Project Report

Project title	Enhancing Access to Kenya's Agricultural Sciences and Technology (AS&T) Information in Institutional and KAINet e-Repositories
Grant recipient	Kenya Agricultural Information Network (KAINet/KARI)
	P.O. Box 57811-00200
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	http://www.kainet.or.ke and http://www.kari.org
Dates covered by this report	01 – 12 – 2013 / 31 – 05 – 2014
Report submission date	31 – 05 – 2014
Country where project was implemented	Kenya
Project leader name	Richard Kedemi – Richard.Kedemi@kari.org
Team members (list)	Joseph Koech (KEFRI) - jgkkoech@yahoo.com Stephen Rono (AIRC) - ronosteve@gmail.com Zachary Chepukaka(MoA) - chepkaka@yahoo.com
Partner organizations	Kenya Forestry Research Institute Ministry of Agriculture
Total budget approved	US $ 9,990
Project summary	

TABLE CONTENT

1.0   BACKGROUND

The Kenya Agricultural Information Network (KAINet) was officially launched on 14 May 2009. The project's overall objective was to establish a pilot implementation of an electronic repository as part of the Kenyan national agricultural sciences and technology information system in relation to the Strategy for Revitalizing Agriculture (SRA). The pilot project was also responding to the need for a platform that would support information management, exchange and impact on food security and development within the sector agricultural in Kenya and the global need for coherence in the management of agricultural information to enhance information exchange and access.

KAINet was set up to foster improved archiving, dissemination and sharing of agricultural content between researchers and other stakeholder groups. KAINet's vision is to make public domain agricultural information and knowledge accessible to all. Its mission is to build a common and freely accessible information system through partnership in the generation, collection, processing archival, and dissemination of agricultural information. Providing access to metadata and their associated full-text documents is one way of working towards achieving the network's vision.

The proposed project is aimed at addressing the above problem and contributing to making public domain agricultural information and knowledge generated in Kenya accessible to all.

The founding partners of KAINet are:

- Kenya Agriculture Research Institute (KARI)
- Kenya Forestry Research Institute (KEFRI)
- Ministry of Agriculture.

2.0   GOAL OF THE PROJECT

The main goal of the project is to enhance access to Kenya's agricultural sciences and technology (AS&T) information by research scientists, extension agents, public policy officials, lecturers, students, and members of the public, through increasing the number of full-text documents available in the institutional e-repositories and on the KAINet e-Repository.

3.0   SPECIFIC OBJECTIVES

The specific objectives of the project are:

1. To digitize and process (based on agreed standards, tools and mechanism for information exchange and long-term preservation) agricultural sciences and technology information documents in the KAINet member institutions and include them in institutional e-repositories;
2. To establish a mechanism for harvesting metadata and associated full-text digital documents for the KAINet e-Repository;
3. To promote KAINet e-Repository and services in Kenya and international level.

4.0   ACTIVITIES AND SUB-ACTIVITIES PLANNED

The following are the main project's activities.

1. **Digitize and process agricultural sciences and technology information documents for the institutional e-repositories, based on agreed standards, tools and mechanism for information exchange**.

   Sub-Activities

   - Obtain copyright clearance for the documents, where this is required (i.e. for documents co-produced with another institution, articles published in journals, etc), to be digitized and included in the e-repositories;
   - Link already digitized documents to their associated metadata;
   - Digitize the documents following the established institutional document workflows;
   - Create metadata, based on agreed standards and methodologies for information exchange adopted by KAINet;
   - Conduct quality control of both the digital documents and metadata.

2. **Enhance the visibility of AS&T content in the institutional and KAINet e-Repositories on the Internet**
   Sub-Activities

   - Review the existing technical infrastructure supporting institutional repositories in KAINet member institutions;
   - Migrate from WebAGRIS tools to AgriDrupal and AgriOceanDspace "suite of solutions" for agricultural information management and dissemination;
   - Develop mechanism and guidelines for the exchange of metadata and full-text documents between institutional repositories and KAINet e-Repository, based on AgriDrupal and AgriOceanDspace.

3. **Capacity Development in Agricultural Information Management and Dissemination**

   - Train information professionals and IT support staff in KAINet member institutions on AgriDrupal "suite of solutions" for agricultural information management and dissemination.

