Agricultural Information Worldwide

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Acknowledgements

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From the Editor's Desk

Coherence in agricultural information. What a concept! I remember when this movement first really caught my attention. I was chatting with Chris Addison during the 2005 IAALD World Congress in Lexington, and he mentioned a publication he had co-authored entitled *Fertile Ground: Opportunities for Greater Coherence in Agricultural Information Systems.*[1] He was even kind enough to give me a copy. This IICD/DFID research report spoke volumes in terms of what was yet to come in the agricultural information realm. That fall, FAO, CGIAR, CTA, GFAR, and INASP, with the support of DFID, organized the landmark Expert Consultation on International Information Systems for Agricultural Science and Technology (IISAST): Review of Status and Prospects, which was held at FAO Headquarters in Rome.

There had been numerous prior efforts to promote greater coherence in agricultural information and knowledge management. What was different about that particular consultation was that it was jointly organized by some of the powerhouses in the field, organizations that had already launched significant coherence initiatives in their own right, such as AGRIS (FAO), the Fertile Ground Study (IICD/DFID), Global.RAIS Inter-regional Initiative (GFAR), Système d'Information Scientifique et Technique (SIST), and the CGIAR ICT-KM Program. Prior to IISAST, efforts had centered around one or two organizations; great things were happening, but collaborative synergy was lacking. IISAST was a definite step in the right direction, in that the major international institutions that had supported the aforementioned initiatives worked together on the development of a new initiative on coherence to which all actors could relate.

The IISAST partners reconvened at a 2nd Consultation in 2007 to review progress since the 1st Consultation in 2005, reassess the objectives of the IISAST initiative and confirm commitment of the partners, reassess the modalities of implementing the initiative, and establish future priorities for and contributions to the initiative. A facilitating body was established to keep the initiative moving forward, comprising CGIAR, CTA, FAO, GFAR, IAALD and MAE. While the initiative itself was heading in the right direction, the IISAST partners agreed at a follow-up meeting in January 2008 that the IISAST title was inappropriate for the overall initiative. After considerable discussion, a new name was selected: Coherence in Information for Agricultural Research for Development, or CIARD (http://www.ciard.net/).

One of the key players throughout this entire process had been the Global Forum on Agricultural Research (GFAR), whose efforts in this area date back to at least the mid-1990s. GFAR is a platform at the global level for dialogue and action of all stakeholders of agricultural research and innovation for development. Its road traveled, from the ICT consultations of the 1990s to the "CIARD RING"[2] of 2009, is fully documented in this issue. It is a dynamic story of how GFAR has tenaciously followed its vision of transforming agricultural information systems from static isolated mechanisms to dynamic distributed connectors between all the appropriate stakeholders, by building on its guiding principles of complementarity, subsidarity and—I might add—interoperability. I trust you will find it as interesting and thought-provoking a read as I did.

What's next for GFAR? Just a little something called GCARD 2010, i.e. the first Global Conference on Agricultural Research for Development (http://www.gcard2010.net), which is being organized through GFAR to inspire development of new agricultural research systems around the world. Watch for more about this new initiative in upcoming issues of *Agricultural Information Worldwide.*

I hope you enjoy this special issue. Many thanks go to GFAR's Dr. Ajit Maru and Valeria Pesce for conceiving this issue and seeing it to fruition, as well as the authors of the five Regional Profiles, which serve to reiterate just how vibrant and innovative this organization is. And special thanks go to GFAR for providing not only the content, but also sponsorship for this issue.

As always, please feel free to contact me at the address below if you have any comments, questions, or concerns.

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1. *Fertile Ground: Opportunities for Greater Coherence in Agricultural Information Systems.* 2003. IICD/DFID Research Report no. 19. http://www.ftpiicd.org/files/research/reports/report19.pdf

2. For more information on the CIARD RING (Routemap to Information Nodes and Gateways), go to http://www.fao.org/docs/eims/upload/262654/The%20CIARD%20RING%20final.pdf

VOICES FOR THE FUTURE OF AGRICULTURE: MAKE SURE YOURS IS HEARD!

Building from demand: transforming agricultural research for development

28-31 March 2010, Montpellier, France   www.**gcard2010**.net

GCARD 2010
GLOBAL CONFERENCE ON
AGRICULTURAL RESEARCH
FOR DEVELOPMENT

WHAT IS GCARD 2010?

GCARD 2010 is the first of the Global Conferences on Agricultural Research for Development (GCARDs). These will be held every two years. GCARD 2010 will be held in Montpellier, France, 28-31 March 2010.

GCARD is organised through the Global Forum on Agricultural Research (GFAR). GCARD will replace the GFAR triennial conferences and the annual general meetings of the CGIAR.

The GCARD consultations draw on two scene-setting processes: a) regional identification of documented national and regional demands and research priorities and b) proposals from the CGIAR on how international research could help deliver national impacts.

By bringing together all those who are actively involved in agricultural development to share their views, the GCARD conference and its associated processes aim to inspire development of new agricultural research systems around the world, driven by tangible results for poor farmers.

GCARD 2010 is important in:
- Reshaping the future of agriculture
- Making sure research meets the needs of the poor, especially smallholder producers in developing countries
- Changing how agricultural research is done
- Making agricultural research more accountable to those it serves

Objectives of GCARD

To help ensure that:
- Agricultural research outputs are accessible and relevant to the poor in developing countries;
- Research is aligned with and driven by the development needs of the resource-poor;
- Knowledge generation through scientific research is embedded in development thinking and practice;
- Funding systems are better aligned between research and development;
- Constructive and effective innovation pathways are developed between diverse stakeholders for the more rapid uptake of new knowledge, tools and technologies; and
- International agricultural research systems are more effectively integrated with regional and national partners (public, private and civil) and are responsive and accountable for development impact against national and sub-regional demands.

The GCARD processes aim to promote effective and targeted investment at all levels of the agricultural system to ensure that today's agricultural research will meet the needs of the resource-poor end user. The GCARD processes will help to refine regional and global agricultural research priorities, as identified by different stakeholder groups and representatives in each region, in an inclusive way.

GCARD 2010 programme
- **28 March 2010** On Day 1, participants will look at what investment, policies and changes are needed to transform global, regional and national systems of agricultural research, innovation and knowledge sharing.
- **29 March 2010** On Day 2, participants will look at the key challenges in development and where to focus research so it makes the most difference.
- **30 March 2010** On Day 3, participants will look at the tools and changes necessary to create agricultural research systems that impact more effectively on development. Among other topics, sessions will discuss how to boost North-South and South-South collaboration and what is required to develop and inspire a new generation of researchers to meet the challenges of a changing world.
- **31 March 2010** On Day 4, GCARD 2010 wraps up by pulling together solutions and ways forward, setting out better ways for all concerned — farmers, civil society, policy makers, development agencies and researchers — to work together to achieve development goals.

Plan for action

GCARD 2010 will spell out an action plan and a framework for improving agricultural research globally. These will be the blueprints for developing:
- Closer relationships between all involved and collaborative action for agricultural research and innovation.
- New relationships that push agricultural development forward.
- New tools and information directly relevant to agricultural development.

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GFAR's Experiences in Fostering and Supporting the Development of Agricultural Research Information Systems at National, Regional and Global Levels

Ajit Maru and Valeria Pesce

Abstract: This article describes the experiences of the Global Forum on Agricultural Research (GFAR) in fostering and supporting the development of agricultural research information systems at national, regional and global levels, illustrating the evolution of the overall approach, the initiatives of the various stakeholders and the experiences with different technologies. A description of the evolution of the approach in building agricultural information systems and an overview of the major services implemented over the last decades and their technological features will demonstrate that creating integrated information services giving access and adding value to information that is electronically available, especially through semantics, remains a major challenge. In order for this to be achieved, the existing sources of information must become truly interoperable and allow for easy automatic retrieval of information, and work on mapping between vocabularies or advanced natural language processing must be done to improve the semantic accessibility of information.

Resumé: Cet article décrit les expériences du Global Forum on Agricultural Research (GFAR) pour encourager et soutenir le développement de systèmes d'information de recherche agricole au niveau national, régional et global, en illustrant l'évolution de l'approche générale, les initiatives des divers partenaires et les expériences avec des technologies différentes. Une description de l'évolution de l'approche pour construire des systèmes d'information agricole, et un aperçu général des services majeurs réalisés pendant les dernières décennies avec leurs caractéristiques technologiques démontreront que créer des services d'informations intégrés donnant un accès et une valeur ajoutée aux informations électroniquement disponibles, surtout par la sémantique, reste un défi majeur. Pour atteindre ceci, les sources actuelles d'information doivent devenir véritablement interopérables, permettre une récupération a\utomatique simple de l'information, et des liens entre les vocabulaires ou sur le traitement avancé de langage naturel doivent être établis pour améliorer l'accessibilité sémantique à l'information.

Resumen: Este artículo describe las experiencias del Foro Global de Investigación Agropecuaria (GFAR) en el fomento y apoyo al desarrollo de sistemas de información de investigación agrícola a nivel nacional, regional y mundial, ilustrando la evolución del enfoque general, las iniciativas de los diversos interesados directos y las experiencias con diferentes tecnologías. Una descripción de la evolución del enfoque para establecer sistemas de información agrícola y un resumen general de los principales servicios implementados en las últimas décadas y sus características tecnológicas demostrarán que la creación de servicios integrados de información que dan acceso y valor agregado a la información electrónicamente disponible, especialmente mediante la semántica, continúa siendo un reto importante. Para lograr lo anterior, las fuentes existentes de información deben llegar a ser verdaderamente interoperables y permitir la fácil recuperación automática de la información. También se debe emprender un trabajo que incluye el mapeo entre vocabularios o el procesamiento avanzado de lenguajes naturales para mejorar la accesibilidad semántica de la información.

Introduction

The Global Forum on Agricultural Research (GFAR / http://www.egfar.org) is a platform for dialogue on critical issues related to agricultural research for development (ARD) as well as collaborative action through partnerships on these issues. Improving sharing and exchange of information that contributes to agricultural research for development is one of the primary actions of GFAR.

In line with GFAR's mission, i.e. mobilizing all stakeholders involved in agricultural research and innovation systems for development, the role of the Global Forum has been to foster and support the development of agricultural research information systems at national, regional and global levels. This cross-stakeholder vision has allowed GFAR to have a privileged perspective and a good awareness of the direction and progress in information and communication management (ICM) and information and communication technology (ICT) in agriculture over the last ten years, including the evolution of the overall approach, the initiatives of the various stakeholders and the experiences with different technologies.

Timeline and GFAR's Role

A brief chronological overview of the initiatives organized and carried on by GFAR demonstrates that ICM has always been one of the main pillars of the Global Forum's strategy and how the Global Forum's activities in this field have always partnered, supported and encouraged those of the stakeholders.

- The ICM-related activities of the Global Forum between 1996 and 1999 culminated in the organization of the ICT consultation held in Rome in 1999 together with the Food and Agriculture Organization of the United Nations (FAO), Consultative Group on International

Agricultural Research (CGIAR) and other stakeholders (GFAR, 1999).

- Between 1999 and 2004, activities focused on supporting the development of regional information systems in the Southern regions: West Asia and North Africa, Asia-Pacific, Sub-Saharan Africa, and Latin America and the Caribbean. This phase also includes the development of e-GFAR, the website of the Global Forum, which was developed to electronically support GFAR and offer a platform for sharing and exchange of information among GFAR's stakeholders.

- Between 2003 and 2005, the Global Forum created and carried on the GLOBAL.RAIS initiative to effectively support a wide consultation process by the Regional Forums and their stakeholders to identify needs and priorities to improve information and communications management for ARD globally, starting from National Agricultural Research Systems (NARS). This led to an Inter-regional consultation in Rome in 2004 that also involved stakeholders and actors in agricultural information management and services like FAO, CGIAR and CABI (AARINENA et al, 2004).

- In October 2005, GFAR co-organized an Expert Consultation in Rome jointly with the Technical Center for Agricultural and Rural Cooperation (CTA), CGIAR, FAO and the International Network for the Availability of Scientific Publications (INASP) (CGIAR et al, 2005). This expert consultation with representation from more than 50 stakeholder organizations across the world endorsed the ICM agenda that emerged from the GLOBAL.RAIS consultations. The agenda included:

  - The need to strengthen the capacity of NARS leaders to advocate, articulate appropriate policies and strategies, attract more resources and greater investment for further development of ICT enabled NAIS and lead further development of agricultural information systems (AIS);

  - Capacity development, in terms of infrastructure, institutions and human skills, among stakeholders in ARD to create, manage, share, exchange and use scientific and technical information, technology related information, research and research management information, extension, outreach and market information, etc., for agricultural innovation and development;

  - Greater integration of national and regional agricultural information systems and easier access to them, especially websites, through a GLOBAL.RAIS Web Ring, and cohesive activities for improved management and more seamless sharing and exchange of information, experience and knowledge in agricultural information management through a Knowledge Network;

  - The need to establish appropriate governance structures such as task forces and steering committees for the global, regional and sub-regional AIS of GFAR, AARINENA, APAARI, CACAARI, FARA, ASARECA, CORAF, SADC and FORAGRO to promote and support more equitable access, sharing and exchange of agricultural information through ICT enabled AIS.

  - The consultation also set up three Task Forces to consider issues related to advocacy, content management and capacity development for ICM in ARD.

- Between 2005 and 2007, ICM activities were conducted in the framework of the ICM4ARD Global Partnership Programme (GPP), which covers activities to strengthen ICM under the four main areas of advocacy, capacity development, greater integration and coherence of agricultural information systems, and improved governance of agricultural information systems at regional and global levels.

- Several regional workshops and annual inter-regional consultations were held under the ICM4ARD GPP through September 2007, culminating in the Second Expert Consultation on International Information Systems for Agricultural Science and Technology (CTA et al, 2007).

- In January 2008, the group that co-organized the 2005 and 2007 Expert Consultations, commonly identifying themselves as the International Information Systems for Agricultural Science and Technology (IISAST) initiative partners, agreed that the initiative should henceforth be known as "Coherence in Information for Agricultural Research for Development" (CIARD / http://www.ciard.net).

- In 2008 and 2009, GFAR, building on the former idea of the GLOBAL.RAIS Web Ring that aimed at improving integration of national and regional agricultural information systems, has been promoting the idea of a Global ARD RING, now endorsed by the CIARD initiative as the "CIARD RING" (Routemap to Information Gateways and Nodes)[1]. This Routemap consists of a registry of existing information services in ARD, indexed and described in a way that makes them more easily "exploitable" for building value-added integrated services.

- Recent activities also include participation in communities and events focusing on capacity building and learning, in order to bring learning into the picture.

In accordance with its mission and objectives, GFAR's focus has always been on collaboration, partnership and inclusiveness in cross-stakeholders activities in ICM. One of the main roles that GFAR has had is that of bringing the NARS into the picture, thereby enhancing the importance of national information systems.

Building ARD Information Systems. Evolution of the approach, representative projects and technologies adopted

Before 1999, most if not all agricultural information systems concentrated on giving access to Scientific and Technical Information (STI), and the major services, especially at the global level, were bibliographic databases.

The overall approach to developing information systems was the idea of ONE global information system. The major project, coordinated by FAO, was the AGRIS project, started in 1974. AGRIS (http:/www.fao.org/agris/) is a cooperative system in which participating institutions contribute references to their literature and can draw on information provided by other participating centers. From a technological point of view, the AGRIS search engine is built on bibliographic records exported from cooperating centers in an agreed XML format (the AGRIS Application Profile[2]) and imported into a central database.

Lessons learned from the AGRIS project led to the first change in the approach. The 1999 Rome consultation agreed that 1) a bottom-up approach should be followed; 2) the new systems should build upon existing structures (most of the first centers were created expressly for inputting into AGRIS); 3) the concept of decentralized, but coordinated and interlinked databases, is the most effective and efficient approach; and 4) it is important to develop capacities to manage data and knowledge in addition to documents.

The fourth point acknowledged the importance of managing data about projects and organizations. Two big projects were already in place: the FAO CARIS[3] project (begun in 1975) and the agricultural research Management Information System (MIS) called INFORM, created by ISNAR around 1992[4]. ISNAR also developed the AROW online database of agricultural research organizations. CARIS followed the same approach as AGRIS: the collaborating centers contributed their records in an agreed format. INFORM enabled the collection of data about organizations, projects and experts through manual centralized input in a database; the ultimate purpose of collecting these data was to help national systems set research priorities.

Around 2000, the AiDA[5] database of projects and organizations was created, adopting a workflow similar to that of CARIS, i.e. XML exports from different databases and subsequent import into a central database. Another approach was that used by TECA[6], the FAO database of agricultural technologies, and by the WISARD[7] and Infosys+[8] databases of organizations, projects and experts, which are all based on decentralized data entry into a central database.

Between 2002 and 2005, greater attention was paid to integration between systems. Several databases, with different coverage, existed and a few started to find ways to share information with each other. An example is the sharing of information between WISARD, AiDA and Infosys+, all systems collecting information on the management of agriculture (organizations, projects, and experts). WISARD also started exchanging information with ISNAR's AROW database of organizations. However, exchange of information was on a case-by-case basis and did not involve the adoption of international standards.

