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# Optimizing national transforming structures for Open Access agricultural repositories in Africa

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## Abstract

Agriculture is a crucial sector for most of sub-Saharan Africa. In Kenya for instance agriculture is the largest sector in the Kenyan economy, generating a quarter of the gross domestic product and two-fifths of export earnings. Indeed reports have shown that efficient and effective dissemination of agricultural knowledge and information can help governments meet six of the eight millennium development goals. But for this to happen, transforming structures (policies and strategies) that encourage digital documentation of agricultural indigenous knowledge and digitization of valuable information emanating from agricultural research in Kenyan institutions of higher learning and research centres must be formulated, publicized and implemented.

The Kenya Agricultural Information Network (KAINet) was established in 2006 in response to a need for coherence in the management of agricultural information and to enhance exchange and access to agricultural knowledge and information through a digital collaborative institutional repository. From a national perspective, KAINet is enshrined in the Kenya government Strategy for Revitalizing Agriculture (SRA). The SRA, launched in March 2004, aims at achieving a reduction in unemployment and poverty through application of, among other things, new technologies and information as the basis for a thriving agricultural system. Besides the SRA, another policy that has been launched to create an enabling environment for projects such as the KAINet initiative, is the National Information and Communication Technology Policy. The paper will look at the KAINet progress in the light of these policies and at what lessons can be learnt from them. In addition, suggestions will also be discussed about the additional digital agricultural content that Kenya and Africa at large can develop to have Africanized open access repositories available on the World Wide Web, which will ensure that Africa establishes her niche in the information and knowledge age.

## Introduction

For the agricultural sector to significantly contribute to the overall goal of economic growth, wealth and employment creation, food security, improvement of farm incomes and poverty alleviation, agricultural support services need to be improved. According to the Kenya government Strategy for Revitalizing Agriculture (SRA), these support services include research, extension, training and information. The cross-cutting issue in these support services is

basically information. Responsive research services, demand-driven and participatory agricultural extension, and industry-driven agricultural training revolve around purposeful collection, dissemination and exchange of appropriate information.

Similarly, successful agriculture depends on provision of relevant, precise and timely information, to enable farmers to make informed decisions on what, where and when to plant. Agriculture heavily relies on information from production to marketing. With the myriad of challenges facing agriculture today, it would be prudent for any government that relies heavily on agriculture to consider various ways of providing farmers, especially in rural areas, with adequate information that will empower them.

At a global level, nations are moving towards open access initiatives where information is freely available on data networks as a public good. Even in Africa, in agricultural research and training there is increased application of ICT (Information and Communication Technology) to achieve efficiency and speed. To accelerate the contribution of the agricultural sector to the national economy and encourage farmers to adopt new technologies and innovations, the Kenya government is supporting infrastructure development for Information and Communication Management (ICM) within public institutions so as to improve access to information using modern ICM approaches in keeping with the times.

**Kenya Agricultural Information Network (KAINet)**

KAINet is a national initiative that aims to contribute to the transformation of Kenya's agricultural sector to one that is modernized, productive, profitable and competitive nationally, regionally and internationally. At a national level KAINet was a response to a recommendation to build a Kenyan national agricultural science and technology information system, enshrined in the Kenya government SRA. It identifies information and new technologies as the basis for a thriving agricultural system, in addition to linking the national research system with international information systems, and establishing an agricultural technology dissemination system linked to extension.

Initiated in April 2006 and launched on 14th May 2009 in Nairobi, Kenya, KAINet evolved from a similar on-going project, the Kenya Pilot AGRIS (International Information System for the Agricultural Sciences and Technology), spearheaded by the Food and Agriculture Organisation (FAO). KAINet's mission is to build a common and freely accessible information system through partnership in the generation, collection, processing, archiving and dissemination of agricultural information. Its vision is to make public domain agricultural information in Kenya truly accessible to all.

KAINet 's objectives include:

- To establish and manage performance-driven national ICM networking, resource mobilization and partnership mechanisms;

- To establish and manage information resources and systems for generation, collection, acquisition, processing and preservation of agricultural and related information;
- To promote the development and implementation of appropriate ICM/ICT policies and legal frameworks;
- To promote the development and maintenance of adequate ICM/ICT infrastructure and facilities;
- To promote the development and implementation of strategic ICM human resource capacity building;
- To enhance availability, access, sharing and utilization of agricultural knowledge and information.