4. **Promote KAINet e-Repository and Services in Kenya and the International Level**
   Sub-Activities

   - Hold KAINet introductory seminars/presentations in agricultural research institutes and universities of agriculture
   - Design and print KAINet brochures and posters
   - Register the KAINet e-Repository with DOAR
   - Develop and print promotional materials

5.0   STATUS

5.1   Inception Workshop

To kick off the project, an inception workshop was held in the month of December bringing together members of the 3 participating institutions:-

- Kenya Agriculture Research Institute (KARI)
- Kenya Forestry Research Institute (KEFRI)
- Ministry of Agriculture.

The members were briefed on the objectives of the project and they agreed on the modalities and framework of the projects as follows:-

i)   That the training on technologies of information management should be carried out in early January to facilitate the digitization and input of the same onto the repositories. The training was planned to cover the agricultural knowledge management platforms that meet international standards of sharing, disseminating and management information.

ii) The meeting to also develop the criteria of recruitment of the staff to assist in the digitization and input of the repository. The meeting recommended the use of universities students managing in ICT and library studies.

iii) KAINet would then at a later stage harvest from the institutional repositories.

5.2   Training

Of the 3 institutions, only KARI's repository is accessible at http://www.kari.org:8080/repository while the other 2 institutions repositories are accessible on the local area networks. It was therefore important to identify technologies that improved access to agricultural information. To achieve this we look at 2 approved, tested and open access technologies developed with the management and sharing agricultural knowledge:

- **Agridrupal: -** AgriDrupal is a "suite of solutions" for agricultural information management and dissemination, with special functionalities for repository management, built on the Drupal Content Management System.
- **AgriOceanDpace: -** AgriOceanDSpace (AOD) is a joint initiative of the United Nations agencies of FAO and UNESCO-IOC/IODE to provide a customized version of DSpace 1.7.1 (JSPUI version), an open source, digital repository software.

Its main objective is to make scientific literature in the field of oceanography, agriculture and related sciences available in digital form. AgriOceanDSpace is set-up for the digital repository communities of AGRIS (FAO) and Odin (UNESCO-IOC), but can be downloaded and used by any research institution interested.

The training was contacted during the first week of the month January 2014 with 12 officers of the 3 institutions being trained on 2 institutional repository information management platforms. For us to achieve our objectives, we trained a team of librarians and ICT personnel from each institution.

The Librarians main responsibility on the systems is to manage the information and the ICT person to manage the ICT system.

The training included both theory and practical where the officers were able to develop institutional repositories.

Attendances of the Training

KAINet AFRINIC-FIRE TRAINING WORKSHOP
HELD AT KARI HEADQUARTERS

REGISTRATION FORM

No	Name	P/No	Institution	Dates			
				21/1/2014	22/1/2014	23/1/2014	24/1/2014
1	STEPHEN RONO	9702952	AIRC	*(signed)*	*(signed)*	*(signed)*	*(signed)*
2	JOHN KIMANI	870593	MoALF AIRC	*(signed)*	*(signed)*	*(signed)*	*(signed)*
3	Lucy Gichuki	9921335	MoA	*(signed)*	*(signed)*	*(signed)*	*(signed)*
4	Zachary Chipukaka	910267	MoA	*(signed)*	*(signed)*	*(signed)*	*(signed)*
5	Robert Mutua	870349	MoA	*(signed)*	*(signed)*	*(signed)*	*(signed)*
6	Johnston Magang	6748	KEFRI	*(signed)*	*(signed)*	*(signed)*	*(signed)*
7	Joseph Koech	5871	KEFRI	*(signed)*	*(signed)*	*(signed)*	
8	Lawre Makong M	6329	KEFRI	*(signed)*	*(signed)*	*(signed)*	*(signed)*
9	Pauline Mburu	6766	KARI	*(signed)*	*(signed)*	*(signed)*	*(signed)*
10	Anthony Biegon	6677	KARI	*(signed)*	*(signed)*	*(signed)*	*(signed)*
11	STEPHE						
12	Johnshara Macgang	6798	KEFRI				
13							
14							
15							

5.3   Technical Back stopping

A technical follow-up exercise at all the 3 institutions is on-going to ensure that each institution have a functional institutional repository. KARI's repository is accessible at http://www.kari.org:8080/repository while the other 2 institutions repositories are accessible on the local area networks.

All the three institutions were able to engage 2 personnel to start the scanned and the metadada entry onto the developed institutional repositories.

