

## A FRAMEWORK FOR DEVELOPING A KNOWLEDGE BASE FOR INDIGENOUS ECOLOGICAL KNOWLEDGE IN UGANDA

**Robert R. Ikoja-Odongo**  
**East African School of Library and Information Science,**  
**Makerere University, Uganda**  
**E-mail: [ikoja@easlis.mak.ac.ug](mailto:ikoja@easlis.mak.ac.ug) or [ikoja@yahoo.com](mailto:ikoja@yahoo.com)**

Received: 19 January 2009

Revised: 15 February 2009

Accepted: 30 March 2009

### **Abstract**

*Interest is growing at national and international level in the role of indigenous knowledge in participatory development. But information scientists are paying more attention to the conceptual understanding of indigenous knowledge than the practical aspects of building a knowledge base for it. This is attributed to the absence of an agreed framework for documenting indigenous knowledge. Consequently documenting, preserving and disseminating indigenous knowledge are less than satisfactory. A framework for developing a knowledge base is needed to bring a combination of the best practices from the traditional and modern knowledge. The article presents a framework for documenting indigenous knowledge in Uganda. It raises issues to document and using them to develop the framework. With such a framework information scientists can document, preserve and disseminate indigenous knowledge.*

**Key words:** Indigenous ecological knowledge, Knowledge base, Uganda

### **Introduction**

This article aims at providing a framework for documenting indigenous knowledge in Uganda. The need arises out of many factors including inadequate skills in documentation, poor infrastructure for documentation work, language and cultural barriers, inadequate and disparate capacity to identify and manage indigenous

knowledge, and inadequate coordination of indigenous knowledge activities. Little involvement of stakeholders in processing and disseminating indigenous knowledge, difficulties in accessing acceptable content for re-packaging, and inappropriate communication channels are additional constraints. Motivation for suggesting a framework development is due to absence of a framework or guidelines for documenting, repackaging and disseminating indigenous knowledge. Traditional knowledge research is a new and rapidly evolving field with no one method for data collection (Grenier 1998:93). Moreover indigenous knowledge has been ignored or marginalized for a long time.

This article is an attempt to stimulate a debate that can trigger actions leading to adoption of a national agenda for the documentation of indigenous knowledge. Presently, the Uganda National Council of Science and Technology (UNCST) is responsible for the development of indigenous knowledge policy in the country while the National Chemotherapeutics Research Laboratory is responsible for the validation of traditional medicine. The article also aims at encouraging parties interested and involved in gathering, storing, managing and disseminating information to use a shared framework for documenting this knowledge as a way of standardizing the recording and sharing of indigenous knowledge. It is targeting librarians and those persons and organizations engaged in documenting indigenous knowledge.

### **Indigenous knowledge**

There are many definitions of indigenous knowledge. According to Lengisugi (2006) indigenous knowledge is an ethno science, or traditional wisdom. It is knowledge that evolves over time and is communicated orally from one generation to the next. The generic characteristics of this knowledge include its uniqueness to every culture, can be transferred orally, experientially and practically, it is knowledge used to guide, control and explain actions occurring in specific settings, it is based on beliefs and embedded in a natural environment. Warren (1993) defined indigenous knowledge as body of knowledge acquired by local people through the accumulation of experiences, informal experiments and intimate understanding of the environment in a given culture. It is knowledge that is unique to every

culture or society and communally known as knowledge that is community specific. It is knowledge tacit by nature, practical in value and kept in the form of wisdom and practice. Nakashima and Roue (2002) described it as a system of complex arrays of knowledge, know-how practices and representations that guide human societies in their interactions with the natural environment.

Indigenous knowledge has several synonyms, including traditional knowledge, ecological knowledge, but can be divided into three categories: ecological, spiritual and astrological. This article focuses on indigenous ecological knowledge because of its socio and economic value.

### **Value of indigenous knowledge**

In the past indigenous knowledge was thought of as unsystematic and incapable of meeting the productive needs of the modern world. It was considered inefficient, inferior and an obstacle to development because it was perceived as being primitive with nothing to offer (Kashweka and Akakandelwa 2008:116). This kind of thinking prevailed during the time of colonialism in Uganda as elsewhere colonialism had control. As a result indigenous knowledge was neglected and undocumented and left to die with old generations.

