

Maximizing RUFORUM's Knowledge Management and Outreach

Building an Institutional Repository and
Enhancing the Effectiveness of the
RUFORUM Website

a consultancy for the
Bill and Melinda Gates Foundation

Lisbeth A. Levey

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Every effort was made to ensure accuracy. I hope that any errors are small ones—but they are all mine, both those large and small.

Lisbeth A. Levey
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Acronyms

AAU	Association of African Universities
ACBF	African Capacity Building Foundation
ACP	African, Caribbean, Pacific group of states
AERC	African Economic Research Consortium
AfSIS	African Soils Information Service
AGRIS	Agricultural Information System (developed by FAO)
AGROVOC	Agricultural Vocabulary (a part of the FAO AIMS system)
AICM	RUFORUM Agricultural Information and Communications Management MSc
AIMS	Agricultural Information Management Standards
ALIN	Arid Lands Information Network
ANAFE	African Network for Agriculture, Agroforestry, and Natural Resources Education
ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
ASTI	African Science and Technology Indicators
CABI	CAB International (formerly Commonwealth Agricultural Bureau)
CC	Creative Commons
CGIAR	Consultative Group on International Agricultural Research
CIAT	Centro Internacional de Agricultura Tropical/International Center for Tropical Agriculture
CIMMYT	Centro Internacional de Mejoramiento de Maíz y Trigo/International Maize and Wheat Improvement Center
CMS	Content Management System
COMESA	Common Market for Eastern and Southern Africa
CORAF/WECARD	Conseil Ouest et Centre Africain pour la Recherche et le Développement Agricoles/West and Central African Council for Agricultural Research and Development
CTA	Technical Centre for Agricultural and Rural Cooperation
DFID	UK Department for International Development
DLIO	Document Like Object
EAFF	Eastern African Farmers Federation
ECX	Ethiopia Commodities Exchange
ELDIS	Electronic Development and Environmental Information System
ESRI	Environmental Science Research Institute
FANRPAN	Food, Agriculture, and Natural Resources Policy Analysis Network
FAO	UN Food and Agriculture Organization
FARA	Forum for Agricultural Research in Africa
GEAR	Graduate Environmental and Agricultural Research
GIS	Geographic Information System
GRG	RUFORUM Graduate Research Grant Program
IAALD	International Association of Agricultural Information Specialists
IFAD	International Fund for Agricultural Development

IFPRI	International Food Policy Research Institute
ILRI	International Livestock Research Institute
ICT	Information and Communication Technologies
IPR	Intellectual Property Rights
IT	Information Technology
ITOCA	Information Training and Outreach Centre for Africa
IUCEA	Inter-University Council for East Africa
JISC	Joint Information Systems Committee
JSON	Java Script Object Notation
KIPS	Kenya Information Preservation Society
KIT	Royal Tropical Institute of the Netherlands
JKUAT	Jomo Kenyatta University of Agriculture and Technology
KAINET	Kenya Agricultural Information Network
KARI	Kenya Agricultural Research Institute
KNUST	Kwame Nkrumah University of Science and Technology
M&E	Monitoring and Evaluation
MPEG	Moving Picture Experts Group
NARO	National Agricultural Research Organization
NBA	Neil Butcher Associates
NGO	Nongovernmental Organization
NIH	US National Institutes of Health
OA	Open Access
OAI	Open Archive Initiative
OECD	Organization for Economic Cooperation and Development
OER	Open Educational Resources
OIE	World Organization for Animal Health
PDF	Portable Document Format
PROTEA	Plant Resources of Tropical Agriculture
PMH	Protocol for Meta Harvesting
PHP	Hypertext Preprocessor (The “P” is said to stand for PHP.)
RAP	RUFORUM Advocacy and Publishing strategy
RATIN	Regional Agricultural Trade Network
RDF	Resource Description Framework
RUFORUM	Regional Universities Forum for Capacity Building in Agriculture
SADC	Southern African Development Community
SCAIN	Strengthening Capacity for Agricultural Research for Innovation
SCARDA	Strengthening Capacity for Agricultural Research for Development in Africa
SEO	Search Engine Optimization
SPARC	Scholarly Publishing and Academic Resources Coalition
TOR	Terms of Reference
TRFK	Tea Research Foundation of Kenya
UCT	University of Cape Town
UNITAR	UN Institute for Training and Research

URL	Universal Resource Locator
WaterCAP	Water Capacity Building Network
WOUGHNET	Women of Uganda Network
XML	EXtensible Markup Language
ZAR4DIN	Zambia Agricultural Research for Development

Definitions

Below is a glossary of terms, most of them technical, used in this report and with which readers may not be entirely familiar. Almost all are defined within the report, but I thought it would also be useful to provide a glossary for easy reference for instances in which a term reoccurs and you have forgotten its meaning and for the few occasions in which a term is not defined at all. I have tried to use “non-techie” language whenever possible, but in some instances I could not do so.

AgriDrupal	AgriDrupal was developed by FAO to extend “Drupal, an open source content management system, with ready-to-use functionalities for agricultural information management.” ¹ See definition of Drupal below.
AgriOcean DSpace	AgriOcean DSpace is a version of DSpace developed by FAO for the agricultural sciences. See the definition of DSpace below.
AGRIS	AGRIS is an international online information system established by FAO with bibliographic records and abstracts contributed by participating centers worldwide. Currently 65 countries participate. AGRIS covers a wide range of disciplines associated with agriculture.
AGROVOC Thesaurus	The multilingual AGROVOC Thesaurus contains covers topics related to food, nutrition, agriculture, fisheries, forestry, environment, and other disciplines relevant to FAO. It was developed by FAO to standardize the indexing process for AGRIS database in order help users find the most relevant resources by making searching simpler and more efficient.
Content Management System	A Content Management System (CMS) is a software application used to upload, edit, and manage content displayed on a website. A content management system can perform a variety of different tasks for a website including regulating when content is displayed, how many times the content is shown to a specific user, and managing how the content connects or interacts with other elements of the website.” ² Content Management Systems referred to in this report include Drupal, Word Press, and 68KB.
Controlled Vocabulary	“A controlled vocabulary is an established list of standardized terminology for use in indexing and retrieval of information. An example of a controlled vocabulary is subject headings used to describe library resources.” ³
Course Management System	Course Management Systems allow instructors to create and administer online course content without needing to know HTML or other programming languages. Instructors can therefore use a Course Management System for administrative functions, such as class rosters and recording student grades. In addition to posting content online, instructors can also post exercises and exams, organize real-time chat, bulletin boards, and email exchanges about the course. All kinds of content can be mounted—documents, Power Point presentations, audio-visual materials, and links—to name a few. Basically, these systems focus on all aspects of teaching, learning and teacher-student interaction. Moodle, which is discussed in this report, is an example of a well-known open source Course Management System. Proprietary CMS include Blackboard.

¹ <http://aims.fao.org/tools/agridrupal>

² <http://www.businessdictionary.com/definition/content-management-system-CMS.html>

³ <http://stats.oecd.org/glossary/detail.asp?ID=6260>

Creative Commons	Creative Commons is a nonprofit organization “that enables the sharing and use of creativity and knowledge through free legal tools.” ⁴ To do this, Creative Commons has developed a series of licenses that work along side of copyright to make it possible for authors to modify the standard copyright terms and provide open access privileges to users. Each Creative Commons license provides a different degree of freedom to users.
DSpace	DSpace is an Open Source software application developed by the Massachusetts Institute of Technology (MIT) for creating an institutional archive or repository. Many universities use DSpace for this purpose.
Data Mining	Data mining is the process of collecting raw data and turning it into useful information. Search engines use data mining algorithms to enable users to identify relevant resources efficiently.
Document Like Object	“A document-like object is a digital data unit that is comparable to a paper document.” ⁵ DLDs are important concepts for the protocols necessary to create institutional repositories.
Drupal	Drupal is a commonly used open source CMS to support a website. Institutions using Drupal include RUFORUM, OER Africa, and ILRI.
Dublin Core Metadata	“The Dublin Core metadata terms are a set of vocabulary terms which can be used to describe resources for the purposes of discovery. The terms can be used to describe a full range of web resources: video, images, web pages etc. and physical resources such as books and objects like artworks.” ⁶
Greenstone	Greenstone is open-source software used to develop and distribute digital library collections. The University of New Zealand developed Greenstone, in conjunction with UNESCO. ⁷
Institutional Repository	Institutional repositories collect, preserve, and disseminate in digital form the intellectual output of an institution.
Intellectual Property Rights	According to Wikipedia, “Intellectual property (IP) is a legal concept which refers to creations of the mind for which exclusive rights are recognized. Under intellectual property law, owners are granted certain exclusive rights to a variety of intangible assets, such as musical, literary, and artistic works; discoveries and inventions; and words, phrases, symbols, and designs. Common types of intellectual property rights include copyright, trademarks, patents, industrial design rights, and in some jurisdictions trade secrets.” ⁸
Java Script Object Notation	“JSON is a non-proprietary syntax for storing and exchanging text information,” ⁹ which is based on JavaScript and is (computer) language independent. It is flexible and considered easy to use, but it is prone to security issues and certain precautions are advised.
Keyword	PCnet defines keywords as follows: “Keywords are words or phrases that describe content. They can be used as metadata to describe images, text documents, database records, and Web pages. A user may “tag” pictures or text files with keywords that are relevant to their content. Later on, these files may be searched using keywords, which can make finding files much easier.” ¹⁰

⁴ <http://creativecommons.org/about>

⁵ <http://www.oaforum.org/tutorial/english/page6.htm#section11>

⁶ http://en.wikipedia.org/wiki/Dublin_Core_Metadata

⁷ <http://www.greenstone.org/>

⁸ http://en.wikipedia.org/wiki/Intellectual_property

⁹ <http://www.w3schools.com/json/default.asp>

¹⁰ <http://pc.net/glossary/definition/keywords>

Metadata	Metadata means “data about data.” It “describes how and when and by whom a particular set of data was collected, and how the data is formatted.” ¹¹
Mega-Tag	A meta-tag provides information about a web page, but does not affect how a page is displayed. This information can be: “who created the page, how often it is updated, what the page is about, and which keywords represent the page's content. Many search engines use this information when building their indices.” ¹²
MPEG	MPEGs are a “family of digital video compression standards and file formats.” ¹³
MySQL	MySQL is an open source relational database system used to store information. It can consist of many types of data.
OERbit	OERbit is an open-source publishing platform for OER and OCW designed by the University of Michigan, which is based on the Drupal content management system. ¹⁴
Open Access	The Budapest Open Access Initiative defines open access to mean that resources are freely available for “users to read, download, copy, distribute, print, search or link to the full text...” ¹⁵
Open Archives Initiative-Protocol for Metadata Harvesting	OAI-PMH describes a mechanism to collect records containing metadata from repositories. It offers “a simple technical option for data providers to make their metadata available...” ¹⁶
Open Courseware	The Commonwealth of Learning (COL) defines open courseware as follows: “The term ‘Open Courseware’ (OCW) is used for publicly available materials that are either a part of, or a complete course from an educational institution such as a university or college.” ¹⁷
Open Educational Resources	The COL definition for Open Educational Resources is as follows: “materials offered freely and openly to use and adapt for teaching, learning, development and research. While OER are mainly shareable in digital formats (both online and via offline formats such as DVD or CD-ROM), COL sees OER not just synonymous with online resources, online learning or e-learning, and within the development context COL is working, OER can also be in printable formats.” ¹⁸
Open Source Software	According to Webopedia: “open source refers to a program in which the source code is available to the general public for use and/or modification from its original design free of charge.” ¹⁹
PHP	PHP is an open source language that allows web developers to create dynamic content that interacts with databases.
RDF	Resource Description Frameworks are a family of specifications developed by the Worldwide Web Consortium to represent information on the web.
Repository Platform	A repository platform is the underlying system or software that is used to build a repository. Examples include DSpace, Greenstone, and AgriDrupal.
68KB	68KB is an open source CMS.

¹¹ <http://www.webopedia.com/TERM/M/metadata.html>

¹² http://www.webopedia.com/TERM/M/meta_tag.html

¹³ <http://www.webopedia.com/TERM/M/MPEG.html>

¹⁴ <http://open.umich.edu/sites/default/files/3659/PDFs/OERbit-infosheet.pdf>

¹⁵ Budapest Open Access Initiative, quoted by by Scholarly Publishing and Academic Resources Coalition (SPARC). The SPARC page on open access provides useful information and documentation on open access in the academic setting.

¹⁶ <http://www.oaforum.org/tutorial/english/page1.htm>

¹⁷ <http://www.col.org/resources/crsMaterials/Pages/OCW-OER.aspx>

¹⁸ Ibid.

¹⁹ http://www.webopedia.com/TERM/O/open_source.html

Search Engine Optimization	Search engine optimization consists of “strategies, techniques and tactics used to increase the amount of visitors to a website by obtaining a high-ranking placement in the search results page of a search engine...” such as Google, Yahoo, or Safari. ²⁰
Social Networking	Social networking creates a virtual community of family, friends, and colleagues to share information about a particular topic. Familiar sites include Face Book and Twitter. Some organizations use social networking to notify users of new publications or activities. Moderated discussions on different subjects are also common. In short, social networking allows organizations a more interactive relationship with their constituency.
Taxonomy	Taxonomy means a hierarchical classification or categorization system to organize concepts of knowledge. In botany, taxonomies are used for plant classification. In knowledge management, digital libraries or repositories can use taxonomies to make searching for resources more efficient—searching by author, title, subject, or abstract, for example.
URL	A URL is the address of a worldwide web page.
XML	XML is used for defining data elements on a web page.
WordPress	WordPress is an open-source software used to create websites. ²¹

²⁰ <http://www.webopedia.com/TERM/S/SEO.html>

²¹ <http://wordpress.org/>

Introduction

Knowledge management and information dissemination are major components of RUFORUM's mission of improving postgraduate training and research in the institutions where RUFORUM works.

RUFORUM asked for assistance in:

1. Planning and implementing an online institutional repository.
2. Conducting a critical review of the RUFORUM website.
3. Recommending changes to the website to enhance RUFORUM's information sharing and knowledge management activities.
4. Helping to implement website revisions.

RUFORUM had two overarching goals in requesting this assistance. The first was to help RUFORUM create a more targeted strategy for knowledge management and information dissemination in order to serve the needs of its constituency. The second goal was to use the institutional repository to ensure that research conducted within the RUFORUM network becomes a part of the global knowledge pool and, thus, more visible to the world.

In addition to extensive desk research and email exchanges with RUFORUM staff and other experts in the field, I visited RUFORUM in October 2012 to discuss the institutional repository. A second trip is scheduled in mid-February 2013 to lay out a logic model for website revisions, based on chapter four of this report and appendices three-eight.

The Bill and Melinda Gates Foundation covered the costs of this consultancy.

A note about URLs

Every effort has been made to ensure the accuracy of the URLs in this report. But websites sometimes change their addresses, go down temporarily, or in some cases disappear altogether. It is therefore important to double-check the URL of every organization included in this report and added to the RUFORUM website to ensure that it is still alive and well.

Executive summary

2.1 Introduction

This report is divided into four chapters—an introduction; a chapter on the RUFORUM institutional repository; a chapter on the RUFORUM website; final recommendations; and this executive summary. Front matter includes a list of acronyms and definitions of technical terms. There are eight appendices at the end of the report—a list of collections to be included in the institutional repository; background information on publishing in open access journals; and suggestions for resources to be included in the stakeholders' directory, subdivided by topic (donors; nongovernmental organizations, associations, and networks; trade associations and commodity exchanges; RUFORUM network universities; open data and research institutes or organizations; and African open access journals in the agricultural sciences. This executive summary focuses primarily on chapters three through five.

2.2 RUFORUM institutional repository

2.2.1 Introduction

RUFORUM requires an institutional repository to organize its research output and make it more visible to the outside world. This chapter discusses possible platforms, what the repository should contain, visibility, and the environment for institutional repositories in sub-Saharan Africa. It concludes with a section on weighing options and recommendations.

2.2.2 Selecting a platform

RUFORUM asked that I investigate three possible platforms to use for the institutional repository—68KB, OERbit, and DSpace. We then added AgriDrupal as an option. 68KB is the platform used by SCARDA/SCAIN (Strengthening Capacity for Agricultural Research for Development in Africa/ Strengthening Capacity for Agricultural Research for Innovation). It was selected and installed by Pamoja Media, a digital marketing agency with which RUFORUM had a contract for this work. There were numerous shortfalls to 68KB as an appropriate platform for the repository, which are detailed at length in section 3.2.2. OERbit is an open-source publishing platform for Open Educational Resources (OER) and Open Course Ware (OCW) designed by the University of Michigan, which is based on the Drupal content management system (CMS). Although excellent for OER and OCW, it is not appropriate for an institutional repository (section 3.2.1), and it was therefore eliminated from consideration. DSpace is an Open Source software application developed by the Massachusetts Institute of Technology (MIT) for creating an institutional archive or repository. Many universities use DSpace for this purpose, including in Africa, among them Makerere University. RUFORUM decided against DSpace because of the expense and human resource requirements involved. DSpace would have required RUFORUM to upgrade its current hosting facility and install Dspace on a separate server. There would also have been an extra burden on staff for maintenance and training. Considering RUFORUM's small staff and limited budget, DSpace was not the best option (section 3.2.3). AgriDrupal is the last platform that we considered, and the one that RUFORUM ultimately selected (section 3.2.4). As its name implies, AgriDrupal is a variant of Drupal, which the UN Food and Agriculture Organization (FAO) developed for use by agricultural organizations. Its advantages for RUFORUM include the following—RUFORUM is already using Drupal as the CMS for its website, so less training will be required. In addition, AgriDrupal comes with the FAO thesaurus of agricultural terms; it will therefore be relatively straightforward to include keywords for all resources in the repository from a drop down menu. Thus, there will be consistency in selecting keywords.

2.2.3 What should the repository contain?

The repository should contain all of RUFORUM's published and unpublished resources (section 3.3). These include—annual reports; books; briefing papers and policy briefs; brochures and fact sheets; case studies; conference and workshop papers; consultancy reports to the secretariat journal articles; multimedia; newsletters; OER and open access training materials; posters, SCARDA/SCAIN resources; tenders, procurements, and expressions of interest; and theses and dissertations.

2.2.4 Searching the repository

Searching the repository will require the ability to browse—by collection, author, title, topic, etc. Both simple and advanced searches should be possible, and there should be a help document to provide guidance (section 3.4).

2.2.5 Maximizing the repository's visibility

Repository resources must be easily findable and very visible within search engines and indexing/abstracting services. In addition to Google, RUFORUM should be sure that scholarly output is included in Google Scholar and Scirus. Appropriate resources should be indexed in CABI, AGRIS, and ELDIS (section 3.5). RUFORUM will need to put in place Search Engine Optimization (SEO) mechanisms, which are discussed in chapter four.

2.2.6 Intellectual Property Rights (IPR) policies for the repository

IPR is an essential component for all of the work that RUFORUM conducts. Its IPR policy requires updating, particularly as it pertains to scholarly resources, including theses and dissertations, and OER. Section 3.6 analyzes how IPR impacts on RUFORUM work and makes recommendations on changes that should be implemented to ensure that the rights of authors are protected, but that resources produced under RUFORUM auspices are openly and publicly available to the public. This section also surveys open access policies in a selection of US and African universities and the International Livestock Research Institute (ILRI), which has a sponsored thesis program similar to that of RUFORUM.

2.2.7 Institutional repositories in sub-Saharan Africa

This section (3.7) gives a brief overview of the status of institutional repositories in sub-Saharan Africa, with a focus on the countries and institutions within the RUFORUM network. Of the 17 RUFORUM countries, there are fully functional and up-to-date repositories in four of them—Ethiopia, Kenya, Uganda, and Zimbabwe. There are also a few small repositories that are works in progress, but not really active. This survey should be repeated in a few months because there is so much nascent work underway that I am certain the situation will improve. But until it does, the RUFORUM network may wish to deposit their scholarly output in the RUFORUM repository.

2.2.8 Weighing options and recommendations

This section (3.8) lays out a number of options and recommendations on the platform; how to populate the repository; and technology management, human resource, and financial considerations. The last component—technology, people, and money—are overarching issues that impact on every part of my work for RUFORUM. To these three issues, I would also add setting priorities. These are discussed in the final chapter of this report.

2.3 RUFORUM website

2.3.1. Introduction

In chapter four, I provided a critical review of the RUFORUM website, making suggestions on how to enhance its effectiveness in order to promote RUFORUM's information sharing and knowledge management activities. I used numerous screen captures from the website to illustrate my points.

RUFORUM's goal for the website is that it serve the requirements of network members and also the needs of the worldwide community of students, researchers, and scholars interested in postgraduate training and research in the agricultural sciences in Africa. My review of the website was carried out within the context of these goals. It took place first in October and then again in December 2012.²² It does not reflect any website revisions made since then.

2.3.2. RUFORUM home page

Home pages should be clear, easy to navigate, and well designed. This is not the case with the RUFORUM home page, however. Section 4.2 provides examples of technical and editing issues--in the Power Point section, news and events, and "recently added resources," to give three instances. In section 4.2.1, I made recommendations on how to clarify the RUFORUM welcome message to explain more clearly RUFORUM's intent for the website. Sections 4.2.2, through 4.2.7 focus on further technical, editing, and design concerns pertaining to the home page, which I comprehensively assessed. In addition, the problems that I noted on the home page repeat themselves elsewhere on the website. Even so, it isn't easy to design a website that navigates effortlessly; websites everywhere have kinks that warrant revision. The RUFORUM home page is no exception, but there is a good basis from which to start.

2.3.3. E-learning and OER

E-learning and OER are important components of the RUFORUM program, but this part of the site could have been presented more clearly. In section 4.3.1, I suggested ways to enhance the effectiveness of the e-learning/OER welcome message. I also found and noted technical errors in layout and navigation, about which I wrote in section 4.3.2. These ranged from links that did not work properly to a search engine that was not configured correctly. In section 4.3.3, I recommended ways to improve the resources themselves by adding more pertinent readings than the ones given by the lecturers who wrote the courses. Finally, in section 4.3.4, I reviewed the OER resources, which are OER in name only because they are open only to visitors with log-in access. Here, too, I made suggestions on additional, more relevant readings, with a focus on materials from and about Africa.

2.3.4. RUFORUM stakeholders' directory

In sections 4.4.1 through 4.4.3, I suggested new text and editorial changes to improve clarity of the overall layout. I also noted that many of the resources in the stakeholders' directory are not relevant to the RUFORUM mission of promoting postgraduate training and research in the agricultural sciences in Africa or to the geographical area in which RUFORUM works. As a result of my review of the resources included in the directory, I made recommendations for revisions and additions for each type of organization represented in it (sections 4.4.4 through 4.4.7). This section of the website chapter should also be read in conjunction with appendices three through eight, which provide extensive detail on exactly how I recommend reworking the directory to enhance its effectiveness--specific resources that I recommend adding and deleting and why.²³

2.3.5. Multimedia

There aren't many multimedia resources on the website yet. In addition to the Power Points addressed above, there are a few YouTube videos that are discussed in section 4.5. My comments on the RUFORUM videos were primarily technical in nature. I noted that there are inappropriate videos promoted on the RUFORUM channel that were not produced by RUFORUM and are not relevant to the RUFORUM mission. When using any Google feature, it is important to go to account settings and disable external advertisements. I gave detailed instructions on how to do this in section 4.5. A second problem relates to video length. One of the RUFORUM videos was too long, and was removed from the channel by Google. As a final comment, I suggested that RUFORUM clearly state why it placed each

²² Two reviews were necessary because new resources were added to it in the intervening period.

²³ In the appendices, you will also see that I suggested adding resources for three new categories--open data, commodity associations, and African open access journals in the agricultural sciences.

video on its channel. This was not the case with "Thema's Journey." It's good that the multimedia collection is still small, so that it will be easy to make revisions. But I also look forward to seeing it grow. These videos could be very useful in creating and using the RUFORUM OER materials.

2.3.6 Social networking

RUFORUM has links to six social networking services; but it has invested the most effort in only one of them—the alumni Face Book page. Carolyn Nandozi was contracted to serve as a virtual intern for this work, and her efforts have been noteworthy. Ms. Nandozi presented on her work at the RUFORUM September 2012 biennial conference in Entebbe, Uganda. RUFORUM now wants to do more with social networking. The questions are how to make effective use of these tools and at what priority level should attention be paid to them, taking into consideration other demands on staff time. As RUFORUM considers these questions, both the draft Terms of Reference (TOR) for a social networking consultant and the accompanying strategy document could use tightening and more focus. Together with this, RUFORUM would benefit from establishing stronger guidelines for using Face Book and other tools and a strategy document that specifically concentrates on ways in which RUFORUM would benefit from and use social networking tools.

2.3.7 Searching, controlled vocabularies, and tracking usage

You will find a brief discussion on searching and visibility in chapter three. This section of the report is about the website overall. As noted in the previous chapter, many of the resources on the RUFORUM website lack keywords, which means that searches do not pull up relevant records. Using the FAO controlled thesaurus that comes with AgriDrupal, together with author keywords when available, and adding free text search capability, will ameliorate this problem, both for the repository in particular and also the website, in general. Tracking usage is another area that may warrant attention. In its 2012 proposal to the William and Flora Hewlett Foundation, OER Africa wrote an excellent appendix on its methodology for tracking user statistics. RUFORUM may benefit from reading it and applying the OER Africa methodology where relevant. In section 4.7.2, I also suggested that RUFORUM build its Search Engine Optimization (SEO) capacity, if it has not already done so, in order to ensure that resources on the RUFORUM website will be as highly ranked as possible on search result pages. RUFORUM may also want to consider installing software that checks for and reports bad links.

2.3.8 Weighing options and recommendations

In this section, I asked a series of questions and made recommendations order to help RUFORUM weigh options and make decisions. They are bulleted below:

- Pertaining to the RUFORUM communications strategy and work plan, my input focused on how to make the website tighter and more useful. But RUFORUM should set and follow priorities as well as put in place a strategy for moving forward. I recommended that RUFORUM revisit the Neil Butcher advocacy and publications strategy document and build on it.
- With the exception of the alumni Face Book page, the RUFORUM approach to social network tools has been scattershot, to date. I recommended that it would help if RUFORUM were to conduct a landscaping exercise, as described in section 4.6, which would assist RUFORUM in determining technical and human resource requirements.
- I believe that given its experience to date with its own e-learning efforts and through its collaboration with AgShare, RUFORUM would be well placed to rethink its approach to e-learning and OER, both contextually and how these resources are displayed on the website. In light of RUFORUM's growing collaboration with AgShare and OER Africa, this is a good time to make these revisions, for it has always been RUFORUM's intent to create true OER teaching and learning content. RUFORUM's efforts would also benefit from working with participating universities on helping them create appropriate OER and OA policies.
- The stakeholders' directory could become an important resource for anyone who is interested in postgraduate training and research in Africa. Information on African websites and resources is scattered on the Internet, and the RUFORUM directory could help mitigate this problem. Section 4.4 and appendices three-eight provide detailed recommendations.

- I made a number of recommendations on human resource inputs in the weighing options and recommendations section in chapter three. The recommendations in this chapter focus on the RUFORUM website, but there is overlap, of course. As a start, in addition to implementing the institutional repository, I believe that RUFORUM's small ICT staff could use external assistance in reconceptualizing and revising the website. Other human-resource issues pertain to setting priorities, which was mentioned earlier; meeting deadlines; and assigning staff for each activity and tracking progress. Together with this, the person responsible for managing and updating the RUFORUM website should be detail oriented, with good editing and writing skills. Good websites frequently require an investment of more time than anyone envisages at the outset.

2.4 Concluding recommendations

There are specific recommendations for the RUFORUM institutional repository and for website revisions in the last sections of chapters three and four, respectively. Because I noticed many overarching issues in writing these sections, I thought it would be useful to encapsulate them in a final chapter. My particular concern in this chapter focuses on how to help the small ICT staff meet its very heavy workload demands. My points are delineated in the bullets below.

- Spreading the burden—the ICT staff carries a heavy workload, but there are only two people. Although it might not be possible or feasible to hire additional staff, I asked about making additional use of other organizations, such as NBA and OER Africa. I also inquired about bringing in a librarian with subject expertise in the agricultural sciences to help with the institutional repository and the website overall. A librarian could be especially helpful in entering resources and ensuring that correct keywords are entered for each one.
- Website maintenance, revisions, and additions—many of the errors that I noticed on the RUFORUM website could have been avoided if more attention had been paid to detail. I recommended keeping a checklist for everyone working on the website and included a series of questions about which the responsible person should cognizant.
- Setting priorities—given the amount of work to be done in the ICT department, I recommended that RUFORUM establish a realistic set of priorities that can be revised, as necessary. Based on my consultancy, I suggested first the repository, second the website, and last social networking. I also recommended a detailed work plan for each priority, which would include activities; tasks within each activity; timelines and deadlines; and staff/consultants responsible for each task.

Finally, I view the RUFORUM website as a "work in progress," as are all good websites. A static site is neither current nor interesting. I believe that the RUFORUM website has the potential to become an essential resource for anyone interested in knowing about agricultural research and training in Africa.

2.5 Appendices

There are eight appendices in this report. The first lists collections to be included in the institutional repository. The second is meant to accompany the draft open access policy for theses, dissertations, and other research in section 3.6.3. Appendices three through eight focus specifically on revisions to the stakeholders' directory—with proposed deletions, additions, and introductory text. Categories included are donors (appendix three); nongovernmental organizations, associations, and networks (appendix four); trade associations and commodity exchanges (appendix five); universities (appendix six); open data and research institutes or organizations (appendix seven); and African open access journals in the agricultural sciences (appendix eight).

-3-

The RUFORUM institutional repository

3.1 Introduction

RUFORUM requires an institutional repository in order to organize its research output and make it more visible to the outside world. Choosing which platform to use is probably the most straightforward part of the activity, deciding what to include, adding resources, and updating the repository in a timely fashion require a long-term commitment on the part of RUFORUM. Its commitment, in principle, is not in question. But it needs the scaffolding on which to build the repository and enable it to grow. This chapter discusses selecting a platform, what the repository should contain, visibility, and the environment for institutional repositories in sub-Saharan Africa. It concludes with a section on weighing options and recommendations.

3.2 Selecting a platform

RUFORUM asked that I assess and make recommendations on three software platforms—68KB, OERbit, and DSpace. The first two are content management systems (CMS); DSpace is an institutional repository platform. It is possible to use a CMS for the main site and a platform, such as DSpace, for the repository, as do large institutions, such as the University of Michigan, Cornell University and the International Livestock Research Institute (ILRI), for instance. Some smaller institutions, such as OER Africa, have integrated their resource repositories into their content management systems.

Although there are overlaps between content management systems and repository platforms, the differences are worth noting. A CMS allows for collaborative content creation, revision, and publication. It is geared towards allowing people to work together and thus ideal for OERs. A repository can be thought of as a digital archive or library (with open stacks). It is meant for the long-term storage, preservation, and accessibility of completed content, which is usually scholarly in nature. This would include theses and dissertations, journal articles, case studies, research reports, monographs, and proceedings volumes, to name a few.²⁴ The question is how best to serve RUFORUM's scholarly output without burdening the organization's finances and staff.

In selecting which platform to use for its repository, RUFORUM will need to conduct a careful needs assessment to ascertain the features it requires, assess funding requirements over the long term, and examine possible human resource constraints. Sections 3.2.1-3.2.4 lay out the options, advantages, and disadvantages of each platform. In section 3.8, you will find recommendations. Human-resource issues pertaining to all aspects of development of the repository are addressed in detail in 3.8.3. With this information and recommendations, RUFORUM should be well placed to make a final decision on how to move forward in implementing the repository. In fact, between the time I sent this chapter in draft form to RUFORUM (October 2012) and the submission date of this report (7 February 2013), RUFORUM was able to decide on its repository platform, based on the findings of this report and recommendations from the ICT staff.

²⁴ The frequently asked questions page of Duraspace, which produces DSpace, includes an explanation of content management systems and repositories and their differences. Go to <http://www.duraspace.org/faq>. The Repository Support Project in the UK provides guidance and advice to universities and research institutions interested in establishing a scholarly archive. There are a number of free resources on the site, including briefing papers on benefits; content types; access; interoperability and integration; and a comparison of the major commercial and free software packages available. Go to <http://www.rsp.ac.uk>. RUFORUM may want to look at the RSP guide titled "Alternatives to Repositories" at <http://www.jiscinfonet.ac.uk/infokits/repositories/alternatives>.

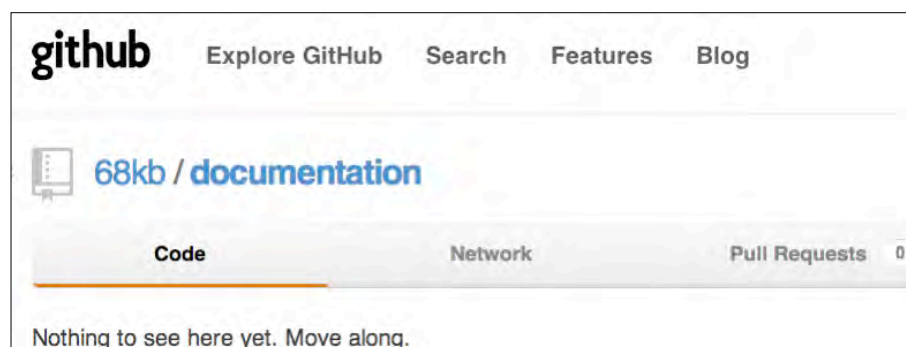
3.2.1 OERbit

OERbit is a publishing platform to share publicly licensed learning resources, created by the University of Michigan. Although OERbit is built on Drupal, it offers additional features pertaining to the organization of resources; collaboration and revisions; Creative Commons license specification and integration; simplified publishing and downloading; and more powerful searching ability. It is an ideal platform for publication of e-learning and OER modules.²⁵

RUFORUM currently uses Drupal as its content management system for the website as a whole. It would not be difficult to install OERbit, which would provide good OER repository functionality, a more powerful search engine, and the required metadata storage capacity. In addition, RUFORUM staff, which are already familiar with Drupal, would not need to learn a new system. One must ask, however, whether OERbit provides the kind of functionality RUFORUM wants for its institutional repository platform.

