

Research Application Summary

**Documenting and disseminating Agricultural Indigenous Knowledge for sustainable food security in Uganda**

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**Abstract**

Indigenous Knowledge (IK) has for long been an integral part for maintaining and strengthening sustainable livelihood opportunities in rural communities. Indigenous Knowledge is socio-economically affordable, sustainable, involves minimum risk to rural farmers and producers, and it is better for conserving natural resources. Indigenous Knowledge in rural agricultural communities has supported agricultural practices be productive and environmentally sustainable even under extremely challenging conditions. Despite interferences from the colonial practices and systems, IK remains highly practiced in rural communities. This work examines the concept of Agricultural Indigenous Knowledge (AIK) focusing on how the AgShare methodology is promoting the documentation and dissemination of AIK and how the AIK is promoting sustainable food security and improving livelihoods among rural communities. It also highlights the achievements of the project as well as challenges in the protection and preservation of IK in the selected rural communities in Uganda. Data were collected using focus group discussions. Field visits were also made to the three districts to observe unplanned acts, activities and events while taking videos and audio information recorded through the use of smart-phones. Pictures and documents were reviewed. From the study findings, three forms of AIK were revealed namely: pest and disease management, food/grain storage and preservation, and soil fertility management. Indigenous Knowledge has remained un-documented posing a threat to its consistency and sustained utilization. Limited access to relevant and usable AIK among diverse stakeholders is a major constraint to its utilization. Based on the experience from the AgShare methodology implementation, it is hoped that development partners, rural farmers, agricultural faculties of African Universities and researchers will leapfrog in the utilisation of IK as well as rejuvenate the discourse on its preservation.

Key Words: Agricultural Indigenous Knowledge, AgShare, Uganda

**Résumé**

Les connaissances autochtones (CA) ont longtemps été une partie intégrante du maintien et de renforcement des moyens de subsistance durables dans les communautés rurales. Les connaissances autochtones sont socio économiquement abordables, durables, impliquent un minimum de risques pour les agriculteurs et les producteurs, et elles sont

privilégées pour la conservation des ressources naturelles. Elles ont assuré la productivité et la durabilité écologique des pratiques agricoles dans les collectivités rurales agricoles, même dans des conditions extrêmement difficiles. En dépit des interférences des pratiques et des systèmes coloniaux, les CA restent très pratiquées dans les communautés rurales. Ce travail examine le concept des connaissances autochtones agricoles (CAA) en se concentrant sur la façon dont la méthodologie AgShare fait la promotion de la documentation et la diffusion des CAA et comment Les CAA promeuvent la sécurité alimentaire durable et l'amélioration des moyens de subsistance dans les communautés rurales. Il met également en évidence les réalisations du projet ainsi que les défis de la protection et la préservation des savoirs autochtones dans les communautés rurales choisies en Ouganda. Les données ont été recueillies à l'aide des discussions en groupes de discussion. Des visites de terrain ont également été menées en trois districts pour observer les actes imprévus, des activités et des événements tout en prenant des vidéos et des informations audio enregistrés par l'utilisation des 'smart phones'. Les photos et documents ont été examinés. Les résultats de l'étude, ont révélé trois formes des CAA à savoir: la gestion des parasites et des maladies, le stockage et la conservation des aliments/graines, et la gestion de la fertilité des sols. Les connaissances autochtones restent non documentées ce qui pose une menace pour sa cohérence et son utilisation durable. L'accès limité aux CAAs qui sont pertinentes et utiles parmi les diverses parties prenantes est un obstacle majeur à leur utilisation. Basé sur l'expérience de la mise en œuvre de la méthodologie AgShare, on espère que les partenaires de développement, les agriculteurs ruraux, les facultés d'agronomie des universités africaines et des chercheurs vont joindre leurs efforts dans l'utilisation des CAAs ainsi que la reprise du dialogue concernant leur préservation.

Mots clés: les connaissances autochtones agricoles, AgShare, Ouganda

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## **Background**

Indigenous knowledge (IK) is generally perceived as knowledge that is possessed by communities and is used to understand their realities and to resolve problems of survival of the community. According to Dei *et al.* (2000), IK is about the common sense ideas and cultural knowledge of "aboriginal" or "natives" who live in a given place and they use it in matters concerning day-to-day life. This knowledge is variously labeled as focal ecology, ethnology, aboriginal knowledge, customary laws and knowledge of the land (Kyasiimire, 2010). According to Hammersmith (2007), IK is linked to the communities that produce it. Such communities are branded by multifaceted affiliation systems of relationships among people, animals, the earth and the cosmos from which knowing stems. IK systems manifest themselves through different dimensions including; agriculture, medicine, security, botany, zoology, craft skills and linguistics (Altieri, 1995).

