



Development and implementation of an institutional repository for the
CSIR-Food Research Institute

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ABSTRACT

An institutional repository is a digital archive of the intellectual product created by the faculty, research staff, and students of an institution and accessible to end users both within and outside of the institution, with few if any barriers to access. This report presents a practical account of an Institutional repository developed from planning to its implementation phase in the CSIR-Food Research Institute using AgriOcean Dspace, an Open Source Institutional repository software and also describes its objectives as well as the implementation workflows. The report notes that most of the academic and research institutes adopt the open source Institutional repository software's for creating and developing their own repositories.

It looks at the concept of open access institutional repositories, the technical consideration to follow in order to set up an institutional repository and further discusses the prospects to be derived from setting up an institutional repository (IR) and challenges it brings to those deciding to implement it. This report clearly states that the institutional repository is a very powerful idea that can serve as an engine for institutions of higher education and research institutes, and more broadly for the scholarly enterprises that supports research activities.

1.0 **PROFILE OF CSIR-FOOD RESEARCH INSTITUTE**

1.1 **Introduction and Background**

The Food Research Institute (FRI) is one of the thirteen (13) Research Institutions of the Council for Scientific and Industrial Research (CSIR) which operates as a Science and Technology Research Development Organisation. The Food Research Institute was established in October 1963, incorporated by L I No. 438 of 19th March 1965 and became an institute of CSIR in October, 1968 by NLC Decree 293.

CSIR-FRI is mandated to conduct market-oriented applied research, provide technical services and products to the food industry and assist in poverty alleviation through the creation of opportunities for income generation, thus contributing to food security and foreign exchange earnings. CSIR-Food Research Institute is the leading S&T Institute in the transformation of the food processing industry in Ghana.

The core research interests and programs of the FRI include:

- (i) Food Products Development, Up-scaling & Technology Transfer
- (ii) Technical & Analytical Services
- (iii) Quality Assurance, Food Security and Analytical Services
- (iv) Technology, Business Incubation, Community Outreach
- (v) Knowledge & Performance Management.

The Food Research Institute, as the leading Food Research Institution in Ghana has been given the mandate to reduce food insecurity and also advise government on its food policy.

1.2 **Vision**

The Institute's vision is to play a key role in the transformation of the food processing industry and to be internationally competitive with particular reference to product safety, quality and preservation.

1.3 **Mission**

The Institute's mission focusses on providing scientific and technological support to the growth of the food and agricultural sectors of national economy in line with corporate prioritisation and national objectives. Primarily, the Food Research Institute's mission is to conduct market-oriented applied research and provide technical services and products profitably to the private sector and other stakeholders.

1.4 **Objectives**

- To develop and provide technical information, training and services to the private sector and other stakeholders in the food industry.

- To provide appropriate technology packages for processing and storage of raw agricultural produce to facilitate curtailment of postharvest losses and promote value addition for local and export markets.
- To strengthen the Institute's capability and linkages with industry through human resource and re-organisation for effective commercialization of operations.

1.5 Information resources generation

The Institute since its inception has blossomed into a full-fledged research institute and as a result of its mandated objectives produces a lot of information resources. The information resources that are generated within the institute can be categorized as follows:

- Technical reports
- Manuals
- Conference papers
- Conference abstracts
- Flyers
- Annual reports
- Thesis dissertations
- Journal articles
- Posters
- Newspaper publication

These resources generated by the research scientist and technologists are mainly available in hard copies. In addition, most of them are stored in boxes, drawers and shelves in the offices of the research scientists who originated the documents. There is no policy that compels research scientists to deposit copies of their publications in the library. As a result most of the materials generated by the research scientists are not available in the Library and therefore are not easily accessible to information users.

To forestall, the above-mentioned development the Information Management Section of the Commercial Information Division under the auspices of the Ghana Agris Pilot Project (GAPP), coordinated by Ghana Agricultural Information Network System (GAINS), decided on the development and implementation of an institutional repository for seven pilot institutions after a stakeholders meeting on 5th December 2007 at the Erata Hotel in Accra.

The main goal of the Ghana AGRIS Pilot project, which is funded by the Food and Agriculture Organization (FAO) and the United Kingdom-Department for International Development (UK-DFID), is to develop open access to public domain scientific and technical information on agriculture through

interlinked full-text repositories at institutional level as part of a Ghanaian national agricultural science and technology information system. GAINS, an information exchange network of agricultural libraries of various member institutions in Ghana, has the mission to provide effective coordination among libraries and information centres of the network for improved information and communications management.

The specific objectives for the development and implementation of the institutional repository are:-

- To publish and archive the scholarly works of an institute locally using authentic information sources
- To enable long term preservation of the scholarly work of the institute
- To facilitate researchers an easier and rapid way to publish and archive research locally
- To provide integrated view of and act as a single entry point to collect scholarly work for the institute
- To provide wider accessibility, visibility and distribution of scholarly work of the institute
- To act as a self-evaluation tool for management
- To create global visibility for an institution's scholarship
- To serve as a clearinghouse for the institute and a mechanism for identifying researchers with similar interests.

2.0 **INSTITUTIONAL REPOSITORY**

2.1 **What is an Institutional repository?**

Today, information is increasingly being recognized as a key resource of any organization that has become more important for production than the “classic” human and financial resources. Thus we now live in an information economy in which the major source of wealth and prosperity is the production and distribution of information. It is, therefore, now believed that the way organizations and nations manage information will determine their survival and growth in the future.

Institutional repositories are the latest development in a series of systems aimed at managing digital content. In the words of Lynch (2003), an institutional repository is a set of services that an institution offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members. It is most essentially an organizational commitment to the stewardship of these digital materials, including long-term preservation where appropriate, as well as organization and access or distribution.

On the other hand, Crow (2002) notes that an institutional repository is a digital archive of the intellectual product created by the faculty, research staff, and students of an institution and accessible to end users both within and outside of the institution, with few if any barriers to access. In other words, the content of an institutional repository is:

- Institutionally defined
- Scholarly
- Cumulative and perpetual and
- Open and interoperable.

An institutional repository is thus defined not by the type of data it stores but by the purpose that it serves: in essence, this is the capture, collection, management and dissemination of the ‘intellectual output of a single or multi-university community (Crow, 2002).

Institutional repositories are becoming a major component of the evolving structure of scholarly communication. Institutional repositories are now being created to manage, preserve, and maintain the digital assets, intellectual output, and histories of institutions.

Librarians are taking leadership roles in planning and building these repositories, fulfilling their roles as experts in collecting, describing, preserving, and providing stewardship for documents and digital information. Repositories provide services to faculty, researchers, and administrators who want to archive research, historic, and creative materials. Thus, development of institutional repository has become a necessity to reveal the scientific research output for which Library and Information professionals have to take keen interest and initiation.

2.2 Institutional repository policy

Repositories now represent potentially rich sources of information, data, images, and valuable research results. The movement is new and the time it takes to plan, formulate policies, and bring institutional communities to consensus can make it a slow process.