The main stakeholders in the implementation of KAINet are the Kenya Agricultural Research Institute (KARI), the Kenya National Agricultural Research Laboratories (KARI-NARL), the Kenya Forestry Research Institute (KEFRI), the Ministry of Agriculture (MoA) and Jomo Kenya University of Agriculture and Technology (JKUAT). At the international level FAO, CABI Africa and the Regional Agricultural Information Network (RAIN) of the Association for Strengthening Agricultural Research in East and Central Africa (ASARECA) have participated in developing the project and are supporting its implementation through providing expertise in ICM.

**Functions of KAINet:**

- Communicate agricultural information by making research findings publicly available and accessible through repositories and other channels;
- Support and promote development of capacities required to design, deliver and manage agricultural information, including policies, processes, skills and technologies at the institutional level;
- Advocate effective investments and sustainability of ICT activities at both institutional and national level;
- Promote coherent information systems and services through adoption of common principles and standards, to ensure that the research and information systems add value to others in the overall knowledge system.

**What has KAINet done?**

The four pilot institutions established mechanisms for capturing information, storing it and standardizing it for sharing, first with the respective institutions on their websites, and subsequently harvesting the same information in a national repository for sharing nationally, regionally and globally. It has further provided capacity building in ICM for professional and technical staff in developing information communication management policies, running and maintaining the information systems, and identifying tools for harvesting, storing and sharing information on a global scale.

To facilitate development, KAINet partnered with FAO which has been facilitating the training and identification of open source IT tools that are useful in the management of the repositories

at institutional level and for KAINet. The network helped the institutions involved to develop ICM policies that define how information and knowledge sharing strategies in the agricultural sector will provide a framework for organizing and sharing information, a factor that will in effect catalyse the growth of the economy. Participating institutions are charged with the responsibility of ensuring that institutional interests do not impede information flow.
At the onset, KAINet helped the four pilot centres to remove constraints in information management and exchange between the institutions and their users. The network plans to address the critical constraints hindering effective and efficient collection, access, storing and sharing of agricultural information and knowledge. This entails the establishment of a strong and well supported mechanism to act as a catalyst for ensuring dialogue, negotiation, joint planning and implementation and sharing of knowledge and capacity among institutions, communities and individuals, an aspect that can best be taken care of by establishment of a governance structure for the network.

The network recognises that the concept of comparative advantage of each member institution encourages interconnectivity and partnerships to complement each other in addressing national ICM issues. The network activities are guided by a joint strategy, planned to realise the set goals. The network plans to implement a suitable monitoring and evaluation system or mechanism capable of tracking the status of approved network activities and operationalized by providing effective feedback.

KAINet is also providing technical backstopping on agricultural information management to its member institutions and building capacities in the areas of management of electronic documents, digitization, web development, marketing of agricultural information services, open access, monitoring and evaluation of information projects and strategy formulation for members.

## Challenges

The KAINet project involved creating a full text repository but was faced by several challenges, ranging from lack of resources (human and infrastructure) to poor or non-existing collection development policies and workflows. Other challenges included technical difficulties related to operating the software system being used to create the repository. However, this particular problem was dealt with by training the personnel involved in system administration in each of the participating institutions.

## Policies

### Strategy for Revitalizing Agriculture (SRA)

The Government of Kenya launched the Strategy for Revitalizing Agriculture in March 2004, as a ten-year programme to guide agricultural sector development until 2014. It was part of a broader development framework of the Economic Recovery Strategy. An inter-ministerial Agricultural Sector Coordination Unit was appointed and charged with implementing the SRA.

To hasten the implementation of the SRA, a log frame identifies six strategic intervention areas, one of which is "Improving delivery of support services". One of the expected outputs under this intervention is a comprehensive agricultural information system. KAINet therefore is a response to this recommendation.

Section 4.2 of the SRA recognizes that an efficient agricultural research system, which consistently provides appropriate technology, knowledge and information, is necessary to improve agricultural productivity and for competitive and cost efficient agricultural production systems. Correspondingly, one of the products that KAINet has provided is access to a national agricultural electronic repository of information in full text and metadata. The content of the repository includes technical notes, manuals, conference proceedings, research notes, annual reports, sessional papers, journal articles and project reports.

Section 6.1.1 of the SRA sees new technology and information as the basis for a thriving agricultural system: "...in this regard, the government will continue to encourage the national research system to link up with the international research system for new technology and information." In tandem with this, KAINet has a web portal with links to other national and international agricultural resources such as Access to Global Online Research in Agriculture (AGORA), Online Access to research on the Environment (OARE), Information Management Resource Kit (IMARK) and other open access tools.