The GFAR's GLOBAL.RAIS initiative (2003-2005)

aimed at improving integration of national and regional agricultural information systems and providing easier access to them; the objective was improved management and more seamless sharing and exchange of information, experience and knowledge. During this time, the Regional Agricultural Information Systems (RAIS) improved the management of information at the national level by developing and promoting the adoption of advanced tools for managing information on organizations, projects and experts. In particular:

- the Association of Agricultural Research Institutions in the Near East and North Africa (AARINENA) promoted two tools, NERAKIN[9] and NARIMS[10], since adopted in different countries, that help manage and exchange information on research management (organizations, projects, experts and project outputs), with a focus on interoperability and compliance to standards;

- the Forum for Agricultural Research in Africa (FARA) manages information on organizations, projects and news on African agriculture and has, through the FARA Regional Agricultural Information and Learning System (RAILS), focused on capacity building and creating appropriate national agricultural information systems in Africa;

- the Forum for the Americas on Agricultural Research and Technology Development (FORAGRO) has developed an interactive platform (Infotec) for interactively sharing different types of information, e.g. news, documents, technologies, events, links, experts, and institutions; and

- the Asia-Pacific Association of Agricultural Research Institutions (APAARI) has developed directories of institutions and projects in the region and has implemented an ARD Information Gateway giving access to external information sources.

From the architectural point of view, the RAIS have adopted two different approaches to improving access to national information: a) central regional databases with decentralized data entry (e.g. FORAGRO, FARA); and b) development or adoption of advanced tools for managing information at the national level and harvesting/importing it at the regional level (e.g. AARINENA).

As a background to all of this, work on specifications for describing information objects (FAO[11] and AiDA[12]) and on vocabularies (FAO[13] and NAL[14]) has gone on continuously, but only recently have organizations started to collaborate and agree upon common standards.

A renewed interest in standards has developed in recent years. Since 2005, the adoption of new technologies, especially the Web 2.0 approach to information, and the failure of some experiences with big databases where data were inputted from scratch led to another important change in the vision: it was recognized that a distributed approach was more efficient and that the accent should be on interoperability, standards, protocols for communication, tools and applications.

In line with this approach, some information services have started giving access to external information sources through both remote access to databases and HTTP-based retrieval. An example is the CGIAR Virtual Library (http://vlibrary.cgiar .org/), which, in addition to querying the databases of all CG centers, can query many external sources, including AGRIS, CARIS, the GFAR document repository, Cornell University, and so forth. The AGRIS project itself adopted a new approach favoring the involvement of existing institutions already managing repositories rather than the creation of new contributing centers, and automatic harvesting rather than manual exports and imports (an OAI approach is under study). Many organizations have implemented or are implementing the Open Archive protocols for their repositories. New information services were created to automatically aggregate information on news and events from several sources and in turn provide re-aggregated feeds for further re-use; examples are Agri-Feeds (http://www.agrifeeds.org) and the NewsForDev (http://www.news fordev.org) service.

RSS technology has also been used beyond the use-case of sharing news. The Système d'Information Scientifique et Technique (SIST / http://www .sist-sciencesdev.net) uses RSS for harvesting and exposing any type of information, e.g. bibliographic information, organizations, projects, and so forth. The Global Forest Information Service (GFIS / http://www.gfis.net) and GFAR use RSS as an alternative way for giving access to their bibliographic records. Another example of an information service built on RSS feeds, though not strictly in the agricultural domain, is Euforic (http://www.euforic.eu/).

All of the work done in the past on metadata standards and vocabularies is now benefitting from Web 2.0 technologies and the semantic-web framework, e.g. thesauri like Agrovoc are made accessible through web services and are transformed into RDF ontologies for enhanced interoperability and use in a distributed environment; thematic inter-linked RDF ontologies are being developed in the Fisheries area[15]; and the Gene Ontology[16] is published in Linked Data[17].

Finally, all organizations are experimenting with new ways of creating and sharing knowledge like blogs and wikis. Figures 1 and 2 treat key elements in the evolution and interoperability of regional and global information systems.

FIGURE 1 – Evolution of the approach in building regional and global information services

FIGURE 2 – True interoperability

Where We Are

For traditional information types (documents) and for information produced with the newest technologies (news, blogs), the process towards interoperability and advanced services is well advanced, while for other types of information that are vital to the management of agriculture (institutional information, projects, experts), there is still a lot of work to be done.

Creating integrated information services giving access and adding value to the information residing in the available distributed sources, especially through semantics, remains a major challenge. In order for this to be achieved, the existing sources of information must become truly interoperable and allow for easy automatic retrieval of information, and work on mapping between vocabularies or advanced natural language processing must be done to improve the semantic accessibility of information.

Value added services cannot be built without an awareness of what others have done and how to leverage it. The above mentioned CIARD RING, through a registry of existing ARD information services, will provide what can be considered the "missing link" between existing

Figure 3 – The objective of the CIARD RING: new value-added services exploiting interoperability between existing services

and managing national facilities for information management in agricultural research in most developing countries. Common issues have been retention of the necessary human expertise in the management of ICT enabled information systems as well as the costs of developing and operating these systems. A major impediment to investment in agricultural information systems has been the lack of appropriate frameworks to design these systems and assess the impact and returns on investment. Advocacy for increased investment in ICT enabled agricultural information systems thus requires developing appropriate frameworks for the design of these information systems, building capacities and retaining expertise in managing these systems and in developing methods for assessing impact and returns on investment. It is also important to document case studies of successful national agricultural information systems and to disseminate them. These are objectives that GFAR continues to foster in advocating improved agricultural information management through ICT enabled information systems.

services that are not aware of each other and between existing services and the value-added services that can be built on top of them. The RING will orientate those working on information systems by: a) categorizing and interlinking the featured services according to criteria based on standards used, vocabulary used, technology used, protocols used, level of interoperability, etc.; and b) giving detailed instructions on how to interoperate the featured services (Figure 3).

The RING will benefit both users looking for existing services into which they can tap for building value-added information systems and users interested in an overview of current information services in ARD.

Lessons Learned

In the process of strengthening the information systems of the regions through its regional forums, GFAR has realised the need for: increased *and* improved investment; new capacities for information management among agricultural research organizations; change in institutions, integration and coherence of information systems; and improved governance of information flows in order to effectively contribute to the progress of ARD globally.

Improved investment, both financial and in human capacity, requires that NARS leaders and senior policy makers understand in detail the issues related to agricultural information management and the role of ICTs in improving agricultural information systems. There is a common misconception that because information and communications management and ICTs, are a non conventional agricultural subject, they are too difficult to be conceptually grasped. GFAR has attempted to sensitize NARS leaders through workshops on needs assessment in ICM for agricultural research and the national level, and also in developing funding proposals by national governments and foreign donors. A major revelation has been the lack of expertise in designing, development

The building of new capacities in agricultural research organizations requires financial investments in hardware, software and connectivity and in developing human skills in information generation, processing and use. New skills in ICT enabled information systems management are paramount but in short supply in the NARS. The problem is compounded by the inability to retain trained staff in agricultural organizations, as those with ICT skills are comparatively better paid and have greater opportunity for career advancement outside agricultural organizations. At the moment, there does not appear to be a viable solution to this problem except to train people with agricultural qualifications with a stable career in these organizations to manage ICTs. This training can be face-to-face and/or through distance learning. GFAR has collaborated with other stakeholder organizations such as FAO and CGIAR on workshops on information management and in distance learning through IMARK (http://www.imarkgroup.org/), a multi-organizational initiative to provide new knowledge in information and knowledge management.

A major challenge is achieving greater coherence in information sharing and the ability to integrate information and information systems. Alongside this challenge are issues related to intellectual property rights and information systems security. The CIARD initiative, which was co-founded by GFAR, attempts to improve coherence in information and integration of information systems and improve availability, accessibility, and applicability of agricultural information related to research. CIARD does this

by contributing to appropriate standards, norms, structures, rules and regulations and building partnerships among stakeholders in agricultural information.

Conclusions

GFAR is a well placed platform to discuss the governance of information flows in agricultural information, and especially in agricultural research. In the past decade, GFAR has contributed significantly to developing appropriate governance structures for information flow in agricultural research information at global, regional and national levels. In the future, the challenge for GFAR and its CIARD partners will be to overcome the barriers of intellectual property rights, systems security and equity in the ability to learn and use agricultural research information effectively for development.

After a decade of advocating ICM for ARD, the importance of coherence in information for ARD has been acknowledged by many key actors in recent years, and activities in this area are now run under the umbrella of CIARD. This is an important achievement. As stated in the CIARD Manifesto, "the partners in the CIARD initiative have made a collective commitment to promote the sharing of data, information, and knowledge in a global network of truly public collections of information, based on a common set of Principles, to increase the public benefits from investments in agricultural research and innovation for development."

Notes

1. See http://www.egfar.org/egfar/website/action/knowledge-for-all/ring for more information on the CIARD RING.

2. AGRIS Application Profile: http://aims.fao.org/en/website/The-AGRIS-AP/sub

3. Current Agricultural Research Information System: http://www4.fao.org/caris/

4. ISNAR closed operations in 2004, so INFORM and AROW are no longer accessible.

5. Accessible Information on Development Activities: http://aida.developmentgateway.org/

6. Technology for Agriculture: http://www.fao.org/teca/

7. Web-based Information Services for Agricultural Research for Development: http://www.wisard.org/

8. European Information System on Agricultural Research for Development (ARD): http://www.infosysplus.org/

9. Near East and North Africa Rural and Agricultural Knowledge and Information Network: http://www.nerakin.net/frontend/index.aspx

10. National Agricultural Research Information Management System

11. Agricultural Information Management Standards: http://aims.fao.org/

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Main Issues in Developing a Complementary and Subsidiary Information System at the Global Level: The Experience of e-GFAR

Valeria Pesce and Ajit Maru

Abstract: This article begins with the basic requirements for a global information system in general before shifting its focus to the initial development and ongoing re-design of e-GFAR in particular. By staying on the technological forefront and endeavoring to adhere to GFAR's core principles, e-GFAR seeks to facilitate the exchange of information made available by its stakeholders without developing information services that other stakeholders are better placed to implement. The article details the challenges faced, choices made and steps taken to preserve complementarity and subsidarity in e-GFAR's new distributed information system, and relates how e-GFAR is contributing to international efforts to bring greater coherence to agricultural information.

Resumé: Cet article commence avec les conditions fondamentales pour un système d'information global en général, avant de se concentrer sur le développement initial et la révision continuelle de la conception d'e-GFAR en particulier. En restant sur le premier rang technologique et en essayant d'adhérer aux principes fondamentaux de GFAR, l'e-GFAR cherche à faciliter l'échange d'information mise à disposition par ses partenaires sans fournir des services d'information que d'autres partenaires sont mieux placés pour exécuter. L'article détaille les défis affrontés, les choix faits et les étapes entreprises pour conserver la complémentarité et la subsidiarité dans le nouveau système d'information distribué d'e-GFAR, et relate comment l'e-GFAR contribue aux efforts internationaux pour amener une plus grande cohérence à l'information agricole.

Resumen: Este artículo empieza con los requisitos básicos para un sistema global de información en general antes de desplazar su enfoque hacia el desarrollo inicial y el rediseño en curso de EGFAR en particular. Al permanecer a la vanguardia en cuestiones de tecnología y al esforzarse en adherir a los principios básicos de GFAR, EGFAR busca facilitar el intercambio de información puesta a disposición por sus interesados directos sin implementar servicios de información que otros interesados directos están en mejor posición de implementar. El artículo detalla los retos enfrentados, las escogencias hechas y los pasos dados para preservar la complementariedad y subsidiariedad en el nuevo sistema de información distribuida de EGFAR y relata cómo EGFAR está contribuyendo a esfuerzos internacionales para dar mayor coherencia a la información agrícola.

Basic Requirements for a Global Information System

Developing an information service at the global level poses a series of crucial questions, especially when it comes to defining the level/extent of complementarity and subsidiarity[1] with respect to regional, sub-regional and national information services and to other global information services in the same area:

Which audience? – Any information service has to first identify its audience, in order to then identify their information needs and the content that can meet those needs.

In the case of e-GFAR, the prospective users of the service are the GFAR stakeholders: Regional and Sub-Regional Fora (RFs) and Organizations; Farmer Organizations (FOs), Non-Government Organizations (NGOs) and Civil Society Organizations (CSOs); National Government and Public Sector Agricultural Research for Development (ARD) Institutions; Private Sector Institutions; GFAR Partners such as FAO and CGIAR, including CGIAR International Agricultural Research Centers (IARCs) and Non-CGIAR IARCs; donors who contribute to GFAR and potential donors; general public and the Press; and members of GFAR's governance structures and its Secretariat staff.

Many of these stakeholder groups are also targeted by other information services, both at the global and at the regional/national level. Therefore, identifying the specific content that these users may expect to find on e-GFAR as opposed to alternative services is crucial to defining the scope of e-GFAR.

Which content? – It is essential to identify information needs at the global level and specific use cases that distinguish a global information service from a regional or a national information service.

In the case of GFAR, these needs have been identified as information on[2]:

- platforms for advocacy;
- ARD institutions and agricultural technology they offer;
- relevant linkages that FOs, NGOs and CSOs can form for better ARD;
- funding sources;
- institutions, experts, projects and project outputs, including collaborative projects at sub-regional, regional and global levels as well as Public-Private and Public-Private-Community Partnerships classified thematically, geographically and by commodity;
- partner and stakeholder contact details and specialization, especially related to technology, information and skills availability; and

■ details on current and proposed GFAR and partner activities along with their status.

Some of these information needs do not differ from needs that exist at the regional and national level, but there are specific use cases for a global service, e.g. a search for institutions, technologies or projects in the same field in different parts of the world, or researchers / institutions in one region looking for partnerships with researchers / institutions in other regions.

At the same time, some of these needs do not differ from the needs that other global information systems already meet or are supposed to meet. A global information service like e-GFAR has to decide to what extent to apply the principle of subsidiarity. For instance, a global information service on available technologies in agriculture is already provided by FAO (TECA), and global databases of organizations are made available by FAO (the NARS database) and by international information services like WISARD, Infosys+, AiDA, and so forth. So the question is: should e-GFAR provide this type of information, or leave it to other global information services that already do it and also have it in their mandate? The answer that seems more in line with the subsidiarity and complementarity principles is actually a third option: implement a customized, value-added gateway that gives access to the existing information sources, e.g. by customizing the searching and browsing interface using the GFAR classification of regions and countries, or mapping the fields of activity or topic areas used for indexing purposes in the sources to the classification of activities that is familiar to GFAR stakeholders.

Which sources? – Regional and global information systems normally have two choices when it comes to information sources: build their own databases from scratch, using either centralized or de-centralized data entry, or harvest from existing sources.

Following the complementarity and subsidiarity principles, if a global service does not want to duplicate what has already been done and does not want to do what can be better done at a more local level, the best choice is harvesting from existing sources and, if there are no good sources for a certain type of information, probably encourage those who are in a better position to build them to do so, and only as an extreme measure decide to build them from scratch.

Identifying the best sources for a specific type of information is difficult, at the global level because there are similar sources that overlap and none of them is comprehensive, and at the regional level because few comprehensive databases exist and they are not up to date.

A good example once again is databases of organizations working in ARD. Many databases of these organizations already exist but none are comprehensive and all differ in coverage (often overlapping), semantic organization, currency, and quantity and quality of the information they provide. In addition, only a very few information systems share and exchange data among each other.

At the global level, this could be solved by harvesting from all available sources, accepting the risk of duplicate results.

But when it comes to non-global information, e-GFAR should act as a gateway to the regional system. More or less all of the Regional Forums have developed databases of institutions, usually entering data from scratch and asking the countries to contribute by entering the information themselves. Unfortunately, this model is not very sustainable and these databases are rarely up to date. Some Regional Forums have developed information platforms that implement subsidiarity at the regional/national levels in a more integrated and sustainable way, like AARI-NENA with NERAKIN and NARIMS, but setting up a system does not mean that national systems will adopt it quickly, and at the moment there are no comprehensive databases built on these systems.

The point is that the question of which sources is related to the question of "which flow". Can we expect information to flow in a coherent way in line with the principle of subsidiarity and therefore the generally shared idea that information is best managed and maintained at the lowest and most local level? Of course such a coherent information flow would make the selection of sources and their organization in an information system much easier. (Regarding this issue, see the paragraphs below on "Information flow and the subsidiarity principle".)

Basic requirements for e-GFAR – These issues have been even more relevant in developing e-GFAR because the conceptual framework for e-GFAR as an information gateway encapsulates the core principles of GFAR: subsidiarity, complementarity, additionality, partnership and involvement of all stakeholders.

The implications of these principles in developing an information service were clear from the beginning. In 2000, one of the first documents on EGFAR had underlined its objective as being

> to complement existing activities and avoid duplication through coordination with the major organizations that already play a role in ICT at global and regional levels (Derevier, 2000).

In 2002, a project document stated

> The ultimate purpose will be to use a multihosts database search engine allowing transparent access to decentralised resources managed at a regional or national level. This kind of application is totally relevant to the […] principles of subsidiarity and decentralisation. This means that EGFAR has no vocation to develop and manage databases at a central level. EGFAR will have to promote standards to be shared by the various stakeholders (GFAR and FAO, 2002).

However, the first release of the website did not really reflect these principles, primarily because the old technologies did not easily allow access for to remote sources. Soon enough, though, the availability of new technologies and their wider and wider adoption made it possible to re-think the whole approach to information flows in e-GFAR.

