



# A home for agricultural knowledge

**DRAFT**

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## A home for agricultural knowledge

*Why do we continue to create new agricultural knowledge when the foundations of existing knowledge in Developing Countries are being lost? To lose this knowledge is tragic and wasteful. To preserve and build upon it is a truly effective use of research Dollars. Save our knowledge!*

### Executive Summary

Concern about food security and climate change worldwide is at an all time high and it is widely accepted that the most vulnerable communities in the tropical regions of the developing world will be hit hardest. Investment in international agricultural research is being increased to meet these threats and technological innovations offer great promise for improved food output in the future. Nevertheless, there is much that we already know at local and national levels that could immediately improve yields and reduce losses if effectively disseminated and implemented. However, much of this information is not readily accessible in a format that allows it to be shared within countries, let alone across regions. This Concept Note presents a proposal for addressing the lack of visibility and accessibility of agricultural knowledge generated in 10 countries in Africa, along with longer term investment in building sustainable systems and capacity within those countries. It responds directly to the demands from these countries for assistance from CABI.

This project will digitally capture and build a knowledge repository on behalf of developing countries to preserve, disseminate and apply this valuable material, and the knowledge it contains, for generations to come. This will be a vital resource within the target countries as well as offering the potential for creating an information network that could be shared across the region, facilitating adaptation in countries experiencing climate change and food security challenges to learn from successes in climatically similar zones.

Improving access will liberalise agricultural knowledge. When research succeeds and outputs are documented, disseminated and preserved the result is often that a small team of researchers raises the productivity and income of millions of farmers



## 1. The Challenge

Around 80% of Africa's poor live in rural areas, but even those who do not depend heavily on agricultural productivity to lift them out of poverty. Across the continent, 70% of all Africans, and nearly 90% of the poor, work primarily in agriculture<sup>1</sup>. Thus increasing agricultural productivity is an overarching goal which will simultaneously increase food supplies, reduce food prices, and increase incomes of those working in agriculture. Lack of access to information on new, locally generated technologies has been identified as a key constraint to economic development

New technologies required to achieve increased agricultural productivity are usually discovered and developed through investment in research and development which brings together needs and entrepreneurial innovation. However, making the jump from the research findings and outputs to increased productivity and increased incomes does not always happen, and especially so in Developing Countries.

Over several decades national agricultural research institutions in Africa, as in the rest of the world, have been carrying out local research seeking local solutions, but there has been a disconnect in the sharing and dissemination of the newly discovered solutions, in part through lack of investment in the documentation, dissemination and preservation of the outputs. **Thus research has not been put to use.** Time and again it has been shown that the capacity to use existing knowledge, of what worked well and what didn't work so well, has led to questions about the value in investing in research. Conversely where research succeeds and outputs have been documented, widely disseminated and preserved the result is often that a small team of researchers raises the productivity and incomes of millions of farmers<sup>2</sup>.

There are many investors, actors, stakeholders and beneficiaries interested in new agricultural technologies to improve productivity and raise the income of the poor. There are many problems to address in terms of strengthening capacity in Africa to focus on demand led research, capitalising on the existing local knowledge base, and putting that into the context of regional, south-south, and global knowledge sharing and lessons learned.

**Access to knowledge has been identified as a key constraint to economic development.** Lack of access to agricultural research information has stifled innovation, particularly in Africa where the situation has been compounded by slower investment in information and communication technologies. The negative effects of this can be observed throughout the agricultural systems, from researcher to extensionist to farmer.

Access to global agricultural research information has been addressed by several programmes, including PERI (Programme to Enhance Access to Research Information), AGORA, (Access to Global Online Research on Agriculture), HINARI (Health Information Network Initiative), TEEAL (The Essential Electronic Agricultural Library), and OARE (Online Access to Research on the Environment), which provide free or low cost access for developing country institutions to the world corpus of scholarly information in their field. These programmes ensure that access to peer reviewed research journals, such as those that are found in any Northern university, are made available free at the point of use. Valuable, useful and important as these resources are, they will often be lacking in materials of direct local relevance and of direct applicability for the extension worker and farmer in Africa.