This perception has changed with indigenous knowledge increasingly recognized as a valuable and underutilized resource of importance to communities and development (Kashweka and Akakandelwa 2008: 117). As Rouse (1999) observed, the change of attitude was manifested as a response to the failure of some of the modern scientific approaches to development programmes and a change from centralized, technically oriented solutions of the past decades that failed to improve the life prospects for the majority of the local people. For this reason, The World Bank (1999) recommended the need to harness local knowledge or reconcile it with new technologies by involving those who possess it. The Bank noted that steps need to be taken to harness the knowledge so that it is easy to access it as well as attach value and rights to it. In this way would it be meaningful, economic, and easy to explore and utilize it for development.

It is clear from literature that indigenous knowledge is a resource that assists local people in solving local problems. Indigenous knowledge is the basis for decision making at grassroots level. Solution-seeking behaviour is based on indigenous creativity, leading to experimentation and innovations as well as appraisal of knowledge and technologies introduced from other societies (Warren 1990).

Indigenous knowledge is essential for the attainment of Millennium Development Goals (MDGs). As Mkapa (2004) put it, there is not one MDG to whose achievements indigenous knowledge cannot contribute. The potential development impact of indigenous knowledge can be gauged by a number of practical examples where its application has produced desired results. Examples include: Goal 1: Eradicating extreme poverty and hunger; Goal 6: Combating or suppressing HIV/AIDS, malaria and other diseases; and Goal 7 of ensuring environmental sustainability (Kashweka and Akakandelwa 2008:116).

Focusing specifically on HIV/AIDS, Green as quoted by Kashweka and Akakandelwa (2008:120) observed that the global model of AIDS prevention; which is based on risk reduction or interventions such as use of condoms or treating Sexually Transmitted Infections (STIs) with drugs rather than risk avoidance, has been ineffective in Africa.

In response to the scourge, two African countries, namely Uganda and Senegal, developed prevention programmes that emphasized primary behaviour change along with risk reduction interventions. Uganda's locally developed prevention programme largely basing on Abstinence, Being Faithful, Use of Condoms (ABC) and "zero grazing" have met with a measure of success. This is in addition to scaring lunch time messages from radio using drumbeat warning. The Senegalese model, based on traditional practices which do not allow women in their early 20s to have sexual intercourse, has enabled the country to reduce the rate of HIV/AIDS increase and minimize new infections. To implement this model, Senegal enlisted the support of religious organizations in HIV/AIDS prevention, started HIV/AIDS education in primary schools and deliberately used fear arousal as a prevention strategy that also worked well.

In Ghana, Burkina Faso, Cote d'Ivoire, Togo, Benin, Niger, Sierra Leone, Senegal and Guinea-Bissau, the World Bank (1999) reported

that indigenous knowledge has been applied in epistemological and pharmaceutical eradication of river blindness. The World Health Organisation [WHO] (2007) reported significant role of circumcision in the reduction of HIV/AIDS. It is also estimated that up to 80 percent of the non-industrial world's population relies on traditional forms of medicine and 42 per cent of the world's top-selling drugs in 1997 were derived from natural resources with a global market value of US\$75-150 billion. Indigenous knowledge is therefore a pillar of traditional medicine and health systems.

Pakia *et al.*, (2008:129-131) gave examples of the value of indigenous knowledge in Kenya. They reported that patients often sought complementary therapies including herbal remedies because of high costs of western drugs, non-availability of such drugs, adverse effects of conventional medicines and others. They estimated that for every individual who sought medical and pharmaceutical care, three times as many people sought complementary care. Remedies derived from plants are common in many cultures, and a number of modern drugs are derived from plants. In Uganda there is evidence of a growing trade in Chinese herbal remedies such as Uganda *samona* soap and jelly that are effective in curing human skin infections. Madugereira (2008) gives an example of *Thithonia diversifolia* from Sao Tome that is used for the treatment of malaria because of its active principle *Tagitinine C*. This same plant is used as an anti-inflammatory remedy and anti-diabetic treatment.