3.2.2 68KB

The 68KB platform was set up for RUFORUM by the consulting company, Pamoja Media, specifically for SCAIN (Strengthening Capacity for Agricultural Research for Innovation). It is an open-source free knowledge base script built with PHP and MySQL on top of the CodeIgniter web application framework, which is also open source. 68KB is used for part of the SCAIN pages on the RUFORUM website, but for nothing else. Upon checking with Neil Butcher Associates (NBA),²⁶ I learned that the SCAIN website uses WordPress as its base platform, but the resources section within SCAIN uses 68KB. This raises the number of content platforms on the RUFORUM site to three. Of them, 68KB comes with little information about itself via the Internet and no documentation, except for a small and sketchy users' guide on the RUFORUM website created by Pamoja Media for RUFORUM.²⁷



A site from which you can download 68KB. Note the statement at the bottom of the screen capture—"Nothing to see here yet. Move along."

Some background information about SCAIN would be helpful here. SCAIN is a follow-up project to SCARDA (Strengthening Capacity for Agricultural Research and Development in Africa), a three-year collaborative project, funded by the UK Department for International Development (DFID). SCARDA was carried out by RUFORUM, the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA); the West and Central African Council for Agricultural Research and Development (CORAF/WE CARD); and the Food, Agriculture, and Natural Resources Directorate of the Southern African Development Council (SADC-FANR). SCAIN's objective was to identify,

²⁵ Go to <https://open.umich.edu/wiki/OERbit> for more information on OERbit. In 2011, OERbit received a site award for Open Courseware Excellence from the Open Courseware Consortium (OCW). Go to <http://www.24-7pressrelease.com/press-release/ocw-consortium-announces-winners-for-site-awards-on-opencourseware-excellence-210026.php> for the OCW press release.

²⁶ Telephone conversation with Neil Butcher and Monge Tlaka of Neil Butcher Associates (NBA), 18 June 2012 and subsequent email from James Swash, 20 June 2012. NBA are RUFORUM's technical providers and maintain its website, so it is possible for staff to check source files for all systems.

²⁷ In an email from Moses Mutuku, dated 25 June 2011, I learned that SCAIN consists of three components—content management, and the resources section. He used 68KB, he told me because of its stability and flexibility. The same is true for AgriDrupal. Mr. Mutuku offered to change how the search functionality works. I recommended to both him and RUFORUM that nothing be done until a final decision is made on which platform to use.

commission, and disseminate information to show how capacity strengthening for agricultural research leads to measurable and sustainable impact. The SCAIN collection contains abstracts, briefing and discussion papers, reports, and theses. Its resources will be an important part of the RUFORUM repository.

The SCAIN search tool is not configured properly, as the screen captures below demonstrate. I tried searching on the name of one of the Lesotho case study authors—Joyce Macala—but neither the SCAIN nor the RUFORUM search engines found the resource. I also searched on “Lesotho,” but came up empty-handed. After searching for several SCAIN discussion papers, I discovered that none of them is findable through the RUFORUM search engines. The same is true for the briefing papers. The briefing papers do not include key words, but the search engine should have been able to locate these resources through the author’s name. In fact, when I searched on “SCAIN” in the RUFORUM search engine, I identified resources about SCAIN in the main RUFORUM collection, but was not pointed to the SCAIN page on the website. It is possible to search, but not to find.

RUFORUM
Capacity Building in Agriculture

SCAIN is a new initiative which builds on the SCARDA project and provides support to agricultural research and training organizations in sub-Saharan Africa

Nothing Found Search for Macala from within SCAIN

Sorry, but nothing matched your search criteria. Please try again with some different keywords.

Joyce Macala Find

RUFORUM HOME SCAIN HOME ABOUT SCAIN RESOURCES OUR COMMUNITY PROJECT PAR

CASE STUDY ON INSTITUTIONAL CHANGE OF THE NATIONAL AGRICULTURAL RESEARCH SYSTEM IN LESOTHO

Author Joyce Macala and Nick Mokhothu, Barry Pound on January 4, 2012 | [Print](#) | [Bookmark](#)

This paper examines the design and implementation of a package of capacity strengthening in undertaken between March 2007 and March 2011, which aimed to enhance the performance of the agricultural research system (NARS) in Lesotho. It also identifies some initial outcomes from these in

James Swash of Neil Butcher Associates, which provides technical support to RUFORUM, explained the reasons for these anomalies. First, the resources do not contain keywords, noted above. In addition, as illustrated in the screen capture below, when trying to use the search function on the SCAIN resources page a dropdown menu that allows you to limit results by category is not functioning correctly. The dropdown remains empty and does not populate with the SCAIN categories. Instead, the term “in category” appears, but nothing else.

Search

Home > Search Search for Macala from the RUFORUM home page

Search

Enter your keywords:

Joyce Macala Search

Advanced search

Your search yielded no results

Resources

Search the resource area:

In Category Search

There appears to be a problem, as well, for the dropdown menu for resources. I received the same error message for each resource on which I clicked:

An Error Was Encountered

The URI you submitted has disallowed characters.

RUFORUM HOME SCAIN HOME ABOUT SCAIN RESOURCES OUR CO

Resources

Search the resource area:

Most Popular

thesis

ABSTRACTS
BRIEFING PAPERS
DISCUSSION PAPERS
REPORTS
THESIS
TOOLS AND METHODS
MULTIMEDIA

The question is whether this is an issue with the platform as Pamoja Media configured it or whether there is a problem with the platform itself. There is a short Pamoja Media 68KB user guide on the RUFORUM website, but there is nowhere near the kind of documentation on the Web for 68KB as is found for Drupal, OERbit, and other content management systems.

The SCAIN repository is important, but it is still small. To keep it in its current format would require revising the configuration to permit the search engine to work properly. Why use a platform that is demonstrably so inferior? RUFORUM's interest in maintaining a discrete identity for the SCAIN collection is understandable. It will be possible to integrate SCAIN into the institutional repository as a whole. This is discussed in more detail below.

3.2.3 DSpace



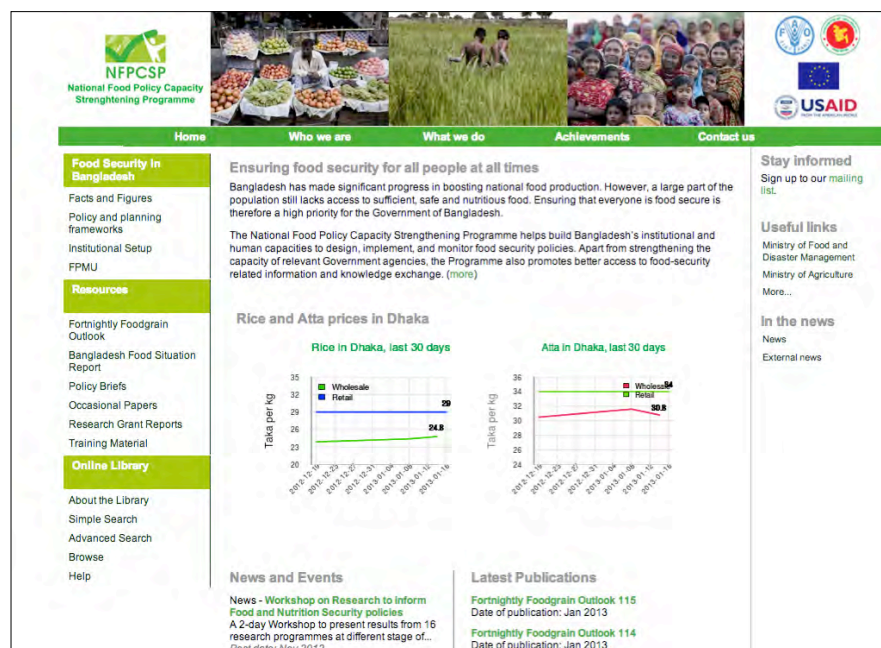
This is the ILRI DSpace repository. Note that you can limit your search to ILRI or expand it to include the entire CGIAR system. Advanced searches are possible and you can also browse. All ILRI resources are now open access and carry a Creative Commons license.

The DSpace open source software platform is a turnkey institutional repository application.²⁸ Although it is possible to install DSpace “out of the box,” it can also be customized to meet specific user needs—such as a specialized controlled vocabulary in agriculture. More than 1,300 academic, research, and public libraries worldwide employ it. DSpace preserves and enables easy and open access to all types of digital content including text, images, moving images, mpegs and data sets. There is a large user community, including in Africa, and excellent documentation.

The excellence of the DSpace platform is not in question, but installation of DSpace will require RUFORUM to upgrade its current hosting facility and install it on a separate server. There would be an extra burden on staff for maintenance and training, and expenses would be higher. Considering RUFORUM's small staff and limited budget, DSpace may not be the best option. (See section 3.8.1 for platform recommendations.)

²⁸ <http://www.dspace.org/>

3.2.4 AgriDrupal



This is the Bangladesh AgriDrupal repository, which is still quite new. Note that you can conduct both simple and advanced searches and categorize resources into separate collections. AgriDrupal will offer the functionality that RUFORUM requires at lower cost.

RUFORUM did not ask me to investigate AgriDrupal, but I learned about this platform in the course of researching this chapter, and thought it worth exploring. AgriDrupal, which was created by the UN Food and Agriculture Organization (FAO), extends Drupal with ready-to-use functionalities for agricultural information management. According to FAO, it is an easy-to-use tool that can be sustainable in small institutions with little IT support. An added advantage to AgriDrupal is that the installation already contains the necessary content types, taxonomies, and views to manage a basic agricultural management system. It has good support and documentation through FAO and the AgriDrupal user group. The Zambia Agricultural Research for Development Information Network (ZAR4DIN) began using AgriDrupal in 2010.²⁹ The National Food Policy Capacity Strengthening Programme of Bangladesh also uses it for its repository.³⁰ As further recognition by peers in information sciences and documentation, the International Association of Agricultural Information Specialists (IAALD) adopted AgriDrupal as its web platform in 2012.³¹ Thus, although it is new, AgriDrupal is beginning to gain some traction.

In support of using AgriDrupal as the platform for an agricultural institutional repository, John Ferreira, Programmer/Analyst, Technology Strategist for the Cornell University Mann Agricultural Library, wrote the following in a forum on institutional repositories established by the Association of African Universities (AAU) and the Royal Tropical Institute of the Netherlands (KIT):³²

I've done a fair amount of work with Drupal, and specifically a customization of Drupal called AgriDrupal. AgriDrupal includes some additional content models for a "Document Like Object" (DLIO). A DLIO can take on many forms, as a journal article, book, conference proceeding, and many of the other forms that one might include in a DSpace or Greenstone repository. It has robust vocabulary/taxonomy management, access control, workflow, and thousands of contributed modules that can be used to enhance the delivery of the content. Documents can be exposed in many formats using custom views as xml, json, rdf, and as an OAI provider. In other

²⁹ Go to <http://aims.fao.org/news/zambia-agricultural-research-development-information-network-zar4din-uses-agricultural-informat> for a description of this initiative and to <http://zar4din.org/> to visit the repository.

³⁰ <http://www.nfpcsp.org/agriDrupal/>

³¹ <http://aims.fao.org/news/iaald-launches-new-website-based-agriDrupal>

³² John Ferreira, <http://www.ir-africa.info/forum-topic/understanding-terms-digital-librarydl-institutional-repository-ir-integrated-library-sys>, 21 June 2012

words, I wouldn't be too quick to dismiss a CMS, especially one based on Drupal for a digital repository.

In my subsequent email exchange with James Swash, he confirmed that the AgriDrupal platform could be an excellent platform for a small institutional repository, such as the one RUFORUM plans to install. AgriDrupal will allow room for growth, but it is not meant for large library repositories. Swash explained that AgriDrupal uses the AGRIS subject categories and standards-compliant solutions. These promote more efficient management and sharing of agricultural knowledge. Moreover, AgriDrupal provides repository functionality, such as the OAI-PMH protocol and the Dublin core metadata set. OAI-PMH allows materials in an AgriDrupal repository to be harvested and mounted on other web sites in a structured format, i.e., retaining separate fields for authors, titles, dates, abstracts, etc. Structured data not only provides opportunities for richer search services, but also facilitates data analysis and data mining.³³ According to UK Joint Information Systems Committee (JISC), about 75 percent of the repositories worldwide use OAI-PMH.³⁴ In addition, with AgriDrupal, advanced searches are possible, which permits a simple search to be fine tuned, for example by stipulating year, country, type of resource, or other parameter.


(Searching in AgriDrupal is discussed in sections 3.4 as it pertains specifically to the repository and 4.7.1 as it pertains to the website overall.)

3.3 What should the RUFORUM institutional repository contain?

The repository should contain full-text journal articles written by RUFORUM members or bibliographic citations and abstracts if the full text is not available; conference and workshop papers; theses and dissertations; newsletters; annual reports; monographs; case studies, multimedia, e-learning and OER; and other resources, as relevant.³⁵

In populating the repository, RUFORUM will need to take into consideration copyright and intellectual property rights of the authors and publishers, and have appropriate policies in place. RUFORUM should aim for an open access policy for its repository contents. Open access means free public availability, which allows users to read, download, copy, distribute, print, search, or link to the full texts of any resource in the repository—with attribution, of course.

For journals, it can be tricky. The *African Crop Science Journal*, where many RUFORUM grantees publish, is a digital open access journal available through Bioline in Brazil.³⁶ Other journals have different policies pertaining to copyright. All content in *Plant Disease*, which is published by the American Phytopathology Society, is open access 12 months after publication; authors may designate their article for immediate open access for a fee. In addition, authors have the right to mount on an institutional or personal website the pre-refereed document. Many journals follow these or similar guidelines regarding open access.

 **Genetic Characterization of *Cercospora sorghi* from Cultivated and Wild Sorghum and Its Relationship to Other *Cercospora* Fungi**
P. Okori, P. R. Rubaihayo, A. Ekwamu, J. Fahleson, and C. Dixelius
Phytopathology Jul 2004, Volume 94, Number 7
Abstract | PDF Print (414 KB) | PDF with Links (267 KB) | Add to Favorites | Related

Thus, this article co-authored by Adipala Ekwamu and published in *Plant Disease* in 2004, could be added to the RUFORUM repository, if he wished to do so.

³³ The Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) is a mechanism to enable repository interoperability. There is a good article on OAI-PMH in Wikipedia (http://en.wikipedia.org/wiki/Open_Archives_Initiative_Protocol_for_Metadata_Harvesting). As described by the Search SOA technology website, "Dublin Core is an initiative to create a digital "library card catalog" for the Web. Dublin Core is made up of 15 metadata (data that describes data) elements that offer expanded cataloging information and improved document indexing for search engine programs." Go to <http://searchsoa.techtarget.com/definition/Dublin-Core>.

³⁴ <http://www.rsp.ac.uk/grow/registration/harvesting/>

³⁵ See appendix one for a full list of proposed collections.

³⁶ bioline.org.br/cs

In finding and selecting journal articles to include in the repository, RUFORUM can use Appendix J5: examples of publications from FORUM/RUFORUM, which was a part of its August 2008 Gates Foundation proposal, although it needs updating.³⁷ Fifty-eight out of 145 journal articles included in this appendix appeared in *African Crop Science Journal*, which is an open access journal. The appendix also includes an impressive list of other publications—conference papers and proceedings, briefing documents, etc. RUFORUM PhD students are required to publish their research before graduation. It would also be good to identify and locate as many of these publications as possible for inclusion in the repository.

3.4 Searching the repository

Using the University of Michigan, which has an excellent and simply laid out repository, as a model, the RUFORUM repository should allow visitors to browse by collection, title, author, and topic. Collection categories can include SCAIN, journal articles, theses and dissertations, newsletters, case studies, books, reports, etc. All repositories include a search box in order to carry out free-text searches. Many offer advanced search possibilities, as well, in order to filter a visitor's search in a number of ways. The University of Michigan search page is shown in the screen capture on the left.

3.5 Maximizing the repository's visibility

RUFORUM scholarly resources can be valuable additions to the global knowledge pool. It is important to enhance their visibility to the maximum extent possible. First of all, RUFORUM scholarly output should be indexed in Google Scholar. RUFORUM resources can be found in Google, but Google Scholar³⁸ is just as important. It includes journal papers, conference papers, technical reports, or their drafts, dissertations, pre-prints, post-prints, and abstracts. The RUFORUM institutional repository appears to meet the Google Scholar inclusion criteria.

Google Scholar, which is widely used by researchers worldwide, contains a small number of RUFORUM citations, but not very many and none recent. RUFORUM should make every effort to use Google Scholar to enhance its visibility.³⁹ Google Scholar gives detailed instructions on its inclusion guidelines at <http://scholar.google.com/intl/en/scholar/inclusion.html>. Although it recommends using Eprints, Digital Commons, or DSpace as a possible repository platform, James Swash wrote me that AgriDrupal provides the metadata that Google requires to be included in Google Scholar.

³⁷ Sent to Lisbeth Levey by email, 28 June 2012

³⁸ <http://scholar.google.com/>

³⁹ Google Scholar gives detailed instructions on its inclusion guidelines at <http://scholar.google.com/intl/en/scholar/inclusion.html>. Although it recommends using Eprints, Digital Commons, or DSpace, James Swash wrote me that OERbit provides the metadata that Google requires.

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 Articles
 Articles in Press

Subject Area
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 Astronomy
 Chemistry and Chemical Engineering
 Note: Hold down the <ctrl> key to select multiple categories

Verify Your Submission Enter the text shown below [What's this?](#)

b e f t l e s

Scirus, which is maintained by the scientific publisher Elsevier, is a comprehensive science-specific search engine. It is more specific than Google Scholar because it concentrates on a smaller amount of scholarly output. Like Google Scholar, Scirus screens requests from websites to be indexed in the database, but the process is simpler. (See screen capture on left.)

In addition to conducting simple searches, it is also possible to conduct more specific advanced searches with Scirus than with Google Scholar and be more specific with subject areas and content. Moreover, Scirus uses OAI-PMH parameters, which are discussed above.

Filter search results by

Content sources

☐ Journal sources (491)

- ScienceDirect (441)
- Royal Society Publishing (19)
- Springer (17)

[more >](#)

☐ Preferred web (627)

- Digital Archives (268)
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- impacts of climate change
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- intergovernmental panel on climate change
- changing climate

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- 1. Climate Change and Security in Africa: A Study for the Nordic-African Foreign Ministers Meeting** [PDF-5MB]
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 ...impacts of **climate change**. Conflict is multi-dimensional...report we argue that **climate change** presents very real...agrees that four main **climate** links to conflict in **Africa** may emerge. First...Second, reductions in **crop** yields and increasingly...
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 Nov 2009
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[\[http://www.fao.org/uploads/media/LWdisc_paper8_temp.pdf...\]](#)
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- 3. Opportunities to reduce the vulnerability of dryland farmers in Central and West Asia and North Africa to climate change**
Thomas, R.J., Agriculture, Ecosystems & Environment, 126 (1-2), p.36-45, Jun 2008
 doi:10.1016/j.agee.2008.01.011
 ...Mediterranean **Africa** is likely...the global **climate** models are...influence. For the **drylands** of Central...Asia and North **Africa** (CWANA...changes in **climate** predicted...these areas. **Crop** yields in the...agricultural **production**, there is...sustainability. **Climate change** is likely to...
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- 4. A method for evaluating climate change adaptation strategies for small-scale farmers using survey, experimental and modeled data**
Claessens, L. / Antle, J.M. / Stoorvogel, J.J. / Valdivia, R.O. / Thornton, P.K. / Herrero, M., Agricultural Systems, 111, p.85-95, Sep 2012
 doi:10.1016/j.agsy.2012.05.003
 ...scale for **Africa** indicate...effects of **climate change**...effects on **crop** and livestock...and cost of **production** and characterizes...manure **production** and capital...of Eastern **Africa** (PROSAM...outputs (**crop** yields, milk **production** and land...TOA-MD as a **climate** impact and...of **climate change**...
 Published journal article available from [ScienceDirect](#)
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- 5. Livelihoods under Climate Variability and Change: An Analysis of the Adaptive Capacity of Rural Poor to Water Scarcity in Kenya's Drylands** [27K]
 Dec 2010
 ...Livelihoods under **Climate** Variability and **Change**: An Analysis...in Kenya's **Drylands** A.W. Mwangi...factor in **crop** and livestock **production** in Arid and...sub-Saharan **Africa**. This study...trends of **climate** variability...of **climate change** were increased...
[\[http://socialnet.net/abstract/?doi=jest.0000.21289.2128...\]](#)
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A Scirus search on a RUFORUM course topic, with the addition of sub-Saharan Africa, resulted in almost 4,000 hits. Note that not every citation is for full text. Scirus also permits searchers to refine their search through its suggestions of alternate keywords. It will even correct spelling mistakes.

CAB Abstracts is the world's largest bibliographic information database in the broad-based agricultural sciences. It covers journal literature, annual and general reports, monographs, conference papers and proceedings, newsletters, discussion papers, and theses and dissertations.⁴⁰ CAB includes bibliographic citations, lengthy and informative abstracts, and some full text. CABI staff select resources to include, and write the abstracts themselves. It is especially important in the developing world context because it includes gray, i.e., non-published literature. RUFORUM resources are not incorporated into CAB Abstracts, but they should be.

In email exchanges with Janet Halsall, head of CABI publishing operations, I learned that with the exception of abstracts and multimedia, RUFORUM resources qualify for inclusion in CAB Abstracts. This includes briefing and discussion papers, reports, theses, and the tools and methods papers. CAB can index from the RUFORUM website. It would include either the URL link or the full text, depending on RUFORUM's wishes. To ensure ongoing inclusion of RUFORUM resources, CABI could monitor the site periodically or ask RUFORUM to email CABI at alerts@cabi.org.⁴¹

⁴⁰ <http://www.cabi.org/default.aspx?site=170&page=1016&pid=125>. CAB is also implementing a new initiative called Global Agricultural Research Archive, which archives agricultural knowledge of behalf of developing countries around the world. Although still quite small in coverage, it would be worth exploring inclusion in GARA. Go to <http://www.cabi.org/gara> for more information.

⁴¹ Email exchanges with Janet Halsall, 27 June 2012

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Abstract *
A short description of the content of the document, bringing out the key conclusions and policy messages

Tip: write the abstract in your word-processor. Use the cut and paste facility to copy the text into this form.

Year of publication:

AGRIS is the second important agricultural bibliographic information database into which RUFORUM should input. Established in 1970's by the FAO, AGRIS aims to create worldwide cooperation for sharing access to agricultural science and technology information. The AGRIS open archives and bibliographic databases cover the many aspects of agriculture, including forestry, animal husbandry, aquatic sciences and fisheries, human nutrition, and extension literature from over 100 countries. Together with CAB Abstracts, AGRIS covers gray literature.⁴² AGRIS includes bibliographic citations and abstracts, but no full text. In addition, unlike CAB Abstracts, participating members are responsible for writing their own abstracts. Although AGRIS input was initially the purview of national AGRIS centers in each country, it is now possible for individual institutions to join AGRIS in order to include their resources. This means that RUFORUM can join AGRIS.

RUFORUM scholarly output should also be indexed in ELDIS, the development gateway maintained by the Institute of Development Studies at the University of Sussex.

Instructions for contributing documents to

ELDIS will be found at <http://www.eldis.org/go/contribute>. The problem with ELDIS, however, is that contributing organizations must submit each resource separately. (See screen capture above left.) This will be a time intensive process if RUFORUM decides to submit its documents retrospectively, which I recommend, if human resource capacity permits. This might be a good job for an intern or a student. In addition, RUFORUM should request inclusion in the ELIS directory of key agricultural websites.

3.6 Intellectual Policy Rights (IPR) policy for the repository

3.6.1 IPR as it pertains to RUFORUM

The RUFORUM IPR policy, which was approved by the board on 27 August 2007, is due to undergo revision, Moses Osiru wrote me.⁴³ The policy, as such does not focus on IPR as it pertains to the publication of research completed under RUFORUM auspices. Nor does it address IPR as it relates to e-learning and OER production. For the purposes of the repository, it would be more useful to examine the appropriate clause of the RUFORUM Graduate Research Grant (GRG) agreement for its MSc program, which is quoted below. Although the GRG agreement does not specifically pertain to the RUFORUM PhD or research grants programs, it would make sense to consider using it, with my suggested modifications (section 3.6.3), for all research supported by RUFORUM. If RUFORUM requires a separate agreement specifically for the GRG program similar to the one already in place, I recommend that RUFORUM revise the last two sentencea to delete the term “developing world.” I think that using this phrase has the unintended consequence of ghettoizing the value of RUFORUM research, which should be a part of the global knowledge pool.

⁴² <http://agris.fao.org/knowledge-and-information-sharing-through-agris-network>

⁴³ RUFORUM Intellectual Property Rights (IPR) Statement, page 2, <http://www.ruforum.org/documents/intellectual-property-rights-ipr-policy-statement>

You agree that you will make available to the public the results of the research emerging from the Project, or any reports or other publications regarding the Project funded by this grant (collectively, the "Materials"), and anticipate that the Materials will be published in a treatise, thesis, trade publication, or in any other format that is available for the interested public as soon as practical, consistent with the need to first secure intellectual property rights in a manner that maximally benefits **developing world** interests. Specifically, you are expected to use good faith efforts and work in a collaborative fashion with your subcontractors and funders associated with the Project to facilitate broad dissemination and accessibility of the Materials in the **developing world**.⁴⁴

Thus, when RUFORUM revises its overall IPR policy, it will also need to establish appropriate policies for the resources placed in the repository. The Kwame Nkrumah University of Science and Technology (KNUST) in Ghana, which has adopted a Creative Commons license policy for the entire university, has an excellent policy for its repository, although not specifically for theses and dissertations, on which RUFORUM may wish to model part of its own policies.⁴⁵ In addition, establishing IPR policies for the repository will also be pertinent as RUFORUM thinks through assisting member universities do the same, including for e-learning and OER resources. OER Africa, which has worked with KNUST, would be an excellent source of information for RUFORUM *vis-à-vis* IPR. A further discussion of OER Africa's work on e-learning and policy issues will be found in section 3.6.4.

3.6.2 Theses, dissertations, and other RUFORUM research output

Students who have not yet published might be concerned about mounting their thesis or dissertation online and allowing free access to the public because they might then have difficulty publishing an article based on their research. Some publishers consider making a thesis or dissertation publicly available as prior publication. RUFORUM may want to consider a range of options for students—ranging from immediate public access to an embargo for a fixed period of time. During the embargo period, only the citation and abstract would be available in the RUFORUM online repository, although the entire thesis would be mounted on a private part of the site. It is fair to assume that if thesis or dissertation research is not written up within two years (or a period to be determined by RUFORUM), it probably will not happen. If students and supervisors know that the embargo period is limited, they may have added incentive to work toward publication of their research. RUFORUM can institute a deadline by which students must demonstrate that they are working on publication. Then, at the appropriate time, the thesis or dissertation would be uploaded automatically. Automating the system would decrease the management load on RUFORUM. The key is to implement an intellectual policy that is fair to students and fair to RUFORUM, which has paid for the work.⁴⁶

Knowing how a selection of leading universities handle IPR for theses and dissertations might help RUFORUM formulate additional text for its grant agreement and IPR policies.

Table 1: University policies toward online publication of theses and dissertations

University	Policy
Columbia University	All dissertations are submitted electronically. Options include—immediate release; embargo for six months, one year or two years. Embargoes are usually requested when a patent is pending, an experiment is not finished, a manuscript has been submitted for publication in a scholarly journal or as a book. ⁴⁷

⁴⁴ Email to Lisbeth Levey from Moses Osiru, RUFORUM deputy Executive Secretary, 15 August 2012

⁴⁵ www.knust.edu.gh/downloads/49/49054.pdf

⁴⁶ Students who have published would not require an embargo, of course.

⁴⁷ <http://gsas.columbia.edu/content/electronic-deposit-faqs>

University	Policy
Cornell University	Students must submit their thesis or dissertation electronically, but they are not required to make their work publicly available online. From the <i>Thesis and Dissertation Guide</i> : “If you have no plans to publish your work elsewhere, you can make your dissertation or thesis immediately available to the public in its entirety by submitting your work to an open community. If you’re planning to publish your work as a book or sections in scholarly journals, you may choose to add your work to a closed community, where only the title, abstract, and other metadata are viewable. An item is closed for up to five years with the possibility of renewal. After that, the complete text becomes available to the public.” ⁴⁸
Harvard University	All dissertations are submitted electronically. Options include—opting out entirely of public accessibility, immediate release; embargo for six months, one year or two years. Students have the right to request continued embargo after two years. ⁴⁹
International Livestock Research Institute	ILRI is not a university, but students conduct research for their MSc and PhD with ILRI funding. ILRI is therefore analogous to RUFORUM in this way. Because of this similarity, I thought it would be useful to quote the ILRI policy in full. Graduate Fellows who receive ILRI support “have the freedom to use the research outputs generated from their research for their thesis or further scientific publications, (unless it is the confidential information of another party or proprietary information). They must also acknowledge ILRI, the funding agency or any other partners involved. We also require them to deposit a digital version of their final thesis to ILRI which is then made publicly accessible on ILRI's open access web portal in conformity with ILRI's open access policy for publications; unless the GF demonstrates that they are restricted from doing so by other 3rd party obligations.” ⁵⁰
Makerere University	Students must submit paper and electronic copies of their theses and dissertations to the Directorate of Research and Graduate Training. The hard copies are then sent to the Makerere University library, where abstracts are uploaded to the Makerere University institutional repository. Authors are encouraged to upload full text. The university is currently formulating appropriate policies to streamline the deposit process and

⁴⁸ Cornell University, 2011 *Thesis and Dissertation Guide*, page 17, http://webcache.googleusercontent.com/search?q=cache:0eOc6g84iFoj:www.gradschool.cornell.edu/pubs_and_fo rms/pubs/thesisbook.pdf+&hl=en

⁴⁹ http://www.gsas.harvard.edu/student_affairs/clarification_on_dissertation_submission.php

⁵⁰ Email to Lisbeth Levey from Joyce Maru, ILRI Capacity Development Officer, 7 January 2013.

University	Policy
	copyright issues. The library is also organizing sensitization sessions on open access.
Stanford University	Options—immediate release; embargo for six months, one year, or two years. ⁵¹
University of Michigan	All dissertations must be submitted electronically and are normally made publicly available. Options include—immediate release (default policy) or embargo for up to two years. ⁵²
University of the Witwatersrand	All students must submit their thesis or dissertation in electronic format. In the form that the student must complete s/he acknowledges that it will be made publicly available within four months of submission “unless permission for further embargo has been approved by the relevant Supervisor...” ⁵³ In an email to Lisbeth Levey, Felix Ubungu, the university librarian wrote: “From time to time we receive requests to temporarily block Internet access so that the author can publish the work and we do so on the understanding that Internet access will be provided after the work has been published. We resist the pressure from publishers to permanently keep the work in the dark archive.” ⁵⁴

The Columbia University electronic deposit FAQs has an excellent explanation to students about why public access to their theses and dissertations is desirable.

Works appearing in the Academic Commons are available to anyone with an Internet connection. Making dissertations available openly will benefit you by broadening your audience, increasing citations, and allowing potential employers and publishers to more easily find your work. By making your work widely available online, you can better protect your intellectual property, by firmly and publicly establishing your ideas. All works deposited into the Academic Commons have a permanent URL that will never change and can be used as a citation in your CV or in bibliographies.⁵⁵

The same is true more generally for all research. Indeed, in the US, all publicly funded research in the biomedical and life sciences must be deposited in PubMed Central,⁵⁶ which is a free digital archive of full-text biomedical and life sciences journal literature, after it is published in a journal.⁵⁷ It is the designated repository for papers submitted in accordance with the NIH public access policy, which requires that scientists submit “final peer-reviewed journal manuscripts that arise from NIH funds to the digital archive PubMed Central *upon acceptance for publication*...The Policy requires that these papers are accessible to the public...no later than 12 months after publication...”⁵⁸ A similar law governing all publicly funded research, including agriculture, is under consideration by the US Congress.⁵⁹ In the UK, effective 1 November 2012, the Department for International Development (DFID) instituted an open access policy

⁵¹ <http://studentaffairs.stanford.edu/registrar/students/edissertation-faq>

⁵² University of Michigan dissertation embargo policy, <http://www.rackham.umich.edu/downloads/oard-dissertation-embargo-policy.pdf>

⁵³ University of the Witwatersrand, *Final Submission of Thesis, Dissertation or Research Report/Project*, page 3, <http://wiredspace.wits.ac.za/bitstream/handle/10539/11623/ETDSubmissionForm.pdf?sequence=3>

⁵⁴ Email to Lisbeth Levey, 22 October 2012

⁵⁵ ⁵⁵ <http://gsas.columbia.edu/content/electronic-deposit-faqs>

⁵⁶ <http://www.ncbi.nlm.nih.gov/pmc/>

⁵⁷ <http://www.ncbi.nlm.nih.gov/pmc/>

⁵⁸ <http://publicaccess.nih.gov/>

⁵⁹ <http://www.taxpayeraccess.org/>

for all new research projects and programs, which requires that all research it funds be made publicly accessible.⁶⁰ Finally, the World Bank and the CGIAR system have become open access publishers. RUFORUM would be in good company if it designates its research output as open access.

RUFORUM may want to adapt the Columbia University wording quoted on the previous page for inclusion in its IPR policy, as an explanation why open publishing is advantageous to members of the RUFORUM community.⁶¹ The wording can easily be revised to make it relevant to both students and members of the academic community. This, together with language adapted from the RGP statement and embargo periods (should RUFORUM decide to permit an embargo), would make an excellent IPR policy for the repository.

3.6.3 RUFORUM open access policy for theses, dissertations, and other research output

Given the existing policy to make theses completed under the auspices of graduate research grants and what we have learned about open access provisions at representative US and African universities, I recommend the text below in **blue** for RUFORUM to consider and revise, as appropriate.

RUFORUM maintains an open access policy for theses, dissertations, and other research output produced within the RUFORUM network. This means that your work will be freely and publicly available online to scholars worldwide. Recipients of support through the RUFORUM Graduate Research Grant program (GRG) are required to make available to the public reports and other publications produced through the GRG, but RUFORUM hopes that all members of the network will see the value of open access publication and the repository.

The advantages of open access include:

- 1. In making your work widely available online through the RUFORUM institutional repository, you can better protect your intellectual property, by publicly publishing your ideas. With open access, authors retain ownership of the copyright for their work, but allow anyone to download, reuse, reprint, distribute, and/or copy it, so long as the original authors and source are cited.**
- 2. All works deposited in the Repository have a permanent URL, and can be used as a citation in your CV or bibliographies.**
- 3. Research has demonstrated that open access brings increased visibility, usage, and impact for your work. RUFORUM can document the number of times resources deposited in the repository are viewed and downloaded.**
- 4. Recognition of African research is hampered because it does not reach the global knowledge pool. Because resources in the RUFORUM repository are indexed and abstracted in the major scholarly search engines and services, depositing your research output in the repository will ensure that it reaches the worldwide scientific community.**

RUFORUM also understands that you may have a patent pending or wish to submit your research for publication in a scholarly journal or as a book. For those reasons, we are prepared to embargo your work for up to two years. This means that your research will not be publicly accessible for the period of time you designate (six months, one year, or two years). Afterwards, your research will receive an open access designation.