**There are further aspects of the information systems equation which impact on the applicability and sustainability of information resources.** Many are articulated in the report from the WorldAgInfo Design Team 'Building Pathways out of Rural Poverty through Investments in

<sup>1</sup> Haggblade, S., Hazell, P., Kirsten, I., Mkandawire 2004. *Building on Successes in African Agriculture. African Agriculture: Past Performance, Future Imperatives.* Focus 12, Brief 1

<sup>2</sup> World Bank Group. *What is the impact of agricultural research in Africa?*  
[www.worldbank.org/afr/aftsr/impact1.htm](http://www.worldbank.org/afr/aftsr/impact1.htm)



Agricultural Information Systems<sup>3</sup>. The complexities of moving from information resources to creating real impact on farmer livelihoods have also been made clear to CABI through African, Asian and Pacific and Latin American Regional Consultations with representatives from the research communities and Governments of our Member Countries.

The WorldAgInfo Team identified that 'it is a mistake to assume that libraries in developing countries are devoid of content. Most agricultural libraries have journals, reports and dissertations on a variety of agricultural topics – frequently covering local crops and farming techniques. The first step in an agricultural library project would be to digitize relevant agricultural content.'

CABI's Member Countries, through the mechanism of regional consultations in Africa, Asia/Pacific and Latin America and the Caribbean, identified the need for their agricultural information systems, specifically in their academic and research institutions, to 'become digital', including support in developing the capacity to implement an Information and Communications Technologies policy and in developing capacity to manage, maintain, and use such a system. **In addition it was clear that the lack of easy access to a digital form of the archived information means that local knowledge, documented over the years, is not shared within and between countries.** This lack of access to the work that has already been done was seen as particularly important in building baseline information to inform research and development in key areas such as climate change and biofuels.

In the North technical and institutional infrastructures have been developed to allow the capture of research outputs of institutions in easily accessible digital formats. Such 'open' repositories hold the potential to provide a solution to the information 'visibility' inequities between developed and developing nations. In most developed countries the debate now involves Government, because it is Government which funds both the research and its availability in libraries and other information resources. Repositories are seen as a fast route to making institutional and national knowledge visible to all in a cost-effective way.

**Most developing nations face institutional and infrastructure constraints.** Often libraries have become the knowledge archive of the research that has been done, but knowledge that is never shared or disseminated because of cost constraints. The knowledge is locked in annual reports, training materials and journals prepared for publication but never printed and even when printed never despatched because of lack of funds. These collections are also suffering degradation, through insect, humidity and temperature damage. There are significant issues for post-disaster, post-conflict states, where decades of knowledge archived in print-only media have been destroyed. With these constraints the result is that knowledge, old and new, that has been accumulated over the years has not been put to work. For example, a recent visit by CABI to agricultural research and training institutions in Malawi revealed that important information is scattered and often not collected in libraries and, further, the capacity to manage information resources was largely inadequate.

In 2007 CABI embarked on a consultation exercise with its Member Countries, with the aim of identifying the key challenges and themes that they most wanted to be addressed with CABI's support. A clear message came from both African and Asian Pacific consultations, and in particular from several post conflict and post disaster states including Sierra Leone, Côte d'Ivoire, Sri Lanka and Pakistan. Under the banner of 'Conservation, management and dissemination of institutional knowledge', CABI was requested to take forward, on their behalf and with their support, a programme to address the creation of national repositories of agricultural knowledge.

FAO, through its WAICENT programme, and the CGIAR through its Virtual Library, are both showing ways of capturing and reusing digital content in ways that are of direct relevance to, and are usable by, agricultural research and extension systems in developing countries. Both are continually developing under the stimulus of a variety of stakeholder demand. CABI also has

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<sup>3</sup> Allen, D. W. and Ochs, M. A. 2008. *Building Pathways out of Rural Poverty through Investments in Agricultural Information Systems*. WorldAgInfo Design Team, Old Dominion University and Cornell University..



extensive experience in the creation of digital agricultural knowledge resources. Our experience with the ongoing development of DFID's Research for Development (R4D) website, and the SARNISSA (Sustainable Aquaculture Research Networks in Sub Saharan Africa) project, shows how research networks, with properly implemented communication and transformation strategies, can bring together in an interactive way a broad range of stakeholders with a common aim – the enhancement of agricultural productivity in sustainable ways.