In agriculture indigenous knowledge and practices developed and practiced by rural people range from seed selection to wild plant selection for consumption. Rural people in developing countries also have intimate knowledge of their natural environment and environmental processes such as land cultivation that stimulates growth of natural vegetation such as in Washamba of Usambara Mountains in Tanzania. Mixing shrubs and trees in the same plot with agricultural crops maintained soil fertility. This practice has been replicated as a success story in similar environments in Rwanda.

Maganga (1998) reported results of a study in Tanzania on the role of indigenous knowledge in irrigation farming that revealed the preference of the local people in retaining and developing their own locally evolved irrigation in which they use bamboo as pipes. All the above

examples demonstrate how local people draw strength from their accumulated knowledge in order to overcome various obstacles to development.

### **Need for documenting indigenous knowledge**

There is a need to standardize documentation of indigenous knowledge and place it in the public domain. In Uganda:

- The management of indigenous knowledge remains problematic and precarious. There is a tendency of people forming organizations (both non-governmental and community-based) for documenting indigenous knowledge when they hear that some international organization has money for such work. To scramble for that money leaders quickly add a line item to their work plans and write proposals seeking funding on indigenous knowledge. Quite often they get the money irrespective of expertise or capacity to do the job. Once the money is spent, the work on indigenous knowledge also stops.
- At the national level there is no database tracking who is documenting what aspects of indigenous knowledge. Information is scattered in local organizations, research institutes, among individuals, and possibly university libraries and accessing the knowledge is difficult.
- Although there are some efforts to bring together people or organizations involved in this kind of knowledge, there is presently no directory to rely on of expertise or institutions holding indigenous knowledge information in Uganda. Scientists who know about indigenous knowledge are concentrated in the National Chemotherapeutic Research Laboratory, research institutions, universities and private organisations. The WHO has been working with organizations and persons with knowledge on herbal medicine, but with little documentation success. The National Chemotherapeutic Research Laboratory has had some success with a group of traditional healers and herbalists in validating herbal products as potential resource for pharmaceutical development, albeit slowly. The main problem is absence of a legal framework to document and utilize indigenous knowledge.
- There is evidence in Uganda that local medicine is increasingly becoming available as a tradable commodity. Practitioners

- (both medical and non medical doctors) and traders of this type of medicine are manufacturing, packing, labeling and selling local medicine in shops. This is besides the herbs sold alongside farm products.
- There is the critical issue of intellectual property rights. It has become known in Uganda by the traditional medical practitioners that there is a lot to benefit from disclosing at a cost the indigenous herbal knowledge, especially to drug companies. Although Uganda has introduced specific legislation on access to biological resources and benefit-sharing as required by the Convention on Biological Diversity (CBD), government has not disseminated it widely and there is little knowledge on how to protect, develop and share benefits from biological resources or how individuals can be protected from exploitation. This gap will continue to hinder documentation of indigenous knowledge.
  - There is also a growing risk that indigenous knowledge will be lost forever since much of it is held by elderly people in rural areas. Continuity would be guaranteed through children but Uganda's education system is orienting children to only exogenous knowledge. Indigenous knowledge has been left out or marginally treated. The informal education where we could learn from has also been invaded by western values.
  - Urbanism is emerging in Uganda, and is narrowing the understanding of traditional issues including indigenous knowledge and replacing it with western values. This weakens links with indigenous knowledge except when there is demand for herbal remedies.
  - Indigenous knowledge is disappearing at unprecedented rate due to deforestation. There is no programme that encourages communities to grow or perpetuate the growing of indigenous species. In most cases the plants are propagated and conserved in botanical gardens mainly for study purposes at universities and research institutions.
  - Some of the pharmaceutical drugs produced today are obtained from plants, growing in African forests. Because these plants are rare it is critical that information about them is documented and stored in databases. This would allow scientific validation of these plants as sources of indigenous and ecological knowledge.

- Uganda's libraries especially public libraries are bastions of foreign ideas from the north. The trend is unlikely to change radically in the next decade if information scientists do not document indigenous knowledge. Documentation of indigenous knowledge would contribute to the world's knowledge reserve.

