide Fund for Nature (WWF) 2000 study of the world's most biodiverse areas, 'Indigenous and Traditional peoples of the world and ecoregion conservation', has documented the rapid extinction of languages spoken by indigenous communities throughout the world.

A key claim of the WWF's report is that, through what often amounts to a long history of managing a particular environment, the ecological knowledge accumulated by these peoples comes to be embodied through spoken

language or oral communication. The failure to document their knowledge has led significantly to 'language extinction', which results in the loss of environment knowledge from many traditional cultures. As mentioned by Hood Salleh (2003, p.7), 200 Orang Asli languages in Peninsular Malaysia have dwindled to only 12 at present. He has further quoted by saying that "when we endanger the indigenous communities' culture we're endangering our knowledge of the forests' biodiversity as well."

According to Daniella Tibury, (1995) as cited in Daniel Gil-Perez et al (2003), environment and development problems are not solely caused by physical and biological factors but an understanding of the parts played by aesthetic, social, economic, political, historical and cultural elements. Those factors are just some of the many cross-disciplinary linkages that should be integral to environmental education. In contemporary international discussion the term 'education for sustainability' has been used by some to reinforce the linkage between environmental education and traditional discipline and areas of study. Therefore documenting the Indigenous knowledge on the environmental will lead to further knowledge on their cultural and historical perspectives. Hood Salleh's (2003, p.7) comment that "so much of the richness of civilization built through the centuries had been lost through modernization. The flowering of the human spirit is so real and wonderful, and it's so sad that a lot of this human ingenuity is vanishing" is certainly food for thought.

We should look at how the great civilizations of the world are built on knowledge, skills and wisdom of a creative and innovative society. For example the Greeks developed the idea of thinking about the meaning of life, known as 'philosophy'. They were also the first to believe that citizens should have a say in making the law of the state. Apart from that most of the rules of geometry and arithmetic were invented by Greek Mathematician such as Euclid and Pythagoras. The knowledge in mathematics helped them to design well proportioned buildings. By 300BC the Greeks had also absorbed town planning. It is their built up local knowledge that further expanded their continuity of survival. The Mayan Indians in Central America who existed in 2000 BC were successful farmers who had built hundreds of great cities out of stone, each with its own character and artistic style. (History Encyclopedia, 1992) Indigenous community's civilization was recognized recently as the whole world is concerned about how we should live in a sustainable way. Their rich knowledge on sustainable agricultural practices, selective hunting and fishing, their struggle against diseases has earned them the title as the 'guardians' of the forest. The rich biodiversity that has been inherited by our world today is a gift from the indigenous communities around the world.

The sustainable way of living of those communities that can be a living example has been eroded in the name of modernization. We classify

development in our perspectives and want the community to live in the way we have designed for them rather than developing from where they have started their life and culture. Development of an educational curriculum for the society and development planning has to take into consideration the cultural sensitivity and environmental background of the community involved. Research has proven that learning only takes place when students understand what they are learning from their own cultural perspectives (Bishop & Stables, 2001, cited in Tony Laughland et al., 2003). Therefore it is vital to introduce IK components into formal curriculum from primary school up to university as well as in Teacher's Colleges. The proposal is in accordance with the recommendations made by the Malaysia Human Rights Commission on Rights to Indigenous Education and way of life in Malaysia's Charter on Human Rights, Article 16.

### **Challenges Incorporating Indigenous Knowledge in Development Planning**

Agenda 21, one of the most important documents accepted in the Convention of Biological Diversity in Rio de Janeiro, Brazil in 1992, recognizes the role of Indigenous groups. There has been little progress over the past decade in mainstreaming their concerns into development decision making. There has been a steady shift in many South East Asian countries including Malaysia in which spiritual values have been replaced by material values. Such a trend has to be reversed if sustainable development is to be achieved (Asian Development Bank Report, Manila 2002). Development must take into consideration the knowledge and skills of the participants. Technological advancements alone is not the answer for development planning in a country whose community still anchor their cultural practices in their ancestors' spiritual beliefs. Supported by Daly (1991;77) cited in Gil-Perez, the aim of technology for a sustainable development must be to increase the efficiency of the use of the resources, rather than raise their extraction rate. Hood Salleh, (New Straits Times, 2003; p.7) has stressed the importance of re-inventing our education system to incorporate enriching aspects to retain the best civilization. According to Hood Salleh protecting the economy of tradition is the highest value we can place on ourselves.

According to Sterling, (2001, 2003, cited in Reid, 2004), well documented inquiries attending to traditional ecological knowledge might inform learners better than science and science education in environmental education that focuses solely on the testing of hypotheses or models for environmental systems. Bowers (2001) cited in Reid (2004), suggests that 'centralized', 'top-down' and modernist approaches to education found in the institutions, philosophies and practices of formal, bureaucratized education have trouble with systems of knowledge such as Indigenous Knowledge based approaches to developing ecosystem resilience. Such critique has to be

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analyzed in our present management and development planning in our country. Our education system is a top-down system with little input from the grass-roots level especially concerning the indigenous people.