Each institution defines its own policies dealing with access to and use of materials in repositories. Not all materials can be made available freely. Copyrighted materials may carry a variety of restrictions. Nonexclusive publisher licenses would increase availability to these materials and place the publishers in the open access arena.

Some publishers permit authors to self-archive. Other publishers opt for exclusive licenses for a limited time, while still others will not allow any deviation from exclusive copyright.

Some materials may be restricted to a small group of researchers or to people associated with the institution because they represent work in progress deemed proprietary or that may entail sponsor restrictions. For example, a group working on a patentable device or process may want to share data only with members of the group.

Librarians both use and create institutional repositories. In establishing repositories there are a variety of decisions to make. Policies, systems architecture, and other elements will depend on institutional context and the scope and purposes of the repository. Policies appropriate for an academic institution may not work in a corporate setting. Not-for-profit organizations have unique purposes and cultures that will dictate how their repositories are formed and maintained (Drake, 2004).

In the development of institutional repositories certain key issues must be considered, and these are:-

- Institutional culture and consensus has to be discussed
- The scope of the repository as to type of publications to be part of Institutional repository
- The information content of the repository
- Access levels as to full text or abstract level/ access to type of users or privileges
- Legal aspects i.e. copyright acts
- Standards
- Sustainability and maintenance
- The appropriate software and funding has to be taken into account before going for institutional repository projects at institution level

Institutional culture depends on how the organization is structured as well as how much collaboration and trust exists within an institution. In academic organizations, faculty belongs to departments, disciplines, and research groups. Academic competition may be fiercer in some universities than in corporations.

In an internally competitive environment where cooperation and trust are not nurtured, building a repository will become more difficult. Faculty will not contribute willingly to a central repository unless they have been consulted and trust the process. Faculty need to be convinced that contributing to a repository will enhance their reputations in their disciplines and result in wider dissemination of their work.

Repository advocates must decide early on the purposes and scope of the repository and communicate them to all affected parties. The sooner participants can buy into the process, the better. Will the repository be central? Distributed? Will it cover only parts or all of the organization? For some institutions, community-based repositories will work well.

Large and complex institutions will need consensus on key issues and technical standards. A repository may be limited to self-archiving by authors or may include the intellectual output and business and administrative documents for the whole institution. Many institutions have treasures known to only a few people. Repositories provide the means for unearthing these treasures and bringing them to light.

2.3 Relevance of Institutional repository

Institutional repositories play an essential role in the preservation and dissemination of institutional research and hence become an integral part of the global research outputs. Research that is currently inaccessible because of financial barriers becomes globally accessible. As more and more international institutes establish archives, a growing body of published research becomes available to anyone with Internet access.

In the view of Crow (2002), although publication by faculty members in scholarly journals could add impact to the prestige of the institutions in which they work, an institutional repository stands to generate greater impact by centralizing research outputs generated by the institution's researchers. This will therefore serve as a much better and simpler method for measuring the quality of the institution's academic scholarship, productivity and prestige.

Research by Egwunyenga (2010) as cited in Iwighrehweta (2012), suggests that, in the case of research and academic institutions in developing countries, development of institutional repository will not only boost the global visibility and utility of their research, but will also introduce a novel research culture focused on meeting international standard and values. Knowledge by a researcher that his research will be openly accessible by a global audience will have an impact on his focus and standard.

The development of institutional repository will not only boost the global visibility and utility of the research outputs from academic and research institutions in developing countries, but will also introduce a new research culture focused on meeting international standards and values. It is an accepted fact that the current closed access publishing has failed to portray the quality and quantity of research outputs from the developing world particularly those in the African universities and by African scholars.

Institutional repositories provide access to wealth of knowledge in the form of scientific and technological information which are very essential for development. Several of the research output from Africa exists in the form of unpublished information and knowledge resources such as research reports, theses and dissertations, seminar and conference papers. Very little research outputs find their way into the world's well-established international scientific journals (Chisenga, 2006).

Repositories are also important for institutions in helping to manage and capture intellectual assets as a part of their information strategy. They provide a link to other repositories and can also provide machine processable data to support higher educational and research institutions to address the challenges of access to print journals.

They serve as tangible indicators of an institution's quality, thus increasing its visibility, prestige, and public value. Institutional repositories can further provide an immediate and valuable complement to the existing scholarly publishing model thereby stimulating innovation in a new disaggregated publishing structure while at the same time build on a growing grassroots faculty practice of self-posting research online.

Institutional repositories create the global visibility for an institution's scholarly research, provide open access to institutional research output through self-archiving and store and preserve other institutional digital assets including unpublished or grey literature. They provide critical component that expand access to research and increase competition while reducing the monopoly power of journals, and hence bring economic relief to the institutions and libraries that support them.

It serves as tangible indicators of a university's quality and increases the institution's visibility, status and public value. Institutional repositories again provide an immediate and valuable component to the existing scholarly publishing model, while stimulating innovation in a new disaggregated publishing structure that will evolve and improve over time. In addition, institutional repositories offer a strategic response to systematic problems in the existing scholarly journal system.

3.0 SOFTWARE FOR THE INSTITUTIONAL REPOSITORY

3.1 Setting up of IT Infrastructure for the Institutional Repository

IT infrastructure for the repository is one of the core components that the team took into consideration especially when you consider user demand, push/pull of technology and ever-growing and emerging global standards. The major areas where the team was actively involved is given below:-

- Selection of hardware and software
- Installation, Configuration and customization
- Selection of Metadata Standard
- Designing standard workflow pattern
- Content Management
- Metadata extraction and injection
- Uploading: Mode of Submissions.

3.2 Selection of Hardware and Software

3.2.1 Hardware

At the initial stages, a virtual server was used for the installation and customization of all the required software packages needed for the repository. Later on this was migrated onto the FRI main server.

To convert the hard copy documents, a high-speed face-up scanner with Optical Character Recognition (OCR) software which was acquired under the AGRIS Pilot Project was used to digitize print documents into digital form.

3.2.2 Software Selection

There are a number of software options (i.e. Open Source and Proprietary) available when setting up an institutional repository and different institutions have chosen different options in relation to the function that their institutional repository will perform. Some of the Open Source software packages for running an institutional repository includes:-

- Dspace
- AgriOcean Dspace
- AgriDrupal
- Eprints
- Fedora Commons
- Greenstone
- Invenio
- SobekCM

On the other hand, an institution can opt for a proprietary software packages for the running of an institutional repository. Some of the available proprietary software services includes:-

- Digital Commons, a full-service commercial platform from the Berkeley Electronics Press
- SimpleDL

3.2.3 Open Source Software

Open-source software (OSS) is software for which the source code is freely available for anyone to see and manipulate. There are various licensing models to which the OSS label has been applied, but the basic idea is that the software's "license may not restrict any party from selling or giving away the software as a component of an aggregate software distribution containing programs" and the working software must either be distributed along with its source code or have a "well-publicized means of downloading the source code, without charge, via the internet". That is anyone can access and manipulate the code that was used to write a program, as long as anything that person comes up with using the code is also offered to the public as OSS. This allows those who use the software to contribute to its further development fix bugs and tinker with it as they please. This is contrasted with proprietary software, which is distributed as compiled object code or machine code, leaving the source code solely under the control of the individual software vendor. Open source software has become a trendsetter in the arena of software development and distribution. The development of open source software was a reaction to the existing legal instrument on software copyright form the software developer's community. Open source softwares are available free of cost and users have the freedom to run and distribute the software without any restriction. Normally small and medium size libraries feel automation of housekeeping operations as a financial burden due to the high price Library Management Systems (ILS). Development of open source software gives effective way to create digital library operations without financial investment (Lee, 2009).