### **Preparations for documenting indigenous knowledge**

UNCST is an apex national institution for coordinating indigenous knowledge in Uganda. It is responsible for the indigenous knowledge policy and other related matters. The National Chemotherapeutic Research Laboratory is involved in validating herbs and remedies for treatment. There is also a National Board of NGOs under the Ministry of Internal Affairs that registers NGOs in the country. There are several research institutes where specialists in scientific knowledge can be sourced. The Ministries of Agriculture, Animal Industry and Fisheries and the Department of Culture also have expertise in local knowledge. These organizations can work together to document indigenous knowledge from local organizations such as the Association of Traditional Birth Attendants, and a council for herbalists. NCST can through these institutions, bring together in a forum all interested parties and individuals dealing in indigenous knowledge to document such knowledge. Through such a meeting key ideas to share would include (a) listing stakeholders and by category e.g. those dealing with indigenous knowledge in agriculture, health, science and technology etc. and developing a working database for it (b) collectively developing the survey instrument to document, photograph etc data about indigenous knowledge (c) defining and identifying expertise for the survey team and seeking their participation (d) preparing the documentary tools (e) soliciting financial resources, and transport (f) arranging meetings with communities where documentation will take place (g) selecting of pilot documentation area (h) meeting with local communities to agree on how documentation will be done (i) management of documented information (j) a review of pilot results, disseminating outputs and sharing lessons learnt.

A national meeting should be arranged to discuss with stakeholders the scope of indigenous knowledge and the need to collect information on it. Understanding what indigenous knowledge is about makes it easy to decide which discipline or knowledge area to cover. Indige-



nous knowledge affects all aspects of people's lives and therefore it is found in different sectors of life. Discipline oriented coverage is advised because it influences formation of a documentation team. In such a meeting the need to document indigenous knowledge is agreed and a plan of action agreed up on.

The instrument for collecting data should be developed, discussed, amended and adopted collectively. The instrument would be a framework for developing the knowledge base for indigenous knowledge. The proposed instrument can be adjusted to suit local circumstances. The key issues and matters to pay attention form part of the framework are shown in Table 1.

**Table 1: Key issues and matters in developing the framework**

<b>KEY ISSUES</b>	<b>MATTERS TO PAY ATTENTION</b>
<b>Organization Documenting</b>	e.g. National Council for Science and Technology
<b>Team documenting</b>	e.g. Librarian, ethno botanist, photographer, linguist, musician
<b>Place of documentation</b>	District, sub county, parish, village, physical location
<b>Community expertise</b>	e.g. Herbalist, traditional birth attendant, traditional psychotherapist, traditional healer
<b>Field of Indigenous Knowledge</b>	e.g. IK in agriculture, health, oral history, science and technology
<b>Ecology of distribution of species/item</b>	Domestic, bush, water , Lowland, plains, highland, riverside
<b>Type of species/product</b>	Woody plant, fungi, cereal, soil, clay, animal etc
<b>Status of species or product</b>	<b>Abundance:</b> Common, Uncommon <b>Local access:</b> Easy , difficult
<b>Description of species/product</b>	Vernacular name, dialect name, translation into English, botanical/scientific name etc
<b>Value of product</b>	Medicinal value, food value, drinks value, other (specify). <b>Human:</b> disease treated, dosage, precautions, side effects e.g. intoxication. Vigour,

	lactation, drowsiness, toxicity other warning. <b>In animals</b> disease treated, dosage, precautions. If food, parts used, taste, age group eating, gender of eater.
<b>Management</b>	<b>Storage:</b> Season of collection, collection time How long and storage conditions (dried, fresh, powder form,) etc
<b>Propagation</b>	Source of initial material, propagation (cultivation), weediness, wild plant, domestic plant. Harvest season, Actively protected by local people
<b>Areas of application</b>	e.g. disease management, food, research, teaching , cultural practices, business,
<b>Parts used</b>	Stem, root, bark, leaves, flower, seeds, soil, pellets (animal droppings, fungi, soil or clay etc
<b>Preparation of species for use</b>	Harvesting, drying, pounding, heating, crushing, brewing or direct application etc
<b>Commercial exploitation</b>	Marketing: local, international etc
<b>Intellectual property rights, if any</b>	Registered? Patent number, <i>sui generis</i> , plant breeding rights, copyright, trade mark, industrial design, and trade secret.