RUFORUM also encourages network members to publish in open access journals or in journals that will permit you to designate your article as open access. In that way, you

⁶⁰ <http://www.dfid.gov.uk/What-we-do/Research-and-evidence/DFID-Open-Access-Policy/>

⁶¹ The *Open Access Scholarly Information Sourcebook* also has an excellent discussion on why open access is beneficial. Go to http://www.openoasis.org/index.php?option=com_content&view=article&id=146&Itemid=253.

will have all of the advantages delineated above. There are page charges sometimes associated with open access publishing, however. Be sure to include a line item of \$2,000-\$3,000 for such charges in your proposal budgets, to be on the safe side. Attached to this document you will find information on open access journals.⁶²

3.6.4 IPR and e-learning

The RUFORUM goal is to convert its e-learning resources into OER and open access resources. Although the existing IPR policy is not written with that intent in mind, there should be a section in this policy on OER that defines the term and outlines the RUFORUM policy. OER Africa has a number of resources on its website that would be helpful to RUFORUM in this context, but two that strike me as particularly useful are the toolkit on policy development and the one on copyright and licensing.⁶³ The one on policy is meant to help users identify policy implications vis-à-vis OER production. The toolkit on copyright and licensing explains copyright and the different kinds of licenses available for OER and open access.⁶⁴

3.6.5 IPR and journals

The above sections focus on RUFORUM internal IPR policies. But researchers and students associated with RUFORUM should also take into consideration where they publish, including the journal's IPR policy. This is important if the RUFORUM constituency is to achieve its mission of "broad dissemination and accessibility of the Materials in the developing world" or anywhere else. The ideal is to publish in an open access journal, of which the *African Crop Science Journal* is one. This will ensure that the article will be fully accessible immediately online, both from the journal and through deposit in the RUFORUM institutional repository. Some universities now encourage their faculty to publish in open access journals and provide grants to cover publication charges. This is the case at Cornell, Stanford, Dartmouth, MIT, Harvard, the University of California system, Nottingham, Cambridge, and elsewhere. In addition, many publishers, among them Elsevier, Springer, and Wiley are hybrid publishers in that they will agree to designate an article open access—for a fee. It is important, therefore, for members of the RUFORUM network to include publication charges in their budgets. These charges can range from \$1,000-\$3,000, but they are sometimes waived for developing country researchers. Finally, some journals have an embargo for a fixed period of time, after which all articles become freely available and open access. This is true of *Plant Disease*, for example.

Moreover, journals have different policies for what researchers can mount online after an article has been submitted for publication. In some cases, authors are allowed to make freely available the pre-peer reviewed article; in other instances, they are permitted to mount the actual article after an embargo period.

Journal: Phytopathology (ISSN: 0031-949X)	
RoMEO: This is a RoMEO yellow journal	
Author's Pre-print:	✓ author can archive pre-print (ie pre-refereeing)
Author's Post-print:	✗ author cannot archive post-print (ie final draft post-refereeing)
Publisher's Version/PDF:	✓ subject to Restrictions below, author can archive publisher's version/PDF
Restrictions:	<ul style="list-style-type: none"> Only Publisher PDF may be used, which can be obtained for a fee
General Conditions:	<ul style="list-style-type: none"> Publisher's version/PDF must be used Published source must be acknowledged Cover page must be included (provided by publisher)
Mandated OA:	(Awaiting information)
Copyright:	Not available online
Updated:	22-May-2007 - Suggest an update for this record
Link to this page:	http://www.sherpa.ac.uk/romeo/issn/0031-949X/
Published by: American Phytopathological Society - Yellow Policies in RoMEO	

The University of Nottingham is responsible for an excellent website called SHERPA/RoMEO, which provides publisher information on copyright policies and self-archiving.⁶⁵ SHERPA/RoMEO uses four colors to categorize archiving policies—green (pre-print, post-print, publisher PDF permitted); blue (final draft, post referee, and publisher PDF permitted); yellow (pre-referee permitted); and white (nothing permitted). On the left, there is a screen capture for the SHERPA/RoMEO entry for *Phytopathology* as an example. Authors in the RUFORUM network and members of the secretariat staff

⁶² This explanation will be found in appendix two.

⁶³ <http://www.oerafrica.org/policy/PolicyReviewandDevelopmentHome/tabid/914/Default.aspx>

⁶⁴ <http://www.oerafrica.org/copyright/CopyrightandLicencingToolkit/tabid/1781/Default.aspx>

⁶⁵ <http://www.sherpa.ac.uk/romeo/>

should consult SHERPA/RoMEO whenever they want to consider where to publish and what can be legally mounted in the institutional repository. It would also be wise for authors to consult the website of the journal to ascertain open access policies and publication charges before they submit their article for publication. When in doubt, they should write the publisher. These are the questions to ask:

- Do you offer an open access option?
- If so, how much does it cost?
- Is there a discount or waiver for developing country authors?
- May I deposit a version of my article in a repository?
- If so, which version?
- Is there an embargo period?

3.7 Institutional repositories in sub-Saharan Africa

I thought that it would be useful to conduct a lightning survey of the status of scholarly repositories in sub-Saharan Africa, as RUFORUM thinks about how to create its own repository. University and research repositories in sub-Saharan Africa, with the exception perhaps of South Africa, primarily use DSpace. Below is a brief description of the situation in Africa, with a focus on RUFORUM countries and universities.

Collaborating with the Royal Tropical Institute (KIT) of the Netherlands, the Association of African Universities (AAU) has taken the lead in helping African universities establish scholarly archives. The program has created an excellent institutional repository toolkit and holds periodic workshops. There is also an excellent resource list with links to readings on open access principles and software.⁶⁶ The AAU has organized two workshops, as well—one in 2009 and one in 2011.⁶⁷ In addition, in 2011, BioMed Central, the institutional repository for research funded by the US National Institutes of Health (NIH), sponsored Open Access Africa, together with the Kwame Nkrumah University of Science and Technology (KNUST) in Ghana. The aim of the conference was to discuss the benefits of open access publishing in an African context, from the perspective of both readers seeking access to information, and researchers seeking to communicate globally the results of their work.⁶⁸ Then, in preparation for Open Access Week 2011, DuraSpace, a not-for-profit organization in the US that promotes the use of DSpace worldwide, published a survey on the development of open-access repository development in Africa.⁶⁹ Finally, BioMed Central has maintained the momentum. In November 2012, it collaborated with the University of Cape Town (UCT) in South Africa in organizing an Open Access Africa conference.⁷⁰

There is a lot going on in Africa, but what about the situation within the RUFORUM network? Not as much as one would like, but perhaps more than one would imagine and the situation changes for the better by the day. Of the 17 RUFORUM countries, I found fully functional and up-to-date repositories in four of them (Ethiopia, Kenya, Uganda, and Zimbabwe), as described below. Bear in mind that this information is up-to-date as of this writing (December 3, 2012). Many universities within the network have in place repository policies and are planning their installation.

⁶⁶ <http://www.ir-africa.info/>

⁶⁷ The 2009 workshop recommendations can be downloaded at <http://irs.aau.org/outcomes.pdf>. The 2011 report can be downloaded at http://events.aau.org/userfiles/file/datad11/docs/OAIR_accra_18_19_july_2011_report.pdf.

⁶⁸ The full program and presentations can be found at <http://www.biomedcentral.com/developingcountries/events/openaccessafrica/program>

⁶⁹ Go to <http://duraspace.org/dspace-africa-growing-open-access-knowledge-and-culture> for reports on Botswana, Ethiopia, and Ghana. Reports for Kenya and Malawi will be found at <http://www.openaccessweek.org/profiles/blogs/dspace-open-access-repository-development-in-africa-mozambique>. Sudan and South Africa will be found at <http://duraspace.org/dspace-open-access-repository-development-africa-sudan-south-africa>. Go to <http://duraspace.org/dspace-open-access-repository-development-africa-mozambique-senegal-0> for Mozambique and Senegal.

⁷⁰ <http://www.biomedcentral.com/developingcountries/events/openaccessafrica>

3.7.1 Ethiopia

Although neither Haramyaya nor Mekelle universities have institutional repositories, Addis Ababa University has a very good one for theses and dissertations, which is based on DSpace.⁷¹ Full text is available. There are over 1,100 of them in the sciences, for example. Although agriculture is not taught at Addis Ababa University, there are faculties of veterinary medicine, development research, and an institute of local and regional development that might be relevant to the interests of the RUFORUM network.

3.7.2 Kenya

Although Egerton University and Jomo Kenyatta University of Agriculture and Technology (JKUAT) do not have repositories, the University of Nairobi (UoN)⁷² and Kenyatta University⁷³ do. Some full-text is available, but not for everything. Theses and dissertations, for example, only include abstracts. There is also a repository at Moi University, but agriculture is not included as one of the disciplines covered.⁷⁴ In addition, JKUAT, Egerton, Moi, Kenyatta, and UoN participate in the Kenya Information Preservation Society (KIPS) initiative, which has as its objective the facilitation, preservation, and conservation of Kenya's national information heritage. As such, KIPS has created a union list of theses and dissertations about Kenya held in its university libraries. There are full citations and some abstracts, but no full text.⁷⁵

ILRI⁷⁶ and the Kenya Agricultural Research Institute (KARI)⁷⁷ also maintain repositories. The ILRI repository uses DSpace (as do the other centers associated with the CGIAR network), and KARI does too. KARI also manages the Kenya Agricultural Information Network (KAINET), which maintains a repository.⁷⁸

3.7.3 Uganda

Although Gulu University and Kyambogo University do not have repositories, Makerere University has a DSpace repository, which is excellent.⁷⁹ In addition, Makerere University is a contributing member to the Africa Portal, an online repository of open access library collection with over 3,000 books, journals, and digital documents on African policy issues. Resources pertaining to agricultural economics are included in this collection.⁸⁰ Uganda Martyrs University also has a DSpace repository.⁸¹

3.7.4 Zimbabwe

The University of Zimbabwe has a repository, which uses DSpace.⁸²

⁷¹ <http://etd.aau.edu.et/dspace/>

⁷² <http://uonlibrary.uonbi.ac.ke/node/759>

⁷³ <http://etd-library.ku.ac.ke/ir>

⁷⁴ <http://41.89.160.13:8080/xmlui/>

⁷⁵ <http://www.researchkenya.org/index.html>

⁷⁶ <http://mahider.ilri.org/handle/10568/1>

⁷⁷ <http://www.kari.org/index.php?q=content/kari-e-repository>. KARI is using a special version of Dspace called AgriOcean Dspace, which was created by FAO.

⁷⁸ <http://www.kainet.or.ke>

⁷⁹ <http://dspace.mak.ac.ug/>

⁸⁰ <http://www.africaportal.org/library>

⁸¹ <http://chisimba.umu.ac.ug:8081/jspui/handle/123456789/93>

⁸² <http://ir.uz.ac.zw/jspui/>

3.7.5 Smaller and recently established repositories in the RUFORUM network

In addition to the countries above, there is a small repository at the University of Botswana, which uses DSpace. It does not appear current.⁸³ There is also a national repository for Mozambique in Portuguese, which uses DSpace. Although it is listed as a member, I could not find any resources for Eduardo Mondlane University in it. The Catholic University of Mozambique is not yet a participant.⁸⁴ The University of Namibia, which presented at Open Access 2012 in Cape Town, has a repository, but it is still being tested.⁸⁵ The National University of Rwanda has a DSpace repository; it is current, but still very small.⁸⁶ In Sudan, although Kordofan University and the University of Gezira do not have repositories, the University of Khartoum does for the faculty of science. It was started in 2011, has only a few records, and is in DSpace. Many of the records do not contain full text, only abstracts.

3.7.6 Summing up

In conclusion, although several of the RUFORUM universities have institutional repositories and more are planned, none includes many research resources in the agricultural sciences. Makerere University has only two theses, for example. In addition to establishing and populating the RUFORUM repository with resources published by the secretariat, RUFORUM network universities may also want to take advantage of the RUFORUM repository by contributing resources to it, particularly once network members fully understand the benefits of using the Internet to ensure wider dissemination of their research. This may be a selling point to convince participating universities to collaborate with the RUFORUM repository effort. Network members may want to input their records into their own institutional repositories at some point, of course. It should be possible to export AgriDrupal records to DSpace as long as the metadata in AgriDrupal is in a standard that DSpace recognizes.

Finally, many of the universities getting started have trouble convincing faculty and students to donate their resources to their institutional repository. This may be because authors are afraid that to do so would make it impossible to publish their research results at a later time. Some may not know about the archives; others do not recognize that a repository and open access can increase the visibility of their research. By sensitizing its membership and establishing a working repository, RUFORUM will be contributing not only to the worldwide community of scientific knowledge, but also to the repository movement in sub-Saharan Africa.

3.8 Weighing options and recommendations

Below are a series of questions that RUFORUM should ask itself in weighing its options.

3.8.1 Selecting the most appropriate platform

This chapter, which laid out a number of options, helped RUFORUM make its decision—the RUFORUM institutional repository will be built on the AgriDrupal platform. We are already moving forward with work on in-depth planning, to be followed by creating a test site, and then mounting the full repository. RUFORUM based its decision on my recommendations, as follows:

- I recommended scrapping the SCAIN 68KB/WordPress system because there is no reason to add an extra layer of complexity to the RUFORUM website, particularly because the SCAIN system is so inefficient. It would have to be reconfigured entirely. The virtual nonexistence of support and documentation would also mean that RUFORUM staff would be entirely dependent on its technical

⁸³ <http://aims.fao.org/botswana-college-agriculture-bca-institutional-repository>

⁸⁴ <http://www.saber.ac.mz/>

⁸⁵ <http://repository.unam.na>

⁸⁶ <http://repository.nur.ac.rw:8080/xmlui>

providers for troubleshooting. Moreover, 68KB lacks the FAO controlled vocabulary that one finds in AgriDrupal and the FAO version of DSpace.

- I recommended against DSpace after contacting Neil Butcher Associates to ask about cost, technology, and human-resource implications for each platform. I did this because I know that these are issues of concern to RUFORM. I received the email response below from James Swash. In a separate email, Butcher requested that I emphasize that these are “notional” estimates, based on an installation of both platforms on the NBA server to ascertain ease of installation and how each platform works. Below is the email from James Swash.

RUFORM's current website hosting would be insufficient to host DSpace as it is a Java website application, as such it may be difficult for them to find a website hosting company that would offer the necessary services. It may require them to rent a server, and RUFORM do not currently have the skills required to manage the server. Costing the DSpace implementation is tricky as it brings with it more questions. If RUFORM use DSpace, then it would make sense to move their existing website to the DSpace server so that the two can coexist and be integrated together. This would increase the amount of work...The DSpace repository would also need to be styled to be in line with the existing RUFORM website branding. My estimate for implementing a DSpace installation would be in the region of about 56 hours. This would include installation, training and styling of the platform. My estimate for the AgriDrupal platform is 32 hours, this would include installation, training and making use of the existing platform's styling. Making use of the AgriDrupal platform would allow us to use the global search at the top of the RUFORM website, as well as a more advanced search which would allow one to filter and refine the results based on the meta data of the AgriDrupal repository section.⁸⁷

- Thus, if one compares DSpace to AgriDrupal, the following should be noted—with DSpace as the repository platform, it would be necessary for RUFORM to upgrade its current hosting facility and server capacity, both of which carry financial and human-resource implications. In addition, installation of DSpace is more time intensive and it would require more work to integrate it with the existing RUFORM website. The learning curve for becoming familiar with DSpace may also be greater than it would be for AgriDrupal. Given RUFORM's limited budget and small staff, these considerations seem to be a heavy and unnecessary burden. Finally, even though installation of AgriDrupal functionality to the existing website will require some development to install and configure, costs will be lower. No additional server will be necessary. Demands on staff time will also be lower, although some training would be required. It is for these reasons that I recommended AgriDrupal.

OERbit will be superfluous because RUFORM's e-learning and OER courses can be mounted using Drupal, as can be the rest of the website, which is the case today, except for SCAIN. Thus, there would only be one platform because AgriDrupal is an extension of Drupal. It will thus be easier to make improvements to the AgriDrupal platform and expand functionality, as necessary.

Therefore, based on the above recommendations, the RUFORM ICT Unit recommended AgriDrupal.

Finally, once RUFORM has decided on which platform to install for its repository, installs, and populates it, if funding permits, RUFORM may want to consider one or more workshops for AICM or the RUFORM network more generally on institutional repositories and platform options. For example, the Information Training and Outreach Centre for Africa (ITOCA) organized a digital repositories workshop in Dar es Salaam in June 2012. Although the focus of this workshop was primarily on DSpace, I am sure it would be possible to concentrate on AgriDrupal if that is the platform RUFORM selects.⁸⁸ Although not included in the workshop, there should also be a session on IPR and open access issues.

⁸⁷ email to Lisbeth Levey, 18 August 2012.

⁸⁸ Email to Lisbeth Levey, 20 June 2012. Ferreira was one of the workshop participants.

3.8.2 Populating the RUFORUM repository

The following inventories will be necessary in order to begin populating the RUFORUM repository:

1. Resources currently on the RUFORUM website.
2. Journals where RUFORUM research is published. For open access journals, such as the *African Journal of Crop Sciences*, it will be possible to include full-text within the repository. In Appendix J5 of its 2007 proposal to the Bill and Melinda Gates Foundation, over 50 percent of the articles appeared in this journal. In the case of some journals, only a link to the article and abstract will be possible.
3. Research output funded by RUFORUM, but held at member universities—theses and dissertations; case studies; reports; etc. Anything that is already in digital format should be considered for inclusion in the repository.

Together with these inventories, the following steps should be taken:

1. Sensitize the community of RUFORUM leaders, researchers, and students to the significance of the institutional repository. Help them to understand the importance of allowing RUFORUM to publish their pre-prints, conference papers, journal articles, and theses in the RUFORUM repository.
2. Establish appropriate intellectual property policies that will permit maximum access, but protect the rights of RUFORUM members to publish their research.
3. Work out modalities with member universities to ensure that electronic copies of relevant resources are emailed to RUFORUM in a timely fashion.
4. Sensitize researchers to the importance of publishing in open access journals or journals that permit open access format, as explained above.

3.8.3 Technology management, human-resource, and financial considerations

1. I've laid out options in this chapter for a platform, content, and other relevant areas. But ultimately it is up to RUFORUM to determine the nature of the service it wants to provide its constituency first and the worldwide community of scholars second. How much time and money can RUFORUM invest in this activity? How much staff time will it require? Is there funding for consultants? What are the operational and financial implications of the different options? For example, DSpace would require server upgrades, not to mention increased costs associated with training staff on how to use it.
2. Over the short term, RUFORUM will need to install, configure, and test the platform it decides to use for its repository. Staff should not be asked to do this internally, but staff time will be necessary to oversee and understand the process. In addition to RUFORUM's regular technology provider, it might be useful to bring in someone with expertise in setting up repositories in the agricultural sciences and in AgriDrupal or in AgriOcean DSpace training, depending which is selected. Justin Chisenga of FAO in Accra organized an AgriDrupal training workshop in 2011; he may have some ideas.⁸⁹ It would also be useful to consult with John Ferreira at Cornell. Both have experience with agricultural repositories. A librarian with subject expertise in the agricultural sciences might also be helpful in indexing and entering records.
3. In addition to installing platforms, RUFORUM will require assistance in building its search optimization capacity, including indexing in Google Scholar, Scirus, CAB abstracts, and Agris, and its web analytics structures. RUFORUM will also need training in how to carry out the kind of analytics required. The other option, of course, is to request that the RUFORUM technical provider do this work. It would relieve the pressure on the secretariat's small ICT office.

⁸⁹ Go to <http://aims.fao.org/community/agriDrupal/blogs/agriDrupal-training-workshop-zar4din-project-22-25-march-2011-lusaka-zamb> for the workshop agenda and slides.

4. Over the long term, I recommend that RUFORUM use one technology provider with which to work rather than contract with multiple agencies. This will simplify lines of communication and prevent the kinds of errors that I noticed with the installation of SCAIN. In addition, I suggest that RUFORUM consider a retainer of some kind so that it knows that the provider is checking the website on a continuous basis. This should include scanning on a regular basis to ensure that all links and content are uploaded and functioning properly.

The RUFORUM website

4.1 Introduction

RUFORUM requested that I conduct a critical review of its information sharing and knowledge activities. The previous chapter identifies options and makes recommendations concerning RUFORUM's institutional repository, which is central to RUFORUM ability to manage its research output and share it with the outside world. The repository will therefore be a critical component of the RUFORUM website.

But the website should serve other important RUFORUM functions. It showcases the overall purpose of RUFORUM and helps visitors locate information about and relevant to RUFORUM. To be very specific, the website must serve the needs of the RUFORUM network first and secondly the broader community of researchers and students interested in the RUFORUM mission. It is for this reason that at the 2011 RUFORUM ICT experts' meeting, we recommended that the website concentrate on agricultural training and research in Africa because these are the RUFORUM mission. This is discussed further below.

Even though the intended audience and mission are apparent, RUFORUM requires a unified communications strategy to help plan and populate its website. I do not know whether one has already been articulated and being used. This does not appear to be the case, although a 2009 paper by Neil Butcher recommending an advocacy and publishing strategy for RUFORUM is a good start. This paper is worth revisiting; it is on the RUFORUM website.⁹⁰

This chapter will assess the RUFORUM website and make recommendations on ways to improve it and enrich its content. Section 4.2 contains a detailed discussion of website issues on the home page that require attention. Sections 4.3-4.7 assess content. Recommendations for the website will be found in section 4.8. I hope that my comments and suggestions will help RUFORUM as it plans and designs a revitalized website to meet the requirements of its network and beyond. Working with professional technical and design consultants in this process would also be useful.

Please note that this chapter is based on a thorough review of the website in October 2012 and a shorter review in December 2012. Websites are dynamic. The RUFORUM website changed between October and December. It will no doubt be revised again between the date I submitted a draft of this chapter to RUFORUM to review and the date the entire report goes to the Gates Foundation. Even so, I believe that my major points and recommendations will remain valid.

⁹⁰ <http://www.ruforum.org/documents/ruforum-advocacy-and-publishing-strategy>

4.2 RUFORUM home page



The RUFORUM home page is the website entry point, which leads visitors to the information they seek. The home page therefore needs to be clearly and concisely presented. The layout should not be overly complicated, which it now appears to be. In addition, not all of the features are in active use or used at all.

Below are the salient issues that I noticed when I visited the website on 22 December 2012. Some of them are technical and others pertain to editing. But the bullet on social networks is particularly pertinent to the need to design an appropriate strategy.

- In the center of the page, there is a very nice window with Power Point presentations presented by RUFORUM Secretariat staff and members of the network. The Power Point in the window, however, appears to be the oldest in the group. Normally, visitors are shown the most recent resource. In addition, I am not certain whether visitors will have the patience to scroll down the entire list of presentations. When I looked at the site on 22 December 2012, for example, there were 784 views of the first presentation, but only 146 of the last.⁹¹ In addition, if the Power Point's first slide does not indicate where it was shown, which is the case for several

⁹¹ There were 2,878 views of the first Power Point when I looked on 5 February 2013, but far fewer of the remaining presentations.

presentations, it is not apparent at which conference or event at which it was given. Finally, there are no videos when one clicks on the video link, even though there is a multimedia presentation to the right. It appears as if this is an excellent idea in need of more thought on its execution. For example, there will be a multimedia collection in the RUFORUM institutional repository. Should visitors be referred to that collection if they wish to browse all of the Power Point presentations on the RUFORUM website? For cross referencing purposes, there will also be a separate collection of conferences and meetings in which there will be links to Power Point presentations.⁹²

- The “news and events” section at the bottom of the page should be renamed because the resources in it are neither news nor events. It could easily be called “announcements,” which is what the African Economic Research Consortium (AERC) does. AERC also has a separate “in the news” section, for news items of relevance to AERC.⁹³ The Arid Lands Information Network (ALIN) has one, as well, called “ALIN news.”⁹⁴ Announcements would encompass everything.
- “Recently added resources” is confusing. These resources may have been recently added to the website, but they were published some time ago. Looking at the website on December 22, 2012, the banana subsector report is undated, but it is for work carried out in 2010.⁹⁵ The newsletters were published in June and July 2012. My question pertains to how RUFORUM wants to handle this link. By showcasing these resources, it looks as if RUFORUM either does not maintain an up-to-date publishing schedule or does not keep its website current.
- At the bottom of the page on the right, there is a box for the “annual report,” but the link is to the RUFORUM strategic plan.

4.2.1 RUFORUM welcome message

The welcome message is very good. It clearly expresses what visitors should know—who you are, where you work, your mission, and what you do. Additionally, however, at the December 2011 meeting of the ICT experts’ committee, committee members suggested that the RUFORUM website, including the resources to which it links concentrate on the two overall RUFORUM mission—to improve postgraduate training in the agricultural sciences in Africa. If the RUFORUM secretariat accepts the committee’s recommendation, visitors to the RUFORUM website will know that they will find information pertaining to training and research in African agriculture, which would entail modifying the welcome message. Below is edited text in **blue** with suggested additions and revisions, for review by the RUFORUM secretariat.

The Regional Universities Forum for Capacity Building in Agriculture (RUFORUM), which is located at Makerere University, is a consortium of 29 universities in Eastern, Central and Southern Africa and was established in 2004. **From 1992 until 2004, RUFORUM** operated as a program of the Rockefeller Foundation. RUFORUM’s mandate is to oversee graduate training and networks of specialization in the Common Market for Eastern and Southern Africa (COMESA) countries. **Because** RUFORUM recognizes the important and largely unfulfilled role that universities play in contributing to the well being of small-scale farmers and economic development throughout sub-Saharan Africa, our mandate is to oversee graduate training and networks of specialization in the countries and universities where it works.⁹⁶ We strongly believe in fostering innovative and responsive research; high performing and proactive graduates; a dynamic platform for university

⁹² See Appendix 1.

⁹³ <http://www.aercafrica.org/home/index.asp>

⁹⁴ <http://www.alin.or.ke/>

⁹⁵ Publishing parameters are beyond the scope of my consultancy, but every resource that RUFORUM publishes should have a date and appropriate copyright information. Otherwise, it will be impossible to cite the publication appropriately and to know the license under which it is issued.

⁹⁶ Please note that I moved the sentence on the “important and largely unfulfilled role...”

networking; advocacy for agricultural higher education; and university transformation for relevance.

This goal of this website is to satisfy the needs of consortium members and visitors who are interested in African postgraduate training and research in the agricultural sciences. You will therefore find the following on the RUFORUM website:

- RUFORUM e-learning courses and Open Educational Resources (OER);
- RUFORUM institutional repository, which includes RUFORUM research and other relevant information about our activities
- Directory of agricultural training and research institutions in Africa⁹⁷
- Other information pertinent to African agricultural training and research

We aim for the RUFORUM website to become an essential resource for anyone interested in agricultural research and training in Africa.

4.2.2 Home page top banner



The home page also has a top banner, with four links—about us, programs, resources, and discussion forums. There is also a link to return the visitor to the RUFORUM home page. The four links are discussed below.

4.2.3 About us

The “about us” link includes information about RUFORUM, its governance structure, the countries and institutions where RUFORUM works, its staff, and a page to write a message to RUFORUM.



In the section on “who we are,” the visitor is asked to click on “read more” for additional information. But it is a dead link.

In addition, in the section on member universities, the 29 institutions are in alphabetical order.

Visitors must scan the whole list to discover that there are two network universities in Zimbabwe. I recommend that the list be divided by country in alphabetical order, with the universities listed inside each country. I also recommend that the list include information on which unit is responsible for RUFORUM. At Makerere University, for example, it is the College of Agricultural and Environmental Sciences. I would also link directly to the college’s independent website (<http://caes.mak.ac.ug/>) rather than to the Makerere home page, as is the case now. I realize that not every RUFORUM network member has a separate home page, of course. But you will see in appendix six on universities, that I have provided details specifically on the unit that collaborates with RUFORUM. Sometimes, however, that information is not available.

In the section on RUFORUM staff, the page gives the email address for almost every person on staff, including that of the Executive Director. As someone who is always searching for email addresses, I think that this policy is laudable. But I wonder whether the in-boxes of RUFORUM staff are overloaded

⁹⁷ This is the stakeholders’ directory with a new name. Although frequently used, the term “stakeholders’ directory” is imprecise. In addition, I am suggesting more than a directory, which is frequently as simple as name and contact information. Please go to section 5.4.

as a result. If not, I recommend that you maintain this practice. But if you are receiving too many irrelevant emails because staff emails are given so routinely, you may want to change this policy.

In addition, I suggest that RUFORUM eliminate the separate “contact us” page. You can simply include a sentence at the bottom of this page—“For further information or to contact RUFORUM staff, please email administration@ruforum.org.”⁹⁸ One person could be assigned the task of receiving these emails, responding to routine inquiries, and forwarding specific emails to the appropriate person within RUFORUM. I hesitate to assign Joan Apio an additional task, but she would be an excellent person to be responsible for this work. RUFORUM would also need to establish parameters concerning which messages can be answered in a routine fashion and which ones require the attention of senior staff.

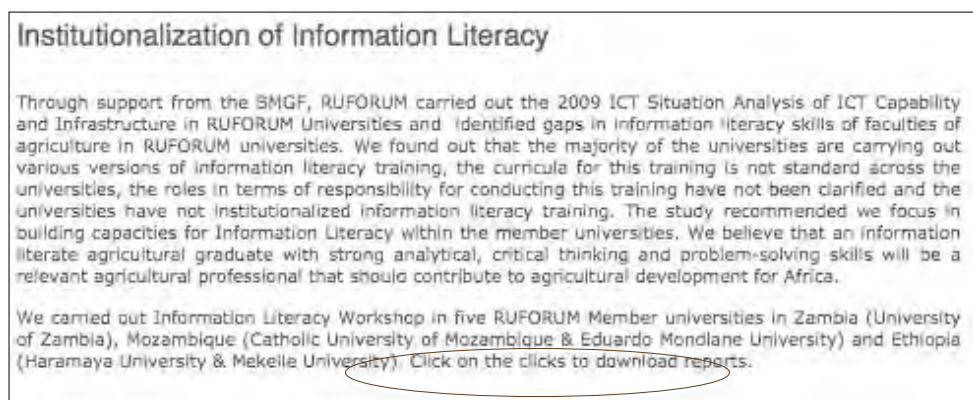


4.2.4 RUFORUM programs

There are seven RUFORUM programs, as indicated in the screen capture on the left; some of the links within these programs do not work. For monitoring and evaluation, there are four links—to monitoring and evaluation (M&E), M&E capacity, M&E findings, take the current survey, and a resource center. Only the last one works, but when one clicks on “resource center,” there are no resources.

>> M&E Capacity >> M&E Findings/Lessons >>Resource Center >> Take the Current Survey

Within the ICT section, there is a link to ICT at the World Bank, which is not a RUFORUM program. Instead, I suggest that RUFORUM include an entry for the World Bank *ICT in Agriculture Sourcebook*⁹⁹ in the institutional repository. The entry for the *Sourcebook* could also include a link to the World Bank ICT page.



For institutionalization of information literacy, which is a subsection of the ICT program, there are no links to reports. In addition, the phrasing is unclear. It would be useful to link to the RUFORUM ICT situation analysis, which is mentioned in the first paragraph.¹⁰⁰ The analysis would be in the repository,

of course.

There are four types of research grants—for graduate students, for the community action research program, for the field attachment program, and for institutional capacity building. Each type of grant has a separate page, but the “read more” link for each page is to the same document—a PDF file about the RUFORUM competitive grants system. It might be simpler to include all of the information about each of the four grants on one page, with a note at the bottom for “read more about the RUFORUM competitive grants system.” Also, there are typos in the text on institutional strengthening grants.

There is good information about the national forums on the page dedicated to them, but it would be useful to have more detailed discussion. For example, is there a specific term of office for

⁹⁸ I made up this email address. It could easily be some other configuration, such as secretary@ruforum.org.

⁹⁹ <http://www.ictinagriculture.org/ictinag/node/105>

¹⁰⁰ <http://www.ruforum.org/documents/ruforum-gap-analysis-2007>

representatives? Also, visitors might want to know the membership for each national forum. That would make a helpful addition to the page. Finally, in addition to the national forums, RUFORUM has discussion forums, which are discussed below. The use of the word “forum” to describe two different and dissimilar activities might confuse the visitor.

The general explanation of postgraduate programs on the page devoted to them is very good. It describes the programs in general and delineates the different MSc and PhD programs, together with the universities where they are taught. I noticed a number of technical and editing issues with the three links at the bottom of the page, however—the MSc, the PhD, and quality assurance for graduate training, as follows:

- For the MSc in plant breeding and seed systems, there is a typo in the heading. More significant, when the visitor clicks to obtain more information, one reaches Alice Candia’s blog. Ms. Candia is an administrative assistant for this program. The blog does not offer the kind of information a visitor who is not familiar with the program might want. The entries are also out-of-date. The last one is dated 3 October 2011. This link should be deleted.
- For the MSc in agricultural information and communications management (AIMS), there are links to the three universities that offer AIMS. But the links are to the university websites, not to the programs at Nairobi, Egerton, and Haramaya. RUFORUM should think about deleting these links unless there is an AIMS URL for any of them. It is important to remember that visitors are not necessarily interested in the university as a whole; rather, they want to know about AIMS at any of these three universities.
- For the MSc in research methods, the link to Jomo Kenyatta University of Science and Technology, where the degree is offered, is to a page on the JKUAT website that does not exist.
- For the PhD in agriculture and resource economics, the link to Bunda College of Agriculture is wrong.
- The link for the dry land resource management PhD is to the institution, not to the program at the University of Nairobi.¹⁰¹ The same is true for the soil and water management PhD at Sokoine University as is the link for plant breeding and biotechnology at Makerere. Since there are lengthy brochures at the bottom of the page about each program, I recommend that you delete the links that you have used for each university, with the exception of the University of Nairobi where there could be a link to the relevant program (footnote 101 on this page). For the Strengthening Agricultural and Rural Innovation Systems PhD, the link is to a description of the program, not to any of the hosting institutions.
- Including links to the PhD program descriptions is an excellent idea, but it would be more accurate to write something like “Click on the links below to read more about these programs” rather than “attached.” There is also a typo. It should be “agriculture and resource economics,” not “agriculture resource economics.”
- For quality assurance for graduate training, clicking on “read more takes you to the RUFORUM blog, which was last updated in February 2012. The blog also contains a description of the program. It would be better to edit down the information in this blog to write a separate page on the program. In that way, no one will say that the information is out-of-date.