The result, according to Bowers (2001), is that little credence is given to their role in developing frames of mind that could bring about sustainability. Another hindrance is authority in education. According to Black (2001), cited in Reid (2004), educators are often classified as outsiders who have not considered the custodians of such knowledge for teaching and learning. The dominant perspective in education often needs some renewal and new truths usually from 'Western Science'. Such practices are the hindrances in assimilating the environmental knowledge of the indigenous communities in our education system. An urgent approach is needed to formulate the role of Indigenous Environmental Knowledge into the mainstream of our education system. The local community, educators, researchers and NGO's can play a role in assisting the Ministry of Education on the importance and urgency of incorporating such knowledge in the formal education system.

### **IK and National Policy on Biological Diversity**

One of the signatories of the International Biological Diversity Convention Malaysia established its National Biodiversity Policy in 1997, four years after the agreement came into force. It is a right move since Malaysia is one of the twelve 'megadiversity' countries of the world. It contains at least 60 percent of the world's known species. The island of Borneo has been listed as one key area for endemism which is waiting to be explored for future research on various fields. In the field of medicine, eighty percent of the world's population is dependent on traditional medicine and medicinal plants for their health security. In the pharmaceutical industry more than two thirds of the world's plant species, estimated to have medicine value, come from developing countries (United Nations Development Program, Resource Centre, 2005). "Much of the world's biological diversity is in the custody of farmers who follow age-old farming and land use practices. These ecologically complex agricultural systems associated with centers of crop genetic diversity include not only the traditional cultivars or 'landraces' that constitute an essential part of our world crop genetic heritage, but also wild plant and animal species that serve humanity as biological resources "(Oldfield and Alcorn 1991, p.37 as cited in Warren 1992)

The Langkawi Declaration on the Environment and Development in (1989) by the Heads of Government of Commonwealth countries marked a significant step in the evolution of Malaysia's role in environmental issues in international arena. Principle (vii) in the National Policy on Biological Diversity; "The role of local communities in the conservation, management and utilization of biological diversity must be recognized and their rightful share of benefits should be ensured," The issue is whether we are prepared

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regarding the aspects of access, property rights and benefit sharing with the Indigenous Communities. Principle (x) Public awareness and education is essential for ensuring the conservation of biological diversity and the sustainable utilization of its components. The present environmental education in schools and Teachers' Colleges syllabus do not incorporate the element of local knowledge in their curriculum and therefore the question arises as to how we can create awareness among the present and future generation on the value of such knowledge.

The aspect of Cultural Heritage in the National Policy on Biological Diversity has clearly defined the rich biological resources that have given rise to a rich cultural heritage of sustainable use amongst the indigenous people of Malaysia, especially those dependent on the forest for their livelihood. The elements of the rich cultural heritage, which relate to nature, are reflected in handicrafts, the belief and religious system and the use of plants and animals of the forest. The indigenous people of Sarawak, for example, have for generations used the sago of a palm found in the forest as a source of protein. (National Policy on Biological Diversity, 1998).

The role of IK at the national and international level is undeniable and therefore educators have to document and further incorporate this knowledge in the formal education system. Since much of the biological diversity is yet to be scientifically investigated, there is a need to enhance efforts in research and development to strengthen opportunities in fields such as genetics, biotechnology, pharmaceuticals, agriculture and fisheries. The state of Sarawak has further adopted a positive approach in documenting IK of the communities by setting up 'The Sarawak Biodiversity Center' in 1998. The role of the center is for biodiversity inventory, monitoring, research, education, utilization, management and conservation. One of the projects work to empower local communities to maintain, document, and share their IK systems on plant resources, with focus on the sugar palm, an essential cash crop in the Bidayuh culture (Wong, 2002). The element of education has to be given priority since knowledge is not static and has to be further developed. To further develop the knowledge it should be taught from the primary education level to instill the sense of belonging among the present younger generation and the future ones. Lynette (2004) has explored the role of IK in environmental education in schools. The study highlighted the role of adults in enriching the curriculum and argued for a contextualizing of schools in communities. Shava (2000) as cited in Lynette (2004; p.361), in a study on indigenous plants as food for rural community, recommended that 'educational approaches should be contextual and should encourage the learners to bring in and share their experiences in the learning situation and be given an opportunity to enhance their esteem, for example by taking excursions into the veld where they can participate by pointing out those wild plants'.