Section 6.1.3 appreciates the crucial role of training institutions for updating the knowledge and skills of farmers, extension staff and agricultural professionals. Equally, the KAINet website serves as a platform for providing synergy from the national research, extension and academic organizations by helping them play their respective roles in information provision and hence national development. In essence, the website forms a one-stop shop for agricultural information in Kenya.

Section 6.1.4 identifies the need to prepare standardized user guidelines for collection, processing, storage, retrieval and dissemination of information, which is something KAINet has already achieved in a bid to consolidate content on agricultural information.

**National ICT Policy**

The National ICT policy was launched in 2006 by the Kenya government, two years after the SRA. In this policy the Kenya government recognizes information as a resource which must be generated, collected, organized, leveraged, secured and preserved for national prosperity. Some of the broad objectives of the Information Technology (IT) policy include:

- Ensuring that IT plays a key role as an empowerment tool, addressing gaps relating to gender, youth, people with special needs, rural and urban and disadvantaged groups, and as a literacy tool for the population and potential users;

- Using IT to generate additional employment and promoting entrepreneurship for the new digital economy;
- Encouraging and accelerating investments and growth in IT hardware, software, Internet, training, IT-enabled services, telecommunications and electronic commerce;
- Providing adequate infrastructure in the country for the IT sector to flourish;
- Facilitating the development of sectoral IT policies and strategies, e.g., education, e-water, e-health, e-agriculture.

It has several sections that encourage the creation of digital content and therefore have a direct link to KAINet. The National ICT Policy identifies the underdevelopment of local content as a major challenge to access of relevant information by the Kenyan populace. Moreover, it appreciates that ICT is the conveyor of information, providing opportunities for local people to interact with each other by expressing their own ideas, knowledge, heritage and culture in their own languages. With regard to this, the policy outlines several strategies for increasing local content, which include:

- Supporting locally based development of IT applications and multimedia content for productivity;
- Encouraging the use of local languages in developing content;
- Encouraging the development of content that captures and preserves knowledge and culture of local communities;
- Promoting electronic publishing, collection and preservation of local materials;
- Encouraging the development and management of information and knowledge resources as a national heritage;
- Rallying support from all stakeholders and development partners in creating local content; and
- Identifying, selecting and capturing information and knowledge available in various formats.

With regard to IT infrastructure as a major prerequisite for accessing digital content, whether libraries, archives or repositories, section 3.3.1 of the policy states that

> measures will be put in place to encourage the provision of infrastructure for access to local, national and international information resources. The aim will be to provide sufficient Internet capacity for schools, colleges, businesses; and to provide a reliable and secure infrastructure. A nationwide network consisting of fibre optic, satellite and terrestrial radio communication networks will be established.

Digital repositories such as KANIet have great potential in supporting e-learning even across borders. The section of the policy which addresses e-learning points out that it is important to facilitate sharing of e-learning resources between institutions -- which is exactly what KAINet is promoting. By collaborating with learning and research institutions, KAINet has pooled resources that academic institutions can use to support e-learning. It has also integrated

resources, making it easier for academicians and researchers to spend less time searching for information materials. Searching for information from a centralized point is usually more efficient and effective than having to check across multiple websites with different structures and operating on different platforms.

## Recommendations

### Capacity building

A remarkable step towards the incorporation of ICM in agriculture, is the regional postgraduate progamme in Agricultural Information and Communication management, whose curriculum was formulated by several Non Governmental Organisations, spearheaded by ASARECA. It has been adopted by several universities across the region in Kenya, Ethiopia, Tanzania and Uganda. The aim of the course is to produce information professionals suited to the management and communication of agricultural information, thus filling a gap that has been in existence for many decades. Such professionals will be able to provide innovative solutions to digitizing not only agricultural information but also the rich heritage of Africa, as the principles of ICM cut across disciplines. It will be appropriate if capacity building for people who are keen on creating digital collections becomes a first step towards the realization of a "digital" Africa.

For KAINet, having already established a national repository, it is imperative to train potential users how to use the repository and, where users have no ICT skills, to help build them.

### Policies and institutions

For institution-based digital repositories, senior management should offer support for the digitization project by first implementing organizational policies that will guide the work. They should ensure that adequate resources in terms of equipment and human resources are available to effectively carry out the exercise. Policies also play a very important role in continuity, especially after the initial project is over. Considering that these days many documents are electronically generated and disseminated, it is important to have guidelines that spell out the processing of such documents before they are added to repositories. Indeed, if institutions engaged in related work can collaborate to create a digital repository, this may be the first step towards the realization of more national repositories, into which other organizations can be incorporated; when the collection becomes substantial, it can be launched as a public repository. This way, many organizations will be able to have digital repositories at a much lower cost.