The Re-design of e-GFAR:
The Subsidiarity Principle in Action

The authors have previously described (Maru and Pesce, 2007) how e-GFAR was re-designed in 2006 in order to fully reflect the GFAR core principles. As explained in that article,

> The major shift required to implement the GFAR principles through a web space was to steer EGFAR from a GFAR Secretariat "owned" website interfacing GFAR's own databases through local queries to a collaborative website of GFAR partners interfacing distributed information sources by using standard web protocols and exploiting the power of metadata and common standards.

For instance, in the old website, a web interface could be used to add/edit data in a local database, particularly information on events and organizations. This translated into duplication of data, i.e. the same data were stored in other similar databases at different levels — national, regional, sub-regional — and duplication of work, i.e. another database to maintain, another database where organizations had to register their own information. This was not in line with the basic requirements for e-GFAR; as stated in the project documents, e-GFAR should re-use and facilitate access to distributed information resources maintained by its stakeholders rather than develop its own databases. This shift was implemented mainly thanks to RSS technology and the development of interfaces to remote web services using specialized XML standards (see Figure 1 and Maru and Pesce, 2007, for further details).

The shift to the new e-GFAR, which is always under development and gradually upgraded as new technologies and new interoperable services become available, reflected a similar shift in most information services: from a central database with decentralized data entry to querying and harvesting from distributed sources (for more, see previous article in this issue).

Now that the distributed approach has been adopted, the new challenge for e-GFAR is one of the objectives set forth in the original project document: "Converting information into knowledge that is useful for different end-users and stakeholders, and facilitating access to it" (GFAR and FAO, 2002).

This objective is very ambitious and, in spite of all the technological advances that have been made, it is still difficult to automate and may still require time. It requires a lot of work on semantics and the re-packaging of information, both for different audiences (scientists, farmers, students, managers) and in different formats (image, video, printed, training material) — which are often inter-linked as certain formats are more appropriate for certain audiences.

Once again, e-GFAR's subsidiarity and complementarity principles come into play: what kind of re-packaging of information is e-GFAR in a better position to provide than any other stakeholder? e-GFAR cannot be expected

FIGURE 1 – e-GFAR as a gateway: searching documents on partner websites
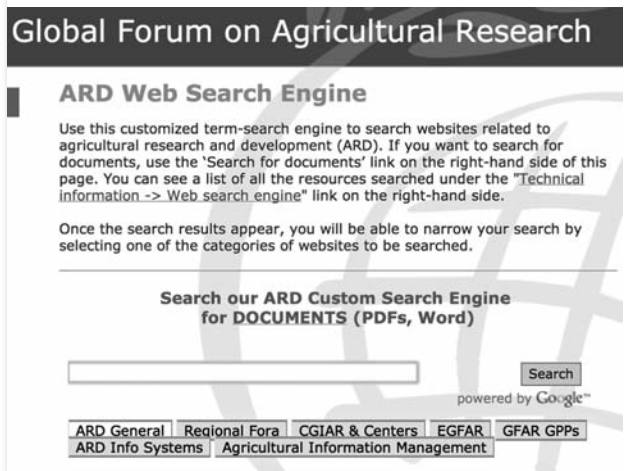
to re-package information for scientists and researchers (Universities, CG Centers and research institutes are better placed), nor for farmers (FOs and governments are better placed), nor for governments and countries (FAO is better placed). What e-GFAR could do is re-package information so that it is accessible in a way that meets its users' needs, e.g. indexed according to a specific classification reflecting GFAR stakeholders' information needs, such as funding sources, advocacy platforms, stakeholder type etc., or digested into customized products, such as digests, classified directories, bibliographies, reviews.

e-GFAR once again mirrors GFAR in that it is a facilitating body and not an implementing body, i.e. e-GFAR will facilitate the exchange of information that is made available by its stakeholders, but will not implement information services that other stakeholders are in a better position to implement. Instead, through initiatives like Coherence in Information for ARD (CIARD) and the CIARD RING, GFAR will support and enable the further development of value-added services by its stakeholders.

Distributed Approach and Subsidiarity:
Main Challenges

Sources: interoperability and semantics – The new distributed approach, though unanimously considered more promising, also presents a major challenge: it relies on the availability of interoperable information sources. This issue can only be resolved through the adoption of standard formats and standard procedures by the various stakeholders and information services. This requires a clear definition and an understanding of the benefits for all parties, and an increased awareness of the need for all partners to participate in the so-called "coherence process".

Nevertheless, basic interoperability may not be enough for building value-added services. Quite often, the price

for choosing a distributed approach rather than an in-house developed database is the loss of semantics.

For example, the organizations search engine on e-GFAR queries four different sources, but the only common search criterion is the country, while the various semantic classifications used in the sources (field of activity, type of organization) are not made available as query parameters by the sources. Even if they were, some additional work should be done to map the four different classifications to a common vocabulary (e.g. *Agrovoc Thesaurus*) and to the GFAR specific categories. Without this kind of semantics, e-GFAR can only offer a basic directory service, rather than the desired value-added service that is customized to its users' needs. Compared to the search engine it could offer to interface its local database, which included a classification by type of organization, this distributed search engine loses an important semantic functionality. However, it gains in coverage and in the potential that this approach has for the future.

In a distributed architecture, the adoption of common vocabularies for semantic indexing, semantic web technologies mapping different vocabularies and ontologies, or reliable automatic indexing procedures are necessary to overcome the issue of poor semantics.

Information flow and the subsidiarity principle – The distributed approach raises two other issues:

- the selection of sources; and
- the identification of the level at which information should be collected and maintained, i.e. which are the sources/producers and which are the consumers.

The role of global information services that use a distributed approach is quite clear: they are consumers (although they might process part of the information they consume and produce new value-added information), but in the identification of sources, it is often difficult to distinguish between the real producers (those who collect and maintain the information) and the secondary sources that re-publish that information. In some cases, like blogs and Web 2.0 platforms, the authors seem to be the producers, but they are not responsible for maintenance and they cannot guarantee it. The real providers are the Web 2.0 platforms (Google, Wordpress, Flickr…).

In such a scenario, selecting and organizing the sources in order to provide a coherent service can be very difficult.

In a paper written for GFAR, Peter Ballantyne (2007) quoted the definition of "innovation" from a 2007 World Bank report on "Enhancing agricultural innovation" and derived from it some consequences for agricultural information management, among which is the fact that

> the knowledge needs to be sourced from an increasingly diverse set of actors. It is not enough for research institutes to access each others' reports—they need to tap into all kinds of other information flows, including from farmers themselves, and find ways to document and provide access to this.

Tapping "into all kinds of other information flows" is a really challenging task, and raises issues regarding these information flows and the subsidiarity of global information services. Starting from this example from Peter Ballantyne's report, in which research institutes are encouraged to tap for instance into information flows whose source are the farmers themselves, a lot of challenging questions arise:

- *At what level can information be expected to be collected (and maintained)?* – Can we expect to establish a workflow that respects the subsidiarity principle? Using the above example of information generated by farmers, what is the subsidiarity relationship for instance between an international NGO (INGO) and a national research institute with respect to farmers? Should the farmers themselves initiate the information flow, or go through FOs? Or is it better to just leave it to whoever can do it and then let other services tap into the newly developed source, even if this means that a national institute or a national FO has to tap into an INGO service to find information generated by farmers in its own country? The issue here is not the dissemination of information or the communication means that farmers use, but the storage and maintenance of the information that they generate; capturing this knowledge and transforming it into a reliable information source requires a sustainable workflow (collection, storage, maintenance).

  Probably very few people still think that information flows can be truly governed, so information services in the future will probably adopt a very flexible approach and tap into as many sources as possible. However, issues of efficient maintenance and coherence will still be there and become bigger. As Peter Ballantyne (2007) says in the same report,

  > People with ideas and messages have very accessible tools with which to communicate. Larger and more traditional organizations might soon be at a disadvantage as they try to organize and manage these dynamic and semi-chaotic information flows

  and those building information systems will have to

  > be able to track and assess interesting content 'traveling' from sometimes strange and unexpected places in the wider innovation system.

- *Into which sources do global information services preferably tap?* – If e-GFAR is expected to fully respect the subsidiarity principle and coordinate with the Regional Forums, should it wait until information of a certain type is coherently managed at the national and then regional level before this information is made available on e-GFAR? An example would be the aforementioned information generated by farmers, which is relevant to both FOs and researchers. If there were blogs and wikis scattered all over the Internet capturing this information at different levels, sometimes individual and sometimes geographic, would e-GFAR just tap into these sources or encourage the national and regional

information systems to develop their workflows for this type of information and then just provide a gateway to the regional systems? Again, can we expect information to flow in such a rational way? Or should we expect it to flow in a "spontaneous" way but then coordinate efforts at the national and regional level to rationalize the flow and provide coherent information services?

One of the main risks of an incoherent proliferation of information sources is the duplication of efforts, i.e. the collection of the same kind of information at the same time by different actors. In a field where activities are generally funded by donors, this could easily be viewed a waste of money. This is why the importance of coherence in information management is generally acknowledged and the CIARD initiative is endorsed by so many key actors.

Things will probably evolve in a very flexible way, much like Peter Ballantyne sees it, and e-GFAR itself will interface information sources independently of the national/regional/sub-regional/national granularity. However, one of the roles that GFAR and the CIARD initiative have to play consists of trying to promote coherence in the way information flows, following the principle that information is best managed and maintained at the lowest and most local level, and discouraging wherever possible the duplication of efforts.

Community platforms:
issues of subsidiarity and complementarity

Many information systems also offer a community platform to allow their users to voice their views and share content with other users. These platforms can be in the form of a wiki or a blog, but in any case, the information that is collected in this way is inputted into a database through data entry, and can then be made reusable through RSS feeds. This means that this is another way to collect and maintain information, and therefore of creating an information source.

Though these communities are usually seen as an informal and spontaneous form of communication, they often contain valuable information and managing that information presents the same challenges as those associated with managing any kind of database.

One of these challenges is avoiding the duplication of effort.

There are many community platforms in the field of agriculture, some with only slightly different scopes, and most sharing more or less the same audience.

e-GFAR also hosts a community platform. In order to make the platform truly "stakeholder-led" and to allow stakeholders to create collaborative content, e-GFAR offers a wiki-like tool: the Open Site section on e-GFAR. The Open Site allows registered users to create and edit articles and entire sections and to upload and share digital resources. The goal was to create a truly neutral platform for sharing views and knowledge.

However, getting users to register and actually contribute to the platform proved difficult, especially as long as its scope was defined as generically as "ARD". It was only after discussion forums were started on very specific event-driven discussions in which GFAR had a relevant role [e.g. on ICM4ARD, on International Information Systems for Agricultural Science and Technology (IISAST) and recently on the GCARD[3] 2010 Conference] that people registered and contributed.

This demonstrates that the principle that things should be done by those who are in the best position to do them is valid.

It does not make much sense to have a lot of small community platforms whose audiences are very similar. However, it is difficult to govern this process based upon some abstract subsidiarity principle, i.e. agree to select just one, cancel the others, and migrate all users to the selected one. Usually, through a natural process, just one or two communities become big enough to really create an interesting information flow. Sometimes, even if the tools are good, it is difficult to know whether they have that 'something' that will bring the necessary "critical mass" of people to use them. In most cases, this occurs virally, i.e. the more people participate, the more people will participate. As Tim O'Reilly (2005) said, this is

> a key Web 2.0 principle: the service automatically gets better the more people use it.

If the objective of a community platform is attracting contributions from many users, it must be considered that the proliferation of separate communities that overlap in both scope and membership quite often discourages participation, as it requires multiple registrations, multiple threads of content, and multiple submissions of postings.

In the absence of coordination between partners in this area, technology, more specifically the adoption of standards, can help. Existing efforts towards the development of distributed and decentralized "single sign-on" systems for managing digital identities, e.g. the OpenID initiative, will help overcome the multiple authentication problem, while many Web 2.0 tools now allow the aggregation of content from different communities and simultaneous submission to multiple communities. Of course, in order to benefit from these tools, community platforms must be built on standard technologies that allow for this type of interaction.

The adoption of these technologies might ultimately make coordination less important, because a single system facilitates access to information sources from multiple communities, i.e. the Web 2.0 tool adopted by the user to navigate through the various communities puts the coordination in the hands of the user.

In conclusion, managing community platforms presents the same challenges as managing information systems; selecting audience and subject domain, not doing what others can do better, understanding and managing the flow of information and, last but not least, adopting standards are crucial factors for the success of the system.

Notes

1. These are not only sensible principles for building any global information service, but are also the core principles of GFAR. The subsidiarity principle is of particular relevance; as defined by the *Oxford English Dictionary*, subsidiarity is "the quality of being subsidiary; spec. the principle that a central authority should have a subsidiary function, performing only those tasks which cannot be performed effectively at a more immediate or local level."

2. cf. Maru, A. 2006. *GFAR's Communication Strategy*. http://www.fao.org/docs/eims/upload/217390/GFAR%20Communications%20Strategy.pdf

3. Global Conference on Agricultural Research and Development, http://www.gcard2010.net

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REGIONAL PROFILE

Near East and North Africa: AARINENA-RAIS

Taraneh Ebrahimi

Introduction

It is widely recognized that the development of regional agricultural information systems is an important step towards the enhancement of information exchange in which knowledge and experiences in agricultural research and development would be made accessible to all countries in the region. With this in mind, the Association of Agricultural Research Institutions in the Near East and North Africa (AARINENA), in co-operation with the Global Forum for Agricultural Research (GFAR) and the countries of the region, is establishing and developing a Regional Agricultural Information System (RAIS) for the West Asia and North Africa (WANA) Region. This system aims to increase the effectiveness of agricultural research in the region and make its outputs accessible to the end user.

The AARINENA-RAIS would serve as an information repository and exchange mechanism at the regional level, aiming to strengthen, co-ordinate, and add value to initiatives of national programs and those coordinated by regional and international organizations.

This article focuses on the regional initiative to establish and develop a Regional Agricultural Information System in the Near East and North Africa region over the past 20 years.

Background

AARINENA was established in 1985 to strengthen cooperation among national, regional and international research institutions and centers through the dissemination and exchange of information, experiences and research results. It includes five sub-regions: Arabian Peninsula, Maghreb, Mashreq, Nile Valley & Red Sea, and Western Asia. One of AARINENA's main purposes is to exchange information via close collaboration between sub-regions and their countries.

The Development of the RAIS Networks

The AARINENA-RAIS Steering Committee was established on the recommendation of the participants in the 2003 AARINENA ICT Expert Consultation held in Cairo, Egypt. GFAR and the Food and Agriculture Organization of the United Nations (FAO) supported this move with the aim to strengthen the Regional Agricultural Information System in the region. The Steering Committee is composed of representatives of the five sub regions and representatives from the Arab Organization for Agricultural Development (AOAD), FAO,

GFAR, and the International Center for Agricultural Research in the Dry Areas (ICARDA).

The RAIS Secretariat has been hosted by Iran, as was proposed by the Iranian Agricultural Research and Education Organization, since the 2001 AARINENA Executive Meeting in Tehran. This Secretariat tries to collect information through National Information Focal Units (NIFUs) from sub-regional countries. All the activities related to the AARINENA website (http://www.aarinena.org) are managed and developed by this Secretariat.

In its first meeting, the AARINENA ICT Steering Committee approved a two-phase mid-term plan for implementing the RAIS:

The first phase included three main components:

- Design a National Agriculture Information System (NAIS)
- Develop an Electronic Forum for discussion
- Develop a Question-and-Answer service

The second phase includes the design and implementation of:

- An Experts Information System (EIS)
- An Institutes Information System (IIS)
- A Projects Information System (PIS)
- A Research Outputs Information System (RIS)
- A Gateway function that serves as a multi-host database search engine

Main Outputs of the Initiative

AARINENA Website – The AARINENA website (Figure 1 — http://www.aarinena.org/) acts as a gateway in the

FIGURE 1 – AARINENA website: homepage

region, with each of the countries in the region having their own page on the website. All the information related to the countries is published on their respective pages.

The new AARINENA website was released in June 2009 with advanced content management capacities. It includes a Members area for the National Information Focal Units to input news, documents and data. It also includes useful knowledge sharing tools like blogs, discussion forums and wikis.

Information Platforms –

- *National Agricultural Research Information Management System (NARIMS)* – Another important project in the region is NARIMS (http://www.aarinena.org/database/NARIMS/index.asp), a web based information system for managing research institutions information that was developed by the Central Laboratory for Agricultural Expert Systems (CLAES) in Egypt. The objective of the project is to strengthen the capacity of the Agricultural Research Center (ARC) of the Ministry of Agriculture and Land Reclamation (MALR) to develop, manage and apply a relevant and effective national agricultural information management system in support of agricultural development and food security policies.

NARIMS is made up of four modules: Personnel, Institutes, Projects, and Research Results and Publications. It enables researchers and scientists to carry out their research more effectively by providing access to research and institutional information from the region and tools for managing information on researchers, institutions, agricultural research projects, and other activities.

- *Near East and North Africa Rural and Agricultural Knowledge and Information Network (NERAKIN)* – NERAKIN (http://www.nerakin.net/) is a platform for knowledge sharing and collaboration in support of Agricultural Research for Development (ARD) for target groups and stakeholders at the regional level in the Near East and North Africa.

The immediate objective of the Network is to strengthen the capacity of the Ministries of Agriculture and Agricultural and Rural Research Institutions to manage information effectively and allow knowledge exchange in support of rural and agricultural development in the region.