This Concept Note presents a proposal for addressing the accessibility and paths to accessibility of locally generated agricultural knowledge by ensuring its' secure digital preservation, along with longer term investment in the creation of sustainable systems and capacity that benefit all stakeholders within those countries.



## 2. Vision

To enable developing countries to preserve, access and use locally generated agricultural knowledge to support policy, decision making, and implementation, such that those implementations have a positive impact on food productivity, food security, and the livelihoods of the poor.

## 3. Goals

The goals of this Concept are:

- To strengthen accessibility and paths to accessibility of nationally generated agricultural knowledge
- To build capacity in national systems in Africa to develop the institutional and infrastructural environment necessary for the capture, preservation and accessibility and use of their own national agricultural knowledge
- To capture digitally the archived agricultural knowledge of 10 countries in Africa
- To build a centrally managed and maintained global archive, for preservation and disaster recovery, for the long term protection of knowledge which might again become inaccessible.

Through this work the benefits of information sharing across borders can be gained and developing country agricultural knowledge can become integrated into the same burgeoning knowledge economy as that of developed countries, while at the same time local knowledge will have been preserved for future local use.

## 4. Proposed project design

CABI has been strongly mandated by its Member Countries to take forward a programme to address the creation of national repositories of agricultural research and training information, and it is on this basis that we build this Concept.

In partnership with Bunda College of Agriculture in Malawi CABI is currently carrying out an implementation study, quantifying the types, quality and value of the research and training outputs that have been documented and are now represented in print on paper documents only (journals, annual reports, conference proceedings, technical reports, and training materials). The focus of this study is to establish local partnerships and then to work out logistical and workflow issues. This small study is funded with a grant from CABI's Development Fund. In addition we are carrying out preliminary and situation analyses in Pakistan and the Philippines. These activities will help us to identify the political, institutional and operational environment to achieve these goals.

To implement the full concept, a global partnership including academics, knowledge managers, policy makers, researchers and extension agencies, will be established.

Candidate countries and systems will be assessed on a combination of need (how challenged is the state), strategic readiness (how is need being expressed and how ready are the state's systems to move ahead) and scope of available content (how productive will the process of digital capture be). We already have specific demand from Sierra Leone, Burundi, Zimbabwe, Côte d'Ivoire, Malawi, Kenya, Uganda, Botswana, Tanzania and Nigeria. Once candidate countries have been agreed the programmes of work will be based around four work packages.

- A. Creating national repositories** — identifying and capturing content and building a centralized knowledge repository. Making content digitally accessible.  
**Outcomes:** Content is captured, digitized and future-proofed by building into an



integrated, searchable database constructed to current best practice international standards.

- B. **Putting the repository to work - advocacy and communication.** Bringing together national stakeholders, including research and extension services, and NGOs, to develop local ownership of the repository content. To develop local strategies for the content of the repository and the different ways in which content will be used to meet the needs of the different stakeholder groups. Strategies to drive the acquisition of further content, the transformation of content for different users, and communication directed at all interested national groups will also be required.  
**Outcomes:** Strategies developed by local stakeholders which will help to embed the repository in the national agricultural system and will provide impetus to its future development. Improved understanding of the importance to national and international systems of the digital visibility of agricultural knowledge.
- C. **Transformation of repository content to meet diverse needs** – driven by local stakeholders, communities of practice can be developed around different types of repository content. Focusing on the needs of different user groups, whether farmers, researchers or policy makers, content can be developed and transformed (by format, by language, by delivery mechanism) to most effectively meet the needs of that group. Develop capacity in information management and communication skills to enable this properly targeted transformation.  
**Outcomes:** communities of practice are developed, capacity is built, to help to ensure that the sustainable ongoing development of national digital repositories of agricultural knowledge are developed to the benefit of all national agricultural system stakeholders.
- D. **Assessment of the repository impact.** Monitoring and assessment will require both quantitative and qualitative approaches the implementation of which would be agreed with the project partners.