### Beyond policies

For initiatives like KAINet to work and remain sustainable, there must be evidence of their usage. Maximum usage of such a resource occurs when people are made aware of its existence. For this reason KAINet should consider public awareness campaigns, especially in the areas where the resource is most likely to be used. Target areas should include all tertiary level institutions that offer any form of training in agriculture and research institutions.

With the laying of the fibre optic cable set to be complete by the end of July 2009, Internet connectivity costs will come down and the digital villages that the Kenya government is establishing in rural areas will be in a better position to access the resources in the KAINet national repository. KAINet should also consider promoting the use of this resource in those digital centres, as the repository contains local content that will be relevant to farmers in rural areas. To increase its usability for the rural farmers, KAINet could engage the services of information professionals who will repackage some of the technical but valuable information into a simple format that IT novices can easily access. In that case in would be ideal for KAINet to have a basic version for novice users who are seeking simple information and a more advanced version for academicians and researchers. Another option would be to have information professionals in the agricultural sector identify information and knowledge that is relevant to farmers in the repository, and repackage it ready for dissemination in a form that farmers will understand. In Kenya for the example, the Agricultural Information Centre has facilities that can assist in repackaging information even into radio broadcasts. The radio broadcasts can also be done in vernacular languages where there is a need be.

Policies are merely a means to an end, and an end in and of themselves. Whereas Kenya can pride itself in commencing the digitization process and having a policy that appreciates the importance of digitization, much still remains to be done. For instance, very few people are aware of the contents of the National ICT Policy let alone its emphasis on creation of local content and digitization of the country's cultural heritage. This means that more public awareness campaigns of the policy should be carried out. There should also be a body to monitor and evaluate the progress of its implementation and give feedback to the public. Moreover, if African governments are keen on having digital economies, their role in the realization of them must extend beyond policy formulation to facilitation, particularly capacity building, subsidies or tax waivers for importation of ICT equipment and, if possible, some form of reward for institutions that eventually make their digital resources available online. In other words they must be more actively involved than they have been in the past.

For other nations, who have not yet formulated an ICT policy or are in the process of creating one, information professionals should actively participate in the formulation so that digitization issues are given pre-eminence; they should be able push for public awareness campaigns especially in relevant circles. Governments should also consider giving incentives to those creating national digital repositories as one way of speeding up the process.

**Additional content**

Digital content allows diversity and sometimes interactivity. Africa is rich in indigenous knowledge, not only in agriculture but also in other disciplines and much of this has not been documented. Currently, Africa is facing an environmental crisis that is largely attributed to modernization, urbanization, soil degradation, unsustainable agricultural practices and environmental pollution. In response to this, scientists are now asking communities to consider

using the indigenous knowledge that had served them well for centuries in a bid to save our dying ecosystems. If this indigenous knowledge can be digitally documented and made available across borders, it will not only preserve our rich heritage but will also increase local content and promote intercultural information exchange that will provide typical African solutions to many of the challenges that the continent is facing.

**Conclusion**

The Kenya government's National ICT policy offers a springboard for the creation of digital collections in institutions. The policy emphasizes the need for these digital collections, not only as part of our national heritage but also for research and learning in all disciplines. It is therefore important for each country and organization to have its own unique policy that addresses the issue of digitization. However, policies that stand on their own without forming a part of another larger policy should be given a thought as they may be more effective in speeding up the process as opposed to those where digitization is part of a larger policy document.

In developing National ICT Policies, members of the selected committee should use foresight as the guiding principle, like beginning with the end in mind, to develop policies that are realistic and achievable as opposed to adopting polices already developed elsewhere that may not fit the unique conditions prevailing in a country.

**Sources**

Advertising Feature, (2009, May 13) *Daily Nation*, pp. 38-39

Government of Kenya (2004) Strategy for Revitalizing Agriculture. Government Printers: Nairobi, Kenya

Government of Kenya (2006) National ICT Policy. Government Printers: Nairobi, Kenya

Kahiga, E & Kahinga, E. (2008) Library consortia in Agricultural Information Management: A panacea to the attainment of MDGs. *Proceedings of the Eighteenth Standing Conference of East, Central and Southern Africa Library and Information Associations (SCECSAL)*, Lusaka, Zambia, 15 – 18 July 2008.