3.2.4 Open Source Software Selection

3.2.4.1 AgriOcean Dspace

After a detailed study and close observation of available Content Management and Digital Library Management Systems, we decided to choose AgriOcean Dspace, a customized version of Dspace developed by the Food and Agricultural Organisation (FAO) of the United Nations. AgriOcean Dspace (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. Features of AgriOcean Dspace includes high standards for metadata (AGRIS AP, MODS) and OAI-PMH compliant; controlled vocabularies (ASFA, AGROVOC); Authority control for journals (ASFA and AGRIS list); Type-based submission; Up-to-date lay-out: personalizable standard, Batch import module for AGRIS AP, Endnote and Web of Science RIS files.

3.2.4.2 Dspace

DSpace is an open-source digital asset management system originally created by developers from MIT and HP Labs in 2002. It is most commonly used by institutional repositories (Tansley, Smith, & Walker, 2005) and as of July 2013, ROAR has recorded 1,356 implementations, making it by far the most popular and tested repository solution available. DSpace provides a way to manage research materials and publications in a professionally maintained repository to give users greater visibility and accessibility over time. Top reasons why we chose Dspace for the project includes its features like granularity, adherence to standards, multi-format support, customizable interface, a suitable windows/linux platform for building an Institutional Repository (IR), Inter-institutional sharing of digital information with easy interoperability of resources and systems, It has Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) Compliance, support with fully qualified DCMI, remote submission, authorization and reviewing, community/sub-community based collection architecture, import and export features, persistent Identifiers Handle System, Open URL Support, Lucene search engine and generation of statistical reports and so on.

3.2.5 Installation, Configuration and Customization of AgriOcean Dspace

Prerequisite software needed to run AgriOcean DSpace (1.7.1 version) includes: UNIX-like Operating System (Linux, Ubuntu Server, etc.); Oracle Java 6 or greater; PostgreSQL 8.4 or later, an open source relational database; and Apache Tomcat 5.5 or later. And also, an Acrobat PDF maker to convert MS documents to Adobe PDF.

Having gone through the due process of systems study and analysis, we successfully installed and configured AgriOcean Dspace (Version 1.7.1) on Ubuntu Virtual Server for testing. Later, we migrated the system onto the FRI Server.

3.2.6 Designing User Interface and Standard Workflow Pattern

Designing user friendly, systematic and simple workflow is one of the essential requirements of any institutional repository to be successful. If you choose any commercial system for its management, the vendor is responsible for configuration and customization as per your needs. But in the case of open source software such as AgriOcean Dspace and for that matter Dspace, you have to thoroughly study and become familiar with it to get the best out of it. We have successfully customized and restructured the user interface as well as the workflow pattern as per our needs. Figure 3.1 below is a home page screenshot of the customized user interface of AgriOcean Dspace of our institutional repository.

FRI Institutional Repository

Home My DSpace Browse Search Language Help About DSpace

Communities in DSpace
Institute [631]

Feeds
RSS 2.0 ATOM FEED

Contact:
Administrator

Links:
Search engines: [Agris](#), [Avano](#), [Google Scholar](#), [OAIster](#), [VOA3R](#)
Repositories: [Aquatic Commons](#), [Archimer](#), [Archive Institutionnelle de l'Ifremer](#), [IRD Documentation](#), [ePrints Soton \(Oceanography\)](#), [Woods Hole Open Access Server](#), [Marine & Ocean Science ePrints Archive @ Plymouth](#), [DRS at National Institute Of Oceanography](#), [Institute of Biology of the Southern Seas](#)

About the Repository
The Food Research Institute library is one of the most important research libraries that provides and disseminates information in the field of food science and technology, nutrition, food microbiology, aflatoxins and mycotoxins, agricultural economics and food engineering in the country.
The clientele of the library has extended beyond the institute's research and technical staff to include students from the various universities and polytechnics in Ghana. The library is also patronized by lecturers, farmers, Industrialists, Journalist, Civil servants and Public servants, Consultants and many others. These users are attracted to its rich and extensive print and electronic resources that have been gathered throughout its history.

Search
Enter some text in the box below to search DSpace.

Recent Submissions

Title - Citation - Author(s)	Type
A risk assessment of the likelihood of anthrax infected hide/skin used on drums exported from Ghana Proceedings of the Pan African Conference On Risk Analysis and Modelling and Sanitary/Phytosanitary (SPS) CapacityBuilding in Sub-Sahara Africa: Addis Ababa, Ethiopia, 27 September - 1 October 2004, p. 21-31 Boateng, B. A.; Glover-Amengor, M.; Kunadu-Ampratwum, F.	Proceedings Paper
A pest risk analysis of the importation of the mango stone weevil (Sternochetus mangiferae) from Ghana into Mainland USA Proceedings of the Pan African Conference On Risk Analysis and Modelling And Sanitary/Phytosanitary (SPS) Capacity Building in Sub-Sahara Africa: Addis Ababa, Ethiopia, 27 September - 1 October 2004, p. 11-19 Woode, R.; Glover-Amengor, M.; Braimah, H.	Proceedings Paper
A risk analysis of the likelihood of the export of tropical bont-tick (Amblyomavariegatum) infected royal python (Pythonregius) to the United States of America Proceedings of the Pan African Conference On Risk Analysis and Modelling and Sanitary/Phytosanitary (SPS) CapacityBuilding in Sub-Sahara Africa: Addis Ababa, Ethiopia, 27 September - 1 October 2004, p. 3-10 Braimah, H.; Glover-Amengor, M.; Kunadu-Ampratwum, F.	Proceedings Paper
A review of extension and technical services programmes available in Ghana for the promotion and development of small-scale industries Workshop of Experts on Small-scale Enterprises development in Ghana, Kwame Conference Centre, Accra, 18-20 July 1978 Lartey, B. L.	Conference Material
Some methods for the domestic preservation of fruits and vegetables and the storage of some grains, tubers and fruits and vegetables in Ghana Ghana Government/UNECA Worksop, Rural Training Centre, Axim, 5-23 May 1975 Lartey, B. L.	Conference Material