During its first three years of operation (2007-2010), the NERAKIN Network is expected to produce the following specific outputs:

- A pilot Rural and Agricultural Knowledge and Information Network (NERAKIN) through the establishment of a Regional Gateway function and a collaborative network of technical institutions and organizations committed to capacity building in this area.

- A pilot NERAKIN knowledge and information management system of national components including modules (information systems) on documents, institutions, experts and projects; this system facilitates access to other agricultural information serv-

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Focus on Information Management Issues

Iran, Turkey and Pakistan, in collaboration with the AARINENA-RAIS Secretariat, have developed the database of Western Asia agricultural researchers (WANARIS). This database facilitates the exchange of information on researchers in the sub-region. The database is now available through the AARINENA web site (http://www.aarinena.org/database/index.htm).

The Pakistan Agricultural Research Center (PARC), which is the main ARC in Pakistan, had already developed RWC-PRISM (http://www.rwc.cgiar.org/), an Internet-based platform for sharing and managing existing and new information on organizations, experts and projects in agricultural research and development. RWC-PRISM was a good example of what we intended to do for the sub-region. The database collects information related to the national agricultural researchers in Pakistan, Bangladesh, India and Nepal.

Information on researchers is collected through a web form (http://www.aarinena.org/database/form.htm) developed in ASP, JavaScript and VbScript; the related database has been developed in Access.

Information collected via the form includes: biographical information, education history, work information, recent projects, and contact information. For the Work Field, a controlled list of terms is provided, in the form of a drop-down list.

A search page allows users to find researcher information based on relevant fields (name, family name, work field, country); a free text search box helps users to find the researchers' recent projects through keywords.

Among the details available for each researcher, their current job title and their work field constitute the most relevant information for collaboration and exchange of experiences; using this information, researchers can find other researchers working on common activities in the sub-region.

An enhancement we expect to add in the near future is to collect the abstracts of the researchers' projects and make a direct link from the titles to the abstracts.

One of the main issues in developing such a database is data collection. Unfortunately, weak communication among and between research institutes, researchers and countries is a frequent obstacle to the successful implementation of an information system. Since the launch of the web form in 2006, we have only received 450 registrations. Increasing the interest of researchers in interacting and collaborating in this kind of project is a very complex and challenging task. One of the solutions on which we intend to concentrate our efforts is strengthening the focal points in our region and encouraging close collaboration between them through the new web tools.

ices and databases relevant to the rural and agricultural sector and enables the exchange of information and knowledge among stakeholder groups.

- Network all ARC agricultural institutions through a regional portal as well as through national portals.

- A team of nationally selected focal points and technical staff at the different agricultural institutions, trained on how to manage and integrate information from their institutions into NERAKIN and to maintain it as a high-quality information and communication resource using the NERAKIN content management system and modern information management approaches. These trained staff are expected to train others in the future.

- Development of operational plans for the network that would strengthen knowledge sharing and learning processes, and foster partnerships for broader knowledge sharing and learning at the national and regional levels.

- Development of an operational framework that defines the roles and responsibilities of all the stakeholders at the national level.

- *Database of Western Asia Agricultural Researchers (WANARIS)* – In collaboration with the AARINENA-RAIS Secretariat, Iran, Turkey and Pakistan have developed WANARIS, a database of Western Asia agricultural researchers. This database enables information exchange among researchers in the sub-region. The database is now available through the AARINENA website (http://www.aarinena.org/database/index.htm). To date, about 450 records have been added by researchers from the above mentioned countries through the form available on the AARINENA website; data entry is still open and researchers continue to enter their data.

Regional Networks – Among its other initiatives aiming to develop agricultural information systems, AARINENA has contributed to the establishment of networks for essential crops in the region, e.g. date palm, cotton, olive, and medicinal plants, as well as other key topical areas, e.g. biotechnology and water use efficiency. These have helped to bring the WANA region's views, aspirations and research priorities to the attention of relevant international organizations. The ultimate goal is to promote sustainable agricultural development by attracting global agricultural and development communities as well as donors to support

Figure 2 – Regional Workshop for Strengthening National Information Communication Management Focal Units in WANA Region, January 8–10, 2008, Muscat, Oman

regional and sub-regional research projects and related activities. The following networks have been established in the AARINENA Region:

- Inter-Regional Cotton Network
- Date Palm Global Network
- Medicinal and Aromatic Plants Network
- Olive Oil Network
- Water Use Efficiency Network
- Plant Genetic Resources Network
- Biotechnology Network.
- National Information Focal Units

The key constraints affecting ICT/M and the building of an efficient RAIS are weak national agricultural information systems in many of the AARINENA member countries as well as inconsistency in information management. With this in mind, the ICT-RAIS Steering Committee has given priority to the formulation of National Information Focal Units as an important step towards strengthening the NAIS in AARINENA member countries. The philosophy behind having Focal Units, rather than focal points/persons, is to provide greater stability and continuity, i.e. to use sustainable institutional bodies rather than individual focal persons (Figure 2).

The main tasks of the NIFUs are:

- To assist in the identification of respective National Agricultural Research System (NARS) information needs.

- To assist in the development of NAIS and RAIS in AARINENA member countries.

- To collect, organize, monitor and update information and make it accessible to the AARINENA-RAIS.

- To assist in the improvement of national research and ICT policies and strategies within the scope of the AARINENA-RAIS mission.

- To share skills, knowledge and experiences in information management among national focal units.

- To represent the respective NARS in the AARINENA General Assembly meetings and relevant ICT/M national and regional events.

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Asia and the Pacific: APARIS

Poonam Saini

Brief History

In 2000, the Asia-Pacific Association of Agricultural Research Institutions (APAARI) organized an expert consultation, inviting agricultural information professionals from member National Agricultural Information Systems (NARS), the Australian Centre for International Agricultural Research (ACIAR), Food and Agriculture Organization of the United Nations (FAO), CAB International (CABI), Asian Institute of Technology (AIT) and other stakeholder organizations, with an aim to promote the use of new information and communication technologies (ICT) for better information and communication management (ICM) in agricultural research for development (ARD) of the Asia-Pacific region. Since that time, APAARI, with the support of ACIAR and the Global Forum for Agricultural Research (GFAR), has been developing the Asia-Pacific Agricultural Research Information System (APARIS). The expert consultation recommended that such a system should serve as a regional de-centralized platform for efficient information and knowledge sharing among the region's NARS and other ARD stakeholders. Accordingly, APAARI decided to establish APARIS as one of the major programs under its umbrella.

Over the last eight years, APARIS has evolved as a knowledge sharing mechanism with active involvement on the part of various APAARI members and stakeholders. APARIS has its own Steering Committee, currently comprising representatives from APAARI, the NARS, GFAR and the FAO Regional Office for Asia-Pacific (FAO-RAP).

APARIS Priorities

Advocacy for enabling, enhancing and enlarging agriculture related information systems at national, sub-regional and regional levels in the Asia-Pacific region. Under this, current priorities are:

- Collecting, collating and providing access, on a biannual basis, to information related to status of the use of ICT and information systems in NARS of the region and indicators of the use of agriculture and rural development related ICT at national and regional levels (2005 and 2007).

- Developing an advocacy paper on ICT and agricultural information related policy and strategy issues at national, sub-regional and regional levels that can

provide fact-based support for the advocacy role of APARIS (early 2005).

■ Organize, during APAARI General Assemblies, a half day sensitization and awareness workshop on policy and strategy issues in enabling, enhancing and enlarging agricultural information systems for senior NARS and agricultural policy makers and managers (2004–2007).

■ Identifying and publishing success stories on ICT/ICM in ARD using case studies from selected Asian countries (2005).

■ Associating and networking with other initiatives and forums to promote awareness about ICT/ICM in ARD and also publicizing APARIS in regional and international conferences.

Capacity development for ICM and use of appropriate ICTs for national agricultural information systems. Under this, activities undertaken have been:

■ An Asia-Pacific Regional Workshop for National Information Nodal Points (NINPs) for needs assessment and to develop a framework for National Agricultural Information Systems (NAIS) (in 2005)

■ Three Sub-regional Training Workshops for NINPs and two ICT/ICM trainers from each country (in 2006):
  • South Asia (Iran, Afghanistan, Pakistan, India, Nepal, Bhutan, Bangladesh, Sri Lanka) in collaboration with the SAARC[1] Agricultural Information Centre (SAIC)
  • Southeast Asia (ASEAN[2] countries) in collaboration with the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA)
  • the Pacific (APAARI member countries) in collaboration with the Secretariat of the Pacific Community (SPC)

■ National Workshops, facilitated by NINPs and trained NAIS trainers, for two officers from each major national agricultural institute (in 2007)

Integration of information resources within NARS, within the Asia-Pacific region and with other regional and global agricultural information systems such as the Global ARD Web Ring[3] being developed by GFAR under the Coherence in Information for Agricultural Research for Development (CIARD / http://www.ciard.net) umbrella. Under this priority, efforts undertaken have been as follows:

■ Develop an on-line compendium of good practices, standards, guidelines, protocols, and so forth for agricultural information exchange and sharing in the Asia-Pacific region (2004–2007).

■ Participate, as a representative of the Asia-Pacific Region's NARS, in negotiations related to the setting of standards, guidelines, and protocols related to agricultural information systems at the global level (2004–2007).

■ Conduct seminars at the sub-regional level (South Asia, Southeast Asia and the Pacific countries) related to the sharing and exchange of information, especially on the use of standards, guidelines and best practices

in agricultural information systems in conjunction with the sub-regional training workshops proposed in the Capacity Development section and other APAARI related activities (2004–2007).

■ Further strengthen the directory of agricultural information on the web and the Gateway/Portal function to access the information resources of various institutes (2005–2007).

■ Promote data and information sharing among various member institutes using applications such MetBroker[4] and localized crop models.

■ In consultation with GFAR and other regional and sub-regional forums, integrate APARIS as the Asia-Pacific node in the Global Web Ring of Agricultural Information Systems (2004–2005). Based on the suggestions of the APARIS Steering Committee, APAARI has developed a proposal for submission to GFAR and other potential collaborators and donors in close consultation with the APARIS Steering Committee members and focal points in Support Group Organizations such as GFAR, FAO-RAP, ACIAR, AIT, JIRCAS/NARO[5], CABI, SDLEARN[6] and others.

APARIS Activities

APARIS has been actively engaged in the dissemination of publications and success stories in the Asia-Pacific Region. It assesses the status and needs of the NARS in the region with regard to ICT in ARD, and monitors and updates information to improve the relevance and effectiveness of APARIS contributions. It also establishes and operates information services for a national and regional clientele based on APARIS processed information and facilitates the sharing of skills, knowledge and experiences in the handling and management of information among NINPs.

The APAARI expert consultations provide NINPs with an opportunity to become familiar with the development and management aspects of a distributed information system as envisioned under the GLOBAL-RAIS initiative and also applicable to APARIS. Considering the diversity within it, the size of its human population and the geographic coverage of the Asia-Pacific region, constraints and issues faced by APARIS are quite similar to those of a global agricultural research information system. In this respect, APAARI can benefit from the experiences of both other regional organizations, such as the Association of Agricultural Research Institutions in the Near East and North Africa (AARINENA), Forum for Agricultural Research in Africa (FARA), Forum of the Americas for Agricultural Research and Technological Development (FORAGRO), and European Forum on Agricultural Research for Development (EFARD), as well as global organizations.

In several developing countries of the Asia-Pacific region, the existing technology transfer mechanisms and extension programs, most of which are government

run, are either slow or ineffective in creating linkages between the research community and farmers. This is partly due to inadequate exploitation of new means of knowledge and information dissemination by these agencies. To partially fill the gap, some private initiatives have recently come up; however, the primary motivation behind these initiatives is the facilitation of commercial transactions in rural areas rather than knowledge/technology dissemination. Hence, it is relevant that the role of ICTs in taking scientific knowledge/technologies to end users is properly examined and understood in order to reap the benefits that have effectively been harnessed by the developed nations.

In view of these issues, it seems that the time has come to recognize agriculture as a rural entrepreneurial activity, delivering a wide range of local, national and international products. And, just like any other economic activity in the twenty-first century, it has its own unique technological and information needs. It requires all pertinent managerial skills for timely planning, risk assessment, efficient resource utilization, product innovation, technology adoption, and so forth, in a dynamically changing environment. For example, after the recent outbreak of Avian Flu in some Asian countries, the most common feature in media reports from various countries were farmer complaints about the delay in getting useful information from relevant government agencies that they needed to tackle the problem at the farm level. This shows how timely information is becoming central to decision-making in all aspects of food production and distribution.

ICT are becoming more and more inexpensive and offer a wide variety of tools that can help develop information products and services designed specifically to enhance the decision-making capabilities of the newly emerging agricultural entrepreneurs. ICT can not only strengthen the traditional channels of information dissemination even further, but also create new ones that allow the localization of content-rich information products and services and their real-time delivery through multiple channels. However, like all technologies, ICT

have costs associated with them, including the cost of building the infrastructure, i.e. personal computers, modems, connectivity, bandwidth, and the costs associated with user training, technology development, system maintenance and, inevitably, obsolescence. It needs to be determined whether ICT are sustainable for rural development and for the resource poor common man.

Several independent public and private initiatives are underway to bridge the digital divide that exists between urban and rural India. There appears to be a clear need to bring all these initiatives together to start a dialogue about generating momentum by working together. Novel partnerships of various players who can complement each other are needed to develop and disseminate information products and services in an economically sustainable and effective manner. These players include agriculture research institutes, cooperatives, the private sector, non-governmental organizations (NGOs), foundations, and concerned government departments at national and state levels. A consortium approach in combining the independent efforts is proposed as it offers the required flexibility in a partnership.

Website Development

APARIS organizes and manages its website (http://www.apaari.org/). It regularly publishes reports/proceedings of Expert Consultations/Meetings on ICM/ICT, the *APAARI Newsletter* (bi-annual) and success stories. Its website also serves as Regional Agricultural Expert Locator (RAEL) and Gateway for ARD Information Resources. APARIS annually releases APAARI on CD, NARS on CD and the Institute Directory of NINPs (see Figure 1).

Inter-regional Collaboration

APARIS also acts as a regional node linking NAIS to global networks such as WAICENT, AGRIS, WISARD[7], ASTI[8], and IFPRI[9]-ISNAR[10], and other regional agricultural information systems (RAIS) such as InfoSys+, AARINENA-RAIS, Agroweb-CAC (Central Asia and the Caucasus), FORAGRO-RAIS and FARA-RAIS.

FIGURE 1 – NARS on CD, APAARI on CD, ICT Status Report, Success Stories in ICT
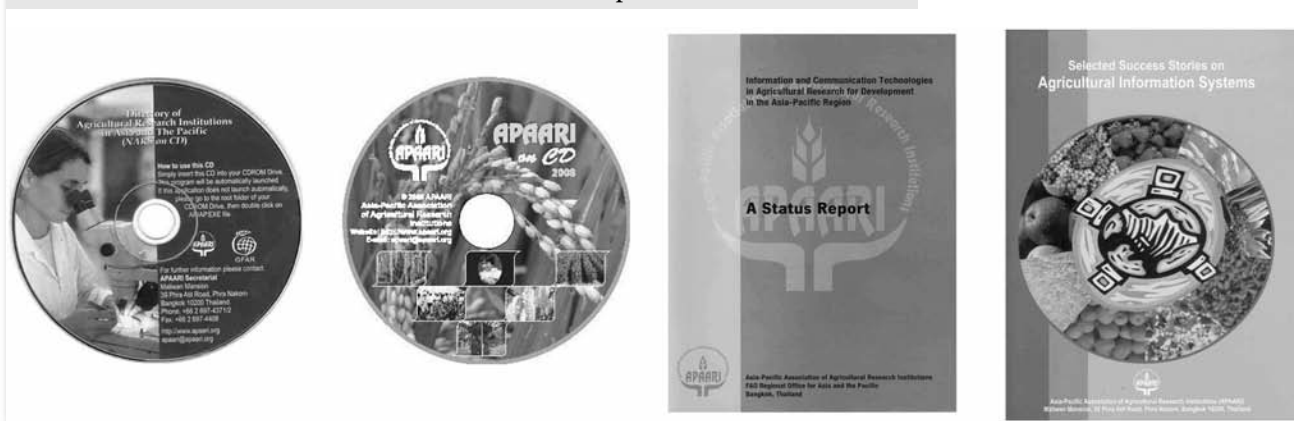
Focus on Information Management Issues

The ARD Information Gateway (http://www.apaari.org/APARIS/GIS/index.php) is one of the tools available in the APAARI website for de-centralized management of information. The APARIS Gateway function, consisting of a search module, acts as a multi-host search engine to locate ARD information resources on the Internet within the APAARI member institutions.

The gateway function has a search module where a user can enter a keyword(s) and get search results based upon it. During the search process, the gateway performs the following actions:

- connecting to APAARI member institution's servers;
- searching the requested keyword in each web file;
- retrieving the information from the selected file(s);
- saving the metadata information in an internal database in order to reduce the search time in the future; and
- displaying the search results in a standard XML format to the user.

For the standardization of ARD information processing, basic content management templates for agricultural research information production/dissemination should be developed and they should be simple and user-friendly. Sustainability of ARD Information Systems is also improved by information products such as e-Books, CD-ROMS, TV programs, etc. on relevant knowledge-intensive content.