Agricultural Indigenous Knowledge (AIK) invites several definitions and interpretations. According to Sundamari and Ranganathan (2003), AIK is an unwritten body of knowledge held in different brains, languages and skills, in as many groups, cultures and environment

as are available and aids them in the day to day farming life. Williams and Muchena (1991) state that AIK is that type of knowledge that covers the whole range of human experience and it's closely related to survival and subsistence thereby providing a basis for local-level decision making in areas such as food security, human and animal health, education and natural resource management. Several researchers have provided a number of underlying indicators regarding what constitutes AIK. For example Bamigboye and Kuponiyi (2010) carried out a study on the "Characteristics of Indigenous Knowledge Systems (IKS) Influencing Their Use in Rice Production by Farmers in Ekiti State, Nigeria". The authors indicate that the characteristics of AIK are highly affordable, considered environmentally friendly, highly effective and easily communicable. Some indicators of AIK have several interrelated aspects that appear to be more or less specific to AIK. According to Boven (2002), these aspects are: AIK is locally bound, indigenous to a specific area, culture- and context-specific, non-formal knowledge, orally transmitted, and largely not documented. Boven (2002) concludes that AIK is dynamic and adaptive, holistic in nature and closely related to survival and subsistence for many people worldwide. Based on the above characteristics of AIK, this study adopted a working definition of AIK as: *"Forms of knowledge that have originated locally and naturally and reside in the minds of the farmers"*.

### **The Agricultural Sharing (AgShare) Project**

The Agricultural Sharing (AgShare) Project was developed with an objective of sharing indigenous agricultural information and knowledge through various platforms. The need to document AIK practices in order to preserve and share them as widely as possible led to the development of the AgShare Project, funded by the Bill and Melinda Gates Foundation (BMGF) and supported by Makerere University and the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM). Under the project, students with computer and agricultural related background participated in field-based participatory action research on farmers' practices and documented cases of indigenous agricultural related knowledge. Students and faculty also participated in capacity-building workshops in research, Open Education Resources (OER) and media production skills. The project envisioned to identify communities that were of focus in the collection of AIK. Farmers who were contacted had experience in this area and were supportive in the identification of such knowledge during the entire project. Farmers were also selected based on age with the minimum admission age of 45 years. Based on life expectancy in Uganda, this age group was considered to have adequate experience and knowledge in local context and issues in society. The AgShare project and subsequent studies therein focused at examining the concept of indigenous knowledge and how it is being applied in agriculture; how the AgShare methodology was documenting and disseminating Agricultural Indigenous Knowledge (AIK) and how the AIK was promoting sustainable food security and improving livelihoods within rural communities. It also considered the challenges inherent in the protection and preservation of AIK within the selected rural communities in Uganda.

## Methodology

This study utilised a case study research approach with mixed methods approach used to collect and triangulate various data types. The dominant-less-dominant model (Creswell, 2007) was used in this study where the qualitative approach was the dominant research method. Qualitative approach was the dominant approach because it is a useful method to study human action in their natural settings, attempting to make sense of, or interpret, phenomena in terms of meanings people bring (Creswell, 2007). This approach has been recognized as an effective method for collecting data in IK studies than quantitative approach (Grenier, 1998). Three districts in Uganda namely Soroti, Hoima and Masaka were selected in this study. The three districts were selected based on fact that they are endowed with vital natural resources such as fertile soils, largely dependent on agriculture, enormous vegetation cover and vegetation composed of diverse plant species. The districts were also selected on a regional representation basis where all three belong to three different regions of Uganda; Soroti in eastern, Hoima is western and Masaka in Central. This gave a good regional representation of the selected districts.

## Results

### AgShare Project Achievements in Uganda

The Agricultural Sharing (AgShare) Project was developed with an objective of collecting and sharing indigenous agricultural information and knowledge through various platforms under the Open Education Resources (OERs) standards. The key targets were recruiting and involving Agriculture and Information Science students in the documentation of AIK from farmers through the use of Smart Phone technology and database creation to enhance access and exchange of information among others. Table 1 below presents a summary of achievements made by the AgShare II project in Uganda.