To document indigenous knowledge one must have interest and prior knowledge about it. Good results come when and where there is a will to achieve something. Indigenous knowledge is multi faceted and requires the services of subject specialists. A team of specialists who understand the concepts need to be formed. Specifically the following expertise will be needed: librarians, ethno-botanists, linguists, musicians, photographers, and data entry clerks with computer skills. For instance when a librarian is responsible for taking notes or filling in the survey data sheet, a photographer will take pictures or do video recording. Documenting herbal plants requires an ethno-botanist in the team; recoding local music, requires a trained musician with sufficient cultural knowledge of local music and so on. These are the experts to join at specific times the local people (bearers) such as herbalists, traditional psychotherapists, traditional healers, traditional

birth attendants, community leaders and others with specialized knowledge.

Community expertise is important because they have knowledge of the subject, and can discuss in vernacular which a linguist can translate to other specialists. The discussion with them should help clear the way to explore what they know, and improve an understanding of local conditions and provide a productive context for documentation. In joint meeting the work plan and language to be used during documentation would be approved. Local leaders should participate in planning e.g. how, where, when and who will collect what information. Women should be included because in most cases they have specific information that is known by women only.

UNCST has to provide recording equipment and materials such as digital and static cameras, video or tape recorder, flash memories, specimen bags and gum boots for bush walks, note books and other writing materials that may become necessary. Computers are needed during data entry, holding of database and dissemination.

The local community where documentation will take place should be selected early enough and partners such as chiefs, indigenous knowledge experts at a community level including traditional psychotherapists, traditional birth attendants, and herbalists identified and informed.

Approaching a community to discuss the intention of the project as well as seek their participation is important. Each team should know their roles and expectations. The purpose of this action is to establish rapport and eliminate suspicion between the documentation team and community leaders and to select from among the community members, experts in indigenous knowledge to work with.

### **Documentation of indigenous knowledge**

There are many ways to document or collect data on indigenous knowledge depending on the type of data to be captured and the format for doing so. It may involve using survey data sheet, taking pictures, or video recording and so on. These activities may take place simultaneously. But what is important is to capture information

and keep it safe after it is collected and discussed to avoid losing vital information.

Once documentation is complete, it is important to give information back to the community. Let the people know what was collected and how it will be used. Most researchers often forget this and can lead to future resistance to new research efforts. It is also important to review how the documentation exercise went. Lessons learnt from it should be used to scale up and roll out the project to other areas.

### **Data entry and dissemination of indigenous knowledge**

As soon as data are collected, they should be discussed and approved. The documentation team should approve data to be entered into a computer. This will make it easy to upload the information on to the Internet. This may involve sorting, transcribing and translations and editing of data. Sorting of the materials depends on the number of computers and the space available. UNCST should create and maintain a database of indigenous knowledge. Computers with Internet connectivity are needed for data entry and information dissemination. A Wiki type of computer software is considered the best because it is friendly to edit and update and does not need special computer languages for uploading information. The field notes should be properly kept in folders even after posting the data to the website. The notes will remain as backups until all data have been edited.

For purposes of inquiries and follow up, contacts of authors of field notes should be available including name, telephone number, contact address, e-mail address and organization imprinted on them. Community members who participated should be acknowledged and their contribution specified. Pictures can be down loaded into CDs or flash memories before they are selectively and systematically uploaded onto the website complete with captions. Pictures that are not used immediately must be stored safely in digital form. The pictures should be clearly marked with the "IK" prefix, dates and place they were taken and the photographer's name. The flash memories should be kept in labelled cases. Pictures that are kept in flash memories should be in specific folders for easy to access and retrieval.

Ideally, indigenous knowledge information should be in the public domain as soon as it is ready. The UNCST as the centre holding the information should market its product quickly to a wider public. The website should be user-friendly. Its address should be promoted using various means. Organized literature and other information materials are best disseminated through the outlets such as print, herbarium species and on the Internet.