¹⁰¹ I think that this would be a better URL: <http://larmat.uonbi.ac.ke/>.



and concluded projects are included on this page. Why not wait until there is something to load and a real link possible? I recommend revising this section in a major way.

4.2.5 RUFORUM resources



Because all of the documentation contained within the resources delineated in the screen capture at the left will be housed in the repository, it would be more appropriate to substitute the term “institutional repository” for “resources.” Rather than list these materials on the institutional repository tab, it would be better to link the visitor directly to the repository page. The repository welcome page will contain an introduction, search mechanisms, a help link, and a list of collections included in the repository, with links to each collection. Each collection will have a brief introduction.¹⁰⁵ I therefore recommend that RUFORUM rename and reorganize the resources mounted in this section.

In terms of RUFORUM’s current resources collection, as captured on the left, I noted incorrect links. The OER link takes the visitor to the PDF e-learning open access files, which are discussed in detail in section 4.3.

Clicking on “research platform” links to the SCARDA/SCAIN pages. RUFORUM case studies link to a page titled “Storylines.” Finally, links to online resources is a miscellany of organizational websites, only some of which are relevant to the RUFORUM mission. The pertinent ones could easily be incorporated into the stakeholders’ directory, which I have recommended calling the directory of agricultural training and research institutions in Africa.

¹⁰² African, Caribbean, Pacific group of states

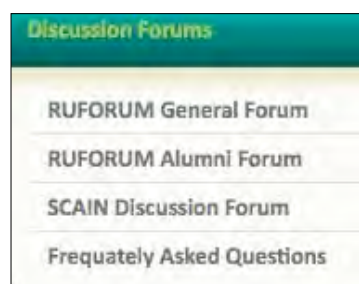
¹⁰³ Strengthening Capacity for Agricultural Research and Development in Africa/Strengthening Capacity for Agricultural Research for Innovation

¹⁰⁴ Water Capacity Building Network

¹⁰⁵ A list of suggested collections will be found in appendix one.

The directory would be second link listed in this tab and either replace discussion forums, which are discussed in 4.2.5 below, or constitute a third link.

4.2.6 Discussion forums



There are four discussions forums, as seen on the screen capture on the left. Each presents a different dilemma.

- The general forum does not appear active. It contains a brief introduction to RUFORUM and links to documents about RUFORUM objectives. All of these documents appear in other places on the website.
- In terms of the Alumni Forum—RUFORUM’s virtual intern, Carolyn Nandozi, has done an excellent job in monitoring and feeding into the alumni Face Book site and there are now 266 members (versus 126 when she started), but she noted in a presentation at the 2012 RUFORUM biennial

that more sustained work needs to be done.¹⁰⁶ (Issues pertaining to social network are discussed in section 4.6 below.) Within the RUFORUM Alumni Forum, there is a link to former students, which is to an appendix from the 2009 proposal to the Gates Foundation. It is interesting, but it would be more useful if the list were updated. Finally, this is a question of organization—but would the link to the RUFORUM alumni forum be better placed in the tab on postgraduate programs?

- The SCAIn discussion forum is not current.
- Frequently asked questions are helpful, but they are not a forum. I recommend placing the FAQ’s as a link from the RUFORUM home page.

For all of these reasons, I believe that the discussion forum tab can safely be eliminated.

4.2.7 Useful links



The RUFORUM website has a” useful links” section on the bottom of the page. I have some taxonomy and organizational questions—why are “Useful Links” necessary to the website? Why are these links more important or different from the various tabs on top of the page? Each of the links, except for Staff Webmail is already included or could be included in the top tabs. GEAR, Genstat, and the Green Book, for example, will be included in the institutional repository. The alumni facebook group can be placed elsewhere. The

RUFORUM project blog is not current. Visitors may not know what the “Moodle Platform” is. What does RUFORUM hope to achieve from the “Useful Links” section? What to keep from it, if anything, and how should these links be named and organized?

4.3 E-learning and OER

RUFORUM has links to both e-learning and OER on its website. As stated above, the links are in two places—one link to Moodle e-learning in useful links and one to OER resources through the resources tab. This is confusing. The Moodle link is password protected, so it is not OER. The OER link is to PDF files, which are also not OER in the true sense of the term. This is explained in detail below.

¹⁰⁶ Carolyn Nandozi, “Exploring the opportunities and challenges of virtual internship: an internship to manage RUFORUM social networks,” Power Point presentation given 26 September 2012.

4.3.1 Introduction to the site

The page should have an introduction. The description on the RUFORUM website is an excellent start. I have made some edits and additions, in **blue**:

E-learning and OER in RUFORUM universities

RUFORUM network universities have been involved in a number of initiatives whose aim is to digitize agricultural teaching materials and **to share as open educational resources. Although some of these e-learning resources are still restricted to lecturers and students at the universities where they were created. Others are OER—available to anyone to duplicate and adapt without requesting permission of the authors. The steps involved in this process include:**

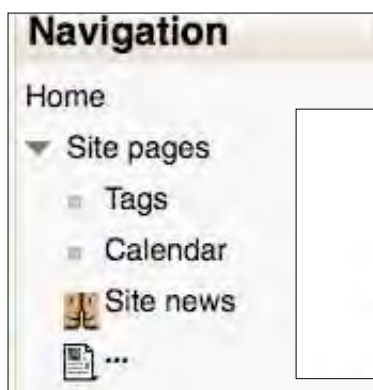
1. **With funding from** the Association of African Universities and **the** Bill & Melinda Gates Foundation, **RUFORUM has developed** e-content **for eight** MSc Agricultural Information & Communication Management courses and **five** PhD Aquaculture **and** Fisheries Science courses. Egerton University, Bunda College of Agriculture, Haramaya University and **the** University of Nairobi participated in this **activity**. A total of 169 topics have been developed and have gone through peer review.
2. Haramaya University, Moi University and Makerere University are **collaborating** in the AgShare **initiative being carried out by OER Africa and Michigan State University. This has** resulted in the development of a number of open educational resources in the areas of Agricultural Economics, Perspectives on Agricultural Extension and Dairy Production. **RUFORUM is also a partner in the second phase of AgShare. AgShare emphasizes engagement with** a wide range of stakeholders, **such as** NGOs, extension **workers, farming communities,** and other stakeholders in agricultural value chains. **The** -compilation of case studies **carried out by students and their supervisors** add value to teaching and learning. These case studies and other modules can be freely shared because they have been created as OERs.
3. Jomo Kenyatta University of Agriculture & Technology, Haramaya University, Mekelle University, University of Nairobi and Egerton University are engaged in a project to develop e-content for the MSc Research Methods and MSc Agricultural Information & Communication Management post-graduate programs. This initiative is funded from the Bill and Melinda Gates Foundation and to date a total of 57 topics have been digitized.

All content is peer reviewed. In addition to the OER and e-learning efforts described above, RUFORUM has also converted the e-learning courses into open access PDF files, which are free of charge and available for distribution without requesting permission.

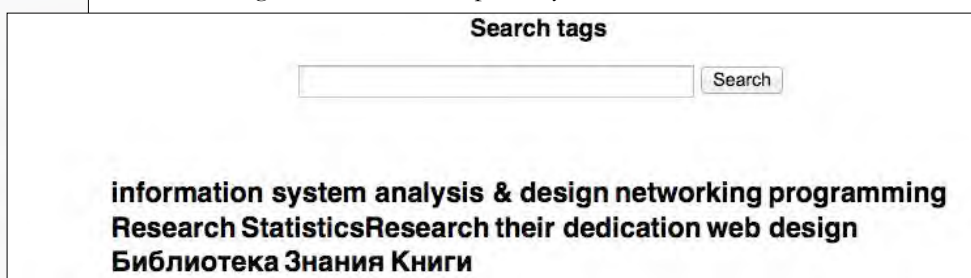
4.3.2 E-learning contents on the site

All the courses published on the RUFORUM platform are licensed under a Creative Commons Attribution-Noncommercial-Share Alike 3.0 Unported License.

The site currently contains both content that is restricted and log-in protected and open access, which is freely available. Visitors do not discover this until they attempt to access courses, upon which they are told that some will permit guest access and others do not. I checked every course in the Moodle tab, which is where the e-learning resources are located. Not one permitted guest access. It is confusing. To add to the confusion, RUFORUM uses a Creative Commons copyright statement for the Moodle courses. One wonders why RUFORUM mounted these courses on its website if they are not available to the visitor.



In addition, navigation within Moodle is convoluted and there is information on the site that is not current. I clicked on every navigation tab. The tag link for search tags was unclear and partially in Russian:



The search engine in search tags didn't work properly either. There was nothing in the calendar or in site news. When I clicked on the Word symbol in navigation, I was linked to an out of date page:

We hope to be able to showcase progress in this project by June 2011

The following courses are currently undergoing peer review:

Course	Post-graduate Regional Program	Implementing University/(ies)
Agricultural Knowledge Management	MSc Agricultural Information & Communication Management	Egerton University
Web Content Design and Management	MSc Agricultural Information & Communication Management	Egerton University
Farming Systems and Rural Livelihood	MSc Agricultural Information & Communication Management	Egerton University
Research Methods for AICM	MSc Agricultural Information & Communication Management	Egerton University
Communication for Innovation	MSc Agricultural Information & Communication Management	Egerton University
Statistical Methods in AICM	MSc Agricultural Information & Communication Management	Egerton University
Information Systems Analysis & Design	MSc Agricultural Information & Communication Management	Egerton University
Geo Informatics	MSc Agricultural Information & Communication Management	Egerton University
Aquaculture Nutrition & Feed Technology	PhD Aquaculture & Fisheries Science	Bunda College of Agriculture
Aquaculture & Fisheries Economics	PhD Aquaculture & Fisheries Science	Bunda College of Agriculture
Molecular Biology & Genetics	PhD Aquaculture & Fisheries Science	Bunda College of Agriculture
Aquaculture Production Systems & Engineering	PhD Aquaculture & Fisheries Science	Bunda College of Agriculture
Fish Bioenergetics	PhD Aquaculture & Fisheries Science	Bunda College of Agriculture

The following MSc AICM course has been developed under a project called AgShare - in which RUFORUM is a partner represented by Haramaya University:

1. Perspective of Agricultural Extension

Please watch this space.

Last modified: Friday, 25 February 2011, 10:10 AM

It is an excellent list and could be used in the e-learning/OER introduction, but it is only by accident or perseverance that the visitor will find it. In addition, the text on updating needs to be corrected, and note that it was last updated on 25 February 2011.

Although the e-learning resources are password protected, RUFORUM gave me access to some of them. I did not review all of the courses; nor am I a specialist in curriculum development and design. I would recommend that RUFORUM work with OER Africa on the curriculum components of the e-learning materials the consortium is creating. The aquaculture fisheries and science PhD is the only program for which there are courses and modules, and I went through a few of them. For Aquaculture and Fisheries Economics, AQF611 through topic six, I have the comments below. I did not look at the other modules in this course.

- The list of recommended teaching resources and readings relies primarily on monographs dating from 1989-2001. These may be classic monographs in the field, but unless they are in the library, they are expensive to purchase. I wonder whether it might not be useful to replace or supplement them with free resources that are more current, particularly those focused on Africa

and on Malawi. In addition, I found two links that don't work, another to a journal on cost-benefit analysis that requires a subscription, and a third to a 2004 paper that is not pertinent to the topic. The paper is titled "Benefit-Cost Analysis of Supermax Prisons: Critical Steps and Considerations." There is one link, however, that might be useful. It is to the website of the *Body of Knowledge Infrastructure Regulation* website of the Utility Research Center at the University of Florida. Although fully copyrighted, users are free to download and distribute the resources on this site for non-commercial purposes. Finally, I have a few suggestions in section 4.3.3 about Africa-focused resources that might be useful in order to give RUFORUM an idea of what I mean.

- I noted some inadvertent plagiarism. At least one of the definitions—the one for “linear programming” is taken directly from Wikipedia. Wikipedia carries a Creative Commons license, so it is permissible to quote in full its definition, but only with attribution and a link to the Wikipedia entry. More work should be done with RUFORUM lecturers to help them to understand the complex differences and similarities among freely available, open access, Creative Commons, and OER. They should also be familiar with fair use and attribution in creating OER. OER Africa ran into the same issues in the AgShare pilot project.¹⁰⁷
- Topic four contains one activity on fisheries in Malawi, but none of the readings are about Malawi, although I found at least one and I am certain that there are more. (See below.)

I looked at further reading and links for two other courses—Aquaculture Production, Systems, and Engineering, AQF622, and for Molecular Biology and Genetics. Like aquaculture fisheries and economics, I have some suggestions on how to enhance these components of the courses. These suggestions are below.

4.3.3 Freely available resources to supplement e-learning courses

Although I did not conduct a thorough scan for useful resources as I did for the AgShare pilot project, I conducted a few searches and have some ideas.¹⁰⁸

¹⁰⁷ OER Africa and the University of Michigan use a tool to manage the copyright clearance process called DScribe. Go to https://open.umich.edu/wiki/DScribe_Training for more information.


¹⁰⁸ See *AgShare resource guide freely available academic readings to supplement course modules*, Lisbeth Levey, March 2011, <http://www.ruforum.org/documents/agshare-resource-guide>

AFS 611: AQUACULTURE AND FISHERIES ECONOMICS

OER, AFS, Aquaculture, Fisheries, Economics

Course Description: Aquaculture and Fisheries Economics course imparts knowledge and skills that would enable students run their enterprises based on sound economic principles. For Fisheries and Aquaculture to contribute significantly to food security and poverty alleviation, there is need to pursue aquaculture and fisheries as business entities. This calls for students to have a clear understanding of the production and marketing concepts. An understanding of how effective and efficient production and marketing systems are run will help the stakeholders diagnose economic problems in fisheries and aquaculture for sound decision making.

Course Aim: To enable students develop a critical understanding

Licensing Condition: Creative Commons: Attribution 3.0 

Source: RUFORUM, Bunda College of Agriculture, Malawi
Author: Dr. George Matiya
Licence Condition: CC Attribution-NonCommercial-ShareAlike
Document Types: Facilitators Resources
 Learning Activities
 Lectures
 Modules
 Useful Resources
Date of Publication: 16/04/2012

Course is the same,
but different lecturer.


AQF 613: MOLECULAR BIOLOGY AND GENETICS

OER, AQF, Molecular Biology, Genetics

Course Aim: To enhance students' knowledge in genetic and molecular biology principles for application to aquaculture and fisheries.

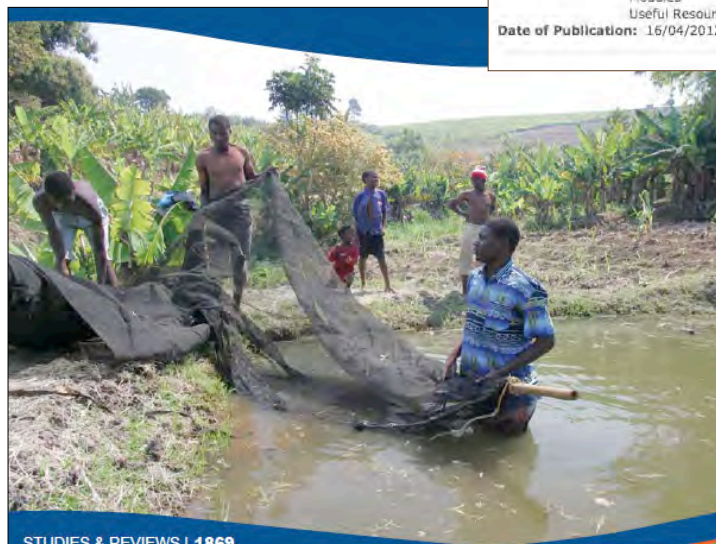
Course Objectives:
 By the end of the course students should be able to:

- Demonstrate an understanding of the importance of species and genetic diversity and how genetic diversity is measured.
- Discuss how selective breeding can be applied in aquaculture.
- Manipulate genetic structure of a fish for the improved aquaculture productivity.

Licensing Condition: Creative Commons: Attribution 3.0 


Source: RUFORUM, Bunda College of Agriculture, Malawi
Author: Dr. Daud Kassam
Licence Condition: CC Attribution-NonCommercial-ShareAlike
Document Types: Facilitators Resources
 Learning Activities
 Lectures
 Modules
 Useful Resources
Date of Publication: 16/04/2012

Same course. Same lecturer.
Same teaching materials?



STUDIES & REVIEWS | 1869

**Recommendation Domains for Pond Aquaculture
 Country Case Study:
 Development and Status of
 Freshwater Aquaculture
 in Malawi**


 WorldFish
 CENTER

When I checked the PDF files, I saw considerable overlap with the password-protected courses in the aquiculture PhD. In addition to APS 611, shown on the left, the remaining PDFs parallel the e-learning PhD courses. AFS 611 is the only one for which the lecturers are not the same. To what extent can these resources be used in the e-learning courses already prepared? Should lecturers suggest that students use these PDFs as supplemental reading? The remaining PDF materials on the OER are discussed in 4.3.4.

As stated above, I noticed that the courses in general recommend resources that are not necessarily about Malawi, in particular, or about Africa, in general. I thought it would be useful to search for aquaculture resources, specifically for Malawi. I conducted a Google search on the keywords “aquaculture fisheries economics Malawi” and pulled up numerous citations, including a 2008 country case study on aquaculture in Malawi, written for the World Fish Institute, which might be useful.¹⁰⁹

¹⁰⁹ http://www.worldfishcenter.org/resource_centre/WF_1104.pdf

I could have searched more broadly by geographic region—southern Africa or sub-Saharan Africa instead of Malawi, for example—or by breed of fish. There are many search permutations that I could have used. The point is that there are freely available, timely, and relevant materials available on the Internet to supplement textbooks and lecture materials.¹¹⁰

More generally on aquaculture, but focused on the developing world, FAO carried out an assessment on the contribution of commercial aquaculture to economic growth, poverty alleviation, and food security, and published the results online in 2008. *Commercial aquaculture and economic growth, poverty alleviation and food security* is available online as a PDF file.¹¹¹

Chapter 5	OPEN ACCESS
Validation of Endogenous Reference Genes for qPCR Quantification of Muscle Transcripts in Atlantic Cod Subjected to Different Photoperiod Regimes	
by Kazue Nagasawa, Carlo Lazado and Jorge M. O. Fernandes	
Chapter 6	OPEN ACCESS
Determination of Fish Origin by Using 16S rDNA Fingerprinting of Microbial Communities by PCR-DGGE: An Application on Fish From Different Tropical Origins	
by Didier Montet, Doan Duy Le Nguyen and Amenan Clementine Kouakou	
Chapter 7	OPEN ACCESS
Mitochondrial DNA Variation as a Tool for Systematic Status Clarification of Commercial Species – The Case of Two High Commercial Flexopecten Forms in the Aegean Sea	
by Anastasia Imsiridou, Nikoleta Karaiskou, Elena Aggelidou, Vassilios Katsares and Sofia Galinou-Mitsoudi	
Chapter 8	OPEN ACCESS
Genomics and Genome Sequencing: Benefits for Finfish Aquaculture	
by Nicole L. Quinn, Alejandro P. Gutierrez, Ben F. Koop and William S. Davidson	

InTech, an open access textbook organization that uses Creative Commons licenses, has published a text titled *Aquaculture* (screen capture to the left). It teaches about a large variety of aquaculture related topics, including microbiology and genetics as they pertain to aquaculture. Part two of the book, chapters five-eight, is on aquaculture genetics. It would be worth skimming the entire table of contents to ascertain relevance as a recommended reading.¹¹²

UNIT 4: Basis of Molecular Biology
Module 9: DNA and RNA
(Available Practice)
Module 10: DNA Replication
(Available Practice)
Module 11: DNA Transcription
(Available Practice)
Module 12: RNA Translation-Protein Synthesis
(Available Practice)

The OER modern biology course at Carnegie Mellon University might also be relevant for the molecular biology and genetics course within the aquaculture PhD, although it is not focused specifically on aquaculture. The Carnegie Mellon resources have a number of pertinent modules, including one on molecular biology.

¹¹⁰ I realize that this is a regional program and that it might be useful to conduct the same exercise for the other participating countries. But the resources on the RUFORUM website were prepared at Bunda College of Agriculture in Malawi. I, therefore, decided to focus on Malawi.

¹¹¹ <http://www.fao.org/docrep/012/i0974e/i0974e00.htm>

¹¹² <http://www.intechopen.com/books/aquaculture>

Environmental and Natural Resource Economics: A Contemporary Approach, Second Edition (2006)



FULL TEXT Now Available Online

Instructors: [Contact us](#) for instructor resources and teaching materials, including UPDATED Power Point slides for 2011.

Students: [Click here](#) for access to chapter review questions and web-based exercises.

I also saw that the aquaculture course relies heavily on microeconomics, value chain research, and that one of the recommended teaching resources is a 1999 volume on resource economics. When I carried out several Google searches, I found a number of freely available resources that might be as or more useful. Bear in mind that not all of them bear a Creative Commons license.

Principles of Microeconomics, v. 2.0

by Libby Rittenberg and Timothy Tregarthen

[Buy This Book](#)

[READ](#)

[STUDY](#)

Table of Contents

[Chapter 1: Economics: The Study of Choice](#)

[Chapter 2: Confronting Scarcity: Choices in Production](#)

[Chapter 3: Demand and Supply](#)

[Chapter 4: Applications of Demand and Supply](#)

[Chapter 5: Elasticity: A Measure of Response](#)

[Chapter 6: Markets, Maximizers, and Efficiency](#)

[Chapter 7: The Analysis of Consumer Choice](#)

[Chapter 8: Production and Cost](#)

[Chapter 9: Competitive Markets for Goods and Services](#)

[Chapter 10: Monopoly](#)

[Chapter 11: The World of Imperfect Competition](#)

[Chapter 12: Wages and Employment in Perfect Competition](#)

[Chapter 13: Interest Rates and the Markets for Capital and Natural Resources](#)

[Chapter 14: Imperfectly Competitive Markets for Factors of Production](#)

[Chapter 15: Public Finance and Public Choice](#)

[Chapter 16: Antitrust Policy and Business Regulation](#)

[Chapter 17: International Trade](#)

[Chapter 18: The Economics of the Environment](#)

In addition to the environmental and resource economics text published by Tufts University and shown above,¹¹³ Flat World Knowledge has published a number of textbooks on micro and also macroeconomics.¹¹⁴ Flat World textbooks bear a Creative Commons license, but they are no longer free. Effective 1 January 2013, it will no longer be possible to read textbooks online at no cost. Students will have to pay \$19.95 for downloading and printing. This price also includes access to interactive study aids. As another possibility, I have seen nothing in the license to prevent universities from purchasing one copy for the entire institution and permit downloading, but RUFORUM would need to check.

In general, however, it will not be easy to locate supplementary readings that are pertinent to the entire course without a thorough search, topic by topic..

4.3.4 OER on the site

There is a link to OER from the resources tab. There are nine courses listed here. By clicking on the course name, which is outlined in white on a green bar, the visitor is linked to a PDF file. All of these resources have a Creative Commons attribution 3.0 license.¹¹⁵ It is important to note, however, that a PDF file is almost impossible to adapt, although it can be distributed. An open educational resource classification permits free sharing and **re-purposing** by others. Instead, I would call these resources open access. In an email exchange with Neil Butcher, he suggested that a Creative Commons Attribution-NonCommercial-NoDerivatives license, which does not permit adaptation, might be more appropriate for instances in which open access is applied.¹¹⁶ This license could also be used for the resources in the RUFORUM institutional repository.

Another issue pertains to explanations. Visitors who have access to the e-learning resources may not understand why some of the PDFs duplicate the e-learning password protected courses, discussed above. Clarification would help.

This part of the site also has five PDFs for the AICM postgraduate degree at Egerton University, a regional program that is taught at several other universities in the RUFORUM network. I didn't review any of the courses carefully, but I did note that some of the readings suffer the same problems I encountered in the e-learning courses—Not all readings appear current, many of them are not free; and I noticed a paucity of supplemental readings about Africa. I did not

¹¹³ ¹¹³ http://www.ase.tufts.edu/gdae/publications/textbooks/env_nat_res_economics.html

¹¹⁴ <http://catalog.flatworldknowledge.com/catalog/disciplines/9/titles?sort=discipline>

¹¹⁵ Go to <http://creativecommons.org/licenses/by/3.0/> for a description of this license.

¹¹⁶ Email exchange with Neil Butcher, 8 November 2012. Go to <http://creativecommons.org/licenses/by-nc-nd/2.0/> for more information on this license.

conduct thorough searches. I lacked the time and it was beyond my remit. But the following points might be helpful:

- The World Bank published an excellent ICT in agriculture sourcebook that might be relevant to the entire AICM program. It is freely available online in html and PDF format. The World Bank recently adopted an open access policy for all of its publications.¹¹⁷ This publication would be pertinent to a number of AICM courses.
- For the knowledge management course, which is very theoretical, I think it would be good to have readings about agricultural knowledge management, particularly in developing regions of the world, such as Africa. I found a number of resources freely available online, including journal literature:
 - “Knowledge management for agricultural innovation: lessons from networking efforts in the Bolivian Agricultural Technology System,” Frank Hartwich, Mario Monge Pérez, Luis Ampuero Ramos and José Luis Soto, *Knowledge Management for Information Journal*, 3(2): 21-37.¹¹⁸
 - Peter Ballantyne, head of information management at ILRI (International Livestock Research Institute) was lead author on a paper in 2000 titled “Information and Knowledge Management: Challenges for Capacity Builders,” which might be relevant as supplementary reading.¹¹⁹
 - Ingie Hovland wrote an excellent briefing paper, published in August 2003, assessing the status of knowledge management for development research and practice, which is also an annotated bibliography. It looks to be a very good overview.¹²⁰ This paper is part of the ODI (Overseas Development Institute) program on research communications and knowledge management. The website might be worth consulting.¹²¹
- For AICM research statistical methods, the reference list is for books that must be purchased. Unless they are in the library, students or the university must buy them. There are two links to websites—one to StatSoft online; I am not certain what the students are meant to do there. It looks like a commercial site. The second link, however, is quite useful. It is to freely available textbooks for learning statistics; there is one link specifically for Africa, which was partially funded by RUFORUM and bears a Creative Commons license. For additional materials, ILRI has a website on biometrics and research methods learning resources. It contains teaching guides, case studies, a subject index, links to software, publications, websites, and more.¹²²
- For the geo-informatics course, the practical exam is based on a 1998 publication, *Getting to Know ArcView GIS*. I do not know whether it is in the university library, but it no longer appears to be in print. None of the references are free; all but one was published before the year 2000. The online geographic information systems (GIS) bookstores to which the students are referred are commercial; but one of them—the Environmental Sciences Research Institute (ESRI) does offer some free online training in how to use ARC, which is a GIS software package that it sells.¹²³ After a brief search, I found a few freely available resources on GIS. One is an open textbook called GIS Commons produced by Michael Schmandt of Sacramento State University.¹²⁴ Flat World Knowledge also published a GIS textbook, *Essentials of Geographic Information Systems*.¹²⁵

¹¹⁷ <http://www.ictinagriculture.org/ictinag/sourcebook/ict-agriculture-sourcebook>

¹¹⁸ <http://journal.km4dev.org/index.php/km4dj/article/view/106/174>

¹¹⁹ http://ilri.academia.edu/PeterBallantyne/Papers/200656/Information_and_Knowledge_Management_Challenges_for_Capacity_Builders

¹²⁰ <http://www.odi.org.uk/resources/docs/170.pdf>

¹²¹ <http://www.odi.org.uk/work/programmes/rapid/topics/details.asp?id=662&title=research-communications-knowledge-management>

¹²² <http://www.ilri.org/biometrics/default.htm>

¹²³ <http://training.esri.com/gateway/index.cfm?fa=search.results&cannedsearch=2>

¹²⁴ <http://giscommons.org/>

¹²⁵ <http://students.flatworldknowledge.com/course/book/705>

For African specific information, students might want to browse the ILRI GIS page.¹²⁶ The African Soils Information Service is another website that might be pertinent in demonstrating the real-life power of mapping for policy formulation and research.¹²⁷ I have a final comment or query about the GIS course—would it be useful to refer students to open source GIS software? If so, I did a fast Google search and found an annotated list and definitions for open source and freeware GIS software applications.¹²⁸ A subject specialist would need to do a better search and evaluation which software is most appropriate for the AICM students.

I decided, however, to browse more carefully through the reference list and links to websites for Prof. Bebe's course on research methods for AICM, and I was glad that I did. Although meant specifically for AICM, I thought that a course on research methods might have more general applicability across the RUFORUM spectrum. I do have a few comments and suggestions, based on my brief look.

- I was pleased to see that Prof. Bebe refers students to the Graduate Environmental and Agricultural Research (GEAR) resources on the RUFORUM website. Considering limited Internet access in many AICM universities, however, it would be good if he were to give the direct link to GEAR rather than to the general RUFORUM website. The same is true for all the other websites he lists. In terms of specific resources to supplement his very detailed course notes, Prof. Bebe might want to consider the following:
 - A paper by Peter Ballantyne, now of ILRI: "Investing in Agricultural Development: Information, Knowledge and Communication—the 'Fertilizers of Future Research Harvests,'" written in 2007 for the Global Forum on Agriculture Research. This paper might be relevant to the knowledge management course, as well.¹²⁹ In addition, the ILRI website on biometrics and research methods learning resources referred to above, might be useful.
 - The *Research Methods Knowledge Base* is a comprehensive web-based textbook that addresses all of the topics in a typical introductory undergraduate or graduate course in social research methods. It covers the entire research process including: formulating research questions; sampling (probability and nonprobability); measurement (surveys, scaling, qualitative, unobtrusive); research design (experimental and quasi-experimental); data analysis; and, writing the research paper. It is freely available online; print copies must be purchased¹³⁰.
 - "Agricultural knowledge and information systems in Kenya—implications for technology dissemination and development," a 20-page paper written for the UK Department of International Development's (DFID) agricultural research and extension network in 2000.¹³¹
 - "Information and communication technologies and agricultural development in sub-Saharan Africa: transformation and employment generation," Julian May, Joseph Karugia and Mimi Ndokweni, a paper for the African Economic Research Consortium (AERC), 2007.¹³²
 - "A methodology for tracking the "fate" of technological interventions in agriculture," Laura German, Jeremias Mowo, and Margaret Kingamkono, *Agriculture and Human Values*, 2006.¹³³
 - *New Research on Knowledge Management Models and Methods*, Edited by Huei-Tse Hou, 2012. This is an In-Tech freely available text, published with a Creative Commons license. But it is very

¹²⁶ <http://192.156.137.110/gis/>

¹²⁷ <http://www.africasoils.net/>

¹²⁸ <http://gislounge.com/open-source-gis-applications/>

¹²⁹ http://www.fao.org/docs/eims/upload/261831/GFAR_paper_Ballantyne_InvestinginARD_Information-knowledge-Fertilizers.pdf

¹³⁰ <http://www.socialresearchmethods.net/kb/>. Click on "table of contents" in the left-hand column for hyperlinks to each section of the book.

¹³¹ http://www.odi.org.uk/work/projects/agren/papers/agrenpaper_107.pdf.

¹³²

http://www.aercafrica.org/documents/ict_project_working_papers/mayet_al_ictagriculturaldevelopmentinssa.pdf

¹³³ <http://www.worldagroforestry.org/downloads/publications/pdfs/ja06277.pdf>

theoretical. Its focus is on the exploration of methods and models, covering the innovations of all knowledge management models and methods as well as deeper discussion.

- *Improving Agricultural Knowledge and Information Systems*, a conference proceedings volume published by the Organization for Economic Cooperation and Development (OECD), 2012. There are developing-country case studies included in the volume.¹³⁴

Above are just a few examples. If there is interest and time permits, RUFORUM might think about sourcing freely available resources from the Internet that meet the needs of its course *syllabi* as a whole (or in part, as a pilot). This suggestion is equally appropriate for those who plan to create OER in the future. It is also something that might be of relevance to AgShare in its next phase. Equally important, not all of these suggestions will be pertinent to the RUFORUM AICM or other courses. It is therefore essential that teaching staff and students learn how to conduct their own targeted searches for pertinent literature.

4.4 RUFORUM stakeholders' directory

RUFORUM Stakeholder Directory

The directory of stakeholders provides information on individuals, organizations among them education networks and universities. The purpose of the directory will be to ensure easy access to information on higher education entities not only in sub-Saharan Africa but also other regions in Africa and the rest of the world.

You can use the directory to Search for Individuals and Organisations or browse a listing by type and country.

Should you wish to update the current information on the database please send us an email.

If you would like to submit a individual or organisation to the directory, please log in and click on either the "Submit a stakeholder individual" or Submit a stakeholder organisation".

We hope that the directory will facilitate sharing and lesson learning amongst universities, improving networking and linking universities to development processes and policy making. The development of the RUFORUM stakeholder directory is supported by the Association of African Universities.

Organisations By Type

- Association (28)
- Bi-lateral/Multilateral Agency (19)
- College (7)
- Donor Agency/Foundation (8)
- Non-Governmental Organisation (12)
- Research Agency/Institute (32)
- University (49)
- University Faculty (10)

Organisations By Country

- Australia (1)
- Botswana (4)
- Burundi (1)
- Canada (2)
- Congo (2)
- Ethiopia (7)
- France (2)
- Ghana (7)
- Israel (1)
- Italy (6)
- Kenya (17)
- Lesotho (1)
- Liberia (1)
- Malawi (4)
- Mozambique (2)
- Namibia (1)
- Netherlands (2)
- Nigeria (3)
- Norway (1)
- Philippines (1)
- Rwanda (1)
- South Africa (39)
- Sudan (3)
- Swaziland (2)
- Sweden (1)
- Switzerland (1)
- Tanzania (8)
- Tunisia (3)
- Uganda (16)
- United Kingdom (3)
- United States (12)
- Zambia (5)
- Zimbabwe (5)

Individuals By Country

- Botswana (2)
- Burundi (2)
- Congo (4)
- Ethiopia (6)
- Kenya (26)
- Lesotho (2)
- Malawi (5)
- Mozambique (5)
- Rwanda (2)
- South Africa (1)
- Sudan (4)
- Swaziland (2)
- Tanzania (7)
- Uganda (54)
- Zambia (3)
- Zimbabwe (6)

4.4.1 Name, focus, and introduction to the page

As indicated above, I recommend changing the name of the RUFORUM stakeholders' directory. I have done this because the term "stakeholder" in this context is so imprecise. Are these organizations and institutions stakeholders within RUFORUM or *vice-versa*? In some instances, it is neither. I would recommend that the name be changed to "Directory of institutions and networks relevant to African agricultural training and research." This is the mission of the website and should be the focus of the directory. It's not as catchy, perhaps, but it is more precise.