## IK and Sustainable development

Education for sustainable development is a life-wide endeavour which challenges individuals, institutions, and societies to view tomorrow as a day that belongs to all of us, or it will not belong to anyone. Environmental education plays an important role in formulating the concept of sustainable development which is defined as 'development that meets the needs of the present without compromising the ability of future generation to meet their own needs' (Brundtland Report, 1987). The strong relationship between environmental education and sustainable development has been further supported by Huckle (1996), who emphasized the urgent need to move towards a more sustainable form of political economy that meets everyone's needs while conserving the means and condition of production. He has further stressed that the role of education for sustainability is to guide people to examine critically the technologies, system of economy production, cultural system of reproduction, laws, politics, ideas and ideologies they currently employ for living with the rest of nature. The continuous survival of mankind depends on the products of educated minds, research and development, inventions and innovations.

According to Nicholas (Coordinator for Orang Asli Concerns) the traditional way of life is progressively being confined to a selected group of Orang Asli who "don't grab everything". For us, it is reassuring to know that the best environmental education reference point for Malaysian is found among the indigenous communities in this country. It is important to realize that indigenous perspectives on sustainability cannot be treated as relevant only in the context of maintaining the interests of the dominant society (New Straits Times, 27.3.05). Lack of studies on this knowledge may lead us to more destruction to the rich treasure in our biodiversity. We have to incorporate some of the methods from other countries such as Thailand and India, which have been successful implementing the IK in development planning.

According to Suraphol Sudara (1999), the NGOs in Thailand played an important role in assisting the rural communities in conservation activities. NGOs have developed community based activities for forest protection. NGOs also played a very important role in getting the relevant authorities to assist villagers in protecting their areas from the intrusion of trawlers and large push-net boats. In Thailand and the Philippines, the role of civil society including the indigenous community's participation in development planning has been highlighted in the annual report of Asian Development Bank, (2002). Community's participation with the guidance of NGOs has proven to be successful in driving them into a more sustainable way of development. Perhaps such methods could be adopted in development programmes in our country that could lead to a win-win situation. In Malaysia there are various Environmental based NGO's can play an important role in research

and in attracting the public in protecting the environmental indigenous knowledge.

Participatory approaches to decision making for sustainable approaches to development have been internationally recognized. There is enough evidence that indicates a strong relationship between IK and sustainable development. Recent studies show that IK of ecological zones, natural resources, agriculture, aquaculture, forest and game management, to be far more sophisticated than previously assumed. Moreover such knowledge offers new approaches for development that are both ecologically and socially sound (Posey 1985; p. 139-140, cited in Warren, 1992). Such knowledge which should further develop with scientific approach can be recognized as universal knowledge. The examples of IK that has been researched and developed as universal knowledge are found in India. The World Bank has disseminated information at the global level on the traditional use of *vetiver* grass in India for soil and moisture conservation. The use of *neem* tree seeds to produce non-toxic biopesticides has also spread from India to other parts of the world through development agencies such as United States Agency for International Development (USAID) (Radcliffe et al as cited in Warren, 1992). Lessons from other countries should give us more ideas on the importance of exploring and further researching our rich IK among the ethnic groups in Malaysia.

### **Case Studies in Sarawak**

A field survey was conducted by the researcher with the Village head, Tuai Rumah German of Kg. Lemujong and Tuai Rumah Robert Gana of Kg. Kesindu villagers on their adat related to land use in September 2004. The field study was conducted to find out some of their practices related to environmental management.

The Village is located 110 km from Kuching. It is connected to Kuching by tar-sealed road but still has no clean water and electricity supply. One of the aspects that has been developed by the community is the water resources management for daily utilization. The gravity water shed is fully protected and any major activities such as logging, land clearing for agricultural purposes the surrounding area are prohibited. Cutting down of big trees was not allowed when paddy plants are flowering. This is for prevention of worms attacking the flowering paddy plants. They place much sentimental value on their land since they developed the land with their local knowledge. Therefore they know every part of their land. Hunting activities are carried out on a sustainable scale. If they hunt wild boar it will last them for a week. They do not hunt for commercial purposes. Each and every development aspect is done to sustain their community's survival for long period.