APAARI organized a meeting to formalize bilateral cooperation between APAARI and members of its support group in the area of ICT (FAO, GFAR, ISNAR and AIT). Linking APARIS with other regional, sub-regional and global agricultural information systems, and functional enhancements or value addition in it emerged as the priorities for its future development. The APAARI website has linkages with its international and regional members through external links.

Future Strategy

- Actively involve NARS leaders, senior managers and policy makers: this is critical in improving ICM at the national level to have greater impact of agricultural research. Increased efforts are needed to sensitize the leadership regarding the urgency of communicating research to extension services and farmers. It is widely observed that the traditional extension mechanisms of NARS need to be revitalized using available ICT such as the Internet, call-centers, TV programs, radio and mobile phones. NARS commitment to APARIS through NINPs needs further institutionalization so that APARIS functions as a network of national information resources.
- Carefully identify NARS priorities in the area of ICT/ICM and address them through appropriate human and financial resources.
- As ICT/ICM needs of most NARS are gradually shifting from hardware infrastructure to human capacity building, greater effort is needed in the areas of standardization, better coordination of information resources, and improved sustainability.
- Develop capacities, through sensitization and awareness building among NARS leaders.
- Develop a regional strategy for information management and knowledge networking.

Notes

1. South Asian Association for Regional Cooperation, http://www.saarc-sec.org/main.php

2. Association of Southeast Asian Nations, http://www.aseansec.org/

3. For more information, see *The ARD Web Ring: A Draft Proposal* (2008), http://www.fao.org/docs/eims/upload/242450/The%20ARD%20Web%20Ring_draft_final.pdf

4. For more information, go to http://www.agmodel.org/projects/metbroker.html

5. Japan International Research Center for Agricultural Science (JIRCAS) National Agriculture and Bio-oriented Research Organization (NARO)

6. Sustainable Development eLearning Network, http://www.sdlearn.net/members.htm

7. Web based Information Services for Agricultural Research for Development

8. Agricultural Science and Technology Indicators, http://www.asti.cgiar.org/

9. International Food Policy Research Institute, http://www.ifpri.org/

10. International Service for National Agricultural Research, http://www.isnar.org/

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Sub-Saharan Africa: RAILS

Myra Wopereis-Pura

Introduction

The Forum for Agricultural Research in Africa (FARA) has identified 'Access to knowledge and technologies' as one of their five major activities to support sub-regional organizations (SROs) in strengthening capacity for agricultural innovation. To achieve broad-based improvements in the livelihoods of smallholder farmers and pastoralists, it is crucial to provide equitable access to information and learning throughout the African continent.

FARA recognizes that there are quite a number of service providers engaged in generating and disseminating agricultural information in Africa. The Regional Forum wishes to add value to the valuable work of these organizations by providing a regional platform for exchange and sharing of information on agricultural issues to its major clients, the SROs and national agricultural research systems (NARS).

In March 2004, FARA organized a consultation workshop with key players in agricultural research for development (ARD) and information and communication management (ICM) in Africa. A key outcome of this workshop was the Regional Agricultural Information System (RAIS) initiative, which was aimed at three main areas of ICM:

- capacity strengthening of NARS leaders on advocacy for ICT;
- capacity development of NARS ICT managers; and
- integration of agricultural information systems in Africa.

Although the importance of RAIS was widely recognized, it was later realized that the channeling of data or information is not enough to catalyze innovation in African agriculture. All stakeholders, from farmers to scientists, have to *learn* how to turn information acquired into knowledge that can improve the livelihoods and well-being of resource-poor farmers and pastoralists. Therefore, agricultural information systems (AIS) require a learning mechanism to assist stakeholders in digesting the information that is made accessible to them.

In March 2006, the RAIS taskforce met and formally endorsed the concept of integrating 'learning'; subsequently, the Regional Agricultural Information and Learning System (RAILS) initiative was developed. The primary purpose of RAILS is to enhance access, retrieval and use of agricultural information and technologies through learning, i.e. by dealing with actual issues and a

rapidly changing environment.

The major objectives endorsed for RAILS were:

- Advocate for increased investments in AIS by African governments and institutions;
- Improve the access and contribution by African ARD stakeholders in global knowledge sharing;
- Facilitate AIS synergies and value-addition between international and national research for development institutions; and
- Consolidate national, sub-regional and continental ARD information systems to create an African platform for AIS that could contribute to the global AIS (FARA, 2006).

Based on the recommendations of several consultations, a proposal was sent to the Global Forum for Agricultural Research (GFAR) and the African Development Bank (AfDB) for financial support. At the same time, a web interface was developed for FARA to provide an African platform for ARD. Funding from AfDB became available to support major RAILS activities starting in January 2007. The RAILS Implementation Workshop was held January 17–19, 2007, at the FARA Secretariat (FARA, 2007).

RAILS Governance Structure and Relationship with Sub-Regional and Global Forums

FARA has developed five Networking Support Functions (NSF) to help it achieve its objectives. The six-year (2007–2012) AfDB-funded RAILS project falls under NSF2: Access to knowledge and technologies. The project is led by a Coordinator, who is also the NSF2 Director, and assisted by a RAILS project officer. These two officers work closely with the RAILS taskforce, which is composed of the information and communications managers of each of the sub-regional organizations:

- Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA), http://www.asareca.org/
- West and Central African Council for Agricultural Research and Development (CORAF/WECARD), http://www.coraf.org/
- Southern African Development Community / Food, Agriculture and Natural Resources Directorate (SADC/FANR), http://www.sadc.int/fanr/
- North Africa Sub-Regional Organization (NASRO)

International partners interested in working with RAILS can sit on the taskforce as observers; such is the case for GFAR, the Food and Agricultural Organization of the United Nations (FAO), and CABI. RAILS is implemented by the SROs together with the RAILS learning team headed by a national focal point. The

learning team is a network of individuals representing the institutions working in the field of agricultural research for development. These institutions include research institutes, universities, government agencies and civil society organizations.

Priorities and Activities

To achieve the objectives stated above, activities are planned and categorized to respond to each of the objectives. RAILS operates as a framework at the continental level adding value to existing initiatives at the sub-regional and national level (see Figure 1). As such, its interventions are aimed at supplementing or reinforcing the priorities identified by the national partners. These are categorized into four priorities, with corresponding planned activities;

Advocate for increased investments in agricultural information and learning systems – Agricultural information systems in African national research institutions are not well supported with adequate financial resources. They usually receive only 1–5% of their institution's total budget, depending on whether extra income was achieved in the year. This is mainly due to an inadequate understanding of the importance of information systems in disseminating research results. It is critical to instill a learning culture in an organization so that it is adequately prepared for the rapid changes that occur in the African ARD environment.

RAILS, through its learning team, will develop the process for formulating national strategies and a corresponding support mechanism for their implementation. This will involve identifying methodologies to facilitate the creation of learning teams at the national level, taking into account existing partnerships among ARD stakeholders, such as research-extension and civil society involvement. A major priority is to develop learning mechanisms that will facilitate the transformation of research results and farmer indigenous knowledge into innovations that will draw private sector interest and investment.

Improve the access and contribution by African ARD stakeholders in global knowledge sharing – One of the weaknesses of Africa's ARD systems is poor accessibility of available agricultural information or technologies and the lack of resources to access it. African ARD institutions generally have very poor information and communication resources relative to ICT infrastructure; human resources to gather and transform scientific results into publications aimed at diverse readers/users; and tools to access Internet resources. They lack the basic infrastructure to access, use and contribute to any agricultural information learning systems exchange. Digital contents are inadequate or not fully developed in most of the national systems.

African agriculture stakeholders need resources that meet their information needs. RAILS will establish a learning team that can facilitate the exchange of information and learning among these diverse stakeholders. The learning team's facilitation capacities will be strengthened, as well as their ability to gather the required resources, i.e. research results, investment opportunities, agricultural policies, and so forth.

RAILS will provide infrastructure support to the learning teams at national and sub-regional organizations/institutions. Infrastructure will be provided by analysing existing national system or SRO initiatives in the region and looking at the sustainability of any proposed interventions. Such an analysis would look at how these different actors could profit from the proposed system and it would look at existing investments by different development partners and initiatives to see if resources could be pooled.

Facilitate agricultural information systems synergies and value-addition between international and national research for development institutions – Creating a learning environment within the African ARD learning system will require people, tools and information resources. People should be dynamic and open to change and accept new tools to facilitate learning. Tools should be appropriately designed so that they can be easily used by all kinds of stakeholders, be they farmers, policymakers or scientists. Information resources should be systematically gathered to facilitate analysis and use by appropriate stakeholders. These tools need to function based on available African resources and capacities.

Consolidate national, sub-regional and continental ARD information systems to create an African platform for AIS that could contribute to the global AIS – In order to implement the proposed RAILS activities, which would add value to existing national and sub-regional initiatives, a continental

FIGURE 1 – Key RAILS components: Stakeholders, Support mechanisms and Services

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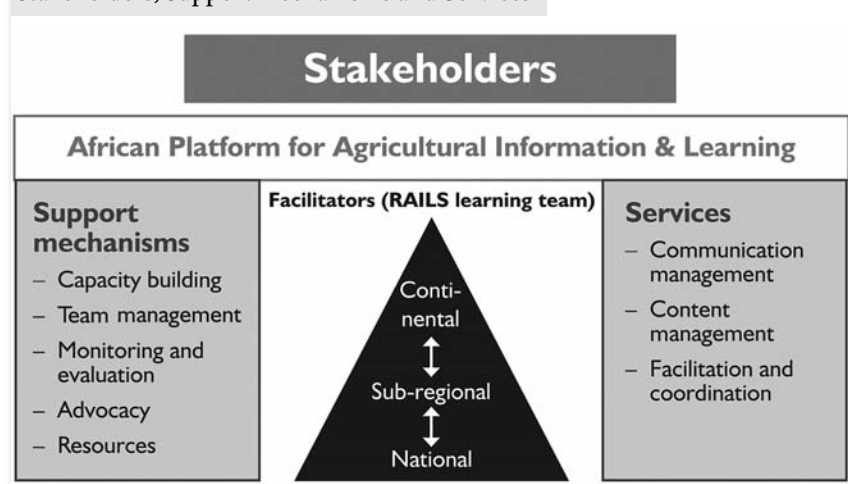
Focus on: the FARA knowledge base as a gateway

The Knowledge Base section of the FARA website (http://www.fara-africa.org/knowledge-base/) provides specialized search engines for accessing both FARA-owned databases and information from relevant external websites.

Over time, FARA has collected a large amount of information on organizations, projects and experts and has developed a library of documents. These databases can all be searched on the FARA website.

Of particular interest is the *FARA Organizations Directory* which, besides being accessible via both a search engine and an alphabetical browse interface, provides XML exports of individual records and of the whole directory. The XML export is compliant with the Ag-Org Application Profile developed by FAO in collaboration with GFAR and Wizard International, in order to ensure better interoperability.

Providing a gateway to both national/sub-regional and global information sources is one of the primary aims of a regional information system. This task has been tackled through the implementation of specialized Google Custom Search Engines (CSE). For example:

- *African Agricultural Research Information* (http://www.fara-africa .org/knowledge-base/african-agricultural-research-information/) searches for projects, organizations, persons and documents/outputs related to agriculture in Africa from a range of data repositories, primarily from sub-regional repositories (such as ASARECA and NEPAD) and international/global information systems (such as CABI, CGIAR, FAO, GFAR, InfoSys+, and WISARD).

- *Farmers Corner* (http://www.fara-africa.org/knowledge-base/ farmers-corner/) retrieves information on best practices and technologies from the following resources: FAO-TECA, RUN Journals, FAO Best Practices, UNDP Experiences, InterSard Good Practices, LEISA Magazine, AGROMISA Afrospecials and Agrobriefs.

In addition, an RSS aggregator harvests news from more than 30 African and international sources.

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level platform was created. It is dedicated to the needs of Africa and managed and maintained by African institutions. The platform operates through a mechanism that makes the RAILS priorities reflective of the needs of the SROs and its member NARS. The SROs each have their own AIS initiative, with each catering to the diverse needs of its stakeholders and at different stages of implementation. At the same time, there are various international service providers of agricultural information and communication that are currently working in Africa, such as the Consultative Group on International Agricultural Research (CGIAR), Technical Centre for Agricultural and Rural Cooperation (CTA), FAO and CABI. Each of these organizations and initiatives has its own strong advantages or focused specialization. Therefore, there is a need to facilitate the pooling of resources so that the African platform for information and learning becomes functional.

eRAILS Website

The eRAILS website (http://www.erails.net) is integrated into the overall FARA portal for African agricultural research for development. Through the RAILS activities, both the FARA portal (http://www.fara-africa .org) and eRAILS are managed and are ensured to have the most appropriate and relevant tools to facilitate the exchange of knowledge among the FARA constituents. The FARA portal serves the Secretariat in delivering or communicating its achievements to its wider stakeholders, while at the same time gathering information relevant to African ARD from the various corners of the world. As FARA grows, its Networking Support Functions are evolving to become the knowledge hubs of their specific interests. Communication and knowledge exchange for each of the networking support functions is facilitated by the RAILS team.

At the national level, eRAILS will be managed and coordinated by the national partners. A national level eRAILS will operate similarly to the continental portal of FARA eRAILS, using the same framework but adapted to the needs and requirements of the specific national partner. Its operations and effectiveness will be dependent upon the capacities and skills of the national learning team.

Conclusion

African agricultural information and learning systems are evolving rapidly, but there is still work to be done in terms of strengthening the capacities of individual and institutional resources of African institutions. RAILS will continue to provide support and services that will increase the impact of research results on rural livelihoods. It will focus its interventions on strengthening the capacities of information mediators that facilitate the linkages between various institutions, from research to advisory services and civil society. It will have to take into account the changing science and technology environment in Africa, where information systems have created greater communication and information exchange. African leaders are increasingly aware of the importance of knowledge resources for the economic development advocated by the African Union's New Partnership for Africa's Development-Comprehensive Africa Agriculture Development Programme (NEPAD CAADP) and the Framework for African Agricultural Productivity (FAAP).

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Latin America and the Caribbean: INFOTEC

Viviana Palmieri

Introduction

The Forum for the Americas on Agricultural Research and Technology Development (FORAGRO) is characterized by the participation of a wide range of stakeholders from different sectors: public, private, producer organizations, non-governmental organizations (NGOs), universities and international research organizations. The FORAGRO Executive Committee is comprised of representatives from all these sectors and from all the sub-regional instances — the PROCIs (Cooperative Programs for Regional Research and Technology Development). As with most fora, FORAGRO's main focus is on dialogue, articulation, fostering alliances, advocating research and development to decision makers, and promoting science and technology development.

FORAGRO has defined seven lines of action in the political-institutional field[1] in addition to the agreement on priority themes for the continental agenda. Information management for research and development is one of FORAGRO's lines of action. During the 1999 meeting of the FORAGRO Executive Committee, the need for better access to agricultural science and technology information via the Internet was recognized. This led to the creation of a Regional Agriculture Information System (RAIS) for Latin America and the Caribbean (LAC) — named INFOTEC — in 2000.

INFOTEC (http://infoagro.net/infotec) is the FORAGRO information service. The Interamerican Institute on Cooperation in Agriculture (IICA), which is in charge of the Technical Secretariat of FORAGRO, is also in charge of INFOTEC.

INFOTEC was created with a vision of providing services to all the different types of FORAGRO stakeholders, according to their individual needs. FORAGRO defined INFOTEC's objective as being to improve the flow of and access to information on agricultural science and technology. INFOTEC works towards this objective by providing up to date information on cutting edge research and technologies in an easily accessible form. It also facilitates information sharing by providing 1) a platform that allows and promotes the participation of stakeholders, and 2) communication tools for different

networks or interest groups according to their needs. Based on demand, INFOTEC also complements the information system with efforts in technical cooperation on information management, especially in advocacy and capacity building.

Relation to Regional Forum and Governance

Since INFOTEC does not have a specific governing structure, decisions regarding new activities or projects, such as involvement in advocacy and capacity building in information management, are taken within the FORAGRO Executive Committee. The day to day management of INFOTEC is an activity of the FORAGRO Technical Secretariat, within the Area of Technology and Innovation in the Directorate of Technical Leadership and Knowledge Management. Within FORAGRO, it has been considered neither necessary nor feasible to create separate mechanisms for managerial decisions regarding this specific line of action.

The decisions regarding the content shared through INFOTEC are in the hands of all the registered users, as is explained in the next sections.

Priorities and Activities

The need for better access to and flow of technological and scientific information was the priority defined by FORAGRO stakeholders almost a decade ago. In response to this, INFOTEC was developed and is still maintained by the FORAGRO Technical Secretariat. The activities involved in the administration of INFOTEC include reviewing international sources of relevant information, reviewing and classifying the information included by registered participants, sending weekly bulletins to all subscribers, providing the support and communication tools required by the stakeholders, and occasional improvements in the website and the software that constitutes the platform.

The need for technical cooperation in topics related to information management has grown over the years and has led to activities in capacity building and advocacy:

Capacity building:

- Online course in 2006 within the FODEPAL[2] platform, in agreement with the Regional LAC office of the Food and Agriculture Organization of the United Nations (FAO). With documents based on the iMark module 'Investing in information for development', activities and content for the 12 week course were designed according to FODEPAL guidelines. Fifty-four students from 13 countries participated in the course.