On the next page is the directory introduction, with my recommended edits and additions in blue. Please note that the revised introduction narrows the focus of the directory to "information on relevant research institutions, universities, networks, and other organizations." This tightens the categories of entries and also the countries included in the directory. I further suggest that RUFORUM delete the names and links to individuals because this information is not always available or accurate. Moreover, it would be difficult to keep this component of the directory current. As a final suggestion, I recommend that RUFORUM not allow visitors to add organizations to the directory themselves. Instead, RUFORUM ICT staff can approve all additions, thus giving RUFORUM complete programmatic and editorial control over the website.

¹³⁴ http://www.oecd-ilibrary.org/agriculture-and-food/improving-agricultural-knowledge-and-innovation-systems_9789264167445-en

RUFORUM DIRECTORY OF INSTITUTIONS AND NETWORKS RELEVANT TO AFRICAN AGRICULTURAL TRAINING AND RESEARCH

The Association of African Universities (AAU) supported the development of this directory. Because RUFORUM's mission and the focus of this website is to improve agricultural research and postgraduate training in Africa, this directory was created to provide you with information on relevant research institutions, universities, networks, and other organizations engaged in these topics. You can search by country or for a specific organization. It is also possible to browse by type of organization or by country. The sections included in this directory are:

- Donors
- Nongovernmental organizations, associations and networks
- Trade associations, and commodity exchanges
- Universities
- Open data and research institutes or organizations
- African open access journals in the agricultural sciences

If you browse the directory, you will see that some organizations carry out multiple functions. It is for this reason that we recommend that you conduct a keyword search. Some entries have multiple keywords. Finally, our goal is to make this directory an essential resource for anyone interested in agricultural research and postgraduate training in Africa. Please email RUFORUM if you would like to add an organization to the directory.

4.4.2 Type of information contained in each entry

The Aquaculture Association of Southern Africa

Organisational Profile

Organisation Acronym: AASA
Organisation Type: Association
Description:
The Aquaculture Association of Southern Africa (AASA) was established in the late 1980's in order to represent the interest of the then fledgling aquaculture industry in Southern Africa. The Association has since developed into a structure with representation from the various sectors contributing towards the aquaculture industry of the region, including marine species such as oysters, mussels, abalone and prawns; freshwater species such as trout, catfish, tilapia, ornamental fishes; as well as service providers such as feed companies, equipment suppliers and veterinary services.

Contact Information

Primary Contact Number Area Code: +27 12
Primary Contact Number: 807 6720
Fax Number Area Code: +27 12
Fax Number: 807 4946
Primary Email Address: info@aasa-aqua.co.za
Website Address: <http://www.aasa-aqua.co.za/>

Physical Address Information

Country: South Africa
City: Pretoria
Address: The Willows
Code: 0041

Postal Address Information

Country: South Africa
City: Pretoria
Address: Pretoria
Code: 0041

Currently, each entry contains the information you see in the screen capture on the left. I think that many of the details are superfluous—they are frequently unavailable or change. I would list the organization's URL, but that is all. The Forum for Agricultural Research in Africa (FARA) partners' page follows this practice,¹³⁵ as do AERC on its links page¹³⁶ and ILRI on its partners' page.¹³⁷ Such a practice would make it simpler for RUFORUM ICT staff to keep the directory current and accurate.

4.4.3 Organization by type

There are numerous listings in the directory. Some are relevant, but many are not. Sections 4.4.4-4.4.7 of this chapter explain the rationale behind my reasoning for additions, deletions, and revisions. Appendices three through eight provide specific details for each category that I propose to include in the directory, including which organizations I recommend keeping, adding, or

deleting. Each entry is accompanied by a description of its specific activities in the areas of African agricultural research and training. You will also see that I have recommended adding two entirely new sections—trade associations and commodity exchanges and African open access journals in the agricultural sciences. I have also proposed including networks and open data in already existing categories.

¹³⁵ <http://www.fara-africa.org/partners/>

¹³⁶ <http://www.aercafrica.org/html/links.asp>

¹³⁷ <http://www.ilri.org/Partners>

4.4.4 Bilateral/multilateral agency and donor agency/foundation

International Fund for Agricultural Development

Organisational Profile

Organisation Acronym: IFAD
Organisation Type: Bi-lateral/Multilateral Agency
Description:
The International Fund for Agricultural Development (IFAD), a specialized agency of the United Nations, was established as an international financial institution in 1977 as one of the major outcomes of the 1974 World Food Conference. The Conference was organized in response to the food crises of the early 1970s that primarily affected the Sahelian countries of Africa. The conference resolved that "an International Fund for Agricultural Development should be established immediately to finance agricultural development projects primarily for food production in the developing countries". One of the most important insights emerging from the conference was that the causes of food insecurity and famine were not so much failures in food production, but structural problems relating to poverty and to the fact that the majority of the developing world's poor populations were concentrated in rural areas.

Contact Information

Primary Contact Number Area Code: +26 51
Primary Contact Number: 277 264
Fax Number Area Code: +26 51
Fax Number: 127 7281
Primary Email Address: ifad@ifad.org
Secondary Email Address: s.khalila@ifad.org
Website Address: http://www.ifad.org/

Physical Address Information

Country: Malawi
City: Lilongwe
Address: c/o Bunda College of Agriculture

Postal Address Information

Country: Malawi
City: Lilongwe
Address: c/o Bunda College of Agriculture P.O. Box 219

Print Bi-lateral/Multilateral Agency Italy

There are 27 listings in these two categories. As a start, the logic differentiating each one is fuzzy. Many of the bilateral and multilateral agencies are funders, although some are not. The International Fund For Agricultural Development (IFAD), for example, is a donor but is included as a bilateral/multilateral agency. What is the reason for separating out different kinds of funders? I recommend combining both categories into one, which I have called “donors.”¹³⁸ Any pertinent agencies that are not donors can be moved into a different section. In addition, the information for some entries is incorrect. IFAD is physically located in Rome, not at Bunda College of Agriculture. IFAD has several offices in Africa, including in Malawi. It would be more precise to add some text to the IFAD description about where IFAD headquarters are located and about country offices in Africa. Visitors could be referred to “contact information” on the IFAD website for details on each country office. This is one of many reasons why physical addresses are not helpful.

In terms of donors, I would delete some of them. Shuttleworth Foundation, for example, does not

support projects in agricultural postgraduate training and research, and works exclusively in South Africa. It does not belong in the directory. For the ones that remain, such as the Bill and Melinda Gates Foundation, I would add text to explain what the foundation funds in agriculture so that visitors will have more precise information on the areas of interest to the RUFORUM network. I would also add foundations that have a major focus on agriculture, such as the Centre for Agricultural and Rural Cooperation (CTA).

4.4.5 Non-governmental organizations

Women of Uganda Network

Organisational Profile

Organisation Acronym: WOUGHNET
Organisation Type: Non-Governmental Organisation
Description:
Women of Uganda Network (WOUGHNET) is a non-governmental organisation initiated in May 2000 by several women's organisations in Uganda to develop the use of information and communication technologies (ICTs) among women as tools to share information and address issues collectively. WOUGHNET's mission is to promote and support the use of ICTs by women and women organisations in Uganda, so that they can take advantage of the opportunities presented by ICTs in order to effectively address national and local problems of sustainable development. The new ICTs, in particular, email and the Internet facilitate communication with each other and the international community. Indeed, access to information about best practices, appropriate technologies, ideas and problems of other groups working on similar concerns have been identified as critical information and communication needs of women organisations in Africa.

Where is agriculture mentioned?

There are 12 nongovernmental organizations (NGO) listed in the directory, most of which do not appear directly relevant to the RUFORUM mission, such as the African Quality Assurance Network and the Inter-University Council for East Africa (IUCEA). At the same time, NGOs, which are pertinent to the RUFORUM mission, are not included, for instance the Arid Lands Information Network (ALIN). In addition, the explanatory text

about those African NGOs that do work in agriculture does not always reflect this, which is the case for the listing of the Women of Uganda Network (WOUGHNET). A fourth issue relates to the difficulty in differentiating between associations and NGOs. Rather than have separate categories, I would combine the two. Finally there are important organizations that are not listed in the stakeholders' directory and that don't fit easily into any of its categories. Where would AGRA belong, for example? What about the African Network for Agriculture, Agroforestry and Natural Resources Education (ANAFE)? It is a network, but there is no separate category for networks. I would therefore create a new designation—

¹³⁸ See appendix three.

associations, organizations, and networks, which would combine associations and NGOs and add networks.¹³⁹

4.4.6 University and university faculty

There are 49 entries in the category on universities and another ten for university faculty. I would argue that it is not RUFORUM's role to list every university in sub-Saharan Africa; the AAU has an excellent directory on its home page.¹⁴⁰ My introduction to the universities section refers visitors to the AAU and other pertinent organization, such as SARUA and IUCEA. In any case, 16 of those listed are South African, where RUFORUM does not work. Moreover, the links are to the university website rather than to the home page of the college, school, or faculty of agriculture. In several instances—Makerere is one—there is a home page for the College of Agricultural and Environmental Sciences¹⁴¹ and a separate URL for the School of Agricultural Sciences, which is located within the college.¹⁴² The list of university faculty is an attempt to provide information on the specific faculty, school, or college within which RUFORUM works. There are only ten entries, although RUFORUM now has 29 participating institutions. In addition, some entries appear incomplete. Instead of aiming for inclusivity, which has not been obtained in any case, and would be difficult to keep current, I recommend that RUFORUM focus on the institutions and countries within the consortium. In appendix six, I have therefore done four things—I have only included RUFORUM network universities; I have eliminated the separate category for faculty; I have given a more precise URL, if available; and my description concentrates on agriculture.

4.4.7 Research Agency/Institute

I have added open data to this component of the directory. I therefore suggest that it be called open data and research organizations.¹⁴³ There are 32 listings for this category, as it stands now. Many are for European organizations that work with Africa, but their overall mission is not Africa. Nor are they research organizations *per se*, such as the University of Greenwich. There are also organizations listed that do not conduct research, for example the International Plant Protection Convention. As for the centers affiliated to the Consultative Group for International Agricultural Research (CGIAR), some are listed, but all are not, among them the International Food Policy Research Institute (IFPRI), the International Center for Tropical Agriculture (CIAT), and the International Maize and Wheat Improvement Center (CIMMYT). But CIAT works on crops pertinent to Africa—cassava—and CIMMYT is responsible for research on maize. Instead, I have given an overall listing for the CGIAR, with a list of each member of the consortium together with its URL. If RUFORUM would like to do so, we can include a separate entry for each center; if so, I recommend that all be included.

4.5 Multimedia

I have already commented on RUFORUM's use of Power Point files in section 4.2. When I visited the site in December, I was pleased to see that RUFORUM has also begun to mount YouTube videos. I have a few comments, however, which I hope will make RUFORUM's utilization of video implemented more appropriately to meet the needs of its constituency.

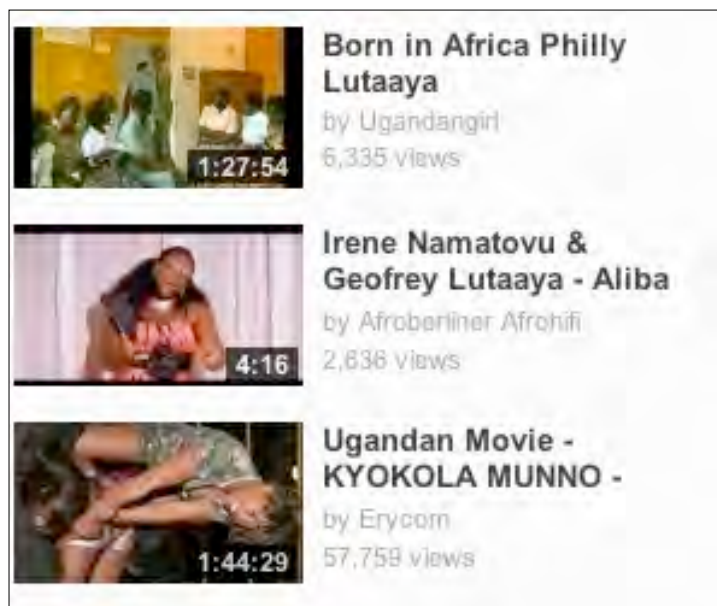
¹³⁹ See appendix seven

¹⁴⁰ <http://www.aau.org/membership/fullmembers.php>

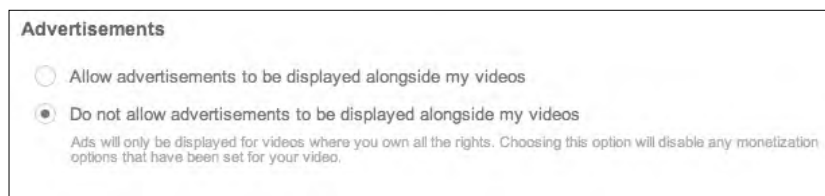
¹⁴¹ <http://caes.mak.ac.ug/>

¹⁴² <http://agric.mak.ac.ug/>

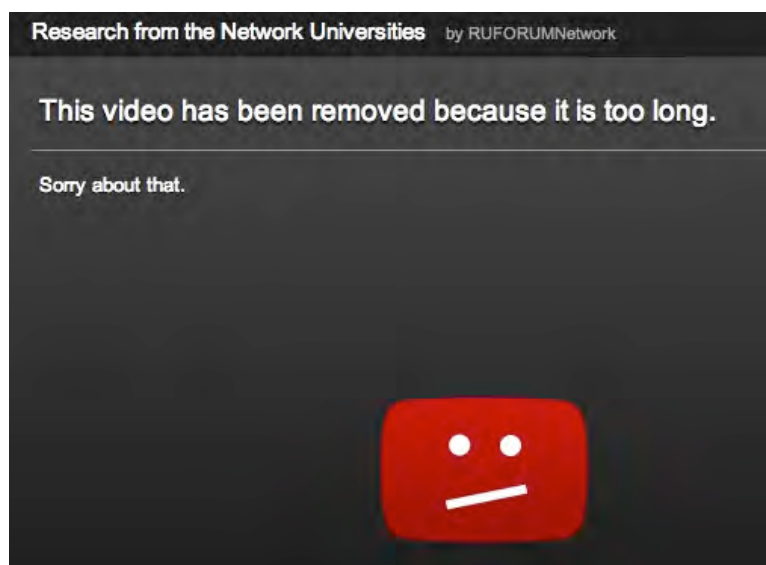
¹⁴³ See appendix seven.



Google and, by extension YouTube, make their services available to earn advertising dollars. Organizations using YouTube should be careful not to permit extraneous advertising or promotions on their channel. Privacy, security, and sharing are serious issues when using YouTube.¹⁴⁴ When I clicked on the “Thema’s Journey” video, for example, I saw that there were several promotions for other videos selected by Google. Three of them will be found in the screen capture on the left. I saw similar promotions on the other RUFORUM videos. The CIMMYT YouTube channel, for example, does not have advertisements.¹⁴⁵



It would be easy for RUFORUM to change its account settings to disable advertisements. In the overview section, you will find advertising options, as pictured in the screen capture to the left. The default is to allow advertising, but select the second option to disallow it.



I then noted a problem with the second video on research from the network universities—it is too long for inclusion in YouTube. On the other hand, the Brazilian presentation from the 2012 biennial was split into several segments, and I am not certain why this was not done for the video on research in network universities.

As a final comment, I recommend that all video descriptions refer specifically to their relevance to RUFORUM. This was not the case for “Thema’s Journey.” Visitors are left wondering why this video was included on the RUFORUM channel. It’s good that the multimedia collection is still small, so that it will be easy to make revisions. But I look forward to seeing it grow. These videos could be very useful in creating and using the RUFORUM OER materials.



4.6 Social Networking

RUFORUM has links to six social networking services—Facebook, Twitter, Linked In, YouTube, the RUFORUM blog, and Flickr. I’ve already commented in section 4.5 on YouTube. None of these sites

¹⁴⁴ This is also the case for Facebook.

¹⁴⁵ <http://www.youtube.com/user/CIMMYTint>

has attracted much attention yet, with the exception of the alumni Facebook page. Twitter is not very active and only has 151 “followers;” and neither the RUFORUM blog nor Flickr are current.

Does RUFORUM have guidelines on its objectives for using Facebook and other tools to meet its goals? Can visitors find useful, relevant, and interesting content that is updated regularly, for instance? There is a draft RUFORUM social media strategy and terms of reference for a consultant to be responsible for social media,¹⁴⁶ but I think that both documents are too general and do not relate specifically to the ways in which RUFORUM can harness social media to meet its needs. Moreover, the strategy document cites one publication that is very theoretical and one that is aimed at the business community.¹⁴⁷ More attention could be given to using social media as productively as possible within the RUFORUM ecosystem. For example, there is a table in the strategy document on social media platforms and target groups that is very instructive. For Facebook and Twitter, however, only RUFORUM students and alumni are given for target groups. As will be seen below, several important organizations use both media to make announcements about publications and events. Additionally, target groups for LinkedIn do not include students, alumni, secretariat staff, or network members. One of the major strengths of LinkedIn is its ability to help people network professionally. This is particularly important for recent graduates just getting started. I would be interested in knowing how many alumni have LinkedIn pages and how they use them.

Nodumo Dhlamini emailed me on 20 November 2012 that she, Joan Apio, and Carolyn Nandozi were taking an online course on using social media.¹⁴⁸ This course, which has been given several times, involves a collaborative effort of the Food and Agriculture Organization (FAO), the UN Institute for Training and Research (UNITAR), and the Technical Center for Rural and Technical Cooperation (CTA). From reading the course description, it appears that the course focuses on the tools and how to use them rather than on how RUFORUM can construct a social media strategy that will address its specific objectives.¹⁴⁹ Having examined the RUFORUM website and visited the websites of other likeminded organizations, I think that constructing an appropriate policy is as important as learning the techniques.

In her email of 20 November, Nodumo Dhlamini wrote me that case studies would be presented during the course. This is excellent, but I believe it would also be useful to carry out a landscaping exercise of groups that are already successfully using social media. How do groups such as OER Africa, ILRI, CTA, WOUGHNET, and the International Association of Agricultural Information Specialists (IAALD) use social media? OER Africa, for example, utilizes social media very actively—Facebook primarily to tell visitors about new resources; YouTube to upload OER videos; and a blog on topics relevant to OER; some blogs are hosted by OER Africa and others by outside organizations. Each is moderated. How much time does it take, who does it, and under what supervision?

¹⁴⁶ Email from Nodumo Dhlamini to Lisbeth Levey, 13 November 2012

¹⁴⁷ “RUFORUM social media strategy,” a part of social media specialist TOR, page 3

¹⁴⁸ Email from Nodumo Dhlamini to Lisbeth Levey, 20 November 2012

¹⁴⁹ <http://www.unitar.org/ksi/innovative-collaboration-development>



ILRI uses Facebook for the same purpose as does OER Africa, but it also makes heavy use of Twitter for short notifications. Some “tweets” come directly from ILRI, but not all of them. ILRI also has an excellent Wiki called “Social Media Risk Mitigation Guidelines,” which delineates ILRI policies for using social media.¹⁵⁰ Once again, whose time and how much of it is expended on keeping ILRI’s social media tools current? These are questions of relevance to RUFORUM.

Questions for RUFORUM to ask in a landscaping exercise:

1. How are these organizations making active use of social networking, if at all?
2. Which applications are being used and how?
3. Are entries current?
4. Who is responsible and how much time is required?
5. Does the organization have a strategy document such as the one ILRI created?

Interviews with relevant staff at OER Africa, ILRI, and WOUGHNET would also be helpful. A fast scoping exercise would thus require online reviews and interviews via Skype or email. It need not be labor or time intensive.

4.7 Searching, controlled vocabularies, and tracking usage

You will find a brief discussion on searching the repository and a longer one on visibility in the previous chapter. This section is about the website overall.

4.7.1 Searching the RUFORUM website

Many of resources on the RUFORUM website do not include keyword terms, which means that a search will not pull up every pertinent resource. For example, a search on “agricultural development” in the RUFORUM website did not identify a recently added resource titled *African Universities contributing to agricultural development: the case of the Bunda College of Agriculture*. It did locate this resource when I searched on “Bunda,” however. Even so, unless a researcher is specifically interested in locating research from or about specific institutions, s/he is more likely to construct a search using key words, including author where applicable. The RUFORUM search engine needs to be strengthened and keywords added to every resource. Many digital repositories permit free-text searching and also use of controlled vocabularies.

The FAO multilingual thesaurus, which is integrated into AgriDrupal, will be important for the website overall in addition to the repository. In an email to me, John Ferreira confirmed that use of controlled vocabularies would be an effective strategy everywhere on the site. Note his comparison between AgriDrupal and DSpace in the last sentence of his email.

Yes, the use of a controlled vocabulary would certainly help. The AgriDrupal distribution is integrated with the AGROVOC thesaurus and Agris Subject Categories and there is a new module called AgrovocField that will actually perform some basic text analysis on a document

¹⁵⁰ <http://ilri-comms.wikispaces.com/ILRI+social+media+risk+mitigation+guidelines>

that is being added, match terms in the document with Agrovoc terms, then “auto-tag” the document when it is saved. One can then go back and look at the terms that were added, include additional terms, or remove any that are not appropriate. The thesauri plugins that are part of AgriOceanDSpace are not quite as automatic as the AgrovocField module but will do everything else you’re asking.¹⁵¹

In addition, in order to maximize the possibility that searchers will identify the largest number of pertinent resources as possible, multiple keywords should be used for each field, where appropriate. Moreover, FAO is developing an “Agrotagger module” for AgriDrupal. In a series of emails to me, John Ferreira wrote that “the tagger uses a text analysis engine to match words in the text with Agrovoc terms and then gives a list of terms from Agrovoc that can be used to tag the document.”¹⁵² The Agrovoc terms include both broad subject categories and narrower descriptors.¹⁵³ Thus, the Agrotagger module could be an important addition to AgriDrupal for RUFORUM because it would remove the guesswork for assigning keywords and would allow RUFORUM to use both general and narrow descriptors, thereby enhancing the number of resources that would be identified following a search.

4.7.2 Tracking usage and finding RUFORUM resources

There are specific recommendations for visibility that are relevant to the RUFORUM institutional repository in the previous chapter (section 3.5). In this section, I discuss issues pertaining to visibility for the RUFORUM website as a whole. If RUFORUM has not already done so, it should carefully track user statistics on the site. It would be good to create a baseline now, if RUFORUM does not have one already. OER Africa uses Google Analytics and AW Stats (both free) to measure the activity of visitors to its website and break it down into trends. AW Stats was installed to measure how much data is being transferred from the OER Africa website; Google Analytics measures website traffic and trends. Thus, these systems track data differently. Taken together, both provide a good picture of who is using the site, from where, and for what.

The OER Africa methodology could provide RUFORUM with guidelines for tracking usage. In appendix two of its 2012 renewal proposal to the William and Flora Gates Foundation, OER Africa documented total visitors, visitors from Africa, average time on the website, direct traffic, and search engine traffic for three periods—September 2010-March 2011, April 2011-October 2011, and November 32011-April 2012. Analysis accompanied the data to clarify their meaning. NBA was responsible for these tracking and analysis exercises.¹⁵⁴

At the same time, in addition to building its visibility with professional search engines such as Google Scholar and Scirus and to beginning its indexing efforts in CABI, Agris, and ELDIS, RUFORUM should build its search engine optimization (SEO) capacity, if it has not done so already, in an effort to ensure that the RUFORUM website as a whole will be as highly ranked as possible on search result pages. This will mean making modifications of the RUFORUM website to improve navigation, including appropriate keywords/tags for every page, etc.¹⁵⁵

¹⁵¹ Email from John Ferreira to Lisbeth Levey, 19 June 2012

¹⁵² Email to Lisbeth Levey, 8 October 2012

¹⁵³ Email to Lisbeth Levey, 7 October 2012

¹⁵⁴ This information comes from the OER Africa 2012 renewal proposal to the William and Flora Hewlett Foundation, particularly appendix two on OER Africa’s media strategy. The proposal was approved at the July 2012 meeting of the Hewlett Foundation board. I am sure that OER Africa would be happy to share this section with RUFORUM.

¹⁵⁵ Go to <http://support.google.com/webmasters/bin/answer.py?hl=en&answer=35291> for more information on SEO. Be sure to consult the Google *Search engine optimization starter guide*. There is a PDF link to it.

[Strengthening Faculties of Agriculture in Africa Through - Al...](#)
[www.aiaee.org/.../615-strengthening-faculties-of-agriculture-in-africa...](#)
 Written by J. Mark Erbaugh, et al. From the 1960s through the 1980s, U.S. universities, foundations, and the U.S. Agency for International Development (USAID) ...

[\[PDF\] Strengthening graduate training and Agricultural ... - F...](#)
[www.fara-africa.org/...](#)

File Format: PDF/Adobe Acrobat - Quick View
 Capacity Strengthening, Information Exchange, Learning & Foresight for **Agricultural**. Innovation. SIDE EVENT REPORT. 10-11 June, 2007, FARA 4th General ...

[\[PDF\] Agricultural Education and Training Access Barriers R...](#)
[www.nda.agric.za/.../educationAndTraining/AET_ACCESS_BARRIE...](#)

File Format: PDF/Adobe Acrobat - Quick View
 The mission of **Agricultural Education and Training (AET)** in **Africa** is to work ... Encourage post-graduate studies in **Agricultural Sciences** in order to produce ...

[InterAcademy Council - Regional Approaches to Graduate Tr...](#)
[www.interacademycouncil.net/24026/AfricanAgriculture/.../26366.as...](#)

Workshop reports and background papers on **African Agriculture** ... 6. New **Agricultural Scientists** · Regional Approaches to **Graduate Training** ...

[InterAcademy Council - Setting Up African-based Graduate...](#)
[www.interacademycouncil.net/24026/AfricanAgriculture/.../26366.as...](#)

Realizing the Promise and Potential of **African Agriculture** ... The donors have thereby accelerated the transition to **graduate training** in **Africa**. Many **African** ...

[\[PDF\] Cultivating Knowledge and Skills to Grow African Agric...](#)
[www.fao.org/sd/er/documents2009/cultivatingknowledge.pdf](#)

File Format: PDF/Adobe Acrobat
 in **Africa**. 24. 4.3 **Agriculture** Enrollments as a % of Total Enrollments by Level, Early 1980s and 1990s. 27. 4.4 **Graduates** from Forestry Technician **Training** ...

[\[PDF\] AGRICULTURE LONG-TERM TRAINING](#)

[pdf.usaid.gov/pdf_docs/PNADT511.pdf](#)

File Format: PDF/Adobe Acrobat - Quick View

Agriculture Long-Term Training Assessment iv. Aguirre Division of JBS International, Inc. ABBREVIATIONS AND ACRONYMS. **AFGRAD**. **African Graduate** ...

[\[PDF\] 1 Preparing Universities in Africa and Asia for the New ...](#)
[worldaginfo.org/.../8b_Preparing%20Universities%20for%20New%2...](#)

File Format: PDF/Adobe Acrobat - Quick View
 25 Oct 2007 - **Africa** plan to respond to the New **Agriculture** and to increase their emphasis on **graduate training** within **Africa** because of the rising cost of ...

[Building the capacity of African university graduates to foste...](#)
[www.acp-st.eu/.../building-capacity-african-university-graduates-foste...](#)

Building the capacity of **African university graduates** to foster change through ... The mid-career **training** course for **agricultural** professionals is composed of four ...

[Selected West African agricultural students' view of their Un...](#)
[https://www.ideals.illinois.edu/handle/2142/23489](#)

by T Maphinda-Lebbie - 1989

For example, I conducted a trial search in Google using the keywords “graduate training, agriculture and Africa” in my search string. RUFORUM was not among any of the hits on the first page of results. In fact, there were no African organizations at all listed on page one, with the exception of FARA. I could not find RUFORUM when I searched on “postgraduate training agriculture Africa” either, although a journal article by Adipala Ekwamu popped up:

[Scholarly articles for postgraduate training agriculture africa](#)

[... to the development of expanded postgraduate training ...](#) - Jones - Cited by 9
[... the quality of scientific training and research in Africa ...](#) - Eiseimon - Cited by 18
[... Africa's Scientific Capacity in Food and Agriculture - Eicher - Cited by 22](#)

[Postgraduate Courses > University of Pretoria](#)

[web.up.ac.za > ... > Academic Programmes > Postgraduate Courses](#)

POST GRADUATE TRAINING IN THE DEPARTMENT OF **AGRICULTURAL** ...

Associate Professor and Director: Centre for Inclusive Banking in **Africa**. 420 5836 ...

[\[PDF\] POSTGRADUATE STUDY at ukzn - Applications UKZN - Univer...](#)

[applications.ukzn.ac.za/.../2013_Postgraduate_Application_Gu...](#)

File Format: PDF/Adobe Acrobat - Quick View

higher educational transformation in South **africa**. the university is home ... Research and **postgraduate training** ... strengths and strategic objectives: **agriculture** ...

[capacity development for agricultural transformation - eLearning](#)

[elearning.jkuat.ac.ke/journals/ojs/index.php/gchera6/.../74](#)

by A Ekwamu - 2011 - Cited by 1 - Related articles

CAPACITY DEVELOPMENT FOR AGRICULTURAL TRANSFORMATION: MAKING POSTGRADUATE LEVEL TRAINING RELEVANT TO AFRICA'S ...

Part of the problem may be that RUFORUM is not paying sufficient attention to meta-tags and keywords. In some cases, the keywords are skimpy; in other instances, there are none at all. Every resource on the RUFORUM website requires appropriate keywords. This will help the visitor identify the most relevant materials on the website itself. It will also enhance visibility of RUFORUM output overall. Using the FAO thesaurus should make assigning keywords easier.

In addition, once RUFORUM creates a body of OER resources, RUFORUM will want to be sure that they are all indexed by the most appropriate OER, open courseware, and Creative Commons sites. In the OER Africa proposal appendix to which I refer on the previous page, OER Africa wrote that it believes that sharing its resources globally has impacted on improving traffic to its

website and the number of resources downloaded.

Another issue pertains to error messages. I'm pleased to report that I haven't encountered any pages that have moved or been deleted in my searches on the RUFORUM site. But they might occur, particularly after RUFORUM incorporates the revisions I suggest. RUFORUM should investigate the feasibility of software that will report bad links on the site to the site administrator. I found a few when I searched online, but I do not know how good they are. In addition, every resource or link placed on the page should be tested both off- and online to ensure that there are no errors.

4.8 Weighing options and recommendations

Below is a series of questions that RUFORUM should ask itself in weighing its options and issues to address. As in the previous chapter, this section is a distillation of options and recommendations discussed above.

4.8.1 Communications strategy and work plan

As stated above, RUFORUM knows its audience—its constituency at member universities (leaders, faculty members, students, and researchers) in the first instance and the wider community of people interested in agricultural research and training in Africa. It is for that reason that in December 2011 ICT experts' committee recommended that the website concentrate on agricultural research and training in Africa. The question is how to get from this audience to focus to a plan for the website. I have tried to assist with suggestions on editing, deleting, and adding in order to make the website tighter and more useful. But this is skirting around the edges unless priorities are set and a strategy for moving forward put in place.

I do not suggest that RUFORUM plan another consultancy on communications strategies. RUFORUM has neither the time nor the funding. Nor do I think that there is any need to do so. But I think it would be useful to revisit the Neil Butcher paper, which concentrates on what a RUFORUM communications strategy should look like, and convene a very small meeting—perhaps Neil Butcher and myself plus the RUFORUM ICT staff—to map out a work plan that meets your needs, your finances, and your human-resource capacity. (I am assuming that because the Butcher paper appears on the RUFORUM website, RUFORUM agrees with it, in principle.)

4.8.2 Social networking

Social networking mechanisms, such as Facebook, Twitter, and blogs are being increasingly used on websites everywhere. To do it properly, however, organizations must have a clear vision concerning its social networking goals, which tools will best achieve these goals, and who will manage work on social networking. In the course of conducting this consultancy, I've visited the sites of many likeminded organizations. Many of them have Twitter and Facebook icons on their home page and employ blogs. But these social media are they not always widely used. In the case of RUFORUM, a "virtual intern" has done an excellent job in managing the alumni Facebook page, but RUFORUM's approach to social networking has been scattershot. I recommend that more thought and attention be paid to creating a workable approach to social networking as a whole, which would start with a short landscaping exercise, as described in section 4.6. RUFORUM would then be better placed to construct clear terms of reference to lay out the parameters and human resource requirements.

4.8.3 E-learning and open educational resources

RUFORUM's e-learning and OER efforts should be conceptualized afresh. Is there a reason to mount e-learning resources if they are not open to the public? It only leads to frustration. I recommend removing the closed e-learning courses from the website until they become true OER. If RUFORUM wants to keep them online, why not place them in a private part of the site that is password protected. If RUFORUM must keep them listed on the home page, it should delete the Creative Commons license until they are turned into OER and this kind of license is appropriate. RUFORUM should also explain why these resources are on the site, even if they are not freely available.

Concerning the "OER" PDF files, they are excellent as far as they go. I am certain the students will benefit by being able to read these resources. But they are not OER in the true sense of the word because they cannot be easily adapted by anyone else. They should be reclassified as open access, which is the designation commonly used for documents that freely available and distributable, without requesting permission from the author or publisher. In addition, there appears to be considerable overlap between these PDF files and the closed courses in e-learning. It would help if RUFORUM were to provide an explanation.

Some of the readings and supplementary resources appear problematic. As I point out in section 4.3, of the courses I examined, several of the readings are not current and few of them pertain to the subjects being taught within an African context. There are also a few that struck me as irrelevant. I believe that RUFORUM has three options—it can delete these resources entirely. It can search for relevant Wikipedia articles, which will be pertinent, but theoretical. The final possibility, which requires time, information retrieval skills, and access to the Internet, is to search for freely available resources online.

I've provided a few examples to demonstrate what is available. Rather than delegate this task to outside experts, it would be better if RUFORUM were to organize workshops and mount guides on the Website to train faculty and students about OA and information retrieval skills. I would also remove textbooks from the readings lists unless lecturers know that they are available in the library or freely available online. It is not fair to recommend these books to students if most of them will not be able to read them. And for those texts published before the year 2000, RUFORUM may want to see whether there are more recent editions.