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Figure 3.1: Home page of FRI Institutional Repository

4.0 WORKFLOW PATTERN AND CONTENT MANAGEMENT

4.1 Submitting Content to the Institutional Repository

AgriOcean Dspace software has been successfully installed and can be accessed using a web browser on the FRI local area network. For submitting content in the specific community, user must register with the software. User chooses a collection; user describes the content of the item by adding metadata and keywords; new users who wish to submit content have to register on the IR by completing a special form. The following are then the basic steps, which need to be followed for the submission of material:

As the user enters the information about an item, the status line at the top of the relevant window shows where they are in the submission process. Users can change their entries and return to a previous step to make changes by clicking on that step in the status bar. The six-step chain, as shown in figure 4.1 below, indicates the submission process. The chain appears at the top of all the screens with the current screen highlighted. The first screen asks for the “type” of digital item (animation, article, book, book chapter, and so on), the language of content (English (US), English, Spanish, German, French and so on) as well as whether the item has more than one title, whether it has been published before and the number of files to be included. The second and third screens present the forms for the user to enter Dublin core metadata elements (such as author, title, publisher, subject keywords, abstract etc). The fourth screen allows the uploading of the digital document which may be PDF, MS-Word, HTML, image files or other acceptable formats. The fifth screen allows verifying and making any corrections on the data submitted in the last four screens. The users can verify the information submitted and can correct information, add or remove the files as and when necessary. The last screen completes the submission of the item.



Figure 4.1: The six-step chain process of submitting an item into the repository

Figure 4.2 to Figure 4.11 below depicts the step by step workflow that a user goes through to submit an item into the repository.

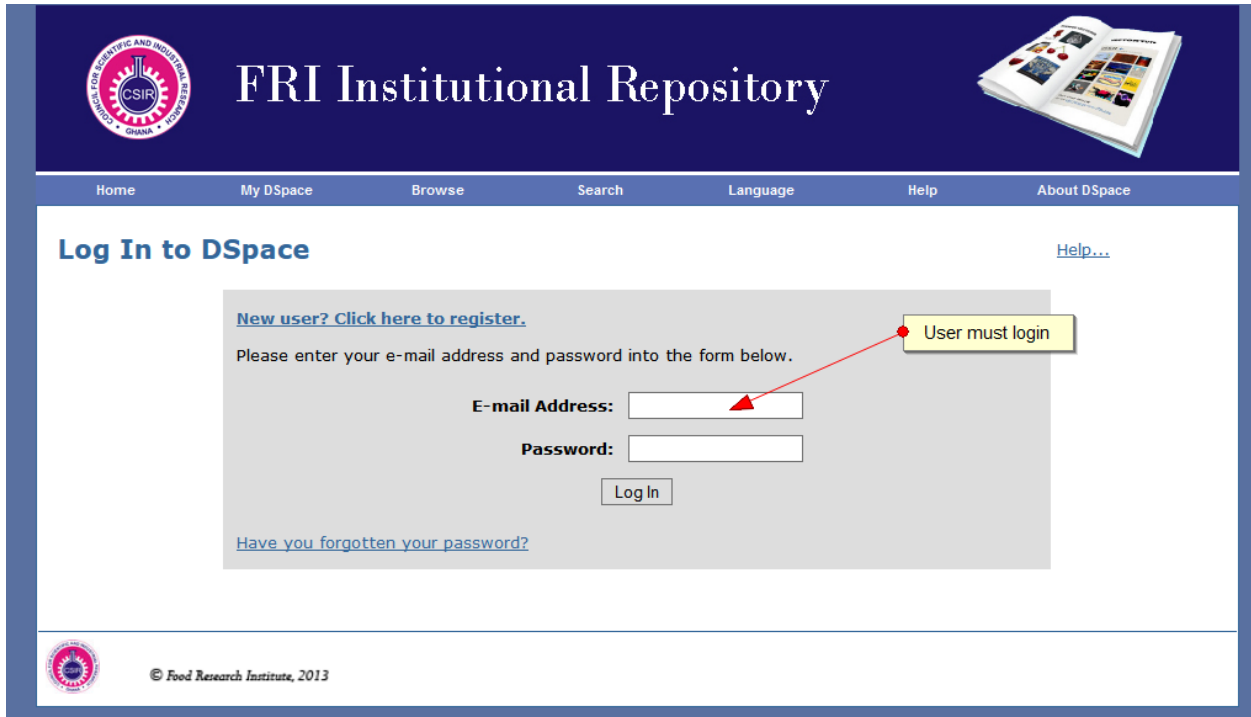


Figure 4.2: User log in to the repository

The screenshot displays the FRI Institutional Repository interface. At the top, the CSIR logo and the text 'FRI Institutional Repository' are visible. Below the header is a navigation bar with links for Home, My DSpace, Browse, Search, Language, Help, and About DSpace. The main content area is titled 'My DSpace: Kwabena Bugyei' and features a 'Start a New Submission' button highlighted with a red arrow. Other buttons include 'View Accepted Submissions' and 'See Your Subscriptions'. A section for 'Unfinished Submissions' contains a table with four rows of submission data. The left sidebar includes sections for 'Communities in DSpace', 'Feeds', 'Contact', 'Links', 'Search engines', and 'Repositories'.

Logged in as bugyeik@yahoo.com (Logout)

Communities in DSpace
Institute [631]

Feeds
RSS 2.0 ATOM FEED

Contact:
Administrator

Links:
Search engines: Agris, Avano, Google Scholar, OAIster, VOA3R
Repositories: Aquatic Commons, Archimer, Archive Institutionnelle de l'Ifremer, IRD Documentation, ePrints Soton (Oceanography), Woods Hole Open Access Server, Marine & Ocean Science ePrints Archive @ Plymouth, DRS at National Institute Of Oceanography, Institute

FRI Institutional Repository >

Start a New Submission

Start a New Submission

View Accepted Submissions

See Your Subscriptions

Help...

My DSpace: Kwabena Bugyei

Unfinished Submissions

This section is for use in the continued authoring of your document.

	Submitted By	Title	Submitted to	
Open	Kwabena Bugyei	Untitled	Publications	Remove
Open	Kwabena Bugyei	Untitled	Publications	Remove
Open	Kwabena Bugyei	Untitled	Publications	Remove
Open	Kwabena Bugyei	Untitled	Publications	Remove

Exported Resources

- [item export 2013 Jul 18 1 2.zip](#)

Figure 4.3: Start a New Submission



Figure 4.4: Choose a collection

FRI Institutional Repository

Home My DSpace Browse Search Language Help About DSpace

Describe Describe Describe Upload Verify Complete

Submit: Describe this Item

Please fill in the requested information about this submission below. In most browsers, you can use the tab key to move the cursor to the next input box or button, to save you having to use the mouse each time. ([More Help...](#))

Select type of document - [Help](#)
 Select type of document

Type - [Help](#)
Specified Type
 Select type

Creators - [Help](#)
Personal Author - Editor - Theses Advisor - Corporate Author
 Enter the names of the creators (Format for a person: Jones, Jim)
 Enter the name of the Authors

Title Information - [Help](#)
Title *
 Enter the complete title of your deposit. Title and subtitle are divided by a double colon (:)
 Enter title of information

Alternative Titles
 Enter here the translation(s) of the title.