Technical support has been offered fortnightly to ensure that the partner institutions repositories and digitization activities are run smoothly and accessible via local area networks and online. Technical expertise has been given on strategies to ensure that all the partner institutions make their information accessible online.

5.4   KAINet Repository

The Kenya Agricultural Information Network (KAINet) http://www.kainet.or.ke has been under-graded to meet international RDF and XML standards of sharing agricultural information. AgriDrupal offers an integrated environment where several types of contents can be managed, searched and browsed on one website, like:

- documents or bibliographic records, using standardized descriptive metadata and controlled subject-indexing based on AGROVOC;
- news, events and vacancies;
- institutions and experts.

Document repository features

The AgriDrupal reference tool has advanced features for managing open access repositories in compliance with widely adopted library standards and the OAI-PMH protocol. The document repository features include:

- a cataloguing interface that out of the box provides the most commonly used metadata elements in bibliographic databases, in particular those defined by the AGRIS AP, but is easily extendable to include any other element;
- internal authority lists for authors (personal and corporate), journals and conferences;
- special input interface for subject indexing with the AGROVOC thesaurus;
- search and browse functionalities;
- exposure of records through the OAI-PMH protocol;
- exposure of records also as RDF feed, XML file, RDF individual records and (in the D7 version) RDF response to SPARQL queries. The XML file is compliant with the above mentioned AGRIS AP, while RDF feeds and query results can be customized in order to include properties from any vocabulary, thus making the repository fully interoperable - the use of Agrovoc URIs also linking it to a published Linked Open Data (LOD) triple store;
- extensible import and harvesting functionalities that also facilitate the exchange of information with other Institutions and the building of networks.

RDF and linked data

AgriDrupal manages documents, news, events, vacancies, institutions, experts and of course web pages. The resulting integrated information system exposes RDF feeds for each type of information managed in the system, and the vocabularies and properties used in the RDF output can be customized, thus making an AgriDrupal installation a potential Linked Data provider.

Besides RDF feeds, AgriDrupal version 7.x.7.9 and above exposes a SPARQL endpoint that accepts queries using several widely used vocabularies: DC and BIBO for documents, FOAF for experts and institutions.

All triples containing terms from AGROVOC are linked to the AGROVOC original URIs, thus making data managed in AgriDrupal Linked Data.

Interlinking with other important agricultural resources and databases has been incorporated into the new KAINet look.

5.5   Promotional Material

The design and development of the promotional material that is complete is shown by the attached images. 1000 flyers and 1000 brochures are planned to be printed and shared among the partners to be used as promotional materials.

5.5.1   Flyer

Front page	Back page

5.5.2   Brochure

- Advocate effective investments and sustainability of ICT activities of both institutional and national levels.
- Promote coherent systems and services through adoption of common principles and standards to ensure that the research . Information systems add value to others in the overall knowledge systems.
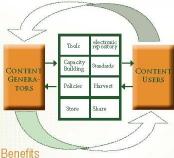
Participating Institutions

- Ministry of Agriculture (MOA)
- Kenya Agricultural Research Institute (KARI)
- Food and Agriculture Organization of the United Nations(FAO)
- Kenya Forestry Research Institute(KEFRI)
- Jomo Kenyatta University of Agricultural and Technology(JKUAT)
- Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA)
- CAB International (CABI)

Membership

Public and private institutions committed to providing their information to the public domain.

How to join

Participation in KAINet is through membership registration. Details are found at: www.kainet.or.ke

The KAINet approach

Benefits

- Access to a national consolidated content on agricultural information.
- Visibility for information products and services nationally and internationally.
- Exposure to new tools and standards for managing agricultural information.
- Access to technical backstopping and consultation from a team of experts.
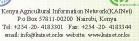
Participating Institutions

Kenya Agricultural Information Network(KAINet)
P.o Box 57811-00200 Nairobi, Kenya
Tel: +254 -20- 4183301   Fax: +254 -20- 4183344
email: info@kainet.or.ke website: www.kainet.or.ke

KAINet
Harvest. Store. Share.

Vision

To make public domain agricultural information and knowledge in Kenya truly accessible to all.

Mission

To build a common and freely accessible information system through partnership in the generation, collection, processing, archival, and dissemination of agricultural information.

Background

The network was initiated in April 2006 in response to demand from national and international communities to promote information availability and access among stakeholders in the agricultural sector. The network evolved from the Kenya Agris pilot project, which aimed at building capacities to manage information and establish institutional repositories of agricultural information.

