

PRESERVING AND TRANSMITTING INDIGENOUS KNOWLEDGE IN DIMINISHING BIO-CULTURAL ENVIRONMENT: CASE STUDIES FROM BOTSWANA AND TANZANIA

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ABSTRACT The rapid bio-diversity loss due to the effects of urbanization, socio-economic demands, change in life style, technological advancement and globalization has resulted in the depletion of the ecosystem. At the same time, the younger generations are no longer acquiring knowledge in their indigenous environment, partly because of the new lifestyle of going to school instead of going hunting or herding, and partly because the fauna and flora is being destroyed and therefore no longer available for the children who are born and raised in villages. This has resulted in them not being able to acquire the relevant knowledge and skills when they become adults. This paper highlights the problem of indigenous knowledge transmission and preservation by describing case studies from Tanzania and Botswana. It then reflects on the known patterns of identity loss in societies. Finally it discusses the several measures that are being carried out to deal with the problems of bio-diversity loss in Africa.

Key Words: Indigenous knowledge; Preserving; Transmitting; Identity loss; Bio-cultural diversity.

INTRODUCTION

Indigenous knowledge refers usually to the knowledge and practices which have been accumulated over the years and used by the first peoples or natives of a given territory before the intrusion of other cultures (Le Roux, 2001). Such knowledge would normally be based on the indigenous peoples' interaction with their physical environment, including fauna and flora, the interaction between themselves and the interaction with their super-natural world. This nature-based knowledge is often referred to as folk wisdom as it is a result of human observation of patterns happening in nature and society which are transmitted through narratives and practices from generation to generation.

In Africa, indigenous knowledge was the accumulated wisdom that societies used in carrying out their socio-economic life, social interactions, spiritual connections, healing rituals and their life aspirations. There was a close relationship between the people, the land and the super-natural world represented by the ancestors and the whole creation. This perception is still vivid in many of the African languages, not only in the content of their vocabularies, but also in some of the structural realities, such as the nature-based noun class system.

In the traditional African societies, children acquired their indigenous knowledge through their constant interaction with both the adult world and the physical environment around them. This knowledge included the understanding of the

ecological system around them, the acquisition of skills in the use of the various tools and devices in their daily activities, their familiarization with the customs and practices of the relevant society, the coming to grips with the societal values and beliefs, and the formation of a world view that reflected the experiences of the society in which they lived.

Thus, through the constant interaction with the adult members of society and the physical milieu or nature, the children were able to progressively master not only the structural aspects of their languages, but also the rich vocabulary which reflected the society's knowledge of its physical world, cultural experiences and practices and its conceptualization of the universe. In this way, traditional knowledge was constantly accumulated and constantly transmitted from one generation to the next.

THE REDUCED HOME-BASED PRESERVATION AND TRANSMISSION OF INDIGENOUS KNOWLEDGE

However, this traditional mode of preservation and transmission of linguistic, cultural and nature-based knowledge has been grossly affected, in recent years, by the reduced bio-cultural diversity and the adoption of Western-based life-style in most of the African societies. This dramatic reduction of the ecological diversity has resulted usually due to a number of factors and circumstances, such as deforestation of the equatorial forests for timber and pulp, the clearing of the woodlands for cultivation and firewood, the overgrazing of the rich savannah lands, the uncontrolled hunting of wildlife, and the pollution of the water places. Consequently, Africa is now experiencing critical desertification, hostile climatic conditions, such as continued droughts, unavailability of clean water and the disappearance of certain species, such as the white rhinos (Batibo, 2001: 313).

Moreover, there is presently reduced contact between nature and the children due to the schooling of the children. They have little contact with nature, as they do not participate in traditional activities like hunting, gathering or herding, which would have brought them in contact with the physical environment. At the same time, many societies have developed negative attitudes towards traditional life as they consider it backward or not in line with the future expectations of the children in the modern world.

As a result of the diminished contact with nature and the traditional cultural environment, the younger generations are rapidly losing their competence in the indigenous knowledge of the ecosystem, such as names of plants and wild animals, and their characteristics or uses. At the same time, they are losing interest in their cultural background and traditions as their current lives are focused on the Western-oriented school system, urban living and the internet.

EFFECTS OF THE DIMINISHING CONTACT WITH NATURE

I. Studies carried out in Tanzania

In two studies which the author carried out in his own ethnic group, Sukuma, spoken in the southern shores of Lake Victoria in Tanzania, a number of observations were made regarding the progressive loss of bio-cultural diversity among the younger generations (Batibo, 1991: 4ff).

In the first study, he asked people of different ages to state the names they could remember of plants, their characteristics and their possible uses. These plants included fruit trees, medicinal plants, trees used for firewood and types of grass. Five age groups were identified, each comprising between three and five subjects, who were interviewed separately. The average of the scores in each age group was given in a rounded figure, as shown on Table 1.

Table 1. The number of names of plants in Sukuma language that the respondents gave in each age-group

		Age-groups				
Item		15-29 yrs	30-44 yrs	45-59 yrs	60-74 yrs	75 yrs and above
1	Wild fruits	7	10	18	26	25
2	Medicinal plants	5	8	12	15	17
3	Trees used for fire-wood	3	6	9	14	13
4	Types of grass	2	3	5	5	7
Total		17	27	44	60	62

Source: Batibo (1991: 4)

While the older generations (60 years and above) knew more than 60 names of plants, fruits and grass in the Sukuma language, the younger generation (aged below 30 years) knew only 17 items. Moreover, most of the younger people were unable to describe the plants adequately or give elaborate account of their characteristics or uses. Assuming that such young people will not have the opportunity to augment their knowledge (as many of these plants are no longer in existence in their immediate environment), then the ecological knowledge is clearly reduced among the younger generations.

In the second study, the author investigated the respondents' knowledge of wild mammals, birds and reptiles. He used a picture book that displayed the known East African animals, birds and reptiles, and asked the respondents in each age-group (which comprised between three and five subjects, interviewed separately) to point out the animals they knew and provide the corresponding ethnic (Sukuma) names. The average of the number of identified wildlife for each age-group was calculated. This is shown in Table 2:

Table 2. The number of names of animals, birds and reptiles in Sukuma language that the respondents gave in each age-group.

Item	Average-groups				
	15–29 yrs	30–44 yrs	45–59 yrs	60–74 yrs	75 yrs and above
1 Wild animals	12	19	23	26	27
2 Birds	9	17	25	25	24
3 Snakes	5	8	12	14	14
4 Fish	6	10	15	17	16
Total	32	54	75	82	81

Source: Batibo (1991:7)

As shown in Table 2, the older generations (60 years and above) had an extensive knowledge of the wildlife in the Sukuma society, as they knew at least 80 names of these animals as well as their most conspicuous physical characteristics. Moreover, the respondents confirmed that they had seen most of these animals in the wild. On the other hand, the younger generations (below 30 years) knew only 32 names of the wildlife. In fact, many of them admitted that they knew some of the animals by name only as they had never seen them except in pictures. Also many of them usually used the Swahili equivalent names. Moreover, in some cases, the same names were used for several animals which resembled.

Moreover, many African languages were rich in traditional processes, such as how to cut meat or plants, how to conserve flesh items, how to prepare food and so on. All these were embedded in the language system, particularly in the vocabulary. In Shisukuma, for example, the notion of “cut” was expressed in more than ten vocabulary items, as shown in Example 1 below:

Example 1: The notion of “cut” in Shisukuma

- ku-búta* “to cut in two pieces”
- ku-gáta* “to cut in several pieces”
- ku-chemba* “to cut progressively into pieces”
- ku-baaga* “to cut to remove skin”
- ku-téma* “to cut by chopping”
- ku-sínza* “to cut neck of animal”
- ku-sanzagá* “to chop an animal to pieces”
- ku-tína* “to cut e.g. rope”
- ku-puuga* “to slash, e.g. grass”
- ku-séenha* “to cut firewood”
- ku-kéng’enha* “to chop with force”

Most young Shisukuma speakers have acquired only one or two terms for “cut”. In most cases, it is the generic or common word *ku-búta* “cut in two pieces”.

This reduced knowledge of traditional terms has gone hand in hand with the loss or reduction in the diversity of the ecosystem and the ethnological skills and practices.

From the above, it is clear that the younger generations have not acquired the same quantity and quality of the Sukuma ecological knowledge as the older generation. This is not only because of the depletion of the ecosystem but also the reduced exposure of the younger people to their environment. This limitation is also true of the transmission of the traditions and cultural experiences of the Sukuma ethnic group.

The effect of the reduced bio-cultural environment and the adoption of new lifestyle in which new languages and socio-economic set-ups are introduced, has had very devastating impact on the acquisition of the ethnic languages and the relevant bio-cultural knowledge in many of the African societies.

In the case of Tanzania, there is no any explicit policy on the transmission of indigenous knowledge or the incorporation of this knowledge into the school system. Formal education is provided through Swahili medium at the primary school level and through the English medium at the secondary and tertiary levels. The more than 120 ethnic languages in Tanzania are not used, at any levels, in the school system. Although during the time of socialist orientation in Tanzania, in the late 1960's, the 1970's and the early 1980's, an attempt was made to develop education based on traditional systems through the philosophy of Education for Self-Reliance (Nyerere, 1967), not much was done to incorporate local or indigenous knowledge in the school curriculum. Most of the content was western based, except for some of the localized examples and concepts and some outdoor activities involving self-reliance projects. The only way that children were exposed to the traditional village life was through sporadic culture-based activities, such as traditional singing and dancing, displaying crafts, sculptures or carvings, making body decorations, and visiting museums which display traditional art.

However, in some vocational training institutions or informal learning centres, some traditional skills were incorporated in modern skills, such as knitting, dyeing, food preservation, beer-making, mat-making and even house building. However, in spite of all these efforts, a lot of indigenous knowledge got lost, such as the knowledge of traditional plants, methods of conservation and the interpretation of phenomena and events in the universe.

Since, in the olden times, there were no written or digital modes of conservation of the indigenous knowledge systems, the most common modes were the preservation of artifacts in various forms, and the making of inscriptions and rock paintings. The use of language was the most extensive and easiest way of representing the indigenous knowledge and skills. This was done in the set of vocabulary which was rich in fauna, flora and the physical attributes of the environment. It expressed not only names of entities, but also the methods and skills of dealing with the environment and the results of the various processes. At the same time idioms and proverbs were used extensively as depositories of the community's wisdom and world view.

II. The Diminishing Cultural Knowledge in Botswana

In the case of Botswana, formal education is provided through the medium of Setswana, the widely used lingua franca and national language, at the lower primary school level, and English, the official language, at the upper primary school level and above. No official role is accorded to the remaining 26 languages of the country. The official school curriculum is basically oriented towards the promotion of modern education based on Western and mainly Christian values. No efforts have been made to link traditional knowledge to the school curriculum or to incorporate indigenous knowledge in the school system. It is usually left to the teachers' initiatives to familiarize the students to some of the traditional concepts and objects.

Since most of the teachers come from the mainstream Setswana groups, the cultural information tends to reflect the world view of the main stream group, namely the Tswana. This would include the erection of a traditional hut in the school compound, the collection and storage of traditional artifacts in mini school museums, the visit to national museums, the formation of traditional dancing troupes and the display of culture-based performances.

The loss of indigenous knowledge by the speakers of the various ethnic groups in Botswana is happening at an alarming rate, not only because of the depletion of the ecosystem, but also because of the dominance of the mainstream Tswana culture and Western-based lifestyle. The traditional linguistic and cultural diversity involving San, Khoe and the other Bantu groups is rapidly giving way to a reduced state of multilingualism and multiculturalism (Nyati-Ramahobo, 2000; Smieja, 1996; Vossen, 1988).