Digital information should have back-ups that can be stored away in secure places to avoid damage but their whereabouts should be known to intended users. Pictures and posters can be laminated while pamphlets can be kept in water proof book-boxes or folders in a secure place and their availability known. Use of pass words to access certain pages of the website is encouraged to insure information validity. If a video recording is narrated in a language that many people cannot understand, then it is essential to translate it into an acceptable language or prepare a documentary from the original video recording in different languages according to demand for such information.

The information on the website should be organized according to thematic areas such as traditional medicine or indigenous agricultural knowledge. Since these areas are not of any scientific classification scheme, it is important for the documentation team to discuss the taxonomies of this knowledge and come up with a classification system that will take into account the dynamism of the thematic areas. The main reason for indexing is to quicken the information search for users. Subject headings or standard keywords should be used to facilitate this process. Indexing is a key to any information storage and the documentalist should have knowledge of indexing.

## **Conclusion**

Uganda has little information base about her indigenous knowledge resources. This is because indigenous knowledge has not been properly documented. The problem has been disparate attempts without accepted criteria to organize this information systematically. Organizations that are documenting indigenous knowledge have limited capacity for this knowledge and their work hampered by lack of legal framework to document indigenous knowledge on a national scale.

Government through the UNCST should take keen interest in this area and empower UNCST as lead agency in implementing this task. A project is needed to initiate and document indigenous knowledge. The Ugandan public and the international community need information on Uganda's indigenous knowledge.

## References

- Grenier, L. 1998. *Working with indigenous knowledge: a guide for researchers*. Ottawa: IDRC
- Kashweka, K and Akakandelwa, A. 2008. Indigenous knowledge and the attainment of MDGs in Africa: opportunities and challenges. Paper read at the Eighteenth Standing Conference of East, Central and Southern African Library and information Associations, Lusaka, Zambia, 15-19 July, 2008.
- Lengisugi, N. O. 2006. Maasae resource centre for indigenous knowledge in Tanzania. Paper read at the XVII Standing Conference of Eastern, Central and Southern African Library and Information Associations held in Dar Es Salaam, Tanzania, 10-14 July 2006.
- Madureira, M. do Ceu 2008. Ethnopharmacology: rediscovering traditional medicine. *Viewpoint Spore* 136 (August): 16.
- Maganga, F. P. 1998 Indigenous knowledge and irrigation development in Tanzania. Experiences from Msanzi and Musa Mwijanga farmer-managed irrigation schemes [Online]. Available WWW: <http://www.cdr.dic/sscafrica> (Accessed 28 November 2008).
- Mkapa, B. 2004 Introduction. Indigenous knowledge: a local pathway to global development. [Online]. Available WWW: <http://www.worldbank.org/html/afr/IK> (Accessed 18 November 2008).
- Nakashima, D and Roue, M. 2002 Indigenous knowledge, peoples and sustainable practice In: Timmerman, P. (ed). *Encyclopaedia of global environmental change*. John Wiley and Sons, Ltd, Chichester, pp. 314-324. [Online]. Available WWW: [http://portal.unesco.org/science/en/files/3519/10849731741IK\\_People/IK\\_People](http://portal.unesco.org/science/en/files/3519/10849731741IK_People/IK_People) (Accessed 18 November 2008).
- Pakia, M., Baraza, D., Nyamulu, J and Tank, P. 2008. Application of indigenous knowledge towards achieving MDGs; the participation of traditional healers in combating HIV, AIDS and other diseases.

Paper read at Eighteenth Standing Conference of Eastern, Central and Southern African Library and Information Associations held in Zambia Lusaka 15-19 July, 2008.

- Warren, D. M. 1993. Using IK for agriculture and rural development: current issues and studies. *Indigenous Knowledge and Development Monitor*, 1(1) [Online]. Available WWW: <http://www.nuffic.nl/ciran/idkdm> (Accessed 18 November 2008).
- World Bank 1999 World Development Report 1998/99. Knowledge for development. [Online]. Available WWW: <http://www.worldbank.org/wdr/wdr98/africa/> (Accessed 18 November 2008).
- World Health Organisation (WHO) 2007. Information package on male circumcision and HIV/AIDS prevention. [Online]. Available WWW: <http://www.who.int/hiv> (Accessed 27 November 2008).