Objectives

- To establish and manage performance driven national Information and Communication Management (ICM) networking, resource mobilisation and partnerships 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 Information and Communication Technology (ICT/ICM policies, legal frameworks.
- To promote the development and maintenance of adequate ICT/ICM infrastructure and facilities.

- To promote the development and implementation of strategic ICM human resources capacity building.
- To enhance availability, access, sharing and utilisation of agricultural knowledge and information.

The Need for Collaboration and Networking

- At national level KAINet is a response to a recommendation to build a Kenyan national agricultural science and technology information system, made in the Kenya Government Strategy for Revitalizing Agriculture (SRA) and the National Information and Communication Policy.
- Most agricultural research institutions work in isolation and their information does not reach the intended consumers. Therefore KAINet was established to provide a collaboration platform for agricultural information availability and access.
- The network recognizes the concept of comparative advantage of each member institution thus encourages inter connectivity and partnerships to complement each other in addressing national ICM issues.

Products and Services

- Access to the national agricultural electronic repository of information in full-text and metadata. The content includes technical notes, manuals, conference proceedings, research notes, annual reports, sessional papers, journals and project reports.
- 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 in the Environment (OARE), Anancy, Ask Food and Agricultural Organization of the United Nations(FAO),Information Management Resource kit (Imark) and open access tools.

- Open access to public domain agricultural information.
- Technical backstopping on agricultural information management to member institutions.
- Build capacity 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.

Functions of KAINet

- Communicate agricultural content by making public domain information resulting from research publicly available and accessible through repositories, networks and other services.
- Develop and recommend appropriate capacities required to design, deliver and manage research information including policies, process, skills and technologies.
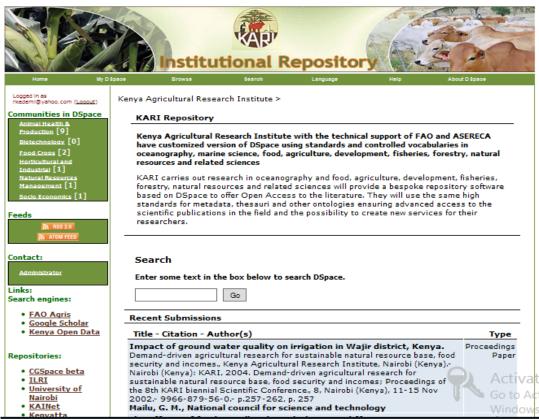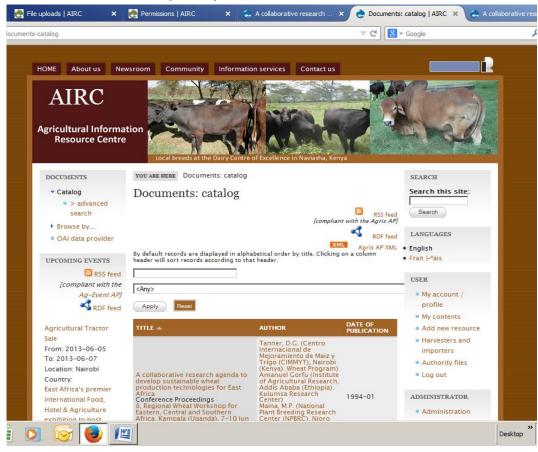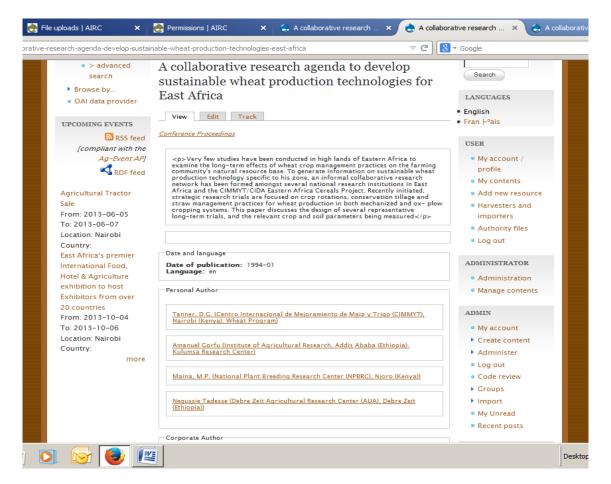
5.6 Institutional Report

5.6.1 KAINet

5.6.2 KARI Respository

5.6.3   AIRC and Kilimo Repository

5.6.4 KEFRI
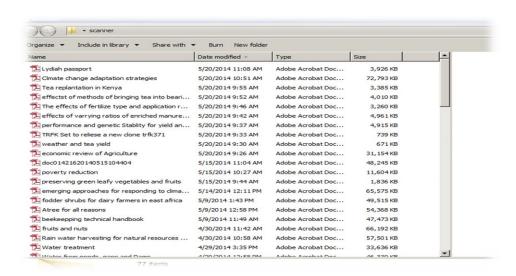
http://41.215.78.76:8282/

5.6.5 Digitized Documents

The table shows what has been digitized and what is on-going. The work is on-going since we began and we also institutionized the repository concept with KAINet and its participating institutions.
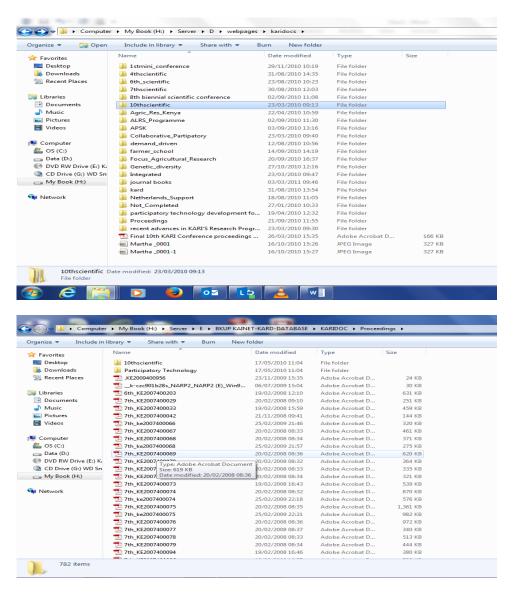
Institutions	Digitized	Planned to be digitized
AIRC and Ministry of Agriculture	558	Over 1,000
KEFRI	773	Over 1,000
KARI	1,158	Over 2,000

Please find below some screen shots of the scanned documents be carried out by the partners: -
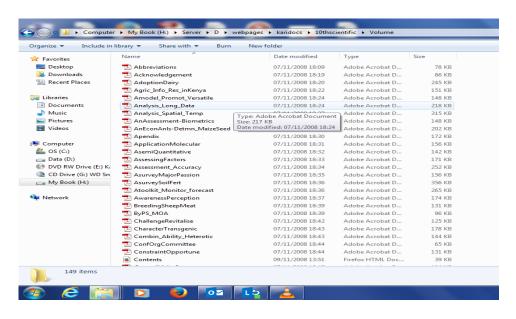
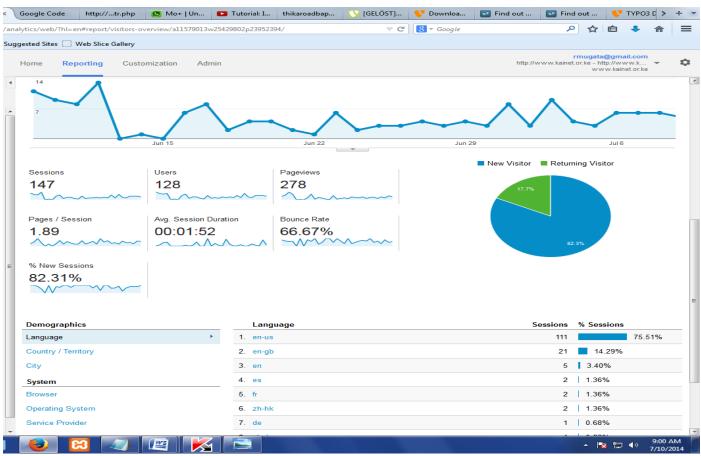### *Ministry of Agriculture*

KARI

KEFRI

5.6.5   Google Analytics

Google Analytics has been implemented and displays of the usage and access to the KAINet repository.

5.7   Memorandum of Understanding (MoU)

A draft MoU was developed to streamline the operations with KAINet member institutions. The MoU would underline the workflows and the structures of operations of the institutional and national repositories. It gives clear guidelines and responsibilities to all the members of the network hence giving round for growth of the membership.

6.0   PROJECT IMPLEMENTATION

Input	Project activities	Outputs	Outcomes	Timeline	Status	Assessment
Financial, human and material resources	Inception Workshop	Project Inception Project modalities and framework	Likely or achieved short and medium term effects. control	Dates were the listed activity was developed	Successful completed	
Financial, human and material resources	Training		Trained ICT and Library staff		Completed	
Human resources	Technical Back stopping	Repositories established in the 3 institutions			Completed and on-going on the technical back stopping	

7.0   KAINet Monitoring and Evaluation Plan

Grant by	FIRE
Organisation	Kenya Agricultural Research Institute
Project title:	Kenya Agricultural Information Network (KAINet)
Amount awarded:	$10,000
Project start date:	November 2013
Project completion date:	June 2014

2. Monitoring & Evaluation Plan.

Objective	Activity	Project Measure	Measure	Tools/ Resources Required	Measured by:	Measure taken every:	Date completed
1. To avail full text content through the Institutional and National Repositories	1. Digitization of print institutional agricultural information materials	List scanned documents	Number of scanned Documents	Scanners, Institutional Publications, Computers	KAINet Coordinator	Do a baseline survey at the beginning of the project and then measure progress monthly	1st June, 2013 Continuous
	2. Enter metadata into existing institutional repositories	Metadata and Full text document in the Repositories	Number of metadata with full text documents	Repository Software, standards and tools	KAINet Coordinator	Monthly	1st June, 2013 Continuous
	3. Migration of the metadata into KAINet	Metadata and full text	Increased metadata and full text onto KAINet	Standards and tools	KAINet Coordinator	Monthly	1st June, 2013 Continuous
2. To facilitating access to the scientific and technical literature in Kenya	Host KAINet e-repository	Linkage with institutional repositories	Assess number of visits to Institutional and KAINET repositories	Google Analytics KAINet Portal, servers, Internet connectivity	KAINet Coordinator	Monthly	Continuous
3. To Strengthen national and institutional capacities to manage, disseminate and exchange agricultural Information	1. Train data entry librarians and ICT support personnel on Agridrupal/ AgrioceanDspace	Trained staff at the Institutional level and KAINET coordination office	Number of trained staff	Agridrupal and AGRIOCEAN DSPACE software/trainers and computing facilities/technical Experts	KAINet Coordinator	After the training	Mid January 2014
	2. Technical support in maintaining database, uploading metadata	Currency of repositories, visits	Currency of repositories and number of visits to	Listed software (AGRIOCEAN DSPACE & AGRIDRUPAL), and	KAINet Coordinator	Monthly	Continues

	and full text and Follow up	and accessibility	partner institutions	back up facilities			
4. To Create Awareness of KAINet	1. Hold multi-stakeholder workshop and consultative meetings	Consultations and workshops held	Number of new participating institutions and the number or new repositories and members	Attendance book, repositories, Google analytics	KAINet Coordinator	Monthly	Continuous
	2. Develop promotional material	Leaflets and brochures	Number of leaflets and brochures	Software and promotional literature	KAINet Coordinator	Before each report is due	Mid March

8.0   WAY FORWARD

The repositories shall eventually been imported onto the KAINet repository to ensure that we have a one stop resources for agricultural information. We are therefore putting in place the structures in place in readiness of this particular exercise.

To improve usability and accessibility of the KAINet platform, we intend to create awareness of among the various stakeholders in the agricultural sector. We also plan to increase the partners onto the KAINet platform even as we market the resource so as to eventually have a one-stop platform of agricultural information in Kenya.

The digitations, knowledge management and making knowledge accessible kick off with the assistance of AFRINIC-FIRE within the partner institutions shall continue to ensure that all the repositories shall be available online with full text documents.

Recruitment of other research institutions into the KAINet membership is underway with the transitions of Kenya Agricultural Research Institute (KARI) to Kenya Agricultural and Livestock Research Organization which will comprise of over 9 Agricultural research Institute into one body (KALRO). This will therefore mean more agricultural information harvested and uploaded onto KAINet repository.

The success of the initiative has promoted the partner institutions to seek more funds to ensure the digitization of institutional content and making it accessible and available via local and online repositories.

9.0   CONCULSION

All the partner institutions have embarked on the first of the project with institutions scanning information and knowledge in readiness of metadata entry and linking onto the institutional repository. The ICT teams within the institutions with the assistance of the backstopping team are also setting up and customizing the institutional repositories.

The AFRINIC FIRE initiative is timely in assisting institutions in the agricultural stake to manage, store, disseminate and share agricultural research findings.