PATTERNS AND PROCESSES OF IDENTITY LOSS

A lot has been studied and written about how the speakers of the smaller languages, in a contact situation, are progressively losing their linguistic and cultural identity by shifting to major languages or cultures through the principles of the Marked Bilingualism Model (Batibo, 1992, 2004; Mestrie, 2007; Molosiwa, 2000; Vossen, 1988). The shift incidence does not involve languages and culture only. It involves all forms of identity, namely linguistic, cultural, autonymic and ethnonymic features. Following the studies of Garcia (2006), Lamy (1979) and Pool (1979), one can identify a pattern in which identity loss takes place. This is shown below:

Patterns of identity loss from A (weaker) to B (dominant)

Stage	Process	Type of identity
1.	A acquires language B	Adopts a new linguistic identity
2.	A thinks like B	Adopts a new cultural identity
3.	A resembles B	Adopts a new autonymic identity
4.	A becomes B	Adopts a new ethnonymic identity

This model can be applied in the case of transmission and vitalization of indigenous knowledge, in that in most of the African countries, including Tanzania and Botswana, there is a progressive reduction in the transmission of linguistic competence of the indigenous languages in favour of dominant languages, including the ex-colonial languages like English, French and Portuguese. According to Batibo (2005), more than 81% of the minority languages are endangered to various degrees of severity. Of course, the minority languages can only be vitalized if the African countries will review their national language policies so as to promote all the indigenous languages and accord public roles in their respective countries, as this makes the speakers valorize their languages, use them actively and transmit them constantly to the younger generations.

Moreover, there is also a progressive loss of cultural identity where children are no longer in contact with their traditional environment to acquire nature-based knowledge, traditional skills and practices that provide the cultural identity. This lack of touch with nature has gone hand in hand with the depletion of the ecosystem and the reduced contact with the nature-based vocabulary which would have enriched the autonymic identity. A number of ethno-linguistic groups are left with only the ethnonymic identity. One example is the Zaramo community of Tanzania (found near Dar-es-Salam city). This community has lost its linguistic identity, as Kizaramo is hardly spoken. The Zaramo culture is generally lost, with only a few traditional practices. Most of them have acquired new names (autonymic loss) after conversion to Islam. However they have maintained their ethnonymic identity, as they want to be known as Wazaramo (Batibo, 1992). In case, one may say that they have reached the last stage of identity loss highlighted in Diagram 1 above.

Also, studies carried out in the central district of Botswana (Batibo, 1997, Chebanne & Nthapelelang, 2000; Hasselbring et al., 2001) reveal that most Eastern Khoesan speakers want to be known as “Basarwa” (Khoesan), although they have lost all other forms of identity and therefore are no longer in a position to transmit their ethno-linguistic identity to the younger generations.

MEASURES TO DEAL WITH THESE PATTERNS OF IDENTITY LOSS

I. Preservation measures

A number of measures have been instituted in many African countries to deal with this trend of transmission of linguistic and cultural identity so as to safeguard bio-cultural diversity. These measures have included the institution of a national policy of protecting all the historical sites, such as rock paintings, old buildings or dwelling places which were created through indigenous wisdom; the preservation of special artifacts in national museums, such as traditional musical instruments, pottery, tools and weapons that were made using indigenous knowledge. Other measures have comprised the identification of talented people in the community and giving them incentives to make traditional objects using indigenous knowledge; the organization of cultural industry where artisans and other

craftsmen could prepare materials to sell to tourists at the same time attracting young people to be trained in the art and therefore preserve the industry; and the encouragement of people with special talents or natural gifts like traditional healers, rain-makers and diviners to impart their skills to academicians and younger generations so as to have the skills well documented (Vigorous & Mufwene, 2008).

In the case of intangible heritage, a number of measures have been instituted, such as the documentation of all oral knowledge existing in a community. This would include the recording of all aspects of a language, cultural experience, history and folklore of a given community for both theoretical and applied studies and kept in a lasting mode. Other measures include the codification of the language in such a way that it is well described so as to result in a good standard orthography, a grammar and a dictionary which would be kept for use by the relevant community and other interested users; the tapping of traditional skills and methods used in conflict resolution, healing rituals, conservation methods and social organization; the collection of information on historical facts and beliefs such as legends, myths, folklores, proverbs, sayings; and the preparation of special dictionaries and thesauruses on the community's knowledge of plants, trees, wildlife and the various traditional uses (Visser, 2001a; 2001b).

