Developing the Global ARD Web Ring

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Abstract

As one of its main activities, the Global Forum on Agricultural Research (GFAR) promotes, advocates and enables sharing of information and knowledge related, in general, to agricultural development and, in particular, to agricultural research for development. The concept of a Web Ring of partners giving access to each other’s information was initially planned by GFAR as a service to be implemented on EGFAR\textsuperscript{1}, the website of GFAR, but has now developed into a broader framework based on a distributed architecture. The Global ARD Web Ring is now defined as a “voluntary coalition of web spaces that share information related to agricultural research and innovation for development.” It is proposed to be developed as a network of cooperating partners that enable sharing and exchange of information in a coherent and integrated manner, agreeing on common standards and protocols and leveraging Web 2.0 technologies. This paper describes in detail the framework of the Global ARD Web Ring as a project under the Coherence in Information in Agricultural Research for Development (CIARD) initiative.

Keywords: information management, information sharing, standards, agricultural information systems

Background

The Global Forum on Agricultural Research (GFAR) is a multi-stakeholder platform for dialogue and collaborative action on critical issues related to agricultural research for development as also impact of research effort on agricultural development. As one of its main activities, GFAR actively promotes, advocates and enables sharing of information and knowledge related, in general, to agricultural development and, in particular, to agricultural research for development.

The EGFAR (ARD) Webring (GFAR and FAO, 2002) was initially defined as “a gateway function to access the GFAR stakeholders’ information resources that are presently available” and “as a formal link between websites of the key stakeholders”. It has been a major component of GFAR’s activities in information and knowledge sharing. The current implementation gives access to GFAR stakeholders’ information resources in different ways:

- through a custom fill-text search on partner websites;
- by harvesting news from several partner organizations;
- through advanced searches on partner databases in those cases where agreement on protocols and standards has been reached (some databases from FAO, Wageningen International, Infosys);

\textsuperscript{1} http://www.egfar.org
Until recently, the Web Ring was seen as a service to be implemented on EGFAR, the website of GFAR. EGFAR, as recommended by the Global.RAIS consultations and the ICM4ARD Global Partnership Program, should be a stakeholder-led platform and a subsidiary information service which has to be guided by the stakeholders in its development and should at the same time support and leverage the development of the Regional Agricultural Information Systems (RAIS). This is why in 2007 the EGFAR Task Force was established as an oversight group for EGFAR composed by representatives of the Regional Fora, other stakeholder groups and GFAR partners. At its first meeting held in September 2007 in Rome, the EGFAR Task Force recommended that the Web Ring concept needed to further evolve considering:

- a more participatory approach, based on voluntary participation, where the RAIS and other partner organizations managing information on Agricultural Research (and innovation) for Development (ARD) play a more active role;
- the changes brought about by new technologies and new paradigms such as Web 2.0 in information access, sharing and exchange;
- active participation of GFAR in the Coherence in Information in Agricultural Research for Development initiative (CIARD; earlier International Information Systems for Agricultural Science and Technology, IISAST).

The ICM4ARD Inter-regional Consultation and the EGFAR Task Force in their meetings in 2007 concluded that the next challenge was to redefine and further develop the ARD Web Ring - which was to be termed the Global ARD Web Ring rather than the EGFAR Web Ring -, its role in the CIARD initiative and the role of EGFAR within the ARD Web Ring.

**Rationale**

Agriculture is increasingly becoming knowledge intensive. The complexity of agricultural research is also increasing. Information needed by agricultural communities, not only farmers but all members of agricultural commodity market chains including consumers and the agricultural innovation system, now include a wider range of topics and go beyond that available from their local communities. Globally, all stakeholders to agricultural research and development are now also demanding cohesive efforts to enable greater equity in access to agricultural and related information. Agriculture is and will remain, for some time to come, the mainstay of livelihoods for rural communities of a large part of the economically developing world. Greater equity in agricultural information access can contribute significantly to food production and sustainable livelihoods, especially participation in markets, by small producers.

Current information systems for agricultural development cannot meet the huge and complex demand of an increasingly knowledge driven agriculture. The primary limitations, especially

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2 The GLOBal ALliance of the Regional Agricultural Information Systems (GLOBAL.RAIS) is a GFAR project started in 2004.
3 The Information and Communication Management in Agricultural Research for Development (ICM4ARD) is a GFAR Global Partnership Programme (GPP) started in 2004.
when ICTs are used, are availability of and access to timely, useful and relevant information. The limited available agriculture related information on the Internet is widely scattered and not organized for easy, efficient and effective access. There is realization among those involved in providing information that the complex information needed for agricultural development cannot be met by simply making information available. Value added information services that enable to search, collate and integrate information from various sources to meet user needs, improve access to the information and enable its effective use are needed. It is also apparent that the gigantic task of providing agricultural information globally cannot be done by a few actors. These information services can be best built through a network of cooperating partners that enable sharing and exchange of information in a coherent and integrated manner.

The Global ARD Web Ring is one of the steps to enable more equitable access to information globally needed for agricultural development. The goal the Web Ring expects to reach is a network of high quality, integrated information services that meet the needs of the agricultural research and development community and which enables this community to share information, knowledge, skills and technology for agricultural development. The information services will be free and publicly available, thus constituting Global Public Goods that can be leveraged by any organization, person or information service.

**Definition**

The Global ARD Web Ring is now defined as a “voluntary coalition of web spaces that share information related to agricultural research and innovation for development.” These web spaces make ARD related information sources more accessible through each other.

The Global ARD Web Ring fits snugly under the umbrella of the Coherence Initiative in Agricultural Research for Development (CIARD) in which GFAR is a leading actor. In the context of CIARD, the specificity of the Web Ring is the focus on agricultural research and innovation for development, thus involving not only all lead partners working in ARD but also organizations in agricultural-related sectors that can contribute information on ARD.

**Architecture**

In the past, following widely accepted approaches to information management, the Web Ring was seen as a coordinated system based on “formal links”, and the first steps where towards merging, integrating, converting, all concepts that require strong commitment from all parties and imply a loss of ownership on the information and imposing a system over another.

Now, the new paradigms emerged in web “practice” as well as (as a consequence in most cases) in information management have created a shift in the overall approach: from formal coordinated systems to informal “hackable” networks, from merging to aggregating, from integrating to interfacing, from converting to mapping. This shift takes into account the irreversible trend towards the a-systematic proliferation of contents and authors on one hand and the need for sharing on the other. A very similar situation can be found in agricultural information systems

Considering how complex and diverse the present state of the RAIS and of all ARD information systems is, the most suitable description is that of an informal network with no hierarchy and no internal coordination, where information sharing can be best facilitated through light
mechanisms like aggregating, mapping etc., mechanisms that do not impose changes in the 
management of already existing contents. 
Thus, the ARD Web Ring is now best described as a network of ARD related “webspaces” 
which may be “gateways” (websites or systems that enable value added access to networks or 
“nodes” of ARD related digital/electronic information through such facilities as search engines, 
indexes, catalogues, classifications, aggregators, digests etc.) or nodes (websites or systems 
that may either store and maintain ARD related information or just consume information from 
other systems). See fig. 1.

In this context, websites / information services can have one or more of the following roles:

- expose their own information;
- aggregate external information;
- further process and elaborate aggregated information;
- expose processed aggregated / elaborated information.

Furthermore, they can make the information available either by publishing it on the web or by 
providing remote services, and they can make it accessible in different ways: static lