DIGITISATION OF INDIGENOUS TRADITIONAL KNOWLEDGE ON FOREST FOODS AND MEDICINE IN GHANA

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Abstract

This paper discusses the digitisation of indigenous knowledge (IK) on forest foods and medicine for the effective management of Ghana's forest resources. The paper is based on a survey conducted in nine communities in Ghana where primary data were obtained from in-depth face-to-face interviews conducted among 606 respondents resident in nine communities and located in three ecological zones in Ghana. The aim of the study was to assess what knowledge local communities had about products of the forest especially indigenous forest foods and indigenous medicine. The findings reveal that local communities have an in-depth knowledge of indigenous forest foods and medicines. They are conversant with what foods are available in the forests, how they are consumed and when they mature. They are equally knowledgeable about traditional medicine derived from the forest. However, the study indicates that consumption of indigenous forest foods is on the decline, while the use of traditional medicine is on the ascendancy. In order not to lose the valuable IK, the digitisation of these resources was initiated using open source software which presents several opportunities to promote Ghana's forest resources and to unearth the hidden treasures of the forest. IK belongs collectively to a community and they should own the intellectual property rights and should therefore be properly compensated when that knowledge is used. There are no such laws or legal instruments in place that promote this idea. The study therefore recommends the promulgation of such laws to protect the country and communities from bio-piracy. Other recommendations suggest the need for concerted interest in digitisation of Ghana's indigenous knowledge to intensify efforts geared towards natural resources management.

Keywords: Indigenous Knowledge; Digitisation; Forest Foods; Forest Medicine; Ghana

1. Introduction

Indigenous Knowledge (IK) refers to the knowledge belonging to a specific ethnic group that is unique to that ethnic group, society or culture (Boven & Morohashi, 2002). According to (Gorjestani, 2000)Gorjestani, (2000) Indigenous knowledge is understood to be the traditional knowledge of indigenous peoples which is oral in nature, usually transmitted from one generation to another and exists mostly in the minds of local people. The medium of transmission is usually through personal communication and demonstration and can be from tutor to the pupil, or to the apprentice and/or from parents to children (Christian, 2009) human and animal health,

education, natural resource management and other vital activities. Local communities in developing countries in Africa are applying traditional medicine knowledge to respond to and manage the HIV and AIDS pandemic as well as in the treatment of other opportunistic infections. Traditional knowledge forms an integral part of the culture and history of local communities and hence their common asset in their effort to gain control of their own lives. One of the best modern approaches to preservation of traditional knowledge is documentation in some permanent form and public accessibility using information and communication technologies. In addition to preservation, documentation and online accessibility of traditional medicine knowledge provides an effective tool for research and innovation. Some of the problems to documentation identified in the course of this research include the absence of collaborative effort by various government agencies engaged in documentation of traditional knowledge. Also the ease with which digitized information could be copied and transmitted raises issues as to the ability of the communities to continuously ensure ownership and integrity of their knowledge and that its sacred features are not compromised. With regards to the applicability of conventional intellectual property rights (IPR).

IK is an essential resource for the developmental process whose application plays an essential role in the lifestyle of members of the local community (Lalonde, 1991). Christian (2009), reports in his study on digitisation of traditional medicine in Nigeria that IK is predominantly tacit and is embedded in the practices and experiences of its holders. Within the local environment, IK forms the basis for decisions pertaining to food security, human and animal health, education, natural resource management and other vital activities (Gorjestani, 2000).

Despite its value, it often remains undocumented and stands the risk of becoming extinct (Battiste, 2005). To avoid IK becoming extinct the use of digitisation has been applied in many jurisdictions to preserve it. The management of IK as a literary material has been a subject discussed by various authorities (Anyira, 2010). However within library and information circles in Africa, it is almost a new phenomenon. In some countries such as Australia, however, major efforts have been made to preserve IK in accessible forms through the recording and documentation of the knowledge, so as to assist in its easy retrieval (Nakata & Langton, 2006). With advancement in the use of Information and Communication Technologies (ICT) a range of new opportunities is now available for processing this unique form of knowledge. The major challenge for Library and Information professionals is usually with the ability to recognise traditional knowledge as a distinct system of knowledge that requires handling and management regimes for its materials that are different from those applied by the Western system of knowledge management (Nakata & Langton, 2006). In Ghana very little attempt has been made to collect, process and digitise indigenous knowledge. Ghana therefore stands the risk of losing its traditional indigenous knowledge if no effort is made to preserve it.

This paper reports on a study undertaken to assess the level of knowledge of local people on forest foods and medicines in some local communities in Ghana and discusses the digitisation of the foods and medicines identified. The digitisation process is to preserve this valuable local knowledge and make it accessible to all. The study was undertaken in forest fringe locations where most of the populations depended on the forests for their livelihoods and general well-being.

Forests worldwide are storehouses of ecological treasures and in Ghana this cannot be understated. According to Arnold et al. (2011) forests and tree-based agricultural systems provide direct and indirect ecosystem services that make essential contributions to human livelihoods and well-

being. Indeed The World Bank Group (2004), reports that an estimated 1.6 billion people around the globe depend on the forests to some degree for their livelihoods. Many of these people live in rural communities and they derive immense benefits from the forests such as food, medicines, wood fuel and shelter among many others. In Ghana, the situation is similar in the sense that forests provide livelihoods to 15% of the population (3.6 million people out of 20m people) (Kpelle, 2012)

2. Benefits of documenting and digitising forest foods and medicine

Due to its oral nature communities risk losing all the local knowledge developed over many generations if it is not processed and stored. Documentation and digitization of indigenous knowledge on foods and medicine are some of the best ways of preserving and accessing this knowledge. During the digitisation process, it is necessary to ensure that processes applied adapt to internationally acceptable guidelines, policies and practices (Hippolyte & Namaseb, 2011). Several benefits of digitisation have been identified worldwide (Holmes, 2015; World Bank Group, 2014; Sabbagh et al, 2013; GBIF, 2008). For instance, documentation and preservation of this delicate knowledge ensures its wider dissemination (Christian, 2009)human and animal health, education, natural resource management and other vital activities. Local communities in developing countries in Africa are applying traditional medicine knowledge to respond to and manage the HIV and AIDS pandemic as well as in the treatment of other opportunistic infections. Traditional knowledge forms an integral part of the culture and history of local communities and hence their common asset in their effort to gain control of their own lives. One of the best modern approaches to preservation of traditional knowledge is documentation in some permanent form and public accessibility using information and communication technologies. In addition to preservation, documentation and online accessibility of traditional medicine knowledge provides an effective tool for research and innovation. Some of the problems to documentation identified in the course of this research include the absence of collaborative effort by various government agencies engaged in documentation of traditional knowledge. Also the ease with which digitized information could be copied and transmitted raises issues as to the ability of the communities to continuously ensure ownership and integrity of their knowledge and that its sacred features are not compromised. With regards to the applicability of conventional intellectual property rights (IPR. Several examples exist on the bio-piracy of indigenous knowledge by multinational entities worldwide in India, South America and South Africa (Avantika, Vinil, & Swati, 2015; Bhattacharya, 2014); Andrews, 2012). Documentation and digitization of this knowledge is therefore an effective tool for defensive protection from bio-piracy as well as expropriation without compensation by multi-national entities (Christian, 2009; Nakata & Langton, 2006). By documenting IK easy access to this knowledge is facilitated.

Documentation provides evidence that a particular knowledge has developed in a particular local community thus vesting the community with claim over such knowledge as well as the right to share in any profit resulting from the commercialization of the knowledge (Christian, 2009).

3. Research problem

Indigenous knowledge has caught the attention of Policy makers and governments as well as international agencies worldwide due to its valuable contribution to local development. Several countries such as Venezuela, India and China have over many years, compiled digital databases, inventories or registries of traditional knowledge. Despite the value attached to it, it risks becoming extinct in many places especially in Africa due to a lack of policy and inadequate

methods of preservation in a complex and dynamic world. Policy makers, scientists and local communities in Ghana have made very little effort at comprehensively documenting knowledge on indigenous foods and medicines. In a few cases, some documentation has been made on herbal drugs (Ministry of Health, n.d.). It is therefore important to assess the knowledge that local people have on indigenous forest foods and medicines, collect, document, digitise and store them appropriately.

4. Objective of the study

The objective of the study was to identify, capture, document and digitise indigenous knowledge on forest foods and medicines in nine communities in Ghana.

5. Research Methodology

5.1 Study Area

Ghana had an original forest cover of 8.2 million hectares at the beginning of the 20th Century but due to several factors including unsustainable agricultural practices, illegal logging, illegal mining etc. only an estimated 1.6 million hectares now remain (Agyarko, 2001; Ministry of Lands and Natural Resources, 2012). The vegetation is divided into the high forest zone in the south, which accounts for roughly 30% of the land area and the Savannah zone in the north, accounting for the remaining 70%. The high forest zone is well known for the high value of wood species and non-timber forest products of commercial importance that it stores (Agyarko, 2001). The study was therefore confined to the southern sector of the country.

The study was conducted in two districts and one municipality of Ghana, namely Asante Akim South district, Assin South district and Offinso Municipal respectively. These areas are located in the moist semi-deciduous, moist evergreen and dry semi-deciduous vegetation zones in the southern sector of the country. A total of nine communities, three in each area were surveyed (Figure 1). The aim of the study was to assess what knowledge local communities had about products of the forest especially indigenous forest foods and indigenous medicine.

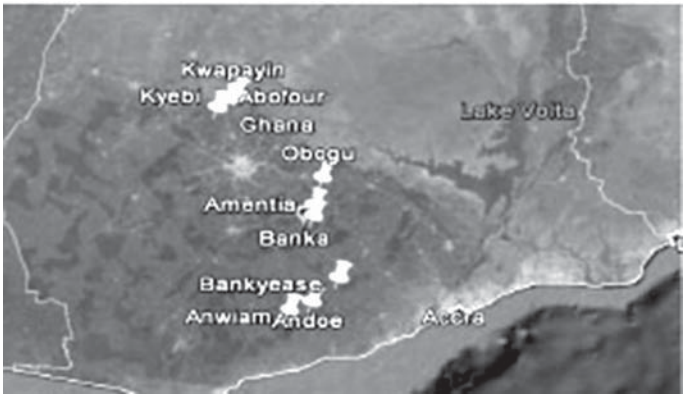

Figure 1: Map of Southern Ghana showing the study communities (Source: Google Earth, 2015)

5.2 In-depth Interviews

Primary data were obtained from in-depth face-to-face interviews conducted among 606 respondents resident in the nine communities using questionnaires. The bio-data of the respondents were collected in addition to other questions on the forest foods and medicines available. The questions posed were open ended and spanned their knowledge in the kind of foods available, times of availability, uses, parts used and ways of preparation and current status of the food or medicine. Three validation workshops were also organised for key informants from each community.

6. Results and Discussion

After collection the data was processed and validated using published literature as well as very knowledgeable members of the three communities in a validation workshop. The results of the study are presented below.

6.1 Species Identified

A total of 336 different species were identified of which 90 can be used as food and 246 as medicinal plants. 43 of these species were identified as food products only, whiles 47 species were identified as foods that have medicinal properties. (See Plate 1)

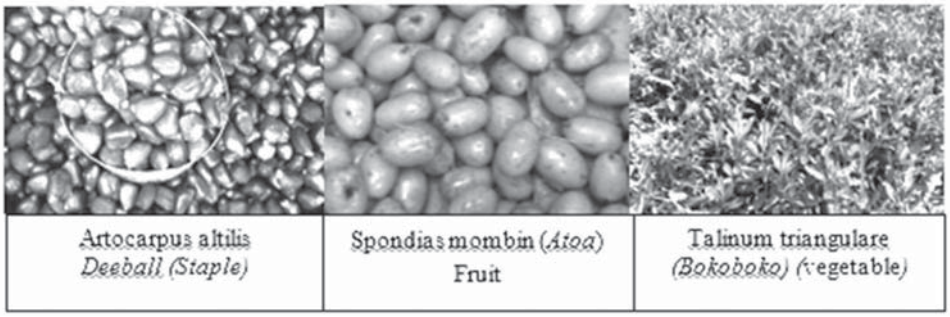

Plate 1: Images of some food species [Source: Field survey]

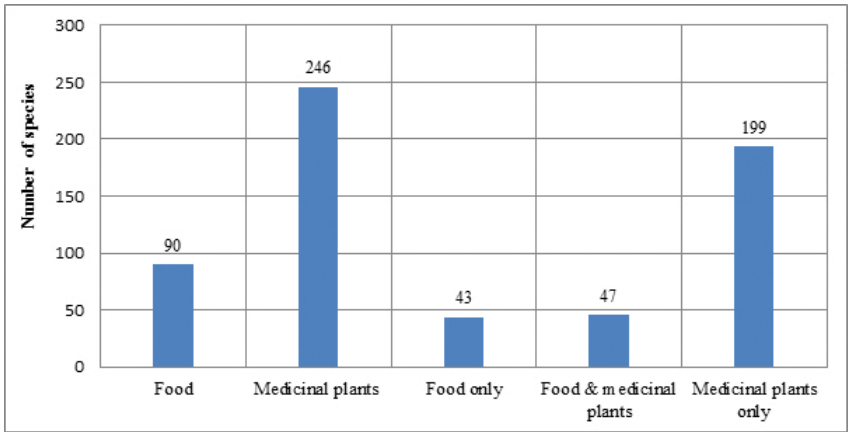

Figure 2: Number of species that can be used for forest foods and medicinal plants.

Although 90 species were identified in the three communities as forest foods it is possible that there may be more species that may have been overlooked, forgotten or unavailable. The species were categorized into 7 commodity groups made up of carbohydrates, vegetables, vegetable oils, spices and condiments using the PROTA categorization (Figure 3). Initial results show that the forests of Ghana harbour treasures that need to be assessed and promoted for livelihood development.

An impressive 246 species were identified as medicinal plants (Figure 2). Information received from the respondents indicated that these medicinal plants can be used to treat 121 different types of ailments.

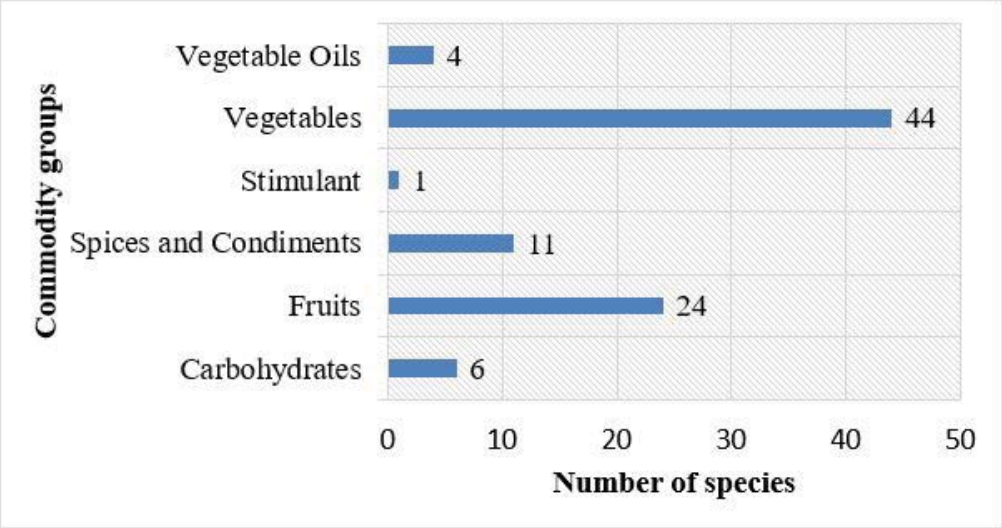

Figure 3: Categorization of forest food species into commodity groups using Plant Resources of Tropical Africa categorization (PROTA)