According to Jayl Langub, (1996) the rural Iban community's way of traditional life is governed by their customary law known as *adat*. The basic concept of the *adat* way of life is that the *adat* safeguards the state of affairs in which all parts of the universe are healthy and tranquil, and in 'balance', that is individuals with individuals and the community with the environment, both physically and spiritually. On stewardship, the Ibans divide the landscape in two: *tana umai* (farming land), *pulau papan*, *pulau ban* (area for the supply of essential items such as timber, rattan, wild vegetables for domestic needs), and *pulau mali* (sacred area). Individuals are restricted from disturbing *pulau mali* which forms the watersheds. The villagers' practice of strictly following the *adat* is the living example of how IK on the environment has helped them in managing their natural resources in a sustainable manner. The land use pattern supported by their cultural and religious belief is a model that can be used in our future development planning on a macro level. As a fast developing nation, we have to adopt policies that are not only good for economic gain but on how our future generations can sustain the economic growth. A fair share in the economic development should benefit every one including the poor and disabled. Therefore our education system has to incorporate the element of sustainable development that has been practiced by the Iban community in benefiting the society as a whole. The modern development planning sometimes neglect the aspect of important environmental elements such as water shed areas, recreation and converting agricultural land into housing and industrial areas. Knowing the importance of preserving and further developing our local Indigenous Knowledge, The Malaysian Charter on Human Rights, Article 16, has made recommendations to the government to recognize the land *adat* and identity of Indigenous community.

### Recommendations

- The 95 subgroups of Indigenous community in Malaysia are diverse in their knowledge development. The significance and practicality of their knowledge is influenced by various factors such as geography, history, culture, religion, and external factors such as outside influence.

For example the Penan in Sarawak are well known for their practice of conserving resources known as *molong*, which acts as beneficiary of the resources and is responsible for ensuring that resources will not deplete, (Jayl Langub, 1996). The Kenyan and Kayans occupy areas far more interior such as Ulu Baram and Ulu Belaga due to historical factors. Their colourful handicrafts, songs and music, and costumes are a reflection of how they embedded their knowledge with local environment. Their knowledge and living skills should be further explored, documented and incorporated in formal education, for the good of present and future generations.

- Some of their knowledge on agricultural practices is still relevant in modern agricultural practices. For example, the *adat* of the Iban community in farming practices are very practical in development strategies whereby we have to balance nature accordingly to be sustainable for future use. *Adat* is a concept that has moral, legal, cultural and religious implications to the particular community. It is a fine example of sustainable development planning to meet the present societies' needs and to cater for future generations. It can be incorporated in formal education on the living example of sustainable land use practices.
- The Penan community's practice of sustainable harvesting of forest is a good moral lesson for our present generation. For example, harvesting wild sago and other forest goods in a sustainable manner for their future consumption. It is the opposite of the greedy nature of the modern society which wants to grab everything on the earth for themselves. Such practice should be a good moral lesson in our formal education.
- Their communal sharing of forest products in 'Communal Forest Reserve' is a practice that shows that nature can serve everybody's need but not everybody's greed. Such values have to be shared among various communities in our country. Concern and caring for others is lacking in our modern society as life becomes more competitive.
- Their knowledge of gravity water management is another example on the importance of protecting watershed areas. It is important in development planning in order that we do not disturb those areas as we may face water shortage.
- Scientific knowledge in pharmaceuticals starts from people's local knowledge. Educating the young generations on such knowledge is important to further develop it into scientific knowledge. The WHO has given wide recognition for the IK on pharmaceutical products.
- The environment is a place where their cultural and religious institutions have been formed and developed. Our ancestors have lived and worshiped the forest for the sake of their survival and for future generations. Their knowledge and wisdom in protecting the environment has to be taught to our present and future generations for continuous survival on the earth. The aspects of moral, respect for nature, managing natural resources in sustainable manner, health related knowledge, hunting skills, handicrafts, songs, music, art, knowledge in assisting the army in time of war, are the elements of IK that can be incorporated into our formal education.

## Conclusion

*“Local knowledge is a repository of diversity and a key resource in understanding the environment and in utilizing it to the best advantage for present and future generations. Incorporating such knowledge into the learning context enables learners to draw scientific principles and social insights from their immediate environment, thus increasing the connections between school, society, between exogenous and endogenous knowledge. Local knowledge is closely associated with ways of articulating it in the local language, the use of local language in education, together with others, is a factor not only in the healthy cognitive development of children, but also in the appreciation, validation and use of what can be learned directly from daily life and the local community”* (UNESCO, Education-Local & Indigenous Knowledge 2005).

As a colonized nation for 446 years, Malaysia is considered as an infant (48 years old). Therefore the influence of western curriculum and its contents are very much detrimental to our own IK. The western approach does not enrich our understanding of our various ethnic cultures in our country and their wisdom in building a civilization in their own perspectives. We should take some serious initiatives to redevelop the curriculum and modules, incorporating IK into the formal education system. Australia, Canada, New Zealand and many other developed nations have not only developed such modules but also recognized the role of IK as a national heritage. It is the basis for a sustainable living example in the modern world. Marsden (1994), as cited in Zawawi (1999), suggested that the Indigenous community could be the bases for building sustainable development strategies, because they begin from where the people are, rather than from where we would like them to be. The assumption is that since peasants, nomads, natives and women have survived for centuries in harmony with nature they have obviously developed highly attuned adaptive strategies which need to be recuperated and used as a basis for planning for the future.

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