Table 1. AgShare II Project Achievements in Uganda

Activity	Achievement
Selection of graduate students for training	Five students were selected for the project, 4 were graduate students and one was Bachelors student. Three of the graduate students were masters students while one (1) was PhD student.
Stakeholders Workshop	Three key stakeholders with vast knowledge in local farming practices were selected and consulted during a two day induction workshop. The students and their academic supervisors were also introduced to the project officially during this workshop.
Data collection techniques and technology applications workshop	A workshop was conducted and the students were trained in data collection techniques

	and technology applications using Smart-phone technology. There was a one day's pilot data collection exercise to test the students' skills.
Pre-field retooling workshop	A pre-field retooling of students in the use of smart phone technology in data collection was conducted to ensure the students had acquired the necessary skills to use the gadgets for data collection and processing.
AIK data collection	AIK data collection by students under the close supervision of project team and academic supervisors. This lasted for two weeks after a comprehensive reconnaissance by the students.
Database created	An AIK Online database was created and hosted on Mak/CoCIS server <a href="http://agshare-ik.mak.ac.ug">http://agshare-ik.mak.ac.ug</a> . This is all the project materials were uploaded.
Data quality control and translations done	A workshop was conducted to authenticate the data collected and to ensure quality control of the data. This involved key stake holders such as students, representatives of farmer groups, student academic supervisors, and project team and development partners from RUFORUM. Translations were also made at this stage.
Farmers' pilot workshop.	A Farmers' pilot workshop was held in Hoima District to validate the data collected. This was meant to substantiate the data collected by the students. The farmers were also asked which format they preferred the information to be packaged. They preferred Flyers, Brochures and DVDs.
Information packaging	Information was packaged in form of flyers, CD-ROM, brochures, posters by the students and project staff.
AIK dissemination workshop	A dissemination workshop was conducted in Hoima to officially launch the sharing of the AIK that was collected and packaged by the project.
Student research experience report	One best student research experience report produced.
Graduate studies completion	1 student submitted his dissertation and successfully defended it leading to the award of Master of Science in Information Science. The student graduated on 22nd/ January/ 2016.

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**AIK forms, creation and preservation**

Findings revealed three major forms of AIK in Soroti, Hoima and Masaka, namely, pest and disease management, food/grain storage and preservation and soil fertility management. To control pests and diseases, farmers use light traps, fly traps, hand picking, pull and burn, rouging of diseased plants and leaves, use of plants as repellents, use of ash and urine as well as timely sowing/planting.

For food/grain preservation and storage, farmers store their produce in locally made granaries, gourds, keep grains around the fire places as well as storage avoidance. Storage avoidance is a practice of deliberately delaying the harvest of crops such as Cassava to keep them in the soils for long. Furthermore, farmers mix their grains and other seeds with red-pepper and christmas tree branches and keep them in aerated bags. This helps in repelling weevils and insects.

For soil fertility management, farmers use animal manure, chicken droppings, compost, charcoal and ashes among other AIK practices. This kind of AIK is believed to be locally bound, indigenous to specific areas, culture- and context-specific, non-formal knowledge, orally transmitted by its holders, and generally undocumented.

The research findings from interviews and four focus group discussions revealed that local farmers create new knowledge through socialization processes such as face-to-face interactions, group interactions like social gatherings and farmer groups meetings, and cultural activities such as trainings and initiation rites during adolescent age. The socialization process enables farmers to combine their knowledge with that of others to carry out their own experiments out of curiosity, to solve problems, and as an adaptation of existing knowledge in their own environment.

**Existing methods of documenting and disseminating AIK**

Findings revealed that there are primarily three existing methods of documenting and disseminating AIK. These methods are in distinctive units namely: Family Units, Agricultural researchers and agricultural extension workers also sometimes called development practitioners.

- Family units. Within family units, AIK is documented by some families and disseminated through family members and the communities. The family members are both female and male. Under the communities, AIK is documented and disseminated through Folklore.
- Agricultural researchers. According to findings, agricultural researchers mainly document AIK through academic research reports, dissertations and thesis.
- Agricultural extension workers. Agricultural extension workers also play a role in the documentation and dissemination of AIK in the three districts. The findings show that agricultural extension workers make field visits. It is during these field visits that they document and disseminate AIK to the locals. This finding supports (Abioye, 2011) who found out that the major channel of documenting and disseminating AIK was through leaflets and bulletins.