There are very few tertiary-level OER or open access resources similar to the RUFORUM e-learning courses. These materials will be an important addition to the global knowledge pool. It is for that reason that I strongly encourage RUFORUM to open up the resources that are closed and re-visit the PDF files.

In addition, RUFORUM should think about helping its member universities create appropriate policies to encourage the production and utilization of OER and OA. RUFORUM is an AgShare partner; OER Africa has experience in working with university leadership on establishing appropriate policies. For this next phase of AgShare, RUFORUM and OER Africa might work together on strengthening RUFORUM e-learning activities, including converting the e-learning courses into OER and policy issues as they pertain to the universities. This is a good time to make these revisions, for it has always been RUFORUM's intent to create true OER teaching and learning content.

4.8.4 Stakeholders' directory

There are several recommendations in each section of my discussion of the stakeholders' directory. Below you will find them consolidated for easy reading.

- Change the name of the stakeholder directory to directory of institutions and networks relevant to African agricultural training and research. It's a mouthful, but more accurate.
- I've made a number of revisions to website text that must be approved and, if necessary, changed. In each instance, I've explained why I believe these revisions are necessary.
- I've recommended numerous additions and deletions to each section of the directory, including revisions to the type of information that should be included for each entry. RUFORUM will need to consult the appendices as well as section 4.6.1-4.6.7. My suggestions are too lengthy to summarize here. The text in these sections of the report and the appendices should also be reviewed and revised, as appropriate.

Once RUFORUM has had a chance to review the relevant sections of the report and the appendices, I recommend that RUFORUM ask NBA to set up a copy of the stakeholders' directory on a hidden part of the site to which only RUFORUM, NBA, and I have access. RUFORUM and I could then revise the directory according to my recommendations and any changes that RUFORUM makes to them. We would then have an opportunity to work with this copy of the directory until RUFORUM thinks that it's ready to replace the current stakeholders' directory and be mounted on the site. To make this work, RUFORUM and I would need help from NBA on learning how to make the kinds of changes necessary.

4.8.5 Human resource inputs

I made a number of recommendations about human resource issues in the previous chapter on the RUFORUM institutional repository. The recommendations in this chapter focus on the RUFORUM website, although there is overlap, of course. The final chapter will consolidate my recommendations from both chapters.

In addition to work on the institutional repository, I believe that RUFORUM's small staff requires external assistance to reconceptualize and revise the website. Below is a delineation of overarching issues that need attention.

- Formalizing a concrete plan with dates by which the work will be completed and by whom would be helpful. I realize that establishing plans and deadlines is easier than keeping to them. But I am concerned about the slippage I have observed during my consultancy—through no fault of the RUFORUM staff, rather because too few people have had to do too many things.
- RUFORUM should set in place systems for enhancing visibility and tracking utilization of the site, as discussed in 4.7.
- I recommend that the stakeholders' directory be renamed and revised along the lines discussed in 4.4.
- For technical work on the website—RUFORUM already has a retainer with Neil Butcher Associates, which set up the original web architecture. When I met with Nodumo Dhlamini on 20 September 2012 in Entebbe, she told me that RUFORUM will discuss website enhancements and changes with NBA. In addition to work on the institutional repository discussed in the previous chapter, I recommend that RUFORUM and NBA discuss a second contract for the website as a whole, once the institutional repository is established.
- Managing and updating websites requires an investment in time and attention to detail. As a result of my examination of the RUFORUM site, I came away with a number of impressions. It is beautifully designed as a whole. The banner on top of the home page and carried through for each link in the site conveys the essence of RUFORUM. The ICT staff is clearly committed to its work on the website. But not sufficient attention is paid to execution and to detail. This is not meant as a criticism. I know under what pressure the ICT staff work. Even so, I recommend that the staff create a checklist to follow every time any changes are made. The checklist should include ascertaining that all links work properly, that text is clear and grammatically correct, that multimedia is mounted correctly, etc. In addition, more attention should be paid to the website's organization. I noted several instances, such as the RUFORUM RAP, where the content appeared misplaced. In addition, innovations to the website, such as using Power Point and YouTube should be tested by outside, but friendly, experts before going live. It is possible that the YouTube issues that I noted above could have been avoided. Finally, there are small design issues. Although the photos that RUFORUM uses throughout the website are excellent examples of its work, text is placed too closely to the edge of the photo. It gives the page a crowded look.
- As a last comment, I recommend that no additions or changes be made to the website until the RUFORUM secretariat has decided on the revisions it would like to make. Given the small staff and limited resources, it makes no sense to add anything to the site if the work must be done again. Better to wait and do everything at once.

Concluding recommendations

There are specific recommendations for the RUFORUM institutional repository and for website revisions in the last sections of chapters three and four respectively. In writing these sections, I noticed a few overarching issues that were common to both. I thought it would therefore be useful to encapsulate them in a separate chapter.

Chapters three and four focus largely on technology issues—how to implement the repository and where the website requires revisions. That’s the easy part. If RUOFRUM is to use ICT effectively to meet its goals, however, then more attention should be paid to human resource issues, particularly how to ensure that a small staff can meet the many demands placed on it. Only two people, admittedly very efficient ones, work on ICT, supplemented by consultants when thought necessary, and interns. In my opinion, there is too much work and not enough hands to do the job properly. I hope that the points below will be useful.

1. Spreading the burden: Although hiring additional staff might not be possible or practical, what about making more use of consultants? Three examples include:
 - a. Neil Butcher Associates already works with RUFORUM on technical fulfillment. NBA staff could assist when new components are added to the website, such as Power Point (section 4.2) or YouTube (section 4.5). These are two media with which I spotted problems. NBA design staff could also help improve page layouts, and I have also suggested other ways NBA could be used in chapters three and four.
 - b. OER Africa could assist in two areas—in creation and implementation of e-learning/OER and in IPR policies for OER. There are several e-learning courses on the RUFORUM website that need to be reworked as OER (section 4.3).
 - c. RUFORUM should think about contracting with a librarian with subject expertise in the agricultural sciences to assist in entering records for the repository and help with revisions to the website. OER Africa and I worked with a Kenyan librarian who was also a graduate of the AIMS program at Egerton University. She was able to use her expertise in agriculture to assign keywords from a dropdown menu. Monge Tlaka of NBA and I were her supervisors. There will be considerable work involved in setting up the repository and implementing the revisions I have suggested. Coopting a librarian to the team would also free up the time of both ICT program staff members.
2. Website maintenance, revisions, and additions: It’s easy to write that good websites require attention to every detail. But as websites get larger and more complicated, things fall through the cracks, particularly when other assignments demand attention. Many of the recommendations below are so simple and straightforward that I almost left them out. But I noticed many errors on the RUFORUM website that could have been avoided if more attention had been paid to website *minutiae*. I therefore think that a checklist for everyone working on the website could be useful. As a start, it could include:
 - a. Is the writing style clear, without grammatical or editing errors?¹⁵⁶
 - b. Has everything been proofread?
 - c. Do all the links work?
 - d. Are the page design and layout uncluttered and user friendly?

¹⁵⁶ See “4 Syllables: Writer’s Review Guide and Checklist,” which gives excellent recommendations on writing and reviewing web content before it is mounted. Go to: <http://www.4syllables.com.au/resources/templates-checklists/writers-checklist/>. There is also a very good reviewer’s guide and checklist: <http://www.4syllables.com.au/resources/templates-checklists/reviewers-checklist/>.

- e. Additional points included in the “4 Syllables” link on the previous page include asking someone else to review the page, with an eye toward clarity and errors, and to wait a while before reviewing it yourself.
3. Setting priorities: Given the amount of work to be done in the ICT program, I recommend that RUFORUM establish a set of realistic priorities that can be revised, as needs require. Timetables would help, but they so often slip that I don’t know whether they have any real utility. Based on my work for this consultancy, I recommend the priorities below in the order that they should be carried out.
- a. Institutional repository. This includes installing the platform; inputting resources; and work with the RUFORUM network on sensitization and on IPR.
 - b. Website. This includes constructing a new logic model for the RUFORUM website; revising resource entries on the site to conform to new guidelines; and redoing the stakeholders’ directory. Because the website will undergo total revision, I recommend that no new resources be added to the site yet.
 - c. Social networking.
 - d. No matter what the priorities, a detailed work plan would help. It should include activities; tasks within each activity (in the order it must be carried out); timelines and deadlines for each task; and staff/consultants responsible for each task.

Finally, I view the RUFORUM website as a “work in progress,” as are all good websites. A static site is neither current nor interesting. I also believe that the RUFORUM website has the potential of becoming an essential resource for anyone interested in knowing about agricultural research and training in Africa. Not a bad goal at which to aim.

Appendix 1

Collections in the RUFORUM repository

Below is a list of the recommended collections to be included in the RUFORUM repository.

- Annual reports
- Books
- Briefing papers and policy briefs
- Brochures and fact sheets
- Case studies
- Conferences and workshops
- Consultancy reports to the secretariat
- Journal articles
- Multimedia
- Newsletters
- OER and open access training materials
- Posters
- SCARDA/SCAIN
- Tenders, procurement and expressions of interest
- Theses and dissertations

Appendix 2

Background on open access journals

Open access means that resources are free to users worldwide and that they may be distributed without requesting permission. Research has demonstrated that open access brings increased visibility, usage, and impact to the work of academics, researchers, and students. Open access is compatible with copyright, peer review, prestige, quality, and indexing. Open access articles must still be cited when used. In fact, there is even an Open Access Search Project in order to detect plagiarism.¹⁵⁷

Open access is particularly important within the African context. Journal subscriptions are expensive. Even though most African universities and research institutions can read journals in the agricultural sciences online at no charge through AGORA (Access to Global Online Research in Agriculture),¹⁵⁸ or on CD-ROM at little cost through TEEAL (the Essential Electronic Agricultural Library),¹⁵⁹ these services will not last forever. Moreover, if Africa's research output is to reach the scientific community worldwide, it must be widely accessible. Governmental and other organizations worldwide have adopted open access policies for the research they fund and publish. It is for these reasons that RUFORUM instituted an open access policy for its research output and encourages network members to publish in an open access format.

There are a number of open access journals in the agricultural sciences that are relevant to the RUFORUM network. The Directory of Open Access Journals (DOAJ)¹⁶⁰ lists more than 150 of them. African Journals Online (AJOL) includes forty-five African journals in the agricultural sciences.¹⁶¹ In the table below, you will find a list of a few journals in the agricultural sciences that focus on Africa or that have a strong interest in the broad based agricultural sciences as they pertain to the developing world. Bear in mind that this is just a sampling.

Table 2: Examples of journals in the agricultural sciences with a strong interest in Africa

Title	Focus	URL
<i>African Crop Science Journal</i>	The <i>African Crop Science Journal</i> , a quarterly publication, publishes original research papers dealing with all aspects of crop agronomy, production, genetics and breeding, germplasm, crop protection, post harvest systems and utilization, agro-forestry, crop-animal interactions, information science, environmental science and soil science. It also publishes authoritative reviews on crop science and environmental issues by invitation. It is bilingual, publishing in either English or French.	http://www.bioline.org.br/cs
<i>African Journal of Agricultural Research</i>	AJAR publishes high-quality solicited and unsolicited articles, in English, in all areas of agriculture including arid soil research and	http://www.academicjournals.org/ajar/

¹⁵⁷ <http://oaps.eu>

¹⁵⁸ <http://www.aginternetwork.org/en/>

¹⁵⁹ <http://www.teeal.org>

¹⁶⁰ <http://www.doaj.org/doaj?func=subject&cpid=116&cuiLanguage=en>

¹⁶¹ <http://www.ajol.info/index.php/index/browse/category?categoryId=5>. Not all journals listed in AJOL are current, however. It is important to click on "current issue" to ascertain whether the journal has a regular publication schedule. Any journal that has not published a current issue in more than one year should not be considered as a vehicle in which to publish your research. Your goals should be to publish and to have your article see the light of day.

Title	Focus	URL
	rehabilitation, agricultural genomics, stored products research, tree fruit production, pesticide science, post harvest biology and technology, seed science research, irrigation, agricultural engineering, water resources management, agronomy, animal science, physiology and morphology, aquaculture, crop science, dairy science, entomology, fish and fisheries, forestry, freshwater science, horticulture, poultry science, soil science, systematic biology, veterinary, virology, viticulture, weed biology, agricultural economics and agribusiness.	
<i>African Journal of Food, Nutrition and Development</i>	AFJAND covers a wide range of scientific and development disciplines, including agriculture, food, nutrition, environmental management and sustainable development related information.	http://www.ajfand.net
<i>African Journal of Plant Science</i>	APJS provides rapid publication (bi-monthly) of articles in all areas of plant science and botany.	http://www.academicjournals.org/AJPS/index.htm
<i>Agriculture and Food Security</i>	<i>Agriculture and Food Security</i> does not focus on Africa, but it has a strong concentration on the developing regions of the world. It addresses the challenge of global food security. It publishes articles within the field of food security research, with a particular focus on research that may inform more sustainable agriculture and food systems that better address local, regional, national and/or global food and nutritional insecurity. The journal considers cutting-edge contributions across the breadth of relevant academic disciplines, including agricultural, ecological, environmental, nutritional, and socio-economic sciences, public health and policy.	http://www.agricultureandfoodsecurity.com
<i>Journal of Development and Agricultural Economics</i>	The <i>Journal of Development and Agricultural Economics</i> does not focus on Africa, but it has a strong concentration on the developing regions of the world. It provides rapid publication (monthly) of articles in all areas relevant to development and agricultural economics.	http://www.academicjournals.org/jdae/index.htm

In addition to publishers that designate all of their journals as open access, some publishers have a hybrid policy. They may have some journals that are fully protected by copyright, but publish others that they have designated as open access. In addition, these publishers may permit authors to designate their article as open access, but authors will be required to pay an extra page charge. Publishers who follow one of these models include Elsevier, Springer, and John Wiley, to name just a few. In addition, some publishers restrict access to their journal for the current year, but permit free and open access after 12 months or perhaps two years. In short, it can all be very confusing for the novice.

The following are points to consider for submitting your article to the most appropriate journal.

1. If you are a student, talk to your supervisor about likely journals that might be interested in your article. If you are a lecturer or researchers, consult with your colleagues. But do your own research. Which journals do you cite in your work? Skim the tables of contents and abstracts of journals in your discipline to see which ones print articles that match the subject about which you want to write.

Journals that are interested in Africa and developing regions of the world might be more interested in your work.

2. As you think about which journal, first search for open access journals. If you identify a journal that restricts readership to subscribers, ascertain whether you can designate your article as Open Access. In addition, for journals that do not have any open access policies, find out the extent to which they allow you to self-archive (mount your article on your website or that of someone else's—such as RUFORUM)

Journal: Phytopathology (ISSN: 0031-949X)	
RoMEO: This is a RoMEO yellow journal	
Author's Pre-print:	✓ author can archive pre-print (ie pre-refereeing)
Author's Post-print:	✗ author cannot archive post-print (ie final draft post-refereeing)
Publisher's Version/PDF:	subject to Restrictions below, author can archive publisher's version/PDF
Restrictions:	<ul style="list-style-type: none"> Only Publisher PDF may be used, which can be obtained for a fee
General Conditions:	<ul style="list-style-type: none"> Publisher's version/PDF must be used Published source must be acknowledged Cover page must be included (provided by publisher)
Mandated OA:	(Awaiting information)
Copyright:	Not available online
Updated:	22-May-2007 - Suggest an update for this record
Link to this page:	http://www.sherpa.ac.uk/romeo/issn/0031-949X/
Published by: American Phytopathological Society - Yellow Policies in RoMEO	

3. Because journals have different policies pertaining to copyright, you should consult SHERPA/RoMEO, an excellent website maintained by the University of Nottingham. SHERPA/RoMEO provides publisher information on copyright policies and self-archiving.¹⁶² It uses four colors to categorize archiving policies—green (pre-print, post-print, publisher PDF permitted); blue (final draft, post referee, and publisher PDF permitted); yellow (pre-referee permitted); and white (nothing permitted). On the left is a screen capture for the SHERPA/RoMEO entry for *Phytopathology*. You should also check the

publisher's website to ascertain this information. When in doubt, write the publisher and ask the following questions:

- a. Do you offer an open access option?
 - b. If so, how much does it cost?
 - c. May I deposit a version of my article in a repository?
 - d. If so, which version?
 - e. Is there an embargo period?
4. Ascertain that the journal publishes regularly and that the publication schedule meets your needs. Some journals have faster review and editorial processes than others.
 5. Where is the journal indexed? Is it in CAB Abstracts, Google Scholar, Science Citation Index, Current Contents, Scirus, etc.? Indexing and abstracting enhance the possibility that people in your field will find and read your article.
 6. Budget for page charges. Many journals, particularly open access journals, charge authors to publish their articles. Page charges are frequently reduced or eliminated for authors in developing countries. But don't count on it. Page charges range from \$1,000-\$3,000.

¹⁶² <http://www.sherpa.ac.uk/romeo/>

Table 3: Publishing terms to remember

Term	Definition
Copyright	The conditions under which a work can be used.
Embargo	The period during which access is not freely and openly permitted in order to protect the publisher's revenue. Many journals provide delayed open access, which means that they embargo journal issues for a fixed period of time.
Indexing and abstracting	This is a library term for services that provide citations and sometimes abstracts for scholarly resources. Important services for the agricultural sciences include CAB Abstracts, Google Scholar, Science Citation Index, Current Contents, and Scirus.
Open access	Open access resources are online, free of charge, and do not bear most licensing and copyright provisions.
Page charges	The fee journals charge authors for processing, editing and other expenses.
Self archive	To deposit a digital document in a publicly accessible website. This can be your website, your university or research institution's website, or the RUFORUM repository.

Appendix 3

Donors

Below is a list of those donors that I recommend be deleted from the directory and an annotated list of those that I think should be included. There is a footnote for each entry, with an explanation why. Some inclusions are already in the directory, but I have revised the text to focus on their work in agriculture. Where relevant, I have also included details about freely available research publications produced by these organizations. Some entries are new. Finally, I have consolidated into one two categories—bilateral/multilateral agencies and donor agencies/foundations. This new category is called donors.

Please note that I have included the name and URL, but no other contact information. The partners' page of the New Partnership for Africa's Development (NEPAD), various links pages of the Alliance for a Green Revolution in Africa (AGRA),¹⁶³ and the links page of the African Economic Research Consortium (AERC) follow this model. RUFORUM may wish to add more details, of course.

The lists are in alphabetical order. You will see that each entry focuses on agriculture, Africa, training, and/or research.

Finally, I have included screen captures, which should be deleted from the online version of the guide, and also text that might need revision. I used screen captures and text to explain in full to RUFORUM why I believe these sites warrant inclusion in the directory. My use of footnotes will have to be revised; footnotes are not appropriate to an online directory. But they are useful in a report, such as this one.

This model and format will be found in all the appendices—three through eight.

App3.1 Deletions

African Association of Agricultural Economists¹⁶⁴
Australian Agency for International Development¹⁶⁵
Carnegie Foundation for the Advancement of Teaching¹⁶⁶
Development Bank of Southern Africa¹⁶⁷
European Commission¹⁶⁸
Kresge Foundation¹⁶⁹
Shuttleworth Foundation¹⁷⁰
UNESCO¹⁷¹

¹⁶³ Go to <http://www.agra-alliance.org/who-we-are/partners/special-initiatives/> as an example.

¹⁶⁴ I would delete AAAE in this category and include it in the one for organizations.

¹⁶⁵ Australian Aid does not work in RUFORUM countries. In addition, its work on food security issues is not focused on postgraduate training and research.

¹⁶⁶ The Carnegie Foundation provides grants only in the US and it does not work in agriculture. The Carnegie Corporation, which does support initiatives in Africa, is included in the directory. Although Carnegie Corporation does not fund agriculture as a discipline, RUFORUM is receiving support through the Carnegie networks program.

¹⁶⁷ I recommend deleting DBSA for two reasons. The first is that it concentrates on infrastructure projects, which may not be relevant to the RUFORUM constituency or other visitors. In addition, its website was down the several times that I tried to access the site. The URL is <http://www.dbsa.org/Pages/default.aspx>.

¹⁶⁸ The European Commission represents the interests of the EU and is the driving force behind legislation. The EU is the donor agency and supports initiatives in Africa. In addition, a search on the EC research home page did not result in any results that appeared useful. Research is focused entirely on Europe.

¹⁶⁹ Kresge does not fund agriculture.

¹⁷⁰ The Shuttleworth Foundation works only in South Africa, which is not a RUFORUM country. In addition, it does not fund agriculture.

¹⁷¹ UNESCO does not work in agriculture.

W.K. Kellogg Foundation¹⁷²

William and Flora Hewlett Foundation¹⁷³

World Food Programme¹⁷⁴

World Organization for Animal Health¹⁷⁵

App3.2 Introductory text

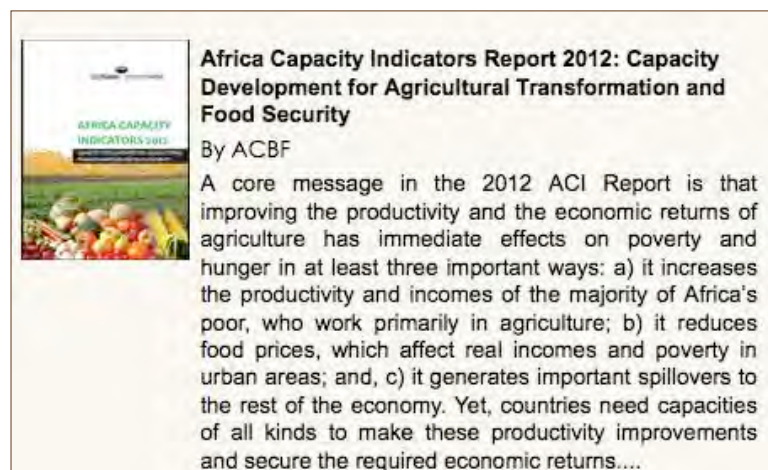
I recommend placing introductory text at the end of the section titled “About this directory” (see section 4.4 in chapter four), which explains what kinds of organizations are included in this section. Below is draft text for donors. In addition, each of the following appendices contains an appropriate introduction.

The section on donors lists some of the major funders of relevance to the RUFORUM network. Only organizations that support training and/or research in the agricultural sciences in Africa are included. Entries focus on the work of these funders in agriculture and also details freely available research publications produced by each organization.

App3.3 Inclusions and additions

African Capacity Building Foundation

<http://www.acbf-pact.org/>



ACBF brings together African governments and the international donor community to build sustainable human and institutional capacity and promote poverty reduction in Africa. ACBF operations focus primarily on improving the macro-economic environment of African countries. Agriculture is a component of this work. For example, in June 2012 ACBF gave a grant of 3 million dollars to the African Economic Research Consortium (AERC) towards the implementation of the Collaborative Masters' Program in Agricultural and Applied Economics (CMAAE) Phase II Project. Also in 2012, ACBF signed a memorandum of understanding with the Chinese Academy of

Agricultural Sciences to work on enhancing human and institutional capacity for technological transformation in Africa. Because so much of ACBF's work is in the policy arena, visitors to the website might be interested in the *African Capacity indicators report 2012* on agriculture, which it published in conjunction with the World Bank Institute.¹⁷⁶

¹⁷² The Kellogg foundation closed its Southern Africa office in 2008 and has a very scaled back presence there. It does not support new projects.

¹⁷³ The Hewlett Foundation does not fund agriculture.

¹⁷⁴ The focus of the WFP is on the distribution of food aid and not on research or postgraduate training.

¹⁷⁵ The World Organization for Animal Health is an important information resource in veterinary medicine, but it does not appear to be a donor. I have included an entry for this organization elsewhere.

¹⁷⁶ The report and other ACBF research publications will be found in the website's virtual library at <http://elibrary.acbfpact.org/>.

African Development Bank Group

<http://www.afdb.org/en/>

The overarching objective of the African Development Bank (AfDB) Group is to spur sustainable economic development and social progress in its regional member countries, thus contributing to poverty reduction. The Bank Group achieves this objective by:

- Mobilizing and allocating resources for investment; and
- Providing policy advice and technical assistance to support development efforts.

Because food security remains a top priority for African development, AfDB is actively engaged in funding and conducting research in agriculture and agro-industries. The AfDB also maintains an active research and publications program.¹⁷⁷ Recent reports include one on improving statistics for food security, sustainable agriculture and rural development and the African statistical yearbook. AfDB has also established an open data portal.¹⁷⁸

African Union

<http://www.au.int/en/>

The African Union (AU), which was established in 2002 as a successor to the Organization of African Unity (OAU), aims to encourage economic development and political stability through increased cooperation among its member states. The department of rural economy and agriculture (DREA) was established with the objectives of promoting agricultural and rural development to ensure food security for Africans and achieve sustainable development and improved livelihoods. The Division of Agricultural Food Security helped implement the Comprehensive Africa Agriculture Development Programme (CAADP), which has a separate entry in this directory.

Canadian International Development Agency

<http://www.acdi-cida.gc.ca/home>

In Africa, the Canadian International Development Agency (CIDA) works in Ethiopia, Ghana, Mali, Mozambique, Senegal, South Sudan, Sudan, and Tanzania. Increasing food security is one of CIDA's three priority themes. It works on food aid and nutrition, sustainable agricultural development, and research and development—including the Canadian International Food Security Research Fund,¹⁷⁹ which is a partnership between CIDA and the International Development Agency (IDRC).¹⁸⁰

Carnegie Corporation of New York

<http://www.carnegie.org>

The Carnegie Corporation of New York was founded by Andrew Carnegie to “promote the advancement and diffusion of knowledge and understanding.” In keeping with this mandate, the Corporation's work incorporates an affirmation of its historic role as an education foundation, but also honors Andrew Carnegie's passion for international peace and the health of democracy in the United States. While Mr. Carnegie's primary aim was to benefit the people of the United States, he later determined to use a portion of the funds for members of the British overseas Commonwealth. Currently, this area of the Corporation's grant making focuses on selected countries in sub-Saharan Africa. The Corporation's Africa related activities are carried out in the higher education and libraries in Africa program. Carnegie Corporation does not typically fund agriculture, but RUFORUM has received funding through its higher education and libraries program to strengthen regional doctoral programs in African universities.

¹⁷⁷ <http://www.afdb.org/en/knowledge/publications/>

¹⁷⁸ <http://www.afdb.org/en/knowledge/statistics/data-portal/>

¹⁷⁹ http://www.idrc.ca/EN/Programs/Agriculture_and_the_Environment/Canadian_International_Food_Security_Research_Fund/Pages/default.aspx

¹⁸⁰ IDRC is described in a separate entry.

Common Market for Eastern and Southern Africa

<http://www.comesa.int/>

The Common Market for Eastern and Southern States (COMESA) works to achieve sustainable economic and social progress in all member states through increased cooperation and integration in every field of development particularly in trade; customs and monetary affairs; transport; communication and information technology; industry and energy; gender; agriculture; environment; and natural resources. In agriculture, COMESA focuses on extending sustainable land management and reliable water control systems; improving rural infrastructure and trade related capacities for market access; increasing food supply, reducing hunger and improving responses to food emergency crises; and improving agricultural research, technology dissemination and adoption. Two cross cutting themes include academic and professional training, and support to farmers' associations together with information and knowledge systems.¹⁸¹

Comprehensive Africa Agriculture Development Programme

<http://www.nepad-caadp.net/>

The Comprehensive Africa Development Programme (CAADP), which falls under the aegis of NEPAD, was created to be an African owned and led initiative, with the aim of boosting agricultural productivity in Africa. It works in four areas—land and water management, market access, food supply and hunger, and agricultural research. You will find a range of CAADP documents in its library.¹⁸²

Department for International Development

<http://www.dfid.gov.uk/>

The Department for International Development (DFID) is a department of the British government and is led by a cabinet minister. Among its key objectives, DFID set out to make global development a national priority and promote it to audiences in the UK and overseas, while fostering a new 'aid relationship' with governments of developing countries. Within its food and nutrition program, DFID supports initiatives relating to food security, agriculture hunger emergencies, and food and nutrition research. The research for development database¹⁸³ is a free open access online portal containing the latest information about research funded by DFID, including details of current and past research. DFID works throughout sub-Saharan Africa.

European Aid

http://ec.europa.eu/europeaid/index_en.htm

The European Commission's Directorate-General for Development and Cooperation—EuropeAid was established on 3 January 2011. It is the result of the merger of parts of the former Directorate-General for Development and Relations with African, Caribbean and Pacific States with the former EuropeAid Co-operation Office. EuropeAid is now responsible not only for defining EU development policy, but also for ensuring the effective programming and implementation of aid. Within its food and natural resources program, EuropeAid works on fighting hunger, the environment, and agriculture and rural development. Promoting research and enhancing education and training are two components of its work.

¹⁸¹ http://programmes.comesa.int//index.php?option=com_content&view=article&id=94&Itemid=111

¹⁸² <http://www.nepad-caadp.net/library.php>

¹⁸³ <http://www.dfid.gov.uk/r4d/Default.aspx>

Food and Agriculture Organization (FAO)

http://www.fao.org/index_en.htm

Agro-MAPS

A global spatial database of subnational agricultural land-use statistics.

AQUASTAT

AQUASTAT is FAO's global information system of water and agriculture developed by the Land and Water Development Division of FAO. AQUASTAT provides users with comprehensive information on the state of agricultural water management across the world, with emphasis on developing countries and countries in transition.

CountrySTAT

A national statistical information system for food and agriculture. CountrySTAT harmonizes and integrates data on food and agriculture coming from different sources. Through a core database, policy makers and researchers can group data across thematic areas - such as production, trade and consumption - in order to study relationships and processes.

FAOSTAT

FAOSTAT, the FAO statistical database, is an on-line multilingual database currently containing time-series records from over 210 countries and territories covering agriculture, nutrition, fisheries, forestry and food aid.

FAOSTAT-Agriculture

Provides statistics on crops, livestock, irrigation, land use, fertilizer, pesticide consumption, and agricultural machinery.

FAOSTAT-Forestry

Provides statistics on imports and exports of woods and paper.

Fishery and Aquaculture Statistics

The FAO Fisheries and Aquaculture Department provides advice and objective information to Members to help promote responsible aquaculture and fisheries. To fulfil this role the Department compiles, analyses and disseminates fishery data, structured within data collections.

FAO, which is an arm of the UN, has as its mandate raising levels of nutrition, improving agricultural productivity, improving the lives of rural populations, and contributing to the growth of the world economy. Its activities can be divided into four major areas—serving as a knowledge network, sharing policy expertise, providing a meeting place for policy makers, and bringing knowledge to the field. Thus, information sharing is an important component of its work, and FAO considers itself a “knowledge organization.” FAO’s funding to implement projects comes primarily from member governments, although private foundations also play a role. FAO is a wealth of research information, including statistics and data, as shown on the screen capture on the left. Visitors might want to explore and browse the entire site. But for targeted searches, it would be more efficient to use Google or Google Scholar and search for FAO plus a search term.

Ford Foundation

<http://www.fordfound.org>

The Ford Foundation works to strengthen democratic values, reduce poverty and injustice, promote international cooperation, and advance human achievement. In sub-Saharan Africa, the Foundation has offices in Johannesburg, Nairobi, and Lagos. The Ford Foundation does not typically fund the agricultural sciences, but RUFORUM has received support from its program on expanding livelihood opportunities for poor households to coordinate the conceptualization and design of its regional MSc program in agro-enterprise development and for outreach to engage network universities in pro-poor activities.

Bill and Melinda Gates Foundation

<http://www.gatesfoundation.org/Pages/home.aspx>

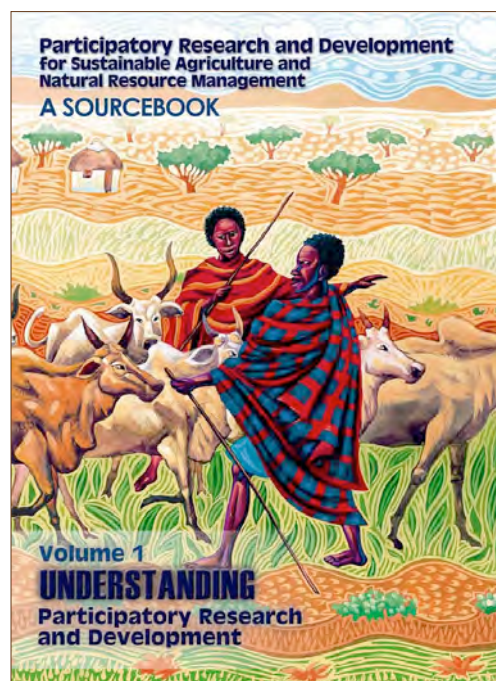
The Bill and Melinda Gates Foundation works to help all people lead healthy and productive lives. In developing countries, it focuses on improving people’s health and giving them the chance to lift themselves out of hunger and extreme poverty. Gates Foundation grants in agricultural training and research are implemented in the global development program. The foundation has supported, for example, RUFORUM, AgShare, and the Alliance for a Green Revolution in Africa (AGRA). You can read research and evaluation reports¹⁸⁴ on the website and find out information about the foundation’s grant making, including search the grants database.¹⁸⁵

¹⁸⁴ <http://www.gatesfoundation.org/Pages/Search.aspx?meta=MDCContentType:Research%20%26%20Evaluation>

¹⁸⁵ <http://www.gatesfoundation.org/grantseeker/Pages/default.aspx>

International Development Research Centre

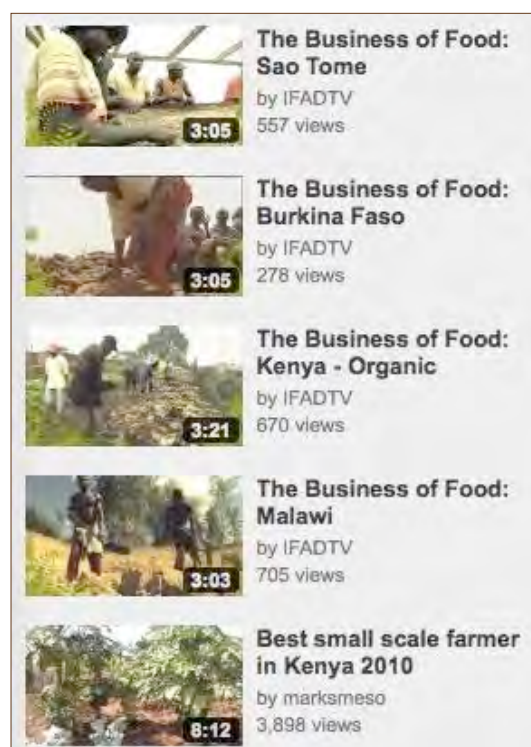
<http://www.idrc.ca/EN/Pages/default.aspx>



The International Development Centre (IDRC) of Canada was established to encourage and support researchers and innovators in developing countries to find practical, long-term solutions to the social, economic, and environmental problems their societies face. IDRC's goal is to find ways to reduce poverty, improve health, support innovation, and safeguard the environment. Food and agriculture is one of IDRC's 11 themes. IDRC funds both research and postgraduate training. IDRC also maintains a digital library in order to provide the research community with access to IDRC research results and documents generated by its grants.¹⁸⁶ The three-volume participatory research and development sourcebook is just one of the many IDRC volumes that would be of relevance to the RUFORUM constituency.¹⁸⁷ In addition, for those interested in value chain research, IDRC published *A handbook for value chain research* in 2001, which is well worth consulting.¹⁸⁸ IDRC publications carry a Creative Commons license.