Reference - [Help](#)
Journal Title + ISSN *
 Enter a word from the journal title and choose the correct title out of the picklist.
 Journal information goes here

Volume **Issue** **Start page** **End page**

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Figure 4.5: Describe the item to be submitted

FRI Institutional Repository

Home My DSpace Browse Search Language Help About DSpace

Describe Describe Describe Upload Verify Complete

Submit: Describe this Item

Please fill further information about this submission below. ([More Help...](#))

Links - [Help](#)

DOI of published version
The DOI is a unique digital object identifier. This identification system is used by international publishers.

Alternative Locations (URL)
If your deposit is available from other sites, enter those URLs here.

Data set(URL)
If the data sets are electronically , enter those URLs here.

Characteristics - [Help](#)

Year of Publication (format: YYYY) *

Refereed *
Please indicate here if your deposit has been refereed.

Language *
Select the language(s) of your deposit.

<input type="checkbox"/> English	<input type="checkbox"/> Polish
<input type="checkbox"/> French	<input type="checkbox"/> Italian
<input type="checkbox"/> Portuguese	<input type="checkbox"/> Arabic
<input type="checkbox"/> German	<input type="checkbox"/> Japanese
<input type="checkbox"/> Spanish	<input type="checkbox"/> Chinese
<input type="checkbox"/> Ukrainian	<input type="checkbox"/> (Other)
<input type="checkbox"/> Russian	

< Previous Next > Stop

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Figure 4.6: Describe the item to be submitted (Continued)

[Describe](#) [Describe](#) [Describe](#) [Upload](#) [Verify](#) [Complete](#)

Submit: Describe this Item ¹

Please fill further information about this submission below. ([More Help...](#))

Subjects - [Help](#)

ASFA Terms
 Enter a (part of) the keyword and choose from the list/ See also at [ASFA website](#)
 English

AGROVOC Terms
 Enter a (part of) the keyword and choose from the list/ See also at [Agrovoc website](#)
 English

Free Keywords
 Enter here any keywords that will help searchers to find your deposit.
 English

Geographical Terms ²
 Select the geographical terms your deposit covers.

Description of Content - [Help](#)

Abstract
 Enter here the abstract, a short summary of the content of your deposit.

 English

Notes
 Enter here any additional information about your deposit.

 English

Bibliography
 You are strongly encouraged to paste the citations present in your deposit into the box below.

Figure 4.7: Describe the item to be submitted (Continued)

CSIR
CENTRE FOR SCIENTIFIC AND INDUSTRIAL RESEARCHES
NEW DELHI

FRI Institutional Repository

Home My DSpace Browse Search Language Help About DSpace

Describe Describe Describe Upload Verify Complete

Submit: Upload a File

Please enter the name of the file on your local hard drive corresponding to your item. If you click "Browse...", a new window will appear in which you can locate and select the file on your local hard drive. [More Help...](#)

Please also note that the DSpace system is able to preserve the content of certain types of files better than other types.

[Information about file types and levels of support for each are available.](#)

Upload Queue

0 Files Uploaded

Upload

Upload the full-text document

< Previous Next > Skip file upload > Stop

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Figure 4.8: Upload the full-text document

CSIR
FOOD RESEARCH INSTITUTE
GURGAON
HARYANA

FRI Institutional Repository

Home My DSpace Browse Search Language Help About DSpace

Describe Describe Describe Upload Verify Complete

Submit: File Uploaded Successfully

Your file was successfully uploaded.

The table below shows the files which have uploaded for this item. [More Help...](#)

Primary bitstream	File	Size	Description	File Format
<input type="radio"/>	Implementation timeline.pdf	48849 bytes	None <input type="button" value="Change"/>	Adobe PDF (known) <input type="button" value="Change"/> <input type="button" value="Remove"/>

You can verify that the file(s) have been uploaded correctly by:

- Clicking on the filenames above. This will download the file in a new browser window, so that you can check the contents.
- The system can calculate a checksum you can verify. [Click here for more information.](#)

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Figure 4.9: File Uploaded Successfully



Describe Describe Describe Upload **Verify** Complete

Submit: Verify Submission

Not quite there yet, but nearly!

1
Correct options by clicking on this button

Please spend a few minutes to examine what you've just submitted below. If anything is wrong, please go back and correct it by using the buttons next to the error, or by clicking on the progress bar at the top of the page. [More Help...](#)

If everything is OK, please click the "Next" button at the bottom of the page.

You can safely check the files which have been uploaded - a new window will be opened to display them.

<p>Specified Type Article</p> <p>Personal Author - Editor - None</p> <p>Theses Advisor - Corporate Author</p> <p>Title * my title</p> <p>Alternative Titles None</p> <p>Journal Title + ISSN * Aana Journal</p> <p>Volume None</p> <p>Issue None</p> <p>Start page None</p> <p>End page None</p>	<p>Correct one of these</p>
<p>DOI of published version None</p> <p>Alternative Locations (URL) None</p> <p>Data set(URL) None</p> <p>Year of Publication (format: 2013 YYYY) *</p> <p>Refereed * Non-Refereed</p> <p>Language * English</p>	<p>Correct one of these</p>
<p>ASFA Terms None</p>	

Figure 4.10: Verify Submission

FRI Institutional Repository

Home My DSpace Browse Search Language Help About DSpace

Describe Describe Describe Upload Verify **Complete**

Submit: Submission Complete!

Your submission will now go through the workflow process designated for the collection to which you are submitting. You will receive e-mail notification as soon as your submission has become a part of the collection, or if for some reason there is a problem with your submission. You can also check on the status of your submission by going to the My DSpace page.