II. The Bokamoso Pre-school Teachers Training Project in Botswana

The Bokamoso Project started as a response to a need to link local or indigenous knowledge with the Western-based education provided in the school system, usually in the mainstream language and cultural set-up (Bokamoso Education Training Centre, 2000). The government of Botswana has long recognized the sharp gradient between the home and the school among the minority or marginalized groups living in the remote parts of the country (Gunnestad, 2004; Matenge & Motshabi, 2001), but they had not acted on it because of the prevailing national language policy, in which only Setswana and English are the languages of education. The Bokamoso Project was started by missionaries and non-governmental organizations based on pre-schools, which are not part of the public school system.

While at home the children used their own ethnic language, in a specific cultural setting and physical environment and made use of the rich local or indigenous knowledge; at the school the children had to use Setswana, the national language and lingua franca and were oriented to a Western-based lifestyle. This caused a sharp disorientation, loss of self-confidence, considerable stress and homesickness. This deplorable situation was made worse by the bullying of the minority students, particularly the San, by the mainstream speakers. As a result many of them abandoned school and returned home.

The Bokamoso programme provides the teacher trainees with a system of educational tools and practices that build on the local or indigenous knowledge which they will encounter in the pre-schools that they will teach. The rural children pre-school knowledge is usually home-based, nature oriented and focused on the

ethnic group's cultural experiences and unique world view. Such rich children's background has to be systematically infused into the formal centre-based and western oriented education.

The curriculum of Bokamoso Teacher Training Centre was developed over two years by a special team made up of not only curriculum experts but also parents, community members and members of the NGO groups. The curriculum development operation, which was sponsored by the Van Leer Foundations, was based on the philosophy that early learning is most effective if it is based on the child's home environment and that the parents and the communities are actively involved not only in curriculum development but also in running the programme (Bokamoso Education Training Centre, 2000: 7). The core elements of the Bokamoso Training Programme are therefore:

- (i) an in-service training of mother tongue speakers, selected by the communities, as pre-school teachers through a two-year programme;
- (ii) a mother tongue pre-school curriculum built around familiar themes and utilizing locally available resources to lay a foundation for a more formal primary learning environment;
- (iii) an extension of the training to the parents and community educators so that communities who have no access to educational facilities will be enabled to prepare their children for formal education. This extension can function as an empowerment tool for the community to build self-esteem;
- (iv) a pre-school enrolment which coincides with the government classification of age-groups for the formal primary school system. Bokamoso deals with children whose ages are between 3 and 6 years. Usually children start formal primary education at the age of 7;
- (v) a series of theme books which have been developed to guide the future teachers. The books contain themes which are based on the local and indigenous knowledge and traditional skills of the marginalized communities

The use of mother tongue in the pre-school system has been very important as it has allowed the children to learn and express themselves in a language in which they had most confidence and which is the base of their cognitive and emotional development. However, these children also learn Setswana, the national language and usual medium of instruction in the formal primary school system (Keakopa & Qubi, 1994). The gradual passage from mother tongue education to bilingual education before moving to Setswana in the primary school system has ensured an effective and sustained learning process (Batibo, 2009). In fact, the Bokamoso Project has changed the attitudes of the minority language speakers towards school life, as both the children and their parents now see the school environment as friendly, accommodating and related to their traditional way of living at home.

The Bokamoso project has displayed clear success as it has helped to re-orient the approaches of teaching and created a more conducive environment in the pre-schools. As a result the children attending these schools have developed more interest and confidence as what they learn is related to their home environment.

Also they have become more at ease with the school environment as they see that the teachers use their language, they understand their customs and are familiar with their nature-based world view. Thus, drop-outs have lessened and the children are now able to sustain their education up to higher levels. At present, the average enrolment ranges between 10 and 80 in a school, with the average around 25 children. Moreover, the parental and community involvement have provided further support, as the children have felt that what they were learning at the pre-school had been approved by the parents and that it involves aspects of their lives.