- In 2008, we began to work to adapt the course to better fit the needs and time constraints of managers.

- Informal or occasional capacity building efforts, such as the inclusion of a chapter on information and communication management (ICM) in other courses organized by IICA or the FORAGRO Technical Secretariat, and training managers of sub-regional systems to utilize the inforagro.NET/infotec platform.

Advocacy of ICM for Innovation:

- The ICM Project carried out in 2006-2007 with the support of the Global Forum on Agricultural Research (GFAR) succeeded in providing elements and arguments for a better design for advocacy efforts. The three main outputs were:

- A compilation of success stories in ICT for technological innovation.

- An initial characterization of information management (IM) in national agriculture for research and development (ARD) organizations and their constraints.

- A strategy proposal, prepared by communication experts, for sensitizing decision makers.

Preparation of printed and digital materials for awareness and sensitizing of decision makers, such as a brochure distributed in the Fifth International Meeting of FORAGRO (Montevideo, July 2008).

- Continuous efforts to include ICM topics and analysis in FORAGRO and IICA meetings and workshops, especially as one of the main issues in institutional innovation.

Another set of activities has to do with providing information and communication support in all FORAGRO programs and activities. Examples include:

- Communication with participants in the Fifth International Meeting of FORAGRO

- Tools for joint drafting of documents by people in different countries

- Dissemination of products and events prepared by FORAGRO and the PROCIs

INFOTEC Website and Its Content

INFOTEC is a web-based information sharing system specializing in information on agricultural science and technology for innovation in agriculture (including research and extension policies). It shares the platform—infoagro.Net—with other specialized information services managed by IICA, such as trade, animal and plant health and food safety, sustainable rural development, ag-industry, biotechnology, and so forth.[3] The platform allows the establishment of different levels of users, with different levels of access.

The information is organized in modules for including, searching, viewing, and editing each type of information, i.e. news, documents, technologies, events, links, experts, and institutions. In each of the modules, the more than 6,000 registered participants can include their information directly online. The uploaded content remains "pending" until approved by the manager for public viewing (the check includes virus-scan, relevance regarding system themes, and appropriateness). Whoever uploads content is the "record owner" and can update his/her records. Each record is then provided with the necessary descriptors (metadata) to allow searches throughout the system. Once approved for INFOTEC, everything is freely available on the website

FIGURE 1 – INFOTEC system home page and entrance to the technology marketplace – English version
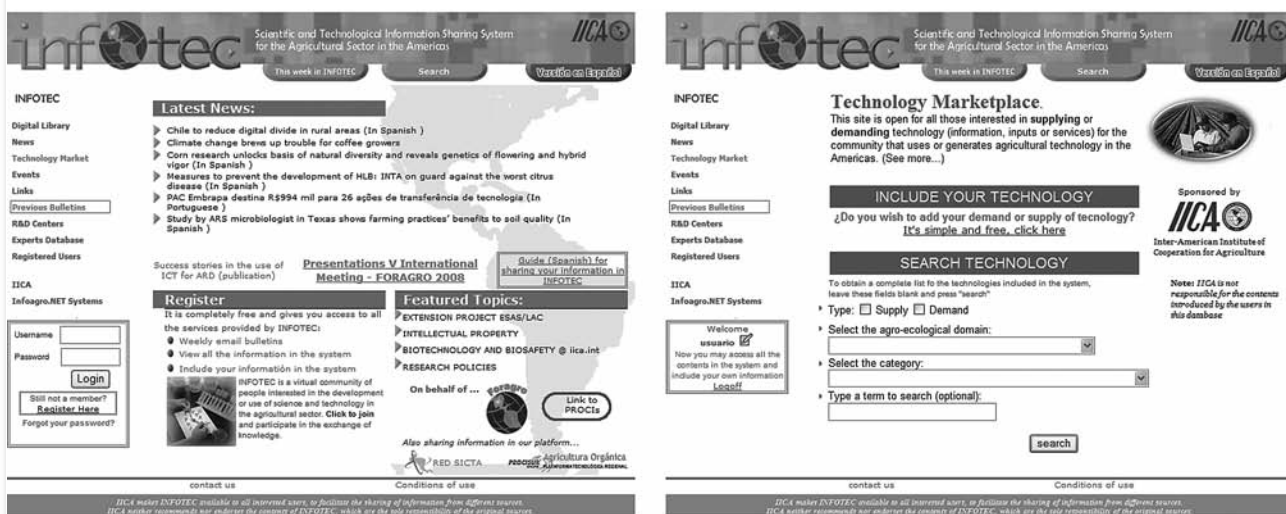
(see Figure 1). The information that has been incorporated and is available in the system includes approximately 1,600 full text documents in the digital library, over 2,300 links to information on other websites, almost 200 technologies in the marketplace, and over 300 research and development (R&D) centers. Approximately 2,000 events and over 14,000 news articles have been shared through the system.

Users interested in the themes included in INFOTEC can register online to receive weekly e-mail bulletins, to have access to all the information in the system and to be able to include their own information online. These registered participants come from all the different sectors represented in FORAGRO and all the regions in the Americas (see Figure 2).

Within its activities for advocacy and capacity building in information management for technical innovation in agriculture, INFOTEC has produced the follow-ing documents and publications (in the last two years):

- *Success Stories in the Use of Information and Communication Technologies for Agricultural Research and Innovation in Latin America and the Caribbean* (2007); available: http://infoagro.net/infotec/exitosos/index_ing.cfm
- *Survey of LAC Agricultural Research Institutes on Technical Information Management* (2007); available: http://infoagro.net/shared/docs/a2/Surveyresults.pdf
- "Information Management for Agricultural Technology Innovation" by V. Palmieri and L. Rivas (2007). *ComunIICA Magazine* 3(2):17-25; available: http://www.iica.int/Eng/prensa/comuniica/comuniica/2007/n9-eng/n2.aspx

Links to Other Information Systems

INFOTEC includes links to most international, regional and national information systems. There are also

FIGURE 2 – Distribution of INFOTEC participants according to the sector and the region of the Americas to which they belong
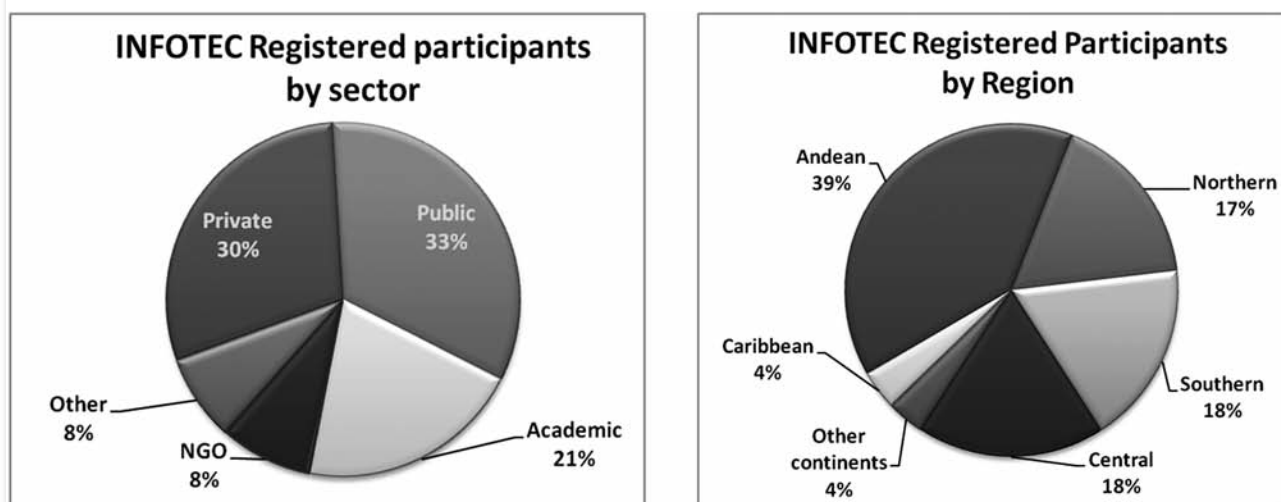
Focus on: ICTs and
Participative Knowledge Development Processes

In pursuing the objective of improving agriculture through the incorporation of knowledge for innovation, information management is obviously a key element. ICTs have, of course, a huge potential role in facilitating sharing and access to technological information. But the constraints usually encountered are not related to the software used to manage the information nor to the standards adopted to classify scientific documents, but rather to cultural traits such as language and information sharing practices.

The capacity for including documents, events, links, news and technologies in INFOTEC has been available for almost a decade, long before web 2.0 tools made user participation commonplace. This was accomplished thanks to an information sharing platform based on relational databases (SQL) and programs in Cold Fusion that allowed new modules to be developed by non-professional programmers. Through the years, the number of users including their information directly online has grown steadily. Nevertheless, it has not reached the levels initially expected.

People — particularly young professionals — tend to include their opinions quite freely in blogs, forums or chats, but when they want to disseminate more structured information — such as a document — online, they tend to send it to a webmaster or website administrator to include it in their name. This tendency is a cultural trait that makes it very difficult to advance towards the participative knowledge development processes that are basic in "closing the innovation circle" and are crucial in promoting innovation.

many participants from agricultural information systems at different levels who voluntarily contribute their information to the INFOTEC platform to reach a wider audience. However, there are no formal agreements with the organizations to regulate the dissemination of their information or to formalize their participation. INFOTEC participants — subscribers and contributors — are individuals, not organizations.

Conclusion

The activities foreseen for INFOTEC within the FORAGRO Technical Secretariat include:

- *Capacity building for ICM managers*
  - Complete the redesign of the online course: tailor it to the time constraints of the participants and program it using Moodle.[4]
  - Offer at least two courses for IM managers in 2009.
- *Put into practice elements of the communication strategy for IM advocacy designed in 2007* (the intensity of these activities will depend on the success in raising additional funds):
  - Promote and provide tools for knowledge sharing and capacity building on ICM among managers of national research organizations.
  - Design and carry out the "IM Certification Program."
- *Maintenance and further development of the online platform for information sharing, including new tools and options for content management and communication.*

Among the topics considered to be the most relevant for hemispheric cooperation in the final declaration of the Fifth FORAGRO Meeting (Declaration, 2008), one of the priorities listed was 'management of information, communication and collaborative learning among actors, in order to achieve technological innovation in agriculture'. This recognition of the relevance of ICM issues by FORAGRO stakeholders provides support for INFOTEC activities, but also presents great challenges. It highlights the role FORAGRO must play in organizing and encouraging the discussion of ICM and collaborative learning as an integral part of the institutional innovations required to promote "agriculture with knowledge".

Notes

1. FORAGRO's seven lines of action in the political-institutional field are: 1) Hemispheric Dialogue; 2) Support for a Regional R&D Agenda; 3) Capacity building, exchange of experiences; 4) Prospective studies; 5) Information management for R&D; 6) Lobbying for R&D in relevant fora; and 7) Support of the Regional R&D System

2. Proyecto Regional de Cooperación Técnica para la Formación en Economía y Políticas Agrarias y de Desarrollo Rural en América Latina, http://www.fodepal.es/

3. IICA's Infoagro.NET platform includes databases in SQL and programs in Cold Fusion that are shared by all infoagro.net systems (the programs as well as the information). It has been in place for almost a decade and has worked well with proven stability.

4. Moodle is an Open Source Course Management System (CMS), also known as a Learning Management System (LMS) or a Virtual Learning Environment (VLE), http://moodle.org/

Reference

Declaration of Montevideo. 2008. Fifth International Meeting of the Forum for the Americas on Agricultural Research and Technology Development (FORAGRO): Institutional Innovations for an Agriculture with Knowledge in the Americas in the 21st century, July 28-30, 2008, Montevideo, Uruguay. http://infoagro.net/shared/docs/a2/FORAGRO2008/ DeclarationMontevideo.pdf

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Central Asia and the Caucasus: CAC-RAIS

Zakir Khalikulov

Background

The Regional Agricultural Information System for Central Asia and the Caucasus (CAC-RAIS) was established in January 2004 during the First Meeting of the stakeholders of the CAC-RAIS in Tashkent, Uzbekistan (Figure 1). Initiated by the Central Asia and the Caucasus Association of Agricultural Research Institutes (CACAARI), the establishment of CAC-RAIS was also supported and facilitated by the Global Forum for Agricultural Research (GFAR), the Program Facilitation Unit (PFU) of the CGIAR[1] Program for Central Asia and the Caucasus, and the International Center for Agricultural Research in the Dry Areas (ICARDA). During that first meeting, regional needs for an agricultural information system were identified. These needs consisted of: support for agricultural information and communication management (ICM); exchange and sharing of information at the national, regional and inter-regional level; identifying focal points in the region as well as the information resources for data and knowledge exchange. It was also decided to develop a strategy for the CAC-RAIS and specific action plans for its implementation.

The general objective of CAC-RAIS is to increase the effectiveness of agricultural research in the region through the improvement of existing information facilities in the region, by strengthening them, developing synergism among them, and increasing their capacities to reach the end user with relevant data. This general objective can also be expressed in terms of increasing access to information by the various end-users, or in terms of developing information management capacities in the region, as a means for increasing the capacity of research to achieve its objectives of food security, poverty alleviation and sustainable development.

The Second Regional Meeting of

the RAIS was organized by CACAARI in collaboration with GFAR and ICARDA on January 15–16, 2007 in Tashkent, Uzbekistan. In all, 22 participants attended the workshop, including representatives of the National Agricultural Research and Extension Systems (NARES), GFAR, two other Regional Fora (AARINENA[2] and APAARI[3]), and ICARDA. The representatives of all the eight CAC countries made presentations on the current status of their respective Agricultural Information System (AIS), highlighting the strengths and weaknesses of the AIS in their countries. The country reports were then synthesized into a regional report.

Governance Structure

CAC-RAIS is an integral part of CACAARI. The CAC-RAIS Steering Committee consists of representatives of the CAC National Agricultural Research Systems (NARS) as well as GFAR, ICARDA and the Food and Agricultural Organization of the United Nations (FAO). At the national level, CAC-RAIS is represented by National Information Nodal Points who serve as the linkage between the CAC-RAIS Steering Committee and the national stakeholders in each country.

Strategies and Priorities

To improve and strengthen ICM for agricultural research for development (ICM4ARD) in the region, the member countries identified the following strategies for implementation through CAC-RAIS in 2007–2009:

- Advocacy and sensitization of NARS leaders and policy makers to increase investment in improving ICM4ARD.
- CAC-RAIS Steering Committee to support develop-

FIGURE 1 – The participants in the First Meeting of CAC-RAIS on January 27–28, 2004, Tashkent, Uzbekistan

ment of national agricultural information systems (NAIS) through recommendations, strategy development and supporting policy making for ICM4ARD.

- Strengthening existing (or establishing new in cases where they do not already exist) National ICM4ARD lead centers that contribute to strengthening NAIS development.
- Capacity building.
- The sharing of information and dissemination of success stories in ARD through the existing CACAARI website and printed publications.

In January 2008, a pilot study on "Assessment of information and communication needs of institutions and stakeholders of the national agricultural research and extension system of Kyrgyzstan" was conducted. The objectives of the pilot study were to identify: policy and legal frameworks, institutional set-ups in agricultural research, extension/advisory services, education actors, and farmer organizations, together with their

linkages and their information and communication needs, in order to meet farmer and agribusiness needs in their orientation to markets. The surveys were conducted with 24 key actors in agricultural research, extension/advisory services, education, farmer organizations, as well as the Ministry of Agriculture and Water Management and Processing Industry of Kyrgyzstan. The final survey report is available at: http://www.icarda .org/cac/files/sacac/SACAC_05_ICT_in_Kyrgyzstan .pdf.

RAIS Website

The RAIS website is located at http://www.cacaari .org/ (Figure 2). The website is available in English and in Russian and presents information about CAC countries, research institutions and contact persons of all the research institutions. There is also a photo gallery of activities and events. The website provides interested stakeholders with the ability to send their comments and feedback to the CAC-RAIS Steering Committee.

FIGURE 2 – The CACAARI homepage

Focus on: the CACAARI website

The lively CACAARI website (http://www.cacaari.org) serves as a window for counterparts both inside and outside the CAC region to a map of the region's agricultural research and contains a detailed list of agricultural institutions located in the region. The website has been created in two languages: Russian, as almost all institutions in the region speak or understand Russian, and English for visitors from outside the CAC region.

There are several sections in the website. In the 'News' section, you can read about the latest activities of CACAARI. In the 'Country Profiles' section, you can find the Country Status Reports in PDF format for easy download. Finally, in the 'Institutions' section, you can find a list of institutions that are working in partnership with CACAARI, including contact numbers.

Some sections of the website are still under development with a view to increasing the usability of the website. We have planned some key improvements which include:

- creating a database of publications of local scientists in different areas and sharing them at the regional level;
- setting up a forum for scientific discussions in different research areas;
- implementing a directory of institutions, where you can find comprehensive information about institutions such as: primary research areas, research topics, scientist profiles, photo galleries of the scientific activities in the institutions, and so forth.

For prospective visitors to the CAC region, additional information will be available about the countries, the traditions, holidays, climate, maps, sights and hotels.