6.2 Creation of an Online Database

An online database has been created using DRUPAL a free, open-source web content management platform. The database presents valuable information on the species identified. For each record on a species therefore, the following fields were included: local traditional name(s), scientific name, family name, uses of species as well as brief information on the seasons when they are available. A digital image of each species is also included in the database.

6.3 Challenges in preserving Indigenous Knowledge

Challenges identified by the project team in the collection and management of IK include language barriers, funding, technological challenges and intellectual property rights.

6.3.1 Language: Language is a major factor in the collection and preservation of Indigenous knowledge (Settee, 2008). It is at the heart of culture and knowledge retention and can either be a barrier or a unifier depending on how it is used. In this study, though all the communities visited were Akan speaking communities, differences existed in the naming of plants (for example same plant species had different names in different localities and were also pronounced

differently). Gathering or collecting indigenous local knowledge is an expensive enterprise but it is even more expensive when translation from a local language into English or identifying the appropriate scientific names for the local plant species) to enable preservation has to take place. It becomes even more costly when errors occur during the translation process and considerable time and effort has to be used to correct it. Language is the most fundamental way that cultural information is communicated and preserved so getting enumerators who understand the local language is an important factor that needs to be determined. To be able to preserve the local language used in transmitting indigenous knowledge, it may be helpful to manually record it. The project team in this study did not come across any documented evidence of preserving IK in any of the nine communities.

6.3.2 Funding: Funding is a significant factor in the collection, processing and digitisation of indigenous knowledge. The major hurdle encountered during this study was being able to fund the survey in all nine communities. Costs incurred included but were not limited to transportation, accommodation and development of research instruments. This project fortunately had the financial support of Elsevier Foundation thereby reducing the financial burden to a minimal.

6.3.3 Technological challenges: Recent advances in technology have transformed the way information is managed and made accessible to relevant stakeholders. Digitisation which is one option is the process of capturing analogue signals into a digital form (Bandi, Angadi, & Shivarama, 2015). It is often used when diverse forms of information, such as text, sound, image, and video need to be converted into a single binary code (Plockey, 2014). Attempting to digitise IK is basically an attempt to create digital collections of oral knowledge that resides in the memories of elders, healers, midwives, farmers, fishermen and hunters throughout the world (Plockey, 2014). Several challenges have been identified in the use of technologies for the management of information in general and indigenous knowledge in particular. The use of modern technologies comprising the hardware, software and data formats used to create and store these digital collections are expensive due to the fast rate at which they become outdated thereby making it difficult to keep up to date with the technology. Retrieval and access to the digitized information therefore becomes difficult.

6.3.4 Intellectual property and ethical rights

The preservation of IK comes with issues of intellectual property rights and ethics. There is no international consensus yet about how indigenous peoples' rights on the protection of their cultural knowledge systems can be secured legally, promoted ethically and used resourcefully This study was conducted ethically with the consent of key informants and leaders of the community. So far no legislative instrument has been identified in Ghana's laws concerning the management of indigenous knowledge.

7. Conclusion

This study has opened up significant gaps in the processing of indigenous knowledge in Ghana with special reference to forest food and medicines. The study has unearthed various valuable species that are beneficial to local people in particular and the wider community in general. The process of digitisation also comes along with some challenges. These notwithstanding, it is recommended that enough attention should be paid to the documentation and digitisation of IK.

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