International Fund for Agricultural Development

<http://www.ifad.org/>



The International Fund for Agricultural Development (IFAD) is a special UN agency, established as an international financial institution in 1977 as one of the major outcomes of the 1974 World Food Conference. IFAD's mission is to eradicate rural poverty in developing countries. It works with poor rural people, governments, donors, nongovernmental organizations, and other partners. IFAD focuses on country-specific solutions, which can involve increasing poor rural peoples' access to financial services, markets, technology, land, and other natural resources. In addition to its funding activities, IFAD also maintains a digital library of documents about IFAD and has made a series of videos about activities it has funded. These videos, such as "the business of food" feature the rural communities with which IFAD works.¹⁸⁹ The IFAD YouTube site also collects videos from other organizations. Some of them might be useful as adjuncts to e-learning teaching modules.

¹⁸⁶ <http://idl-bnc.idrc.ca/dspace/>

¹⁸⁷ <http://www.idrc.ca/en/resources/publications/pages/idrcbookdetails.aspx?publicationid=197>

¹⁸⁸ http://asiandrivers.open.ac.uk/documents/Value_chain_Handbook_RKMM_Nov_2001.pdf

¹⁸⁹ <http://www.youtube.com/user/IFADTV/videos>

New Partnership for Africa's Development

<http://www.nepad.org/>

The New Partnership for Africa's Development (NEPAD) is a program of the African Union (AU) adopted in Lusaka, Zambia in 2001. NEPAD, which is led by African leaders, aims to pursue new priorities and approaches to the political and socio-economic transformation of Africa. Its objective is to enhance Africa's growth, development and participation in the global economy. To fast-track development, NEPAD's agriculture and food security program¹⁹⁰ focuses on helping African countries improve economic growth through agriculture-led development. Specifically, NEPAD aims to ensure that smallholder farmers – the majority of Africans – get better access to markets, finance and technical support, in order to improve their income and get out of poverty. The Comprehensive Africa Agriculture Development Programme (CAADP) framework guides NEPAD's program.¹⁹¹

Rockefeller Foundation

<http://www.rockefellerfoundation.org/>

To achieve its goal to promote the well being of humanity through smart globalization, the Rockefeller Foundation funds a portfolio of initiatives that link and interlink to achieve meaningful and measurable impact. Rockefeller Foundation initiatives are meant to draw on the foundation's commitment to nurture innovation, pioneer new fields, expand access to and distribution of resources, empower beneficiaries to cultivate and spread progress in their countries, and, ultimately, generate sustainable impact on individuals, institutions, and communities. The foundation has a long history of agricultural support for research and training in Africa. Grantees have included RUFORUM, which was established by the foundation, the Alliance for a Green Revolution in Africa (AGRA), which was created with joint support by the Rockefeller and Gates foundations, Sokoine University of Agriculture, University of KwaZulu Natal, Rwanda Agricultural Board, Kenya Agricultural Research Institute, and Makerere University, among others.

Scholarships4Development

<http://www.scholars4dev.com/>

Scholarships4Development is not a funding agency. It is a clearing-house of information on international agencies that offer scholarships for students from developing countries. The site can be searched in any number of ways, including by level of studies and by topic. Agriculture, forestry, and fisheries are located at <http://www.scholars4dev.com/category/field-of-study/agriculture-forestry-and-fisheries-scholarships/>.

Southern African Development Community

<http://www.sadc.int/>

The Southern African Development Community (SADC) was established in 1980, when the majority-ruled countries of southern African states came together to establish the Southern African Development Coordination Conference (SADCC) as a part of their fight apartheid. In 1992, as democracy began to take shape in South Africa, SADCC changed both its name to SADC and also its objective. The SADC mission is to promote sustainable and equitable economic growth and socio-economic development through efficient productive systems, deeper cooperation and integration, good governance, and durable peace and security, so that the region emerges as a competitive and effective player in international relations and the world economy. Food, agriculture, and natural resources (FANR) are a part of SADC's regional integration initiative.¹⁹² Its main function is the coordination and harmonization of agricultural policies and programs in the SADC region. The main focus of FANR is to ensure food availability, access, safety and nutritional value; disaster preparedness for food security; equitable and sustainable use of the environment and natural resources; and strengthening institutional framework and capacity building. An

¹⁹⁰ <http://www.nepad.org/foodsecurity>

¹⁹¹ CAADP has a separate entry.

¹⁹² <http://www.sadc.int/fanr/>

important focus of this work is to promote agricultural research and training.¹⁹³ SADC also maintains an active publications program relevant to agriculture—policy documents, briefings, reports, and other resources.

Swedish International Development Cooperation Agency

<http://www.sida.se/English/>

SIDA is a government organization under the Swedish Foreign Ministry, which administers approximately half of Sweden's budget for development aid. The Unit for Research Cooperation is where SIDA's support to partner country research together with research of importance for the development of these countries is handled. Support is provided for research councils; universities and research institutions; regional research networks; and international research programs.¹⁹⁴ SIDA also maintains a special scholarship site that is subdivided by geographic region and also by discipline. The Africa region is included, as is agriculture as a discipline.¹⁹⁵

Technical Centre for Agricultural and Rural Cooperation (CTA)

<http://www.cta.int/>

The Technical Centre for Agricultural and Rural Cooperation (CTA) is a joint international institution of the African, Caribbean and Pacific (ACP) Group of States and the European Union (EU). Its mission is to advance food and nutritional security; increase prosperity; and encourage sound natural resource management in ACP countries. CTA provides access to information and knowledge; facilitates policy dialogue; and strengthens the capacity of agricultural and rural development institutions and communities. CTA's three strategic goals for the period of 2011-2015 are to strengthen ACP agricultural and rural development policy processes and strategies; enhance priority agricultural value chains; and enhance ACP capacities in information, communication and knowledge management (ICKM) for agricultural and rural development. RUFORUM collaborates with CTA, as do FARA, AGRA, and other organizations in the forefront of training and research in agriculture. CTA maintains an active publications program, but only some of its publications are available online. Even so, it is worth searching the CTA catalogue and virtual learning center.¹⁹⁶ In addition, CTA maintains a separate “knowledge for development” website, which focuses on science and technology for agricultural and rural development in ACP countries.¹⁹⁷

United States Agency for International Development

<http://www.usaid.gov/>

US foreign assistance, goals as exemplified by USAID are twofold—to further US interests while improving lives in the developing world. USAID carries out U.S. foreign policy by promoting broad-scale human progress while simultaneously working to expand stable, free societies, create markets and trade partners for the United States, and foster good will abroad. Advancing agriculture and food security is one of USAID's nine foci.¹⁹⁸ Agriculture capacity building efforts, for example, include work to enhance training, research, and data in developing countries. To carry out this work, USAID primarily funds teams of US and developing country institutions. Many of the organizations funded by USAID carry out and publish research, but it's easiest to locate these research efforts by conducting Google and Google Scholar keyword searches.

¹⁹³ <http://www.sadc.int/fanr/agricresearch/icart/inforesources/index.php>

¹⁹⁴ <http://www.sida.se/English/Partners/Universities-and-research/From-funding-research-to-fighting-poverty/About-FORSK/>

¹⁹⁵ <http://www.scholarships-2013.com/college/swedish-international-development-cooperation-agency-sida/>

¹⁹⁶ <http://www.cta.int/en/content/view/full/3560>

¹⁹⁷ <http://knowledge.cta.int/en>

¹⁹⁸ <http://www.usaid.gov/what-we-do/agriculture-and-food-security>

United Nations Development Programme

<http://www.undp.org/content/undp/en/home.html>

The United Nations Development Programme (UNDP) partners with people at all levels of society to help build nations that can withstand crisis, and drive and sustain the kind of growth that improves the quality of life for everyone. On the ground in 177 countries and territories, UNDP offers global perspectives and local insights to help empower lives and build resilient nations. Agriculture is a strand that runs through much of UNDP's programmatic work—from the Millennium Development Goals (MDG) to poverty reduction to capacity building—and its research. The 2012 Africa Human Development Report, for example, is about how to promote a food secure continent. The report can be downloaded free of charge from the UNDP website. The background papers, a map, and multimedia materials are also available¹⁹⁹

World Bank

<http://www.worldbank.org>

The World Bank is an international financial institution that provides loans to developing countries for capital programs. It is not only an important funder globally, it is also an important publisher. The site is very large and difficult to navigate. The page that lists the agriculture, fishing, and forestry sector can be found at <http://www.worldbank.org/projects/sector?lang=en>. From there, you can find a list of projects that can be sorted by date, location, status and results, and charts. Africa, for example, has 160 open projects, just in agricultural extension and research. The World Bank data and research page is the best place to start if you are interested in finding bank data or publications.²⁰⁰ You can search by keyword or browse by topic. In addition, on 1 July 2012, the World Bank adopted an open access policy, which means that all of its research is available online without charge or restrictions. It would be a good idea to search the open knowledge repository, as well.²⁰¹ And when in doubt—search Google and Google Scholar.

¹⁹⁹ <http://www.afhdr.org/en/>

²⁰⁰ <http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/0,,menuPK:476823~pagePK:64165236~piPK:64165141~theSitePK:469372,00.html>

²⁰¹ <https://openknowledge.worldbank.org/>

Appendix 4

Nongovernmental organizations, associations, and networks

Please note that I suggest that associations and nongovernmental organizations be combined into one grouping. I have also added networks to this section. Below is a list of those nongovernmental organizations and associations that I recommend be deleted from the directory and an annotated list of those that I recommend be included. As in appendix three, there is a footnote for each suggested deletion with an explanation. The model for each entry is the same as described in appendix three.

App4.1 Deletions

African Council for Distance Education²⁰²
African Distance Learning Association²⁰³
African Quality Assurance Network²⁰⁴
African Rural and Agricultural Credit Association²⁰⁵
African Technical Policy Studies Network²⁰⁶
Agriterra²⁰⁷
Association of African Agricultural Professionals in the Diaspora²⁰⁸
Association for Vegetables under Protection²⁰⁹
Association of African Universities²¹⁰
Association for the Development of Education in Africa²¹¹
Common Market for Eastern and Southern Africa²¹²
Comprehensive Africa Agriculture Development Programme²¹³
Distance Education Association of Southern Africa²¹⁴

²⁰² This organization is not of direct relevance to agricultural research and training.

²⁰³ This organization is not of direct relevance to agricultural research and training.

²⁰⁴ This organization is not of direct relevance to agricultural research and training.

²⁰⁵ The ARACA is an association of central banks, commercial banks, agricultural banks, micro-finance institutions, and national programs dealing with agricultural and rural finance in Africa. The website gives good information on events but not much else. The resource center does not appear useful. The section on rural finance contained no documentation, for example. I recommend that this site be deleted now, but it should be visited again periodically to ascertain whether the situation has changed.

²⁰⁶ This organization is not of direct relevance to agricultural research and training.

²⁰⁷ This was a hard call. Agriterra is a Dutch organization that appears to help farmers' organizations and agribusiness in developing countries develop business plans. It does not fund implementation of these plans. The website isn't clear on how these organizations obtain funding. The publications list is not helpful. I don't see any relevance for teaching and learning, but RUFORUM may want to reinstate an entry for Agriterra after looking at the site: www.agriterra.org.

²⁰⁸ From the website, at least, this organization does not appear to be active. There are no completed or current projects listed. The publications list is not current.

²⁰⁹ The Association for Vegetables under Protection, now called Intensive Agriculture South Africa is a lobbying and advocacy group for South African growers and companies. This organization is not of direct relevance to agricultural research and training.

²¹⁰ Like IUCEA and SARUA below, AAU member universities carry out research and training in agriculture. But AAU as an organization does not. AAU, IUCEA, and SARUA are referenced in the section on universities.

²¹¹ ADEA is primarily a grouping of donors and ministers of education, housed at the African Development Bank. This organization is not of direct relevance to agricultural research and training.

²¹² COMESA appears in the section on bilateral/multilateral donors, agencies, and foundations, where I have also placed SADC and the AU.

²¹³ An entry for CAADP will be found in the section on bilateral/multilateral donors, agencies, and foundations.

²¹⁴ This organization is not of direct relevance to agricultural research and training.

Distance Education Association of Tanzania²¹⁵
 Ghanaian Distance Education Association²¹⁶
 Higher Education Learning and Teaching Association of Southern Africa²¹⁷
 Institute of Tropical Agriculture (Ghana)²¹⁸
 International Council for Open and Distance Education²¹⁹
 International Education Association of South Africa²²⁰
 Inter-University Council for Eastern Africa²²¹
 National Association of Open and Distance Education of South Africa²²²
 Open and Distance Education Association of Malawi²²³
 Quality Education Southern Management Initiative for Southern Africa²²⁴
 South African Animal Health Association²²⁵
 South African Institute for Distance Education²²⁶
 South African Regional Universities Association²²⁷
 Uganda National Farmers Federation²²⁸
 Southern African Association for Institutional Research²²⁹
 West African Distance Education Association²³⁰
 Zambia Association for Distance Education²³¹
 Zimbabwe National Association of Distance and Open Learning²³²

App4.2 Introductory text

Below is draft text for this section:

This section on nongovernmental organizations (NGOs), associations, and networks lists some of the major agencies relevant to the RUFORUM constituency. Only organizations that support training and research in the agricultural sciences in Africa are included. Entries focus on their work in the agriculture and also include details on freely available research publications produced by each organization.

App4.3 Inclusions and additions

African Agricultural Technology Foundation

<http://www.aatf-africa.org/>

The African Agriculture Technology Foundation is a not-for-profit organization designed to facilitate and promote public/private partnerships for the access and delivery of appropriate proprietary agricultural

²¹⁵ This organization is not of direct relevance to agricultural research and training.

²¹⁶ This organization is not of direct relevance to agricultural research and training.

²¹⁷ This organization is not of direct relevance to agricultural research and training.

²¹⁸ This organization is located in Ghana, where RUFORUM does not work. More importantly, the links on the website do not work. There are no resources on it of relevance to the RUFORUM constituency.

²¹⁹ This organization is not of direct relevance to agricultural research and training.

²²⁰ This organization is not of direct relevance to agricultural research and training.

²²¹ Like AAU and SARUA, IUCEA member universities carry out research and training in agriculture. But IUCEA as an organization does not.

²²² This organization is not of direct relevance to agricultural research and training.

²²³ This organization is not of direct relevance to agricultural research and training.

²²⁴ This organization is not of direct relevance to agricultural research and training.

²²⁵ There is nothing on the webpage that is relevant to anyone not a member of the society, and South Africa is not RUFORUM country.

²²⁶ This organization is not of direct relevance to agricultural research and training.

²²⁷ Although its member universities carry out training and research in the agricultural sciences, SARUA does not.

²²⁸ The organization may be active, but as of this writing (14/09/12), the website wasn't. The most recent entry was from 2009.

²²⁹ This organization does not appear to work in the agricultural sciences.

²³⁰ This organization is not of direct relevance to agricultural research and training.

²³¹ This organization is not of direct relevance to agricultural research and training.

²³² This organization is not of direct relevance to agricultural research and training.

technologies for use by resource-poor smallholder farmers in Sub-Saharan Africa. The AATF has published a number of studies on the introduction of new technologies and approaches to technology transfer to smallholder farmers. The site would be a rich resource to students and staff particularly interested in issues pertaining to new technologies.

African Association of Agricultural Economists

<http://www.aaae-africa.org/>

The African Association of Agricultural Economists (AAAE) is a not-for-profit organization and a continent wide network of agricultural economists working in agriculture and broadly related fields of applied economics on issues related to improving the productivity of African agriculture. AAAE was established in 2004 in Nairobi during its inaugural symposium. The association has over 600 registered active members working in agricultural and resource economics as well as in other social sciences around the world. Although the AAAE website gives information about its activities, the site is not very active at this writing (12/09/12). The AAAE publishes a journal—*The African Journal of Agricultural and Resource Economics*—which is located at a different URL.²³³ The last issue of the journal published appears to be December 2010.

Alliance for a Green Revolution in Africa

<http://www.agra-alliance.org/>

The Alliance for a Green Revolution in Africa (AGRA) works to achieve a food secure and prosperous Africa through the promotion of rapid, sustainable agricultural growth based on smallholder farmers. Smallholders--the majority women--produce most of Africa's food, and do so with minimal resources and little government support. AGRA's programs focus on four basic areas: soil, seeds, policies and markets. Among its activities, AGRA runs the Farmer Organization Support Center in Africa, together with programs to support seed systems, soil health, market access, and gender in agriculture. AGRA also funds PhD programs for plant breeding and has other partnerships that train dozens of MSc students in agriculture as well as in agriculture and applied economics. Finally, AGRA is responsible for the African Enterprise Challenge Fund.²³⁴

Aquaculture Association for Southern Africa

<http://aasa-aqua.co.za.dedi124.flk1.host-h.net/>

The Aquaculture Association of Southern Africa (AASA) was established in the late 1980's in order to represent the interests of the then fledgling aquaculture industry in Southern Africa. The association has since developed into a structure with representation from the various sectors contributing towards the aquaculture industry of the region, including marine species such as oysters, mussels, abalone and prawns; freshwater species such as trout, catfish, tilapia, and ornamental fishes; as well as service providers such as feed companies, equipment suppliers and veterinary services. As of this writing (12/09/12) there isn't much on the site, but there is a small publications section with full text resources, including sector studies, market analyses, and case studies.

Arid Lands Information Network

<http://www.alin.net/>

ALIN is a network of community development workers. Over 2,000 grassroots organizations, government departments and other organizations are ALIN members. ALIN works directly with local communities in Kenya, Uganda, and Tanzania in order to learn from their experiences and to share with them useful drylands farming methods and technologies developed elsewhere. ALIN uses a variety of communications tools (print, radio, Internet) and languages in its work. The website contains links to numerous resources that ALIN has produced, including some in Ki-Swahili and other African languages..

²³³ <http://www.afjare.org/>

²³⁴ <http://www.aecfafrica.org/>

Association for Strengthening Agricultural Research in Eastern and Southern Africa

<http://www.asareca.org/>



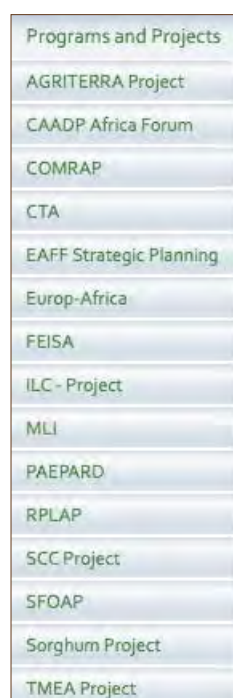
The Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA) is an NGO of the national agricultural research institutes (NARs) of eleven countries-- Burundi, Democratic Republic of Congo, Eritrea, Ethiopia, Kenya, Madagascar, Rwanda, Sudan, Tanzania, Uganda, and now South Sudan. It aims at increasing the efficiency of agricultural research in the region so as to

facilitate economic growth, food security, and export competitiveness through productive and sustainable agriculture. It is based at the NARI in Uganda. The ASARECA website is an excellent source of research information, as can be seen from the screen capture on the left.

E-Agriculture

<http://www.e-agriculture.org/>

The e-Agriculture Community of Practice is a global initiative to enhance sustainable agricultural development and food security by improving the use of information, communication, and associated technologies in the sector. The overall aim is to enable members to exchange opinions, experiences, good practices and resources related to e-agriculture, and to ensure that the knowledge created is effectively shared and used worldwide. There are links to numerous resources on the site. E-Agriculture also organizes online discussion groups.



Eastern African Farmers Federation

<http://eaffu.org/eaffu/>

The Eastern African Farmers Federation (EATF) works with member organizations in Burundi, Democratic Republic of the Congo, Djibouti, Eritrea, Ethiopia, Kenya, Rwanda, Tanzania, and Uganda. Its role is to voice the legitimate concerns and interests of farmers of the region, with the aim of enhancing regional cohesiveness and social-economic status of the farmers. EATF also tries to promote regional integration of through trade and good neighborliness. As can be seen from the screen capture on the left, EATF implements a number of projects for other agencies.

Food, Agriculture, and Natural Resources Policy Analysis Network

<http://www.fanrpan.org>

FANRPAN is an interdisciplinary organization that has as its objectives: promoting appropriate agricultural policies in order to reduce poverty, increase food security and enhance sustainable agricultural development in the SADC region; improving policy analysis, research and formulation of priority SADC agricultural research themes; developing capacity for coordinated dialogue among stakeholders; and improving policy decision-making. FANRPAN conducts research, organizes meetings, and carries out training. FANRPAN's importance to AgShare may lie more in the projects it implements than in the documentation on its website, for there is not very much there.

FoodNet

<http://www.foodnet.cgiar.org>

FoodNet was launched in 1999 as an ASARECA post-harvest and market research network for East and Central Africa and implemented by The International Institute of Tropical Agriculture (IITA). It focuses primarily on agricultural value-chain analyses, market studies, market and marketing information services,

agro-collective enterprise development, and related business development support services in order to link agricultural producers, who are mainly smallholders, to markets. On the FoodNet website, users will find market information and studies; reports and trend analyses; and information on agro-enterprises. Although FoodNet materials are freely available, they are copyright protected. FoodNet also implements a market information service, which disseminates market information through radio throughout Uganda in different languages. There are several radio scripts available on the website, focusing on the advantages of group marketing and of farmers working together in groups. The programs themselves are not available on the site, unfortunately.

Knowledge Base

Select your option from the list:

- Search for projects, persons, organisations and documents/outputs from a range of external databases holding [African Agricultural Research Information](#)
- Search for good practices and technologies in the [Farmers Corner](#)
- Organisations, projects and experts in Africa described in the [Information System](#) used by FARA
- Browse FARA's Secretariat and working group documents and outputs from the [FARA Library](#)
- View [International News](#) items related to African ARD
- Search the FARA [Organisation Directory](#)
- Access a list of [abbreviations](#)

Forum for Agricultural Research in Africa

<http://www.fara-africa.org>

The Forum for Agricultural Research in Africa (FARA), an umbrella organization of major stakeholders in agricultural research and development in Africa, aims to complement the activities of national, international, and sub-regional research institutions to deliver more responsible and

effective services to its constituents. It plays advocacy and coordination roles for agricultural research for development, while its affiliates develop improved technologies along the research-to-development continuum in their respective countries and coverage areas. The FARA website, therefore, mounts information about research rather than the research itself. Visitors can go to the FARA knowledge base page (screen capture above) to locate resources of relevance to them.

M-Farmer Initiative

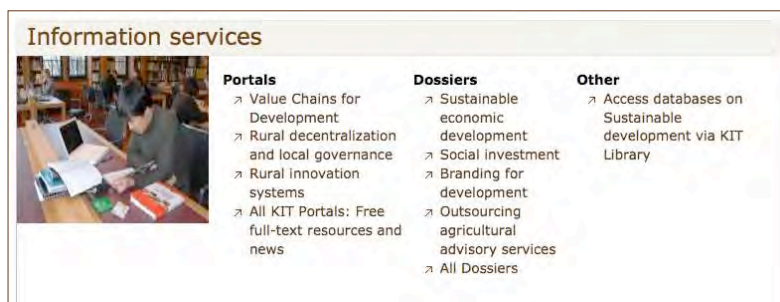
<http://www.gsma.com/developmentfund/programmes/magri/mfarmer-initiative/>

The M-farmer initiative was launched in 2011, with funding from USAID and the Gates Foundation, to support mobile service providers, in partnership with public and private sector agriculture organizations, to utilize the mobile channel to extend the reach and improve the quality of information and advisory services for smallholder farmers in emerging markets. Anyone interested in the implementation and use of mobile technologies for farmers should visit this site. There are many studies available free of charge in the resources section and personal stories in the “life stories” page. There is also a section for women, called m-women.

Regional Universities Forum for Capacity Building in Agriculture

<http://www.ruforum.org/>

The Regional Universities Forum for Capacity Building in Agriculture (RUFORUM), which is located at Makerere University, is a consortium of 29 universities in Eastern, Central and Southern Africa, which was established in 2004. From 1992 until 2004, RUFORUM was a program of the Rockefeller Foundation. Because RUFORUM recognizes the important and largely unfulfilled role that universities play in contributing to the well being of small-scale farmers and economic development throughout sub-Saharan Africa, its mandate is to oversee graduate training and networks of specialization in the countries and universities where it works. RUFORUM strongly believe in fostering innovative and responsive research; high performing and proactive graduates; a dynamic platform for university networking; advocacy for agricultural higher education; and university transformation for relevance.



Royal Tropical Institute of the Netherlands

<http://www.kit.nl/kit/Royal-Tropical-Institute->

The Royal Tropical Institute (KIT) in Amsterdam is an independent center of knowledge and expertise in the areas of international and intercultural cooperation. KIT operates internationally through

development projects, scientific research and training, and also provides consultancy and information services. Sustainable development and agriculture are two areas of KIT expertise. On the sustainable development page, for example, visitors will find an array of information resources, particularly on value chains.²³⁵

Women of Uganda Network

<http://wougnet.org>

The Women of Uganda Network (WOUGNET) is a Ugandan non-governmental organization dedicated to aiding women and women's organizations in the use of information and communication technologies. WOUGNET focuses on using mobile phones, e-mail and the web, and is interested in the integration of "traditional means" such as radio, video, and print in a way that enable wider outreach. WOUGNET works on agriculture in a number of ways, including the Kubere Information Centre (KIC), a multi-dimensional information center offering development-oriented information, with an emphasis on agricultural and rural development information.²³⁶

World Organization for Animal Health

<http://www.oie.int>

The World Organization for Animal Health (OIE) was established to fight animal diseases at a global level. It is not an easy site to navigate, but it would be worthwhile to visit. When I browsed the site, I found the compilation of data by disease page (http://web.oie.int/eng/maladies/en_alpha.htm). For each disease, there is a link to the appropriate code, the disease card, if there is one, and the full *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals*. If you click on the manual link, you will have to scroll down to find the disease you are looking for.

²³⁵ <http://www.kit.nl/kit/sustainable>

²³⁶ <http://kic.wougnet.org/new/>

Appendix 5

Trade associations & commodity exchanges

This is a new category that I thought would be relevant to the RUFORUM network. Only those associations or exchanges that work in the RUFORUM countries are included. In addition, I have concentrated on the ones that provide information pertinent to teaching, learning, and research. Because this is a new category, it is not yet comprehensive, but it is a start.

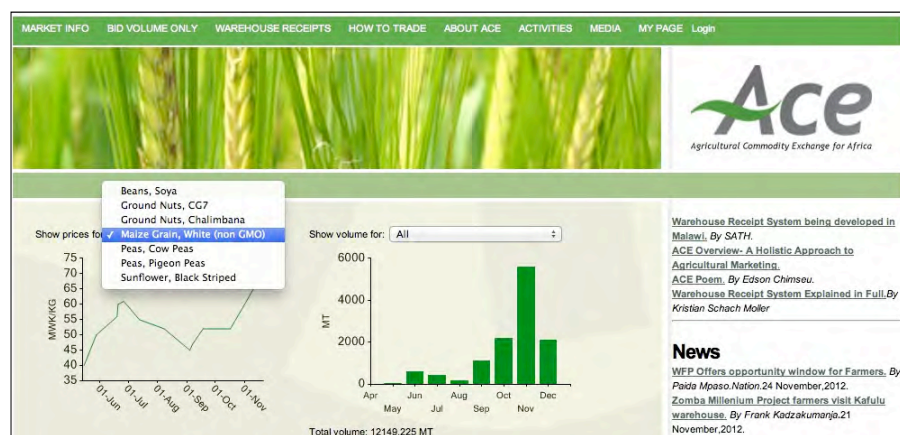
App5.1 Introductory text

Trade associations and commodity exchanges can bring together a diverse group of interests within and across sectors. These include farmers, extension workers, processors, distributors, and policy makers to name a few. These associations and exchanges are also relevant to researchers, particularly those working on supply-side value chains. Below is a small list of trade associations and commodity exchanges in RUFORUM network countries. The number of African commodity exchanges will grow in the period ahead.

App5.2 Inclusions

Agricultural Commodity Exchange for Africa

<http://www.aceafrica.org/default.aspx>



The Agricultural Commodity Exchange for Africa, which is located in Malawi, is an agricultural commodity exchange facilitating trade in the physical spot and forward markets. ACE has designed an online trading platform in which market participants (from smallholder farmer to institutional buyers) can post “offers to sell” and “bids to buy” commodities; a price information system in which market participants can receive market information on the Internet and

mobile phone; and a warehouse receipt system that allows market participants to access finance and end markets. ACE can show prices for maize, soybeans, cowpeas, pigeon peas, groundnuts, and sunflowers.

Ethiopia Commodities Exchange

<http://www.ecx.com.et/>

The Ethiopia Commodity Exchange (ECX), which was created in April 2008, is a new initiative for Ethiopia and, according to the website, the first of its kind in Africa. The vision of ECX is to revolutionize Ethiopia’s tradition-bound agriculture through creating a new marketplace that serves all market actors, from farmers to traders to processors to exporters to consumers. Commodities represented on the exchange include coffee, maize, sesame, haricot beans, and wheat. There are a number of briefs and articles, which might be relevant, including studies from Uganda and Kenya. Go to: <http://www.ecx.com.et/KnowledgeCenter.aspx#Briefs>. There is no licensing information available for

these PowerPoint presentations and other documentation. But perhaps most relevant will be market data (historical and current) for coffee and grain. Click on market data at the top of the page.

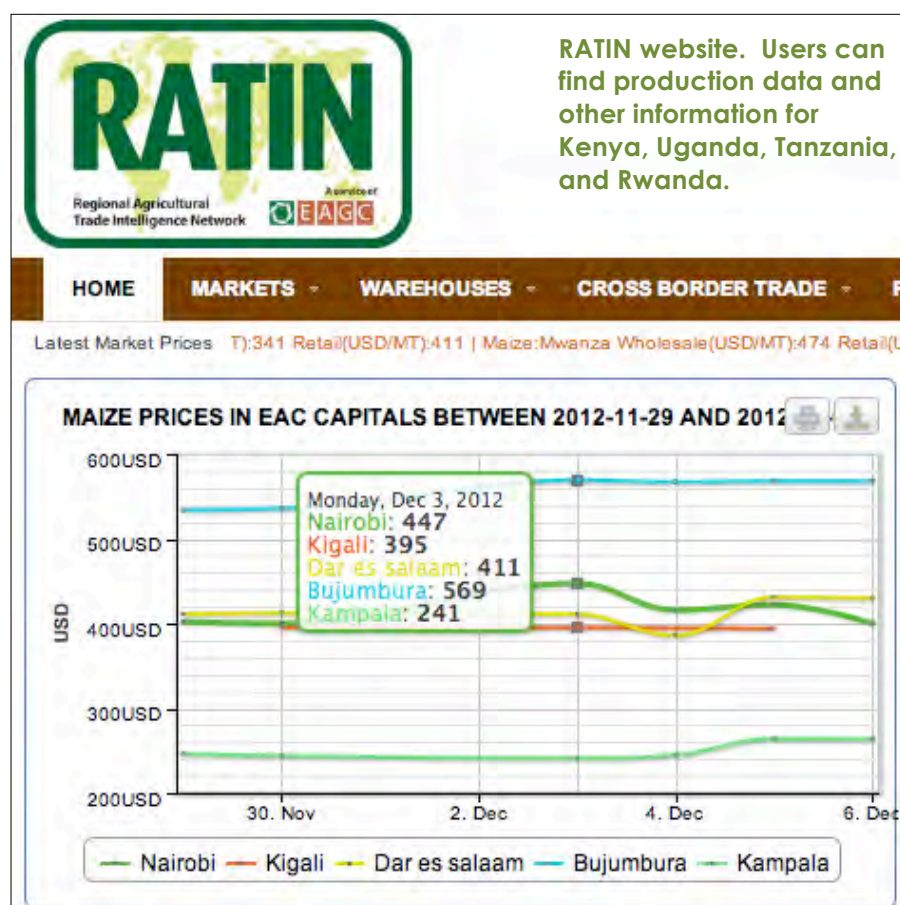
Kenya Agricultural Commodities Exchange

<http://www.kacekenya.co.ke/>

The Kenya Agricultural Commodities Exchange (KACE) is a private sector firm launched in 1997 to facilitate linkage between sellers and buyers of agricultural commodities, provide relevant and timely marketing information and intelligence, provide a transparent and competitive market price discovery mechanism and harness and apply ICT for rural value addition and empowerment.

Regional Agricultural Trade Network

<http://www.ratin.net>



The Regional Agricultural Trade Network (RATIN) was developed to help reduce regional food insecurity by strengthening the ability of markets to provide access to affordable food to poor households and to improve food availability through the provision of adequate incentives to producers. To achieve this goal RATIN provides regional trade analyses for maize, beans and rice by using information from a variety of sources, including ministries of agriculture and other government offices, international agencies, etc. The RATIN website provides full-text access to wholesale prices in East Africa, bulletins, production data, etc. Please note that in addition to the RATIN site, there are a number of sub-regional and national websites on commodities and crops. The NAADS site, for example, links to a number of them in Uganda.

Tea Board of Kenya

<http://www.teaboard.or.ke/>

The Tea Board of Kenya is mandated to license tea manufacturing factories; carry out of research on tea through its technical arm, the Tea Research Foundation of Kenya; register growers, buyers, brokers, packers, management agents and any other person dealing in tea; and promote Kenya tea in both the local and the international markets. The Board also disseminates information relating to tea and advises the Government of all policy matters regarding the tea industry.