Linkages with International, other Regional and NARS Information Systems

CAC-RAIS has been developing linkages with other stakeholders in the Global and Regional Agricultural Information Systems, such as GFAR, APAARI, AARI-NENA, as well as international organizations such as ICARDA and FAO. The respective representatives of the countries from the CAC region endorsed the AgroWeb Network (http://www.agrowebcac.org/) as a relevant initiative that (i) enables the management of national information resources in agricultural research for development, and (ii) provides a gateway function from the regional level, facilitating access to national resources.

The 3rd Meeting of CAC-RAIS was organized in April, 2009, in Issyk-Kul Kyrgyzstan. During the meeting, the results of the pilot ICT needs assessment conducted for Kyrgyzstan were discussed in the context of validating its results for relevance to other countries on the region, and a common project proposal for the development of the agricultural information system in the region was formulated.

Notes

1. Consultative Group on International Agricultural Research, http://www.cgiar.org/

2. Association of Agricultural Research Institutions in the Near East & North Africa, http://www.aarinena.org/

3. Asia-Pacific Association of Agricultural Research Institutions, http://www.apaari.org/

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Focus on Open Access to Agricultural Information

In recognition of the first international Open Access Week,
which was celebrated October 19–23, 2009, we would like to share selected
'Open Access' blog postings from the agricultural information community.

Science for Impact —
Extending the Accessibility of CIAT Research

Ruben Echeverría on an agenda for CIAT – On the first day of this knowledge sharing week, some 50 staff members joined a session organized with the support of the ICT-KM program to discuss the availability and accessibility of CIAT's research outputs.

Ruben Echeverría

At the end of the session, I asked the session organizers to come up with some concrete actions that CIAT could consider implementing. I'm pleased to share some promising ideas that emerged:

In the short term, I would like to see us consolidate available knowledge information and data in CIAT, investing in actions to maximize the accessibility of our work. What might this include?

- I would like to see us use 'open' as the default setting to share our research outputs. We can adopt a suitable 'creative commons' license for all of our Center-produced outputs.

- Where we publish elsewhere, we need to ensure that copyright agreements with publishers allow us to retain CIAT rights to re-use the publications and for us to deposit them in our open repositories.

- We also need to look at our agreements with partners, collaborators, funders and others to ensure any outputs they generate are also published and deposited under similar licenses.

- We urgently need an 'all of CIAT' approach and strategy to guide information, knowledge, data and communication policies and investments.

- We must deposit all CIAT research outputs in publicly-accessible repositories where they are permanently available and can easily be found and re-used. Some of our internal repositories need to be reviewed and migrated outside our intranet to be publicly accessible.

- Many of us need to brush up our skills in this area. I would like to see concrete activities that equip staff to become 'smarter' communicators and sharers throughout the research cycle.

- We can gain a lot from social media like blogs and video that can increase our 'social footprint'—beyond words and text!

- We should also continue to support other innovative applications, such as geo-spatial applications where we have a lot already to build on. There may be other applications like mobile devices or participatory video that are worth exploring.

- We need to look at our web presence—our main website should offer gateways to CIAT knowledge, with appropriate mechanisms for decentralized content management and editing.

- A recurring theme is the incentives—why should staff engage in all of this? I will propose that we look at our personnel systems to see how we can encourage and recognize activities that result in open and accessible, as well as high quality, research.

- Finally, we will need sufficient bandwidth in all of our offices to ensure we can indeed support some of these new kinds of 'e-science.' Appropriate use of this bandwidth will be encouraged.

■ *Adapted from: http://ciatlibrary.blogspot.com/2009/05 /science-for-impact-extending.html*

AgInfo News from

IAALD

Seven Ways to Link Research Knowledge to Action

What helps to close gaps between knowledge and action?

Patti Kristjanson and colleagues argue that "researchers have traditionally focused on research outputs—articles, methods, technologies, trainings—rather than research outcomes. But it is by jointly

PNAS

Preventing genomic instability

defining with project partners the desired outcomes of a project — including changed behaviors, policies, and practices — that links between knowledge and action can be discerned and strengthened."

■ *http://bit.ly/SFiRB*

## ICRISAT Adopts Green Open Access Mandate for its Scientific Publications

ICRISAT "has formally launched an open access (OA) system for its scientific publications." ICRISAT Director General: "Our Institute's Green OA Mandate is in keeping with our guiding principle of developing international public goods, and it will further demonstrate the public value, and social and economic relevance of ICRISAT's research."

■ *http://bit.ly/8YOyp*

IRRI Science More Accessible with Open Licenses and Social Media

The April–June 2009 issue of *Rice Today* contains an article about rice science in the digital age. The story introduces some of the pathways used by the International Rice Research Institute (IRRI) to maximize the accessibility of its research outputs. It adopted a creative commons licence and is publishing on several platforms —Google Books, Flickr, and YouTube.

■ *http://bit.ly/MwlG*
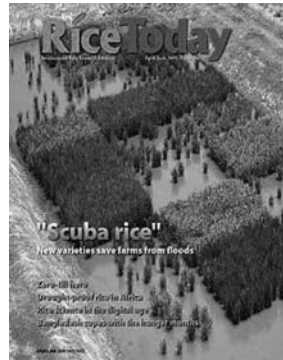
Social Media Tips for Agricultural Research

The CGIAR ICT-KM Program recently published 10 blog posts introducing different social media and how she and her ICT-KM colleagues are using them to make knowledge more accessible.

■ *http://bit.ly/dCUqI*

Radio and Video Help Trigger Rice Innovation in Africa

The Africa Rice Center (WARDA) is using radio and video to get information about improved technologies and market opportunities. An article in the International Journal of Agricultural Sustainability shows

Selected 'Open Access' postings
from the IAALD Blog

http://iaald.blogspot.com/search/label/open_access

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Subscribe to RSS Feed or Alerts from

http://feeds.feedburner.com/openaginfo

how "farmer-to-farmer video has great potential to enhance sustainable agriculture by encouraging local innovations."

■ *http://bit.ly/p8bFg*

CIARD Research Accessibility News

Partners in the CIARD initiative have determined that a global partnership is required to make public domain agricultural research information and knowledge truly accessible.

The CIARD Manifesto recognizes that "public science and research systems are based on the principle of openness and the free exchange of ideas, information and knowledge; and that public access to data, information and knowledge provides greater returns and increases the potential spillover benefits from global investments in agricultural research for development."

Principles and Pathways to accessibility show the many ways that research outputs can be made more available, accessible and applicable.

■ *http://bit.ly/ywtSS*

Weather Info for All: Mobile Communications to Revolutionize African Weather Monitoring

The Global Humanitarian Forum together with Ericsson, the World Meteorological Organization, mobile telecommunications company Zain, and the Earth Institute at Columbia University, announced a major initiative, "Weather Info for All", to improve Africa's weather monitoring network. The partnership will deploy up to 5,000 automatic weather stations in mobile network sites across Africa.

■ *http://bit.ly/Vcx4v*

Alternative Research Publishing Models

The UK Joint Information Systems Committee recently published a report examining the "institutional, budgetary and wider economic implications of three of the major emerging models for scholarly publishing (i.e. subscription publishing, open access publishing and self-archiving)."

"Preliminary analysis of the potential benefits of more open access to research findings suggests that returns to research can also be substantial, and that different scholarly publishing models can make a material difference."

"There is evidence to support a move towards more open access to research findings."

Barriers to "transitioning to more cost-effective scholarly publishing models" need to be reduced, by, for instance: finding ways to reward scholarly communication innovation; ensuring that funds are available to support publisher fees; encouraging self-archiving; supporting advocacy on alternative publishing models.

◼ *http://bit.ly/14BBHb*

African Research Needs to be Shared and be Visible

Harry Heemskerk from the Royal Tropical Institute explains how agricultural research outputs can be shared and made visible.

Digital repositories are important: for the preservation of the content; for the preservation of the URL-links to the publications; to store publications in one place but with visibility in many other places.

◼ *http://bit.ly/nntOe*

How Accessible is Your Agricultural Information?

We can access more agricultural information than ever before … or can we? Access to agricultural information is limited in various ways, including:

- articles published in commercial journals are frequently not available, unless a fee or subscription is paid.

- researchers often choose to disseminate their results in limited-access high impact journals.

- research projects often give insufficient attention to communication and dissemination, or focus only on the 'final' outputs.
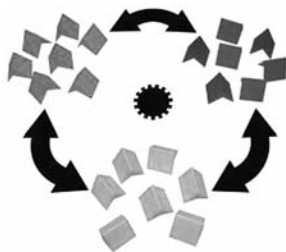
- many organizations do not have complete repositories of the outputs of their staff and they select what they put in their online libraries or web sites.

- outputs are frequently saved in and published online in proprietary 'closed' formats.

- licenses for research outputs often discourage re-use of the content and use cumbersome permission procedures.

- full text on web sites is often, inadvertently, hidden from search engines.

- many information systems do not use common standards so metadata can't be easily shared, harvested and exchanged; it cannot travel.

◼ *http://bit.ly/KBzyv*

Conservation Commons

The Conservation Commons is the expression of a cooperative effort of NGOs, international and multilateral organizations, governments, academia, and the private sector, to improve open access to and unrestricted use of, data, information and knowledge related to the conservation of biodiversity.

◼ *http://bit.ly/vHMQI*

Making Our AgInfo Permanently Accessible?

Take away messages from a meeting on research access include:

- A fundamental challenge is for each organization to provide or guarantee permanent access to their own outputs.

- Even a small group discussion reveals many different ways to make information more accessible. We need to document the concrete 'pathways to accessibility' that work, understanding why, and adapting and replicating them on a large scale.

- Beyond policies, even the choice of publishing format is important. Some formats are more open and permanent than others.

◼ *http://bit.ly/156gqM*

Making the Web Work for Science

One of the ways we can make our information and data more accessible is by paying attention to the way we license our content.

Over at the Science Commons — a sister initiative to Creative Commons — they are proposing some ways that scientific research can be made "re-useful" — so others can use it in new ways.

◼ *http://bit.ly/AtgqS*

ILEIA Repository on Sustainable Agriculture

The www.leisa.info website makes accessible a repository of 4100 full text multilingual articles from the journals published by the LEISA network partners. This is both the recent 'born digital' material as well as older content 're-born digital' through digitization.

A 2008 review of the websites revealed a mass of good content that was not as visible as it could be. New tools they introduced were:

- Google analytics — to better understand visitors and trends
- Google site map — to better expose the content to Google's search engines
  - Social bookmarking with delicious
  - RSS feeds
- A new and improved search page

■ *http://bit.ly/R9hDI*

Selected 'Open Access' postings
from the IAALD Blog

http://iaald.blogspot.com/search/label/open_access

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Pretoria Vet Sciences Library Reaches Out with Accessible Tools

The Veterinary Sciences Library at the University of Pretoria shows some ways to enhance the accessibility of agricultural information:

- The home page gives lots of search and navigation options.
- They use Dspace for the South African National Veterinary Repository;
- The Veterinary Science Dean supports open access;
- The library pages can be bookmarked using an 'addthis' widget;
- The library's newsletter *Infomania* has a range of views and stories, as well as practical tips beyond 'pure' libraries;
- They engage in several special projects and international networks linked to their mandate;
- Their blog reports on major developments in the library services.

■ *http://bit.ly/2hhEE*

News from IAALD

IAALD President Takes on New Position

We are pleased to announce that IAALD President Peter Ballantyne has moved into a new position as Head of Knowledge Management and Information Services at the International Livestock Research Institute (ILRI) in Addis Ababa, Ethiopia. ILRI (http://www.ilri.org/) envisions a world made better for poor people in developing countries by improving agricultural systems in which livestock are important. It is one of 15 Future Harvest Centres, which conduct food and environmental research to help alleviate poverty and increase food security while protecting the natural resource base. The Centres are funded by government agencies, development banks, private foundations and regional and international organizations and are supported by the Consultative Group on International Agricultural Research (CGIAR).

Prior to taking the position at ILRI, Peter was Director of Euforic — an information-sharing cooperative working to open up and enhance access to information and knowledge on Europe's international development. Alongside Euforic, he worked as a freelance agricultural information specialist with the CGIAR ICT-KM Program, several CGIAR centers, the Food and Agriculture Organization of the United Nations (FAO), the Global Forum on Agricultural Research (GFAR), and others.

Peter is particularly interested in more effective collaboration among development organizations, public access to agricultural knowledge and information, and how information and knowledge can be mobilized, shared and communicated to address organizational and development challenges. Thus, this new position appears to be a perfect fit for Peter, who says "I'm looking forward to putting a lot of the ideas and experiences I gained in the past years into action. It will also be good to be back in the CGIAR, in the heart of agricultural information and knowledge sharing, and based in a country where day-to-day living reminds us why we work in this development sector."

We congratulate Peter — and ILRI — on this exciting move and wish him much success! Peter will continue to serve as IAALD President through April 2010 (and perhaps beyond?) when the XIIIth IAALD World Congress is convened and a new Executive Committee is elected.

■ *adapted from an ILRI Staff Profile at http://www.ilri.org/research/StaffProfile.asp?ID=859*

IAALD Second Vice President Steps Down

IAALD Second Vice President Dorothy Mukhebi stepped down from the Executive Committee (EC) in April 2009. Dorothy's departure is a great blow to IAALD, but we cannot help but wish her all the best in her future endeavors. Dorothy became the Mentoring & Training Coordinator for the AWARD Program — African Women in Agricultural Research and Development (http://www.genderdiversity.cgiar.org/resource/award.asp) in April 2008. AWARD operates within the Gender & Diversity Program of the Consultative Group on International Agricultural Research (CGIAR) and is housed by the International Centre for Research in Agroforestry (ICRAF) at its Nairobi headquarters. Prior to this move, she was Coordinator of the Regional Agricultural Information Network (RAIN) for the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA) in Uganda. She was elected IAALD Second Vice President in 2005.

We thank Dorothy for her many contributions during what proved to be an exciting time for IAALD. Following the 2005 World Congress in the USA, she was instrumental in getting the 2006 IAALD Africa Conference organized. The event was a great success, and culminated in the formation of the IAALD Africa Chapter at the close of the conference. The Chapter continues going strong, holding its second conference in July 2009 and electing its new Executive Committee for 2009–2012. Dorothy worked tirelessly in support of IAALD and the Africa Chapter during her time on the EC and will definitely be missed!

Second IAALD Africa Chapter Conference Held

The second IAALD Africa Chapter Conference was held July 15–17, 2009, in Accra, Ghana, with theme "Towards Opening Access to Information & Knowledge in the Agricultural Sciences and Technology in Africa." The purpose of the conference was to initiate meaningful discussion and commitments to actions around opening access to information and knowledge in agricultural sciences and technology generated in public research and academic institutions in Africa. The conference was made possible with support from the Technical Centre for Agricultural and Rural Cooperation (CTA), Forum for Agricultural Research in Africa (FARA), Food and Agriculture Organization of the United Nations (FAO), Council for Scientific and Industrial Research (CSIR) in Ghana, International Association of Agricultural Information Specialists (IAALD), Coherence in Information for Agricultural Research for Development (CIARD) initiative, Information Training and Outreach Centre for Africa (ITOCA), CAB International and AgEcon Search.

The conference brought together 103 individuals from 35 countries, including agricultural information specialists, information and communication professionals, researchers, policy makers, farmers, representatives of farmer organizations, private sector players and representatives of development partners actively involved in agricultural research for development, among others.

A key event during the conference was the Chapter Business Meeting, which was chaired by Chapter President Justin Chisenga and open only to Chapters members and 26 invited observers. The major item on the meeting's agenda was the election of the Chapter's Executive Committee for 2009–2012. The electoral process, which began on February 15, 2009 with a call for nominations, resulted in the following being nominated un-opposed and therefore being declared duly elected:

- *President* – Justin Chisenga, FAO Regional Office for Africa, Accra, Ghana
- *Vice President* – Dady Demby, Forum for Agricultural Research in Africa (FARA), Accra, Ghana
- *Secretary/Treasurer* – Gracian Chimwaza, Information Training & Outreach Centre for Africa (ITOCA), Centurion, South Africa
- *Sub-regional Representative: Central Africa* – Josué Tetang Tchinda, Centre Africain de Recherches sur Bananiers et Plantains (CARBAP), Njombé, Cameroon
- *Sub-regional Representative: Eastern Africa* – Alice Nakagwa, National Agricultural Advisory Services (NAADS), Kampala, Uganda

This schematic from the IAALD Africa Chapter Conference presents the Framework for African Agricultural Productivity (FAAP) that will underpin the restoration of agricultural growth, food security, and rural development in Africa.

- *Sub-regional Representative: West Africa* – Boniface Bourn, Centre National de Recherche Agronomique (CNRA), Cote d'Ivoire

The positions for sub-regional representative for North Africa and Southern Africa would be filled later.

IAALD President Peter Ballantyne delivered the closing address and then congratulated Conference Chair Clement Entsua-Mensah and his team for holding a successful conference. The next (third) IAALD Africa Chapter Conference will be held in South Africa in 2012.