## 5. Partnerships

CABI will develop this concept further with a small group of partners. These partnerships will ensure integration of this concept with other initiatives, such as Coherence in Information for Agricultural Research for Development (CIARD). This collaborative approach will be necessary to bring to the development of the concept at an early stage the perspectives of policy makers, researchers, extensionists and farmers, and the necessary alignment with best practice information and knowledge management techniques.

## 6. Project Budget

It is proposed that full project initiation would be preceded by an Inception Phase which would include a situation analysis involving the identification and short-listing of candidate countries and the consequent formation of the partnerships that will drive the programme. This Inception Phase would require resource in the region of \$400,000 and would produce as its key output a detailed situation analysis and a proposal detailing the approach workplan for the implementation of a full programme. CABI is already investing in the region of \$120k to implement the pilot stage in Malawi and the preliminary work in Pakistan and the Philippines.

### It is anticipated funds for an inception phase:

- will enable the identification and agreement with candidate countries,
- will test workflow and logistics,



- will provide information to cost the full implementation of the following work packages:  
Creating national repositories,  
Putting the repositories to work,  
Transformation of repository content, and  
Assessment of impact.

#### **7. Why is this proposal important?**

- It responds directly to the demands of developing countries for assistance in involvement in the global agricultural knowledge economy, with consequent positive impacts on all parts of the national agricultural system, including farmers.
- It will enable the hitherto largely invisible agricultural knowledge from developing countries to be used for their own benefit but also to the benefit of all nations.
- It presents an opportunity for an international partnership combining knowledge management expertise with in-depth experience of agricultural knowledge challenges in developing countries, to both archive and preserve agricultural knowledge outputs and stimulate knowledge production, capture and use on a truly multinational scale.
- Agricultural knowledge will be captured and maintained securely, such that should a state fail or be hit by natural disaster the information is preserved and can be re-established as and when infrastructure and skills can be reinstated.

#### **8. Benefits for participating countries**

##### **Access to these repositories of archived knowledge will:**

- Strengthen teaching and research
- Strengthen extension services and the knowledge of farmers
- Provide a higher profile of this knowledge to the global community
- Bring prestige and recognition of expertise and contribution to the global knowledge base
- Lead to better agricultural science based policies
- Release the knowledge from the past
- Provide baseline information on issues such as loss of biodiversity, climate change, food security, traditional food crops and indigenous breeds
- Increase citation of researchers and academics based in developing countries
- Reduce duplication of research effort
- Impact positively on the whole national agricultural system and particularly on farmer livelihoods





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**CABI** has collated and managed knowledge in agricultural and life sciences research for almost 100 years. The scale of these activities is very large in terms of volume of information acquired, processed, compiled, indexed and published. CABI has over 30 years' experience in the management of information in the electronic environment, particularly in the structuring and classification of data to facilitate fruitful usage by both experienced and inexperienced users. CABI develops and manages a controlled vocabulary: the CAB Thesaurus. CABI's communication activities include assessing the value of ICTs in rural environments, including telecentre approaches and farmer-centred and farmer-produced videos. CABI has investigated how to re-purpose/re-engineer scientific and technical information into farmer-accessible manuals. CABI acts as a facilitator in Stakeholder Workshops on Communication and Knowledge Management at regional, national and local/institutional levels.

**CABI** routinely project-manages all technical developments. It has adopted PRINCE2 project management methodologies and has accredited more than 60 staff. CABI has project managed: the \$10 Million Compendium Programme on behalf of nearly 70 Consortium members; and the digitisation of the CAB Abstracts and Global Health Archives, which was completed within 18 months.