### Information and Knowledge packaging under AgShare

Information was packaged on DVDs, flyers and banners. The project chose to use DVDs because they offer a very large storage capacity between 4.7 to 9 Gbs, the sound and picture quality is also excellent. This makes DVDs ideal for storing films with video and audio effects. Additionally, they are portable and offer easy storage options. The farmers found it easy to carry along and keep. Brochures form an essential part of the traditional printed promotion collateral. A well-designed brochure is very much a collectible item, not only for its captivating visual effects, but for the loads of product-specific information

featured in it. Brochures help capture the attention of potential customers. They are both effective and cheap, if well designed can focus entirely on the theme and its offerings, thereby getting the undivided attention. They are versatile pieces of printed information that can be used for promoting almost all types of products and services, and in different venues, right from reception desks of offices to promotional events. The farmers and extension officers were pleased to have the information on DVDs and brochures.



Plate 1: A sample AgShare DVD



Plate 2: A sample AgShare poster

### Challenges in the protection and preservation of AIK

There are challenges and risks associated with IK development and promotion through documentation. This is particularly apparent in the manner in which IK is reduced to knowledge dimensions that tend to strip the associated history and structural context. Additional constraints to documentation and dissemination IK include:

- Families. The biggest constraint amongst families is ineffective family link ages. This is coupled with poor gender mainstreaming in extension activities and low land and labour productivity.
- Communities. For the communities, the findings show that the biggest constraints that they face in the dissemination of AIK are communication problems and reservations about innovation, increased population growth and fragmented land holdings and small farms.

- Agricultural Researchers. The findings of the study further reveal that the agricultural researchers are faced with the constraints of inadequate trainings, limited input from the farmers, and complexity of research.

### **How AIK is utilized to improve food security amongst rural farming communities**

In an effort to overcome food insecurity, farmers in selected districts rely heavily on AIK systems. For example in Soroti district, farmers commonly store their harvest in granaries and around fire places or on top of the roof. Elsewhere in Hoima and Masaka, granaries are also used to store agricultural produce although the practice is slowly dying out. For cassava, local farmers in all three districts exercise “storage avoidance”. For groundnuts and soya beans, the seeds are stored in pods or sacks so at the time of planting they have to be further sorted. Similarly after harvesting, the grains are also hung in the kitchen or shades in special containers/baskets. For types of produce such as simsim, sorghum and millet seeds are selected and kept in gourds. Other commonly used AIK practices in harvesting and storage include the use of traditional baskets, dusting with ash for storage preservation against weevils, winnowing of millet to remove thrash, packing cereals in sacks after threshing, sun drying of legumes to dry them fully before storage and mixing with ash for storage.

### **Discussion**

There were major areas where AIK was used in the three study districts. These included pest and disease management, food/grain storage and preservation and soil fertility management. From literature, many authors talk about different forms of AIK. Worth noting is that they differ in names but the applicability is the same from community to community and from clan to clan. This finding supports that of Thomas (2008) who noted that Agricultural Indigenous Knowledge is not uniformly distributed and differs between and within communities. These variations in AIK according to Somnasang and Moreno-Black (2000) occur because of cultural and geographical diversity. This is perhaps true because according to the census of 2014, Uganda is a home to many tribes that speak different languages. Uganda has 56 tribes and about nine indigenous communities. Each tribe is culturally distinct and has unique IK. Even within the same culture there are variations. For example, for each tribe in Uganda there exists a diversity of clans which greatly add to the diversity in IK (Katende and Kityo, 1996). This perhaps explains the variations in AIK forms and names (Tabuti and Van-Damme, 2012).

### **Conclusion:**

This study established that there is a lot of IK in many rural communities in Uganda. However, similar to previous studies such as Aluma (2010) and Lwoga *et al.* (2005) this study found that IK was highly at risk of knowledge loss due to the lack of prescribed structures and rules in the surveyed local communities to facilitate the preservation of knowledge as one would find in formal organizations. The present study showed that IK



was largely preserved in human minds and thus it was disappearing at a high rate due to memory lapses and death of elders.

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