Selected papers from the 2009 Africa Chapter Conference will be published in the next issue of *Agricultural Information Worldwide*. For more information on the conference, see the full conference report at: http://www.iaald-africa.org/reports/iaald_africa2009 _report.pdf

EBHL to Meet Jointly with IAALD in 2010

The 17th Annual Meeting of the European Botanical and Horticultural Libraries Group (EBHL) will be held jointly with IAALD April 26–29, 2010 in Montpellier, France. EBHL is an association to promote and facilitate co-operation and communication between those working in botanical and horticultural libraries, archives and related institutions in Europe. "Europe" is interpreted in the widest sense to include countries both within and outside the European Union (EU). This will be a great opportunity for EBHL members to share experiences with international colleagues and to promote their collections and services to those who may be unfamiliar with them. Still, all the 'traditional' features of an EBHL meeting will be retained, including visits to gardens and libraries of botanical/horticultural interest, talks about local institutions, opportunities for networking, and

good food and drink! For more information about EBHL, go to: http://www.kew.org/ebhl/home.htm

INFITA and WCCA Join CIGR 2010

The International Network for Information Technology in Agriculture (INFITA) is responsible for sponsoring the next World Congress on Computers in Agriculture (WCCA). In July 2008, INFITA representatives confirmed that they "ratified their support in holding the 2010 WCCA meeting with the CSBE (Canadian Society for Bioengineering)/CIGR (Commission Internationale du Genie Rural–International Commission of Agricultural and Biosystems Engineering) Conference in Quebec." WCCA 2010 is being sponsored by CIGR; supporting institutions include the Asian Federation for Information Technology in Agriculture (AFITA), American Society of Agricultural and Biological Engineers (ASABE), European Federation for Information Technology in Agriculture (EFITA), Food and Agriculture Organization of the United Nations (FAO), IAALD, and the Pan-American Federation for Information Technology in Agriculture (PanAFITA) The 2010 WCCA committee includes Dr. Fedro Zazueta from the University of Florida, Dr. Gerhard Schiefer from the University of Bonn, Dr. Seishi Ninomiya from the National Agricultural Research Center in Japan, Dr. Jiannong Xin from the University of Florida and Peter Ballantyne from IAALD.

Representatives of INFITA and of CIGR 2010/CSBE were able to meet and plan the 2010 joint meeting during the 2009 WCCA in Reno, Nevada, USA. Several topics are expected to be of interest for the WCCA during CIGR 2010. A few examples include: decision support systems, field data acquisition, monitoring and control, modeling and simulation, precision agriculture, traceability and food safety, wireless sensor networks. In fact, WCCA covers all information technologies related to agriculture, the food system and environmental protection.

The presence of the WCCA in Quebec City in June 13–17, 2010 will likely result in many beneficial exchanges. Section VII of CIGR deals with Information Systems and is expected to coordinate activities with WCCA. For more information on CIGR 2010, visit http://www.cigr2010.ca

Highlights of the IAALD Executive Committee Meeting — Atsugi City, Japan, August 24, 2008

The IAALD Executive Committee (EC) met on August 24, 2008, in Atsugi City, Japan, in conjunction with the 2008 Japan World Congress. In addition to routine items and regular reports, some highlights were:

- *President's Report:* Peter Ballantyne reported that most of his work since the last EC meeting had centered on the Japan Congress. He commended Takashi Nagatsuka and his group on their work in organizing the Congress. He had also worked on the 2010 World Congress (Montpellier, France). Looking beyond 2010, he thinks IAALD needs to have an event at least

every two years, which could be accomplished by holding more regional conferences.

- *Secretary/Treasurer Report:* Toni Greider reported that income is difficult to chart because of discounts and two-year memberships, but it appeared to be growing. Administrative costs have been reduced and could be further reduced if e-voting were established. However, there would be some setup involved with instituting this cost-saving activity. She suggested putting the budget on a two-year cycle to make it easier to chart our income.

- *Editor's Report:* Debbie Currie reported that the first issue of IAALD's new journal, *Agricultural Information Worldwide*, was issued in April 2008; it focused on e-Agriculture and was sponsored by FAO. The journal will be published three times per year, with one or two sponsored theme issues per year. A portion of the *Quarterly Bulletin* backfile (1992–2007) is being mounted online and will be set up open access once preparations are completed. EC member Barbara Hutchinson was appointed deputy-editor until 2010.

- *General Assembly Meeting:* Topics to be discussed included (i) e-voting by the membership; (ii) changes to the Constitution to keep the organization vital; and (iii) streamlining election procedures.

- *Chapter Updates:*
  - *Africa Chapter:* Justin Chisenga reported that activities included (i) the relaunch of the Chapter's website (www.iaald-africa.org); (ii) an e-agriculture symposium in Zambia that had 28 participants and was covered by news services; and (iii) planning for the second IAALD Africa Chapter Conference, to be held July 10–17, 2009, in Ghana.
  - *Central/Eastern European Chapter:* Tomaz Bartol reported that all of the Chapter activities were related to AGROWEB. They met in Poland in 2008 and hope to meet every other year. They are expanding their activities more towards the east and hope to have their next meeting in the Ukraine as no special visas are required.

- *Conferences*
  - *Japan 2008:* Takashi Nagatsuka reported that the joint conference approach had worked well, with each group bringing a different aspect to the conference. They received excellent support from JAALD (Japan Association of Agricultural Libraries and Documentalists) and the Tokyo University of Agriculture. Registration stood at 250, but some changes were expected due to weather issues (typhoon in Hong Kong). He recommended that some time be taken following the conference to debrief and document lessons learned for future events.
  - *Africa 2009:* The conference, which will be held July 10–17, 2009 in Ghana, has high level support. The conference chair is Clement Entsua-Mensah. The announcement and call for papers is on the website

(http://www.iaald-africa.org/). They are estimating 120 participants.

- *France 2010:* The XIIIth World Congress will be hosted by AGROPOLIS and held from April 26–29, 2010, in Monpellier, France. An election for the new Executive Committee will be held prior to the conference and the results announced at the General Assembly.

- *Other Business:*
  - The United States Agricultural Network (USAIN) has formed an International Agriculture Interest Group. Barbara Hutchinson and Elizabeth Dodsworth will

explore doing a fee-based workshop and a conference program at the 2010 USAIN Conference at Purdue University.

- Roger Mills has been working on forging a closer relationship between IAALD and agriculture-related groups in the United Kingdom. Discussions have included joint membership and joint meetings. The European Botanical and Horticultural Libraries Group (EBHL) will also be meeting in Montpellier in 2010.

■ *from Minutes recorded by Toni Greider;*
adapted by Debbie Currie

Upcoming Events

2009

- **Eleventh International Conference on Grey Literature:** *The Grey Mosaic: Piecing It All Together*, Washington, D.C., USA, December 14–15, 2009. For more information:
http://www.textrelease.com/gl11callforpapers.html

2010

- **GCARD 2010 / Global Conference on Agricultural Research for Development:** *Building from Demand: Transforming Agricultural Research for Development,* Montpellier, France, March 28–31, 2010. For more information: http://www.gcard2010.net

- **IAALD XIIIth World Congress:** *Scientific and Technical Information and Rural Development,* Montpellier, France, April 26–29, 2010. For more information: http://iaald2010.agropolis.fr/

- **USAIN 2010 / 12th Biennial Conference of the United States Agricultural Information Network:** *Agriculture without Borders: Creating Knowledge and Partnerships Across Disciplines and Across the World,* West Lafayette, Indiana, USA, May 9–12, 2010. Deadline for proposal submission is November 30, 2009. For more information: http://usain.lib.purdue.edu/

- **AIAEE 2010 / 26th Annual Conference of the Association for International Agricultural and Extension Education,** Saskatoon, Canada, May 15–18, 2010. For more information: http://www.aiaee.org/

- **NETC 2010 / National Extension Technology Conference,** Auburn, Georgia, USA, May 23–26, 2010. For more information: https://sites.aces.edu/GROUP/IT /NETC2010/Pages/default.aspx

- **WCCA 2010 / 8th World Congress on Computers in Agriculture and Natural Resources,** Québec, Canada, June 13–17, 2010, in conjunction with the 17th CIGR World Congress. Deadline for proposal submission is November 20, 2009. For more information: http://www.cigr2010.ca

- **ACE 2010 / Agricultural Communicators in Education Conference,** Key West, Florida, USA, July 2010. For more information: http://www.facebook.com /group.php?gid=19149539931

- **IFLA 2010 / World Library and Information Congress — 76th IFLA Council and General Conference:** *Open Access to Knowledge — Promoting Sustainable Progress,* Gothenburg, Sweden, August 10–15, 2010. For more information: http://www.ifla.org/en/ifla76

- **AFITA 2010 / Asian Federation of Information Technology in Agriculture,** Bogor, Indonesia, October 4–7, 2010.

- **EFITA 2010 / European Federation for Technology in Agriculture, Food and the Environment,** Netherlands.

2011

- **AIAEE 2011 / 27th Annual Conference of the Association for International Agricultural and Extension Education,** Windheok, Namibia. For more information: http://www.aiaee.org/

- **IFLA 2011 / World Library and Information Congress — 77th IFLA Council and General Conference:** *Libraries Beyond Libraries: Integration, Innovation and Information for All,* San Juan, Puerto Rico, August 13–18, 2011. For more information: http://archive.ifla.org/IV/ifla77/index.htm

- **WCCA 2011 / 9th World Congress on Computers in Agriculture and Natural Resources,** Namibia.

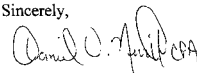# IAALD Report and Accounts for the Years Ended December 31, 2008 and 2007

July 1, 2009

Antoinette Greider
International Association of Agricultural Information Specialists
P.O. Box 63
Lexington, KY 40588

I have compiled the accompanying statement of financial position of International Association of Agricultural Information Specialists (a not for profit organization) as of December 31, 2008 and 2007, and the related statements of activities and cash flows for the year then ended, and the accompanying supplementary information, which is presented for supplementary analysis purposes, in accordance with Statements on Standards for Accounting and Review Services issued by the American Institute of Certified Public Accountants.

A compilation is limited to presenting in the form of financial statements information that is the representation of management. We have not audited or reviewed the accompanying financial statements and supplementary information and, accordingly do not express an opinion or any other form of assurance on them.

Management has elected to omit substantially all of the disclosures required by generally accepted accounting principles. If the omitted disclosures were included in the financial statements, they might influence the user's conclusions about the Organization's financial position, results of operations, and cash flows. Accordingly, these financial statements are not designed for those who are not informed about such matters

Sincerely,

Daniel W. Nevitt   Certified Public Accountant

See Accountant's Compilation Report

STATEMENT OF FINANCIAL POSITION — December 31, 2008 and 2007

	2008	2007
ASSETS		
CURRENT ASSETS		
Cash in Checking	$ 9,964.80	$ 2,860.74
Cash in Savings	20,777.81	30,377.24
Cash on Hand	44.01	-
Total Cash	30,786.62	33,237.98
Advance Payment On Credit Card	971.34	-
TOTAL CURRENT ASSETS	31,757.96	33,237.98
TOTAL ASSETS	$ 31,757.96	$ 33,237.98
LIABILITIES		
CURRENT LIABILITIES		
Credit Cards Payable - Chase Business	$ -	$ 208.81
TOTAL CURRENT LIABILITIES	-	208.81
LONG-TERM LIABILITIES	-	-
TOTAL LIABILITIES	-	208.81
NET ASSETS		
Unrestricted Net Assets	31,757.96	33,029.17
TOTAL LIABILITIES AND OWNER'S EQUITY	$ 31,757.96	$ 33,237.98

STATEMENT OF ACTIVITIES — For Year Ending December 31, 2008 and 2007

	2008	2007
UNRESTRICTED NET ASSETS		
Support		
Conferences	$ -	$ 2,955.00
Currency Conversion	595.19	114.56
Donations	121.00	161.84
Educational Programs	-	7,709.87
Grants	20,369.18	9,141.23
Interest Income	186.21	841.58
Membership Dues	10,772.54	13,363.37
Miscellaneous Income	4,044.74	597.63
Sales	1,300.74	1,173.66
Subscriptions	4,983.00	2,816.00
Subtotal Support	42,372.60	38,874.74
Less: Rebates and Discounts	(167.50)	(608.21)
Net Assets Released From Donor Restrictions	-	-
Total Support	42,205.10	38,266.53
Service Expenses		
Administrative Expenses	4,983.59	8,851.81
Conference Expenses	-	-
Executive Committee Meetings	-	-
Grant Expenditures	14,032.76	-
Journal Expenses	16,883.75	29,486.16
Membership Expenses	667.90	1,672.57
Organizational Memberships Expenses	-	677.32
Travel Expenses	6,908.31*	6,435.55
Total Services Expenses	43,476.31	47,123.41
Total Expenses	43,476.31	47,123.41
Increase (Decrease) In Unrestricted Net Assets	(1,271.21)	(8,856.88)
TEMPORARILY RESTRICTED NET ASSETS		
Net Assets Released From Donor Restrictions	-	-
Decreases In Temporarily Restricted Net Assets	-	-
TOTAL INCREASE (DECREASE) IN NET ASSETS	(1,271.21)	(8,856.88)
NET ASSETS, beginning of period	33,029.17	41,886.05
NET ASSETS, end of period	$ 31,757.96	$ 33,029.17

STATEMENT OF CASH FLOWS — For Year Ending December 31, 2008 and 2007

	2008	2007
CASH FLOW FROM OPERATING ACTIVITIES		
Increase (Decrease) In Net Assets	$ (1,271.21)	$ (8,856.88)
Adjustments To Renconcile Increase In Net Assets		
To Net Cash Provided (Used) By Operating Activities		
Depreciation and Amortization	-	-
Book Value Of Assets Sold	-	-
(Increase) Decrease In Inventory	-	-
(Increase) Decrease In Advance Payment on Credit Card	(971.34)	-
Increase (Drecease) In Credit Card Payables	(208.81)	(202.29)
NET CASH PROVIDED (USED) BY OPERATING ACTIVITIES	(2,451.36)	(9,059.17)
CASH FLOW FROM INVESTING ACTIVITIES		
Acquistions Of Property And Equipment	-	-
Disposition Of Property And Equipment	-	-
Purchase of Certificates Of Deposit	-	-
NET CASH PROVIDED (USED) BY INVESTING ACTIVITIES	-	-
CASH FLOW FROM FINANCING ACTIVITIES		
Proceeds From Additional Long-Term Debt	-	-
Proceeds From Additional Long-Term Debt	-	-
NET CASH PROVIDED (USED) BY FINANCING ACTIVITIES	-	-
INCREASE (DECREASE) IN CASH	(2,451.36)	(9,059.17)
CASH, beginning of period	33,237.98	42,297.15
CASH, end of period	$ 30,786.62	$ 33,237.98

SUPPLEMENTAL SCHEDULE - EXPENSES — For Year Ending Dec. 31, 2008 and 2007

	2008	2007
Administrative Expenses		
Accounting Fees	$ 1,650.00	$ 6,511.80
Bank Fees	500.60	449.82
Credit Card Fees	791.58	225.49
Legal Fees	-	600.00
Miscellaneous	1,350.72	113.55
Postage	278.84	465.49
Printing	360.00	219.72
Supplies	51.85	239.75
Taxes	-	26.19
Total Administrative Expenses	$ 4,983.59	$ 8,851.81
Journal Expenses		
Claims	$ 150.39	$ 169.46
Distribution	93.30	340.53
Editing	586.16	406.85
Postage	1,934.60	1,945.84
Printing	4,970.31	7,365.28
QuickBooks Miscellaneous	196.90	1,379.76
Translation	128.75	65.00
Typesetting	8,823.34	17,813.44
Total Journal Expenses	$ 16,883.75	$ 29,486.16
Membership Expenses		
Dues Discount	$ 407.00	$ -
Recruitment	260.90	968.14
Renewals	-	261.14
Website	-	443.29
Total Membership Expenses	$ 667.90	$ 1,672.57
Travel Expenses		
Editor	$ 1,439.08	$ 1,902.39
President	2,222.76	1,752.23
Secretary & Treasurer	2,197.07	2,111.89
Other	1,049.40	669.04
Total Travel Expenses	$ 6,908.31*	$ 6,435.55

*Travel: $6908.31 — of this amount $4044.74 was reimbursed (under miscellaneous income) by Japan Conference Organizers. The remainder was for the President to speak at USAIN.

International Association of Agricultural Information Specialists (IAALD) — www.iaald.org

IAALD's MISSION is to enable its members to create, capture, access and disseminate information to achieve a more productive and sustainable use of the world's land, water, and renewable natural resources and contribute to improved livelihoods of rural communities.

To further this mission:

IAALD **CONNECTS** agricultural information specialists worldwide, providing platforms and spaces for information dissemination, exchange and knowledge sharing;

IAALD **CONVENES** agricultural information specialists worldwide, organising meetings and catalyzing dialogue among all agricultural information stakeholders;

IAALD **COMMUNICATES** and advocates the value of knowledge and information to its members and others, improving the status and practice of agricultural information management and dissemination;

IAALD **COLLABORATES** with members and other partner organisations, facilitating educational and other opportunities across agricultural information communities.

Executive Committee of IAALD

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IAALD is a partner in the Coherence in Information for Agricultural Research for Development (CIARD) initiative — http://www.ciard.net

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Prof. Mei Fangquan (IAALD China
    Chapter)
Keiko Katsuragi (JAALD)
Roger Mills (EBHL)
Rubén Urbizagástegui (AIBDA)

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T.P. Loosjes (Netherlands)
M.T. Martinelli (Italy)
H. Haendler (FRG)
J.H. Howard (USA)
J. van der Burg (Netherlands)
P.Q.J. André (USA)

In this issue—

*Developing Agricultural Research Information Systems:
Experiences of the Global and Regional Forums*

IAALD

International Association of Agricultural Information Specialists – www.iaald.org