Moreover, the gradual passage, from the indigenous based knowledge to the mainstream or Western-based knowledge, with the change of language from mother-tong to Setswana, has been crucial in meeting the expectations of the communities as they would like their children to preserve their identity through the knowledge of their own culture and practices, but at the same time, be part of the wider world and even benefit from the modern opportunities through the knowledge of the mainstream culture and language. In fact, the involvement of the minority communities in the preparation of the pre-school curriculum and the running of the school affairs has further given the parents confidence as they feel empowered and valued in such important matters as their children's education (Keakopa & Qubi, 1994).

CONCLUSION

It is crucial that the practices of indigenous knowledge preservation be intensified through-out Africa. It is indeed an African challenge, given that the traditional milieu where the indigenous knowledge was based, namely mother-nature (where fauna, flora and the physical environment prevailed), is rapidly been degenerated. At the same time the younger generation is no longer in close association with nature or traditional practices. Thus if we cannot reverse the trend of affairs at least we need to preserve the little that is remaining.

In the domain of intangible heritage, which is the one diminishing faster, the use of documentation as a way of recording the fast disappearing knowledge and skills in the most appropriate. Proper documentation needs to be carried out by several people in an inter-disciplinary project. Such a project needs a linguist to record the linguistic knowledge correctly. There is need for a botanist or zoologist to identify the plants, trees and wildlife so as to accord them proper scientific names. Also there is need of a knowledgeable elder from the relevant community in order to provide the equivalent names in the language. On the other hand the larger community needs to be sensitized about the importance of indigenous knowledge in our countries and the need to preserve such an important heritage.

Generally speaking, most African countries would like to preserve their biodiversity, including fauna and flora, and to make the indigenous knowledge accessible to younger generations. But this is being increasingly difficult because of the reduction of the traditional ecological system and the change in the lifestyle

in many homes. In fact, the rapid erosion of the traditional cultural practices and norms, coupled by linguistic losses and the reduction of the biological diversity, means that the child's home environment is continuously impoverished and that his world is oriented more and more towards a Western based or global village perception.

At the same time, the African school system would like to incorporate cultural features in the school curriculum and even to instill a smooth transmission between the home and the school. However, in most cases the concentration is mainly on the mainstream languages and cultures which may be included in the school curriculum. Only rudiments of the artistic expressions of the other groups may figure in some isolated activities like traditional dances, singing and works of art. The children of the minority, and often marginalized, groups would therefore be grossly disadvantaged. In fact, the position of indigenous knowledge loss between Tanzania and Botswana is similar in a number of respects. Both countries have one dominant language which is the only one being promoted at the expense of the other languages. The indigenous knowledge associated with the neglected languages is not accorded much national attention. Also very little has been done to incorporate indigenous knowledge in the school curriculum, give that in both countries, the school curriculum is largely Western – based. The two countries differ, however, in that Swahili, in Tanzania, has no ethnic roots nor indigenous traditions, as it has been under foreign influences since the 11th century, while Setswana is an ethnic language with a rich tradition of indigenous knowledge in both tangible and intangible forms.

The Bokamoso experience has shown that a proper transmission between the home and the school and the necessity to link the home-based indigenous knowledge to the school-based Western education are the best ways of creating confidence and interest in the marginalized child. Through the activities of the pre-schools in western Botswana, many young minority speakers, especially those from the San groups, are able to build a good foundation and therefore continue steadily in the school hierarchy. One of the fundamental principles of this programme has been the use of mother-tongue based pre-school education that concentrates on relating new information to the children within a familiar cultural and world-view context. It has also focused on involving the relevant parents and the community as much as possible and incorporating traditional learning and cultural knowledge into a classroom environment. Since the Bokamoso Project is limited to pre-schools, which are usually run by missionaries, individuals and non-governmental organizations, it does not have an impact, at the moment, on the regular formal school system, which is run by government from primary to tertiary levels. As long as the government maintains its current national language policy of only having Setswana and English in the school system (Botswana Government, 1984), there is little hope that children will be able to use their home languages and culture at school or to incorporate fully the indigenous knowledge of the minority languages in the school curriculum.

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