Uganda Commodities Exchange

<http://www.uce.co.ug/>

The Uganda Commodities Exchange is an online resource for commodity traders. The first of its kind in Uganda, it is a physical exchange facilitating the trading of graded produce e.g. maize, rice beans, coffee, soya, sesame, coffee, soya, sesame etc. The UCE also sponsors the Rural Information System (RIS) program to empower organized small-scale rural farmers in Uganda to produce marketing information and access timely markets information using ICT, to make informed enterprise selection and selling decisions, and to subsequently earn more competitive incomes.²³⁷

²³⁷ <http://www.uce.co.ug/ris/>

Appendix 6

Universities

Below is a list of those universities that I recommend be deleted from the directory and an annotated list of those that I think should be included. There is a footnote for each entry, with an explanation why I have made these suggestions. Some inclusions are already in the directory, but I have revised the text to focus on their work in agriculture. Where relevant, I have also included details about freely available research publications produced by these institutions. Some entries are new. Please note that I have included the name and URL, but no other contact information. RUFORUM will have to determine which details it wants to include for each entry. See section 4.4.6 in chapter four for my recommendations. Moreover, I have not included information that is liable to change frequently, such as number of students. The lists are in alphabetical order. You will see that each entry focuses on agriculture, Africa, training, and/or research. Finally, I have included screen captures, which should be deleted from the online version of the guide. In addition, text might need revision. Finally, for some universities, there is a paucity of information or it is nonexistent.

App6.1 Deletions

Below are listed the universities that I recommend deleting because none is participating in the RUFORUM consortium.

Copperbelt University
North-West University
Rhodes University
Stellenbosch University
University of Agriculture, Abeokuta
University of Cape Town
University of Dar es Salaam
University of Fort Hare
University of the Free State
University of Liberia
University of Namibia
University of Pretoria
University of KwaZulu Natal
University of Limpopo
University of South Africa
University of Pretoria
University of Venda
University of the Western Cape
University of the Witwatersrand
Walter Sisulu University

App6.2 Introductory Text

Introductory text is below:

The institutions listed in this directory provide information on RUFORUM partner universities, colleges, faculties, and departments. Wherever available, we have included a link directly to RUFORUM's partner at these universities. When these URLs are not available, however, you will find a URL for the university's website.

For more information on African universities in general, go to the website of the Association of African Universities, which is a pan-African organization and has a list of its member universities: <http://www.aau.org/membership/fullmembers.php>. When you click on the university's name you will be taken to the appropriate page for that institution. For Southern Africa, go to the Southern African Regional Universities Association (SARUA) for details about public universities in the SADC region at <http://www.sarua.org/?q=content/sadc-public-universities>. SARUA descriptions also include information about each country's education system, including at the tertiary level.

App6.3 Inclusions and additions

App6.3.1 Botswana

National College of Agriculture

<http://www.bca.bw>

The Botswana College of Agriculture, which is located at Content Farm in Sebele, 12 kilometers north of Gaborone, is an associate institution of the University of Botswana. Both undergraduate and postgraduate degrees are offered. The College also offers short courses through its Centre for In-service and Continuing Education. There are six academic departments—agricultural economics education and extension; agricultural engineering and land planning; animal science and production; basic sciences; food science and technology; and crop science and protection. The College maintains a farm, which is used for teaching, research, and commercial purposes.

App6.3.2 Burundi

National University of Burundi, Faculty of Agricultural Sciences

http://www.ub.edu.bi/index.php?option=com_content&view=article&id=49:agronomie&catid=35:facultes&Itemid=54

The University of Burundi Faculty of Agricultural Sciences, which is located in Bujumbura, Burundi, was established in January 1976, with assistance from the government of Belgium. The faculty's mission is to train agronomists at the national level who are experts in agriculture in the tropical regions. This training emphasizes practical lab work and research in the field. The faculty strives to meet the needs of rural farmers through extension and the dissemination of plants and animals adapted to environmental conditions.

App6.3.3 Democratic Republic of the Congo

Catholic University of Bukavu

<http://www.ucbukavu.org>

The Catholic University of Bukavu, which is located in Bukavu, is a private university, which opened in 1990. The Faculty of Agriculture grants both a BSc and an MSc in agriculture as well as a diploma in agricultural engineering. The Faculty does not have its own website.

App6.3.4 Ethiopia

Haramaya University

http://www.haramaya.edu.et/index.php?option=com_content&view=article&id=61&Itemid=80&showall=1

Haramaya University is located in Haramaya, Ethiopia. The Haramaya University College of Agricultural and Environmental Sciences was established in 1954 as the Alemaya College of Agriculture. It was a part of Addis Ababa University until 1985 when it was upgraded to a full-fledged university of agriculture.

The Alemaya University of Agriculture became a multidisciplinary university in 1996. In 2006 the university was renamed Haramaya University. The college offers BSc and MSc degrees in animal and range sciences; plant science; rural development and agricultural extension; natural resources and environmental sciences; and agricultural economics and agri-business. Together, there are 20 MSc and 12 PhD programs that can be obtained in these disciplines. There is also a two and half year BSc program for mid-career professionals who hold diplomas in agriculture or forestry. Research and extension activities operate under the umbrella of the Ethiopian Institute of Agricultural Research.

Mekele University

<http://www.mu.edu.et/index.php/sites-map/84-academics/colleges/college-of-dryland-agriculture-and-natural-resources>

The College of Dryland Agriculture and Natural Resources, which is located in Mekele, was established in 1993 with the aim of supporting Ethiopia's dryland agriculture, environment and natural resources. The College offers nine BSc and four MSc degrees from the following departments—animal, rangeland and wildlife sciences; natural resource economics and management; and land resources management and environmental protection. Most departments have laboratories, demonstration farms, and off-campus research sites to aid the teaching-learning and research activities of staff and students.

App6.3.5 Kenya

Egerton University

<http://foa.uniipart.org>

Egerton University is located in Njoro, Kenya. The Faculty of Agriculture offers BSc, MSc, and PhD programs in the departments of agricultural economics and agri-business management; animal sciences; crops, horticulture and soils; and dairy, food Sciences and technology. Each of the four departments offers undergraduate and MSc degrees; the only PhD is in horticulture. In addition, both a BSc and MSc are offered in agricultural extension and education, which is taught in the Faculty of Education.

Jomo Kenyatta University of Agriculture and Technology

<http://www.jkuat.ac.ke/faculties/agriculture/>

The Jomo Kenyatta University of Agriculture and Technology is located in Nairobi, Kenya. The Faculty of Agriculture is composed of three departments—food science and technology; horticulture; and land resources. Agricultural economics and rural development is a sub-department of horticulture. Each of these departments offers a BSc degree; food science offers a BSc, an MSc, and a PhD; horticulture offers a BSc and an MSc.

Kenyatta University

<http://www.ku.ac.ke/schools/agriculture/>

Kenyatta University is located in Nairobi, Kenya. The School of Agriculture and Enterprise Development offers undergraduate programs in three Departments—agricultural resources management; agricultural science and technology; agribusiness management and trade, under which the five BSc programs are granted. They include: agriculture; agricultural resource management; animal production and health management, dryland agriculture and enterprise development; crop improvement and protection; and agribusiness management and trade. There are MSc programs in agribusiness management, agricultural economics, agronomy (crop production and crop protection options); plant breeding; land and water management and integrated soil fertility management. There are also PhD programs in soil fertility management; agribusiness management and trade; plant pathology; plant breeding; and other specialized areas within agriculture. Kenyatta University also maintains an institutional archive in which you can find resources in the agricultural sciences: <http://ir-library.ku.ac.ke/ir>.

Moi University

<http://www.mu.ac.ke/en/>

Moi University is located in Eldoret, Kenya. The School of Agriculture and Biotechnology was established in 1991 as a graduate faculty with the specific objective of training highly skilled manpower in agricultural research, production and extension. At inception, four departments were established—soil science; crop production and seed technology; agricultural marketing and cooperatives; and rural engineering. Over the years, the faculty has undergone developmental changes. In 1998 the school established a BS. in horticulture. Later, other Undergraduate programs were added—a BSc in agriculture and a BSc in agricultural resource economics.

University of Nairobi

<http://agriculture.uonbi.ac.ke>

The University of Nairobi Faculty of Agriculture, whose URL is given above, is situated within the university's College of Agriculture and Veterinary Sciences (<http://cavs.uonbi.ac.ke>). It currently has eight undergraduate, 18 MSc, and three PhD programs in five departments—plant science and crop protection; agricultural economics; food science, nutrition, and technology; land management and agricultural technology; and animal production. The Faculty also offers certificates and diploma-level courses.

App6.3.6 Lesotho

University of Lesotho²³⁸

App6.3.7 Malawi

Mzuzu University

http://www.mzuni.ac.mw/index.php?option=com_content&view=article&id=21&Itemid=15

Mzuzu University is located in Mzuzu, in the northern region of Malawi. The Faculty of Environmental Sciences offers five BSc programs—in forestry, renewable energy technologies; fisheries; land management and administration; and water resources management.

University of Malawi

<http://www.bunda.luanar.mw>

The University of Malawi's Bunda College of Agriculture was established just outside of Lilongwe in 1967. It is now a constituent college of the Lilongwe University of Agriculture and Natural Resources (LUNAR). Its first intake took place in September 2012. There are three faculties—agriculture, development studies, and environmental sciences.²³⁹ The College offers BSc degrees in agribusiness management; agriculture (economics, engineering, extension, crop science, family science, nutrition and food science); aquaculture and fisheries sciences; environmental sciences; forestry; horticulture; irrigation engineering; and natural resources management. There are also MSc programs in agribusiness management; agricultural and applied economics; agricultural extension and rural development; agroforestry; agronomy; animal science; aquaculture and fisheries science; crop protection; horticulture; nutrition and food science; social forestry; and soil science. PhD's are offered in agricultural and resource economics; agriculture and applied economics; animal science; aquaculture and fisheries science; biotechnology; and rural development.

²³⁸ The link to the National University of Lesotho is persistently down. I did find a link to a page on the SARUA website-- http://www.sarua.org/?q=uni_National%20University%20of%20Lesotho. I don't know whether RUFORUM would like to use it.

²³⁹ Does RUFORUM want to change the name to reflect creation of Lilongwe University of Agriculture and Natural Resources?

App6.3.8 Mozambique

Eduardo Mondlane University

<http://www.agronomia.uem.mz>

The Faculty of Agronomy and Forestry Engineering is located in Maputo, Mozambique.²⁴⁰

Catholic University of Mozambique

<http://www.ucm.ac.mz/cms/faculties/fagri>

The Catholic University faculty of agriculture is located in Cuamba, Mozambique. In the broad based agricultural sciences, the faculty offers undergraduate degrees in agronomy; rural development; forestry; livestock production; and plant production and protection. At the MSc level, there are programs in rural development and regional extension and in soil and sustainable agriculture.

App6.3.9 Namibia

University of Namibia

http://www.unam.na/faculties/agric/agric_index.html

The Faculty of Agriculture and Natural Resources has its headquarters at the Neudamm Campus, approximately 40 km from the main University of Namibia campus in Windhoek. There are six campuses—agricultural economics; animal science; crop science (Ogongo campus); food science and technology; fisheries and aquatic sciences; integrated environmental science (Ogongo campus). The faculty offers a BSc in agriculture in agricultural economics; animal science; crop science; and food science and technology. There is also a BSc (not research) in natural resources (fisheries and aquatic science and integrated environmental science). An MSc is also offered in rangeland resource management. Apart from these programs, it is also possible to work towards an MSc and a PhD by research and thesis or dissertation.

App6.3.10 Rwanda

National University of Rwanda

<http://www.agriculture.nur.ac.rw>

The Faculty of Agriculture, which is located in Kigali, is made up of four departments (agricultural economics and agribusiness; soil science and environmental management; crop science; and animal science) as well as research units, stations, and laboratories. Each of these departments offers a BSc (honors). There is also an MSc in agroforestry and soil management and a postgraduate diploma in irrigation and drainage. The diploma program, however, is only carried out on special request, with a cohort of students.

App6.3.11 South Sudan

University of Juba²⁴¹

²⁴⁰ The website is in Portuguese.

²⁴¹ I couldn't find a URL for the University of Juba.

App6.3.12 Sudan

Kordofan University

<http://kordofan.edu.sd/natres/>

The Faculty of Natural Resources and Environmental Studies is located in El-Obied, Sudan, 560 kilometers to the southwest of Khartoum. The area of Kordofan has a fragile natural resource base. Desertification and soil degradation are very active and greatly influence the livelihood of people in the area. The Faculty, which was the first faculty opened at the University of Kordofan, has been chosen as a model faculty for its counterparts in Sudan. The Faculty tackles agricultural sciences (crops and livestock; forestry and range sciences) with special emphasis on natural resources and environmental studies. The Faculty is located in a fragile environment exacerbated by irrational use of natural resources. The faculty trains students at the advanced diploma BSc (honors), MSc, and PhD levels.

University of Gezira

<http://fas.uofg.edu.sd>

The University of Gezira is located in Wad Madni City in central Sudan.²⁴²

App6.3.13 Swaziland

University of Swaziland

<http://www.uniswa.sz/academics/agriculture>

The University of Swaziland Faculty of Agriculture is located in Luyengo, Swaziland, about 35 kilometres south of the capital, Mbabane. The Faculty has eight departments—agricultural and biosystems engineering; agricultural economics and management; agricultural education and extension; animal science; consumer sciences; crop production; and horticulture. The Faculty only offers undergraduate degrees—in agricultural and biosystems engineering; agricultural economics and agribusiness; agricultural education; agronomy; animal science; dairy science; consumer science; consumer science education; food science, nutrition, and technology; and horticulture.

App6.3.14 Tanzania

Sokoine University of Agriculture

<http://www.suanet.ac.tz>

Sokoine University of Agriculture is located in Morogoro, Tanzania. There are four faculties—agriculture; veterinary medicine; forestry and nature conservation, which offer 27 undergraduate degree programs in the following disciplines—agriculture, veterinary medicine; animal science, range management, wildlife, forestry, and agronomy. In addition, there are MSc programs in agricultural economics and agribusiness; agricultural engineering and land planning; animal science and production; crop science and production; food science and technology; soil science; forestry and nature conservation; veterinary medicine; and rural development (from the Development Studies Institute). There is a PhD program in soil and water management and PhD's by research only from all faculties and the Development Studies Institute.

App6.3.15 Uganda

Gulu University

<http://www.gu.ac.ug/>

Gulu University, which was founded in 2002, is Uganda's newest university, and is located in Gulu, within conflict-prone Northern Uganda amidst war-devastated communities. The Faculty of Agriculture and the Environment does not have its own website, but more information on the Faculty and its research

²⁴² There was no information on the website about the faculty of agriculture.

programs will be found at

http://www.gu.ac.ug/index.php?option=com_content&view=category&layout=blog&id=45&Itemid=70. The Faculty started with one program, a bachelor of agriculture, as it waited to build its capacity. From the 2007/2008 academic year, the Faculty began a BS in biosystems engineering. Additional programs, such as food science and post-harvest technology and natural resources management, are planned. Gulu does not yet offer a postgraduate degree.

Makerere University College of Agriculture and Environmental Sciences

<http://caes.mak.ac.ug/>

Makerere University is located in Kampala, Uganda. The Makerere University College of Agriculture and Environmental Sciences comprises three separate schools—the School of Agriculture, which is one of the oldest units of the university; the School of Forestry, Environment, and Geography; and the School of Food Technology, Nutrition and Bio-Engineering. There are three departments in the School of Agriculture (<http://sas.mak.ac.ug/>)—agricultural production, agribusiness and natural resource economics, and extension and innovation. Both undergraduate and postgraduate degrees are offered. The school also runs a research institute called the Makerere University Agricultural Research Institute-Kabanyola. The school has an active research program; publications associated with this research and links to full text will be found at <http://sas.mak.ac.ug/index.php/home..>

Uganda Martyrs University

<http://www.umu.ac.ug/>

Uganda Martyrs University is a Catholic University, located in Kampala, Uganda. The Faculty of Agriculture does not have its own website, but information on the faculty can be found on the following university link: <http://www.umu.ac.ug/web/e/index.php?d=3&u=11&e=36>. The faculty, which was established in the year 2000, offers both undergraduate and postgraduate degrees. The undergraduate programs (a four-year BS in agriculture and one in organic agriculture) are through distance learning. The two-year MSc in agro-ecology, which was to start in 2010,²⁴³ is to be run as a weekend program. There are also training courses in organic agriculture. Field demonstrations are carried out at the Kalagala Organic Demonstration and Research Unit and at the university's Equator Valley Farm, where an eco-tourism site is being developed.

App6.3.16 Zambia

University of Zambia

<http://www.unza.zm/agriculturalsciences/index.php>

The University of Zambia is located in Lusaka, Zambia. There are five departments in the School of Agricultural Sciences—animal science, crop science, agricultural economics and extension education, soil science, and food science and technology. The School offers five undergraduate degree programs—in food science and technology; agriculture (animal sciences, soil science, plant sciences); agricultural economics, agricultural extension; and human nutrition. There are six MSc and PhD programs—in plant breeding and seed systems; agronomy (plant science); soil science; plant genetic resources; agricultural economics and extension; and animal nutrition.

App6.3.17 Zimbabwe

Africa University

<http://www.africau.edu/faculties/agriculture/FANR.htm>

The Faculty of Agriculture and Natural Resources, which is located in Mutare, Zimbabwe, offers a BSc in agriculture and natural resources and a BSc in natural resources. Postgraduate MSc programs offered in crop production and agribusiness. There is also an MPhil postgraduate (primarily research) with a

²⁴³ There is nothing on the website to indicate whether this program actually began.

research focus on agribusiness, agricultural economics, crop production, animal science, forestry, horticulture, irrigation, water management, wildlife management or natural resources.

University of Zimbabwe

<http://uzweb.uz.ac.zw/agriculture/>

The University of Zimbabwe is located in Harare, Zimbabwe. There are four departments within the Faculty of Agriculture—animal science, agricultural economics, soil science, and crop science.

Appendix 7

Open data & research organizations

This appendix includes some organizations that are listed in the research agency/institute category in the stakeholders' directory, but many that are not. I am also recommending deletions because of lack of specific relevance to agricultural training and research in Africa. Some of these deletions might be useful to the RUFORUM network in the creation of OER courses, but they are not pertinent to the stated aims of the RUFORUM website. I also deleted the separate entries for centers affiliated to CGIAR because I have a global CGIAR entry. Also, there was a lack of consistency in the Stakeholders' Directory. Some CG centers were included, but not all of them. I have therefore listed all 15 centers in the CGIAR entry. If RUFORUM wishes to add a separate entry for each center, we can do so, of course. Additionally, I have included RUFORUM country NARS entries, whenever available. Finally, I have reworded almost all of the explanations.

App7.1 Deletions

Agricultural Research Council, South Africa²⁴⁴
Agricultural Research Organization, Israel²⁴⁵
Ethiopian Institute for Agricultural Research²⁴⁶
Council for Scientific and Industrial Research²⁴⁷
Council for Scientific and Industrial Research, South Africa²⁴⁸
Food and Agriculture Organization²⁴⁹
Food, Agriculture, and Natural Resources Policy Analysis Network²⁵⁰
Forum for Agricultural Research in Africa²⁵¹
Global Forum for Agricultural Research²⁵²
Human Sciences Research Council²⁵³
International Institute for Tropical Agriculture²⁵⁴
International Livestock Research Institute²⁵⁵
National Food Policy Research Institute²⁵⁶
International Plant Protection Convention²⁵⁷

²⁴⁴ South Africa is not a part of the RUFORUM network.

²⁴⁵ Although Israel collaborates with Africa, this website is not specifically relevant to agricultural teaching and research in Africa.

²⁴⁶ I deleted the Institute because the website has been down for a long period of time. I recommend that we periodically check the website and create an entry for the Institute if it goes "live" again.

²⁴⁷ The CSIR, which is located in Ghana, is not a part of the RUFORUM network.

²⁴⁸ The CSIR, which is located in South Africa, is not a part of the RUFORUM network.

²⁴⁹ FAO is listed in the donor category. We can always add research as a keyword if RUFORUM would like, but there should not be two entries.

²⁵⁰ I have included FANRPAN in the NGO category.

²⁵¹ FARA is listed in the networks category. We can always add research as a keyword to the FARA entry if RUFORUM would like, but there should not be two entries.

²⁵² GFAR, which is an arm of FAO, is an information aggregator. Most of the organizations from which it collects information are listed in the directory. Moreover, I think targeted Google or Google Scholar searches are likely to lead to better results.

²⁵³ The HSRC is located in South Africa, which is not a part of the RUFORUM network.

²⁵⁴ I deleted IITA because there is a global entry for CGIAR, of which IITA is a part. The IITA name and URL are listed in this entry. In addition, although the stakeholders' directory only lists some CGIAR centers, I think that it is important to provide the name and URL for all of them, which I have done in the CGIAR entry.

²⁵⁵ ILRI is a part of the CGIAR system.

²⁵⁶ IFPRI is a part of the CGIAR system

International Portal on Food Safety, Animal and Plant Health²⁵⁸
National Research Foundation²⁵⁹
National Root Crops Research Institute²⁶⁰
International Rice Research Institute²⁶¹
Natural Resources Institute²⁶²
Organization for Social Science Research in Eastern and Southern Africa²⁶³
Technical Centre for Agriculture and Rural Cooperation²⁶⁴
World Agroforestry Center²⁶⁵

App7.2 Introduction

An introduction is below:

In this collection, you will find sites that focus on open data and agricultural research in Africa. Open data is a relatively new development in Africa, but the concept is growing quickly. Open data means that users can make free use of the data without requesting permission and without copyright or patent restrictions. This can streamline the teaching, learning, and research process. In addition, many of the research institutions included in this collection provide their resources in an open access format. In all instances, of course, you must provide full attribution on the source.

App7.3 Inclusions and additions

African Soils Information Service

<http://www.africasoils.net/>

Because knowledge about the condition and trend of African soils is highly fragmented and dated, there is an urgent need for accurate, up-to-date, and spatially referenced soil information to support agriculture in Africa. This coincides with developments in technologies that allow for accurate collection and prediction of soil properties. The Globally Integrated Africa Soil Information Service (AfSIS) is a large-scale, research-based project to develop a practical, timely, and cost-effective soil health surveillance service to map soil conditions, set a baseline for monitoring changes, develop global standards and methodologies, and provide options for improved soil and land management in Africa. In addition to accessing AfSIS data features, the website maintains a library of publications and links by AfSIS and affiliated researchers.

²⁵⁷ The International Plant Protection Convention, which is an arm of FAO, does not concentrate its efforts on training and research in Africa.

²⁵⁸ The International Portal on Food Safety, Animal, and Plant health does not concentrate its efforts on training and research in Africa.

²⁵⁹ The National Research Foundation is located in South Africa, which is not a part of the RUFORUM network.

²⁶⁰ The National Root Crops Research Institute, which is located in Nigeria, conducts research on crops of relevance to the RUFORUM network. But the Institute's website is not current. Moreover, although there is a list of projects undertaken, there are no publications or other resources that would be useful for teaching and learning. It is for these reasons that I deleted the site.

²⁶¹ IRRI is a part of the CGIAR system and there is a master entry for CGIAR.

²⁶² The Institute is located at the University of Greenwich in the UK. Although it works on issues pertaining to agriculture in Africa, the Institute does not concentrate on them. Also, please note that this is a double entry. Both will have to be deleted.

²⁶³ OSSREA is not relevant to agricultural training and research in Africa.

²⁶⁴ CTA is listed in the donor category.

²⁶⁵ This is a part of the CGIAR system.

Agricultural Research Institute, Naliendele²⁶⁶

<http://www.agriculture.go.tz/naliendele/index.html>

The Agricultural Research Institute, Naliendele (NARI) is one of seven agricultural research zonal centers in Tanzania under the Ministry of Agriculture and Food Security. It covers two regions and one district in the southeastern corner of Tanzania—Mtwara, Lindi and Tunduru districts in the Ruvuma region. Established in 1970, NARI was entrusted with a mandate to conduct agricultural research that addresses the needs and aspirations of farmers, particularly improved crop productivity and quality. NARI coordinates cashew and oilseed crop research at the national level, and collaborates within and outside Tanzania in verifying research outputs.

Agricultural Science and Technology Indicators

<http://www.asti.cgiar.org>

ASTI's mission is to provide up-to-date quantitative and qualitative data and subsequent analyses on investment, capacity, and institutional trends in agricultural research and development (R&D) in low- and middle-income countries that will assist R&D managers and policymakers in improved policy formulation and decision making at national, regional, and international levels. Informed policy decisions will have a positive impact on agricultural R&D systems and ultimately enhance productivity growth in agriculture, economic development, food security, and poverty reduction. ASTI covers all developing regions of the world, including Africa.

Agriculture Research and Extension Network

<http://www.arenet.or.ug>

ARENET is dedicated to helping anyone involved in improving rural farming to find practical, technical and relevant agricultural information from various national sources and to ensure that service providers, rural development workers, and extension agents can have access to information to help the farmers in agricultural production.²⁶⁷

Centre de coopération internationale en recherche agronomique pour le développement

<http://www.agriculture.go.tz/naliendele/index.html>

CIRAD is a French research center, working with developing countries to tackle international agricultural and development issues. CIRAD collaborates with many developing countries, including in Africa, to generate and pass on new knowledge; support agricultural development; and fuel the debate on the main global issues concerning agriculture. In Africa, CIRAD conducts research in Eastern and Southern Africa; in Central Africa; and in West Africa. Much of the CIRAD research output is in French, although not all of it.

Consultative Group on International Agricultural Research

<http://www.cgiar.org>

The Consultative Group on International Agricultural Research (CGIAR) is a global partnership that unites organizations engaged in research for a food secure future. CGIAR research is dedicated to reducing rural poverty, increasing food security, improving human health and nutrition, and ensuring more sustainable management of natural resources. This research is carried out by 15 centers, which are members of the CGIAR Consortium, in close collaboration with hundreds of partner organizations, including national and regional research institutes, civil society organizations, academia, and the private sector. Each of the 15 centers focuses on a different discipline in the broad based agricultural sciences. These include rice, biodiversity, forestry, arid and semi-arid lands research, tropical agriculture, population

²⁶⁶ This Institute is a part of the Tanzanian national research system. I would have liked to have included one entry for the country as a whole, but this is the only institute that I could find and the Ministry of Agriculture does not have a listing for any other research institutes.

²⁶⁷ ARENET is in the Stakeholders' Directory. I included a shortened entry for it, but the website is not very useful.

and social sciences, livestock, maize and wheat, potatoes, and water management. These centers generate and disseminate knowledge, technologies, and policies for agricultural development through the CGIAR research programs. Members of the CGIAR consortium are located all over the world. Each carries out research of relevance to the RUFORUM community. A list of these centers will be found below. All CGIAR resources are now open access.

Africa Rice Center (<http://www.africarice.org>)

Biodiversity International (<http://www.bioversityinternational.org>)

Center for International Forestry Research (<http://www.cifor.org>)

International Center for Agricultural Research in the Dry Areas (<http://www.icarda.org>)

International Center for Tropical Agriculture (<http://ciat.cgiar.org>)

International Crops Research Institute for the Semi-Arid Tropics (<http://www.icrisat.org>)

International Food Policy Research Institute (<http://www.ifpri.org>)

International Livestock Research Institute (<http://www.ilri.org>)

International Maize and Wheat Improvement Center (www.cimmyt.org/)

International Potato Center (<http://www.cipotato.org>)

International Rice Research Institute (<http://www.irri.org>)

International Water Management Institute (<http://www.iwmi.cgiar.org>)

World Agroforestry Center (<http://www.worldagroforestrycentre.org>)

World Fish (<http://www.worldfishcenter.org>)

Kenya Agricultural Research Institution

<http://www.kari.org>

The Kenya Agricultural Research Institution (KARI) brings together research programs in food crops; horticultural and industrial crops; livestock and range management; land and water management; and socio-economics. KARI aims to promote sound agricultural research, technology generation and dissemination to ensure food security through improved productivity and environmental conservation. In addition, KARI maintains an institutional repository (<http://www.kari.org/index.php?q=content/kari-e-repository>) to disseminate its research output and manages the Kenya Agricultural Information Network (<http://www.kainet.or.ke>).

National Agricultural Research Organization, Uganda

<http://www.naro.go.ug/>

Open Access Database for Uganda

<http://opendatauganda.com>

The Open Access Database for Uganda, which was created in 2012, combines a comprehensive listing of current and historical data on the economy, migration and tourism, government expenditure, population, poverty, crime, ICT, transport, and other topics about Uganda.

Open Data for Africa

<http://opendataforafrica.org>

Open Data for Africa is a knowledge platform to connect data with analytical and presentation tools. Its data catalogue for agriculture, for examples, includes data from the African Development Bank; the Food and Agriculture Organization; the World Bank; etc.

Open Data for the Horn

<http://data.worldbank.org/data-catalog/open-data-for-the-horn>

Open Data for the Horn, which is a World Bank initiative, facilitates open access to geospatial information, data and knowledge sources, about the ongoing response to the drought in the Horn of Africa. Open Data for the Horn is a project of the Open Data for Resilience Initiative, a global partnership that seeks to build data sharing programs along with the capacity and tools to use data to

make more informed decisions, that is working on implementation in 25 countries. Agriculture and rural development are one of the topics included in Open Data for the Horn.

Open Kenya

<https://opendata.go.ke/>

Kenya is the first developing country to have an open government data portal, the first in sub-Saharan Africa and second on the continent after Morocco. The goal is to make core government development, demographic, statistical and expenditure data available in a useful digital format for researchers, policymakers, ICT developers and the general public. It is freely available. Open source software is used. Other African countries are now following suit. The African Development Bank has launched the Open Data Africa platform aimed at significantly increasing access to quality data necessary for managing and monitoring development results in African countries, including the Millennium Development Goals.²⁶⁸ In addition, a number of African countries have signed on to the “Open Government Partnership” agreement.

Plant Resources of Tropical Agriculture

<http://www.prota.org>

Plant Resources of Tropical Agriculture (PROTA) is an international, not-for-profit foundation that intends to synthesize the dispersed information on the approximately 7,000 useful plants of Tropical Africa and to provide wide access to the information through the Web, CD-ROM, and print. All texts are licensed under a Creative Commons license, but this license does not include the illustrations (maps, drawings, pictures); these remain fully copyright-protected. It is therefore possible to use and adapt the text in PROTA for OER production, but to substitute different images.

Tea Research Foundation of Central Africa

<http://www.trfca.net>

The Tea Research Foundation of Central Africa is a not-for-profit organization funded entirely by its members through a cess per unit kilogram of made tea. Malawi and Zimbabwe tea growers are the current members. The Foundation develops improved technologies and disseminates them to its member growers.

Tea Research Foundation of Kenya

<http://www.tearesearch.or.ke/>

The Tea Research Foundation of Kenya (TRFK), was established in 1980 to replace the former Tea Research Institute of East Africa (TRIEA) with the objectives of promoting research and investigating problems related to tea and such other crops and systems associated with tea throughout Kenya. This includes the productivity (yield), quality and suitability of land in relation to tea planting.. Research focuses on development of improved clones, appropriate technologies for improvement of yield (quantity of green tea leaf/made tea per hectare) and quality of tea products.

Tegemeo Institute of Agricultural Policy and Development

<http://www.tegemeo.org/>

The Tegemeo Institute, which is a part of Egerton University, conducts research and analysis on policy in the domain of agricultural, rural development, natural resources and the environment. The Institute aims at addressing micro- and macro- economic policy issues bearing on farming, transportation, processing, marketing, and trade of agricultural products and inputs; sustainability of agricultural systems and natural resources as well as the environment; and commercialization, income growth and food security. Research

²⁶⁸ <http://opendataforafrica.org/>

conducted at the Institute is mounted online. Several of the papers in this Resource Guide are either published by Tegemeo Institute or written by its staff.

Appendix 8

African open access journals in the agricultural sciences

This is a new collection. It includes those journals in African Journals Online (AJOL) that publish regularly and that are current. By current, I mean that one or more issues of the journal were published in 2012. This is not the case for many of the journals included in AJOL, unfortunately, particularly those in the agricultural sciences. I have also included other journals, such as those published by Academic Press. Unfortunately, the list below is small, but I hope that it will grow.

App8.1 Introduction

The introduction is below:

Open Access means that resources are free to users worldwide and that they may be distributed without requesting permission. Research has demonstrated that open access brings increased visibility, usage, and impact to the work of academics, researchers, and students. Open access is compatible with copyright, peer review, prestige, quality, and indexing. Open access articles must still be cited when used. In fact, there is even an Open Access Search Project in order to detect plagiarism.²⁶⁹

There are a number of open access journals in the agricultural sciences that are relevant to the RUFORUM network. The Directory of Open Access Journals (DOAJ)²⁷⁰ lists more than 150 of them. African Journals Online (AJOL) includes forty-five African journals in the agricultural sciences.²⁷¹ In this collection, we have only included African journals that publish regularly and on time. There are other open access journals, of course, that are pertinent to the RUFORUM network, but African journals are frequently not as well known.

App8.2 Inclusions

African Crop Science Journal

<http://www.bioline.org.br/cs>

The *African Crop Science Journal*, a quarterly publication, publishes original research papers dealing with all aspects of crop agronomy, production, genetics and breeding, germplasm, crop protection, post harvest systems and utilization, agro-forestry, crop-animal interactions, information science, environmental science and soil science. It also publishes authoritative reviews on crop science and environmental issues by invitation. It is bilingual, publishing in either English or French.

²⁶⁹ <http://oaps.eu>

²⁷⁰ <http://www.doaj.org/doi?func=subject&cpid=116&cuiLanguage=en>

²⁷¹ <http://www.ajol.info/index.php/index/browse/category?categoryId=5>. Not all journals listed in AJOL are current, however. It is important to click on “current issue” to ascertain whether the journal has a regular publication schedule. Any journal that has not published a current issue in more than one year should not be considered as a vehicle in which to publish your research. Your goals should be to publish and to have your article see the light of day.

African Journal of Agricultural Research

<http://www.academicjournals.org/ajar/>

AJAR publishes high-quality solicited and unsolicited articles, in English, in all areas of agriculture including arid soil research and rehabilitation, agricultural genomics, stored products research, tree fruit production, pesticide science, post harvest biology and technology, seed science research, irrigation, agricultural engineering, water resources management, agronomy, animal science, physiology and morphology, aquaculture, crop science, dairy science, entomology, fish and fisheries, forestry, freshwater science, horticulture, poultry science, soil science, systematic biology, veterinary, virology, viticulture, weed biology, agricultural economics and agribusiness.

African Journal of Food, Nutrition, and Development

<http://www.ajfand.net>

AJFAND covers a wide range of scientific and development disciplines, including agriculture, food, nutrition, environmental management and sustainable development related information.

African Journal of Plant Science

<http://www.academicjournals.org/AJPS/index.htm>

APJS provides rapid publication (bi-monthly) of articles in all areas of plant science and botany.