[Go to My DSpace](#)

[Communities and Collections](#)

Submit another item to the same collection

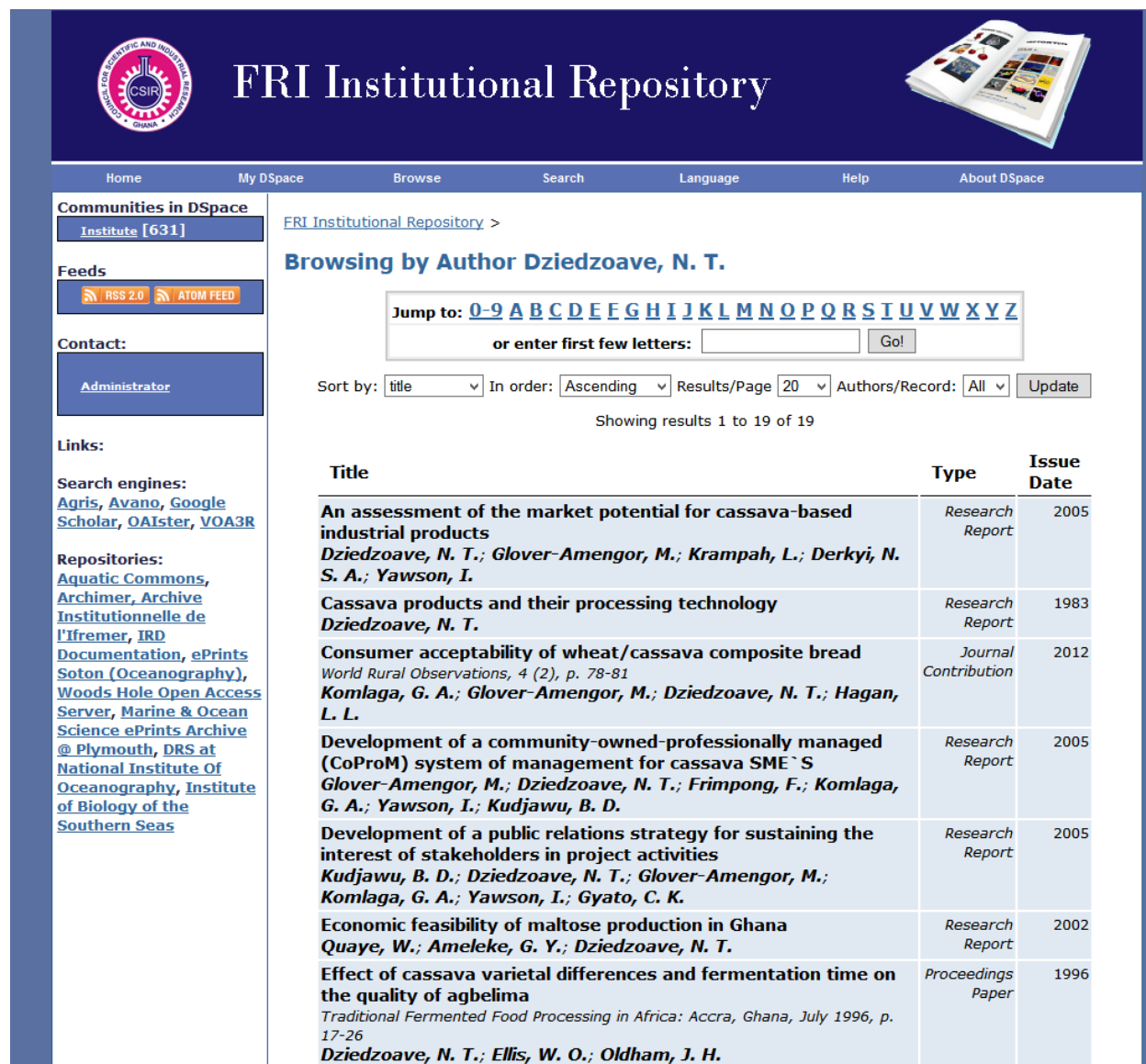
The submission process is completed

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Figure 4.11: Submission Process completed

4.2 Accessing Information on the Institutional Repository

Searching for information on the Institutional Repository is very easy. Since the Repository is a web-based, a user only needs a web browser to search for information. Information may be searched by Title; Author; Year or Issue Date; Subjects and Communities/Collections. There is also a user defined search criteria, that is, a user can enter any search term in the search box provided and search for items in the repository. Figure 4.12 to 4.15 below demonstrate browsing of articles/publications by Author, Title, Subject and Issue Date respectively.



The screenshot shows the FRI Institutional Repository website. The header includes the CSIR logo and the text 'FRI Institutional Repository'. The navigation menu contains: Home, My DSpace, Browse, Search, Language, Help, and About DSpace. On the left sidebar, there are sections for 'Communities in DSpace' (Institute [631]), 'Feeds' (RSS 2.0, ATOM FEED), 'Contact' (Administrator), and 'Links' (Search engines: Agris, Avano, Google Scholar, OAIster, VOA3R; Repositories: Aquatic Commons, Archimer, Archive Institutionnelle de l'Ifremer, IRD Documentation, ePrints Soton (Oceanography), Woods Hole Open Access Server, Marine & Ocean Science ePrints Archive @ Plymouth, DRS at National Institute Of Oceanography, Institute of Biology of the Southern Seas).

The main content area is titled 'Browsing by Author Dziedzoave, N. T.' and features a search interface with a 'Jump to' dropdown menu (0-9 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z) and a 'Go!' button. Below the search bar, there are sorting options: 'Sort by: title', 'In order: Ascending', 'Results/Page: 20', and 'Authors/Record: All', with an 'Update' button. The results show 'Showing results 1 to 19 of 19'.

Title	Type	Issue Date
An assessment of the market potential for cassava-based industrial products <i>Dziedzoave, N. T.; Glover-Amengor, M.; Krampah, L.; Derkyi, N. S. A.; Yawson, I.</i>	Research Report	2005
Cassava products and their processing technology <i>Dziedzoave, N. T.</i>	Research Report	1983
Consumer acceptability of wheat/cassava composite bread <i>World Rural Observations, 4 (2), p. 78-81</i> <i>Komlaga, G. A.; Glover-Amengor, M.; Dziedzoave, N. T.; Hagan, L. L.</i>	Journal Contribution	2012
Development of a community-owned-professionally managed (CoProM) system of management for cassava SME`S <i>Glover-Amengor, M.; Dziedzoave, N. T.; Frimpong, F.; Komlaga, G. A.; Yawson, I.; Kudjawan, B. D.</i>	Research Report	2005
Development of a public relations strategy for sustaining the interest of stakeholders in project activities <i>Kudjawan, B. D.; Dziedzoave, N. T.; Glover-Amengor, M.; Komlaga, G. A.; Yawson, I.; Gyato, C. K.</i>	Research Report	2005
Economic feasibility of maltose production in Ghana <i>Quaye, W.; Ameleke, G. Y.; Dziedzoave, N. T.</i>	Research Report	2002
Effect of cassava varietal differences and fermentation time on the quality of agbelima <i>Traditional Fermented Food Processing in Africa: Accra, Ghana, July 1996, p. 17-26</i> <i>Dziedzoave, N. T.; Ellis, W. O.; Oldham, J. H.</i>	Proceedings Paper	1996

Figure 4.12: Browsing by Author

The screenshot shows the FRI Institutional Repository website. At the top, there is a navigation bar with links for Home, My DSpace, Browse, Search, Language, Help, and About DSpace. The main content area is titled 'Browsing by Title' and features a search interface with a 'Jump to' dropdown menu containing letters A-Z, a text input field for 'or enter first few letters', and a 'Go!' button. Below the search interface, there are sorting options: 'Sort by: title', 'In order: Ascending', 'Results/Page: 20', and 'Authors/Record: All', along with an 'Update' button. The results are displayed in a table with columns for Title, Type, and Issue Date. The table lists eight entries related to cassava and maize research in Ghana, with authors such as Johnson, P. N. T., Oduro-Yeboah, C., Sakyi-Dawson, E. O., and Budu, A. S.

Title	Type	Issue Date
The acceptability of five varieties of cassava for Ghanaian food uses based on their pasting characteristics <i>First Scientific Meeting of the Global Cassava Partnership, Ghent University, Belgium, 21-25 July 2008</i> Johnson, P. N. T.; Oduro-Yeboah, C.; Sakyi-Dawson, E. O.; Budu, A. S.	Conference Material	2008
The acceptability of five varieties of cassava for local food uses based on pasting characteristics Oduro-Yeboah, C.; Johnson, P. N. T.; Sakyi-Dawson, E. O.; Budu, A. S.	Research Report	2008
Acceptance of biotechnology and social-cultural implications in Ghana <i>African Journal Of Biotechnology, 8 (9), p. 1997-2003</i> Quaye, W.; Yawson, I.; Yawson, R. M.; Williams, I. E.	Journal Contribution	2009
Action business plan for Kpansim Manga farmers based organization Oduro-Yeboah, C.	Other	2009
Adaptation of an ammonia volatilization model for a naturally ventilated dairy building <i>Atmospheric Environment, 42, p. 4345-4354</i> Teye, F. K.; Hautala, M.	Journal Contribution	2008
Adaptation of Fateco planetary roaster for roasting gari Attiogbe, D. M.	Research Report	1991
Adoption and impact of high quality bambara flour (HQBF) technology in the Northern Region of Ghana <i>Ghana Journal Of Agricultural Science, 42, p. 31-41</i> Quaye, W.; Yawson, I.; Plahar, W. A.	Journal Contribution	2009
Adoption of the improved maize storage crib by the small-scale farmer in Ghana: problems and prospects <i>16th Biennial Conference of the Ghana Science Association: Cape Coast, 5-9 June 1989, p. 1-7</i> Johnson, P. N. T.; Halm, M.; Vowotor, K. A.	Conference Material	1989

Figure 4.13: Browsing by Title

Full-text document can be downloaded in pdf format or any other acceptable format; however because of copyright issues a user must be registered to have access to full-text document download.



Communities in DSpace

Institute [631]

Feeds

RSS 2.0 ATOM FEED

Contact:

Administrator

Links:

Search engines:
[Agris](#), [Avano](#), [Google Scholar](#), [OAister](#), [VOA3R](#)

Repositories:
[Aquatic Commons](#),
[Archimer](#), [Archive Institutionnelle de l'Ifremer](#), [IRD Documentation](#), [ePrints Soton \(Oceanography\)](#), [Woods Hole Open Access Server](#), [Marine & Ocean Science ePrints Archive @ Plymouth](#), [DRS at National Institute Of Oceanography](#), [Institute of Biology of the Southern Seas](#)

[FRI Institutional Repository](#) >

Browsing by Subject

Browsing by Subject Aflatoxins

Jump to: [0-9](#) [A](#) [B](#) [C](#) [D](#) [E](#) [F](#) [G](#) [H](#) [I](#) [J](#) [K](#) [L](#) [M](#) [N](#) [O](#) [P](#) [Q](#) [R](#) [S](#) [T](#) [U](#) [V](#) [W](#) [X](#) [Y](#) [Z](#)

or enter first few letters:

Go!

Sort by: In order: Results/Page Authors/Record:

Showing results 1 to 15 of 15

Title	Type	Issue Date
Aflatoxin contamination of foods in West African countries <i>Kpodo, K. A.; Hald, B.; Jakobsen, M.</i>	Research Report	2001
Aflatoxin contamination of maize, peanuts and their products in Accra, Ghana <i>Kpodo, K. A.; Allotey, E. A.; Antonio, S.; Anyebuno, G.</i>	Research Report	2005
Consumer preferences and fungal and mycotoxin contamination of dried cassava products from Ghana <i>International Journal Of Food Science & Technology, 36, p. 1-10</i> <i>Gibbs, J. A.; Westby, A.; Allotey, L. D.; Halm, M.; Wareing, P. W.</i>	Journal Contribution	2001
Degradation of aflatoxin B1 by cell-free extracts of Rhodococcus erythropolis and Mycobacterium fluoranthenivorans sp. nov. DSM44556T <i>International Journal of Food Microbiology, 105, p. 111-117</i> <i>Jany, K. D.; Holzapfel, W. H.; Addo, P.; Teniola, O. D.; Zyl, W. H. V.; Brost, I. M.; Farber, P.; Alberts, J. F.; Steyn, P. S.</i>	Journal Contribution	2005
The effect of applying GMP and HACCP to traditional food processing at a semi-commercial kenkey production plant in Ghana <i>Food Control, 18, p. 1449-1457</i> <i>Halm, M.; Ngunjiri, P.; Amoa-Awua, W. K. A.; Jakobsen, Mogens; Anlobe, J. M. Y.; Kpodo, K. A.; Hayford, A. E.</i>	Journal Contribution	2007
Effect of heat, acid treatment and dehulling on aflatoxins in maize and maize products <i>Allotey, E. A.; Kpodo, K. A.; Antonio, S.; Appoh, F.</i>	Research Report	1996
Effect of heat, acid treatment and dehulling on aflatoxins in maize and maize products <i>Traditional Fermented Food Processing in Africa: Accra, Ghana, July 1996, p. 97-102</i> <i>Kpodo, K. A.; Appoh, F. E.; Jakobsen, M.</i>	Proceedings Paper	1996
Experiences in the application of HACCP to traditional food processing at a semi-commercial kenkey production plant in Accra, Ghana <i>Jakobsen, M.; Ngunjiri, P.; Amoa-Awua, W. K. A.; Anlobe, J. M. Y.; Halm, M.</i>	Research Report	2004
Fungal and aflatoxin contamination of maize stored in silos and warehouses in Ghana <i>Kpodo, K. A.; Halm, M.</i>	Research Report	1990
Fusaria and fumonisins in maize from Ghana and their co-occurrence with aflatoxins <i>International Journal Of Food Microbiology, 61, p. 147-157</i> <i>Kpodo, K. A.; Thrane, U.; Hald, B.</i>	Journal Contribution	2000

Figure 4.14: Browsing by Subject



Communities in DSpace

Institute [631]

Feeds

RSS 2.0 ATOM FEED

Contact:

Administrator

Links:

Search engines:
[Agris](#), [Avano](#), [Google Scholar](#), [OAIster](#), [VOA3R](#)

Repositories:
[Aquatic Commons](#),
[Archimer](#), [Archive Institutionnelle de l'Ifremer](#), [IRD Documentation](#), [ePrints Soton \(Oceanography\)](#), [Woods Hole Open Access Server](#), [Marine & Ocean Science ePrints Archive @ Plymouth](#), [DRS at National Institute Of Oceanography](#), [Institute of Biology of the Southern Seas](#)

[FRI Institutional Repository](#) >

Browsing by Issue Date or Year

Browsing by Issue Date

Jump to a point in the index: (Choose year) (Choose month) Go!
Or type in a year:

Sort by: In order: Results/Page Authors/Record: Update

Showing results 1 to 20 of 631

[next >](#)

Title	Type	Issue Date
Heavy metal analysis of fruit juice and soft drinks bought from retail market in Accra, Ghana <i>Journal of Scientific Research & Reports</i> , 2 (1), p. 423-428 Ofori, H.; Owusu, M.; Anyebuno, G.	Journal Contribution	2013
Association between anthropometry and blood pressure among female teachers of child-bearing age in Ghana <i>Journal of Biology Agriculture and Healthcare</i> , 3 (3), p. 197-208 Pobee, R. A.; Plahar, W. A.; Owusu, W. B.	Journal Contribution	2013
The prevalence of obesity among female teachers of child-bearing age in Ghana <i>African Journal of Food Agriculture Nutrition and Development</i> , 13 (3), p. 7820-7839 Pobee, R. A.; Owusu, W. B.; Plahar, W. A.	Journal Contribution	2013
Performance and acceptability of legume-fortified yam flours <i>Food Science and Quality Management</i> , 17, p. 14-18 Glover-Amengor, M.; Quansah, J.; Peget, F. M.	Journal Contribution	2013
Survey on consumption of vegetables and fruits in a coastal district in Ghana <i>Journal of Natural Sciences Research</i> , 3 (8), p. 84-88 Glover-Amengor, M.; Vowotor, K. A.	Journal Contribution	2013
Relationship of sensory and instrumental aroma measurements of dark chocolate as influenced by fermentation method, roasting and conching conditions <i>Journal Of Food Science And Technology</i> , 50 (5), p. 909-917 Owusu, M.; Petersen, M. A.; Heimdal, H.	Journal Contribution	2013
Development of new value-added products from yam (<i>Dioscorea rotundata</i>), consumer data collection and analysis for commercial viability Tortoe, C.; Nketia, S.; Glover-Amengor, M.; Owusu, M.; Hagan, L. L.; Akonor, P. T.; Dowuona, S.; Padi, A.	Other	2013

Figure 4.15: Browsing by Issue Date

5.0 CHALLENGES OF INSTITUTIONAL REPOSITORY

5.1 Challenges

Contrary to what is believed, implementing an Institutional repository is not a matter of obtaining software and hardware, and waiting for content to flood in; it is more about the users and how they appreciate the need and use of an Institutional repository. According to Pickton and Barwick (2006), there are implications and potential barriers to its success and these have been summarised below:-

- **Cost:** The initial financial cost for an open source software adopted by most institutions for creating Institutional repositories is not high but the recurrent costs, especially staff costs (e.g. time spent drafting policies, developing guidelines, publicising, training, supporting users and creating metadata, specialist IT consultancy) may be significant.
- **Difficulties in generating content:** A successful Institutional repository depends on the willingness of authors to deposit their work voluntarily and there may be local barriers and hindrances to be overcome. There are acknowledged difficulties in generating content, especially at the beginning. Unless the value of an IR can be demonstrated quickly, the organization's long-term commitment to the project may begin to wane. The best way to prove the enduring value of the Institutional repository and to ensure its long-term survival is to quickly populate it (Gibbons, 2004).
- **Sustaining support and commitment:** Far too often, it is difficult to sustain continuous support and commitment from the management and academic staff. Lynch (2003) has succinctly described this obstacle: "Stewardship is easy and inexpensive to claim; it is expensive and difficult to honour, and perhaps it will prove to be all too easy to later abdicate". There is a need for institutions to think seriously before launching institutional repository program as it may disintegrate rapidly if not properly managed.
- **Rights management issues:** Sometimes researchers are apprehensive about infringing publishers' copyright and lack adequate awareness about their own intellectual property rights. They may be uncertain about making their work available online before it is published by a traditional publisher. The fact that authors who publish in journals usually sign copyright transfer forms that transfer copyright from the author to the publisher. Although publishers will allow depositing pre-prints or even the final print, many authors are never really aware of their rights and do not have the time to check what rights they have with regard to their published papers.
- **Policy Issues:** Experiences suggest that an Institutional repository will only function to its capacity when a mandate is in place to populate it but clearly researchers can react negatively to any suggestion of compulsion. Lynch (2003) has cautioned that an Institutional repository should not become a tool for enforcing administrative control over academic work.

- **Technical issues:** This also come into play as a challenge and include matters such as the format of items to be deposited, and the fact that software versions change and may not allow retrospective use. This means that depositors may be asked to convert files to pdf format, which may be simple for some, but complex for most and definitely regarded as time-consuming. Learning to use the IR software, for both uploading and retrieving information can also present a significant learning curve (Kingsley, 2008).

6.0 Recommendation and Conclusion

The Information Management Unit of Commercialisation and Information Division of the Food Research Institute has successfully created a model Institutional Repository (IR) using AgriOcean Dspace software and this model could be replicated in all the other CSIR Institutes. Institutional repositories significantly extend the role of a library, and it is very clear that the Institutional repository is a very powerful idea that can serve as an engine of change in Food Research Institute and more broadly for the scholarly enterprises that they support. It can advance a surprising number of goals and address an impressive range of needs.

Building a repository is a major task that requires meticulous planning of various processes and resources such as hardware, software, skilled human resources and uninterrupted Internet connectivity with high bandwidth. Once established, the next task will be to win the trust of content owners to provide the content to populate the repositories. This requires creating awareness among academic and scientific communities about various benefits of open access and self-archiving. Collaborative efforts are needed to develop a new culture of disseminating content from research. Librarians and other information professionals have an important role to play in this respect.

ICT capacity among information managers needs to be built to keep up with the ever changing ICT tools and technologies and promote, implement and support repositories. The disconnect between the information managers and ICT specialists in most institutions creates another obstacle to the development and management of repositories. The two need each other for the successful development of institutional repositories.

Although there are several tools for managing and exchanging content, especially metadata to improve accessibility and visibility, there is need to choose the right tools based on requirements analysis. The challenge for most information managers in agriculture institutions is how to ensure that they get the right tool. AgriDrupal and AgriOceanDspace are tailor-made to meet the requirements of storing, enriching and sharing agricultural information.

However, these tools require some good ICT skills. Therefore, there is the need to also build ICT capacity and skills on the new emerging open source tools to foster achieving, exchange and sharing of information. Institutional policies and strategies that support the use of open access software in addition to creating awareness on IPR (Intellectual Property Rights) issues by content generators are also very important. The ever growing support community around both AgriDrupal and

AgriOceanDspace and the existence of the CIARD Ring and FAO AIMS resources make them easy tools to implement with very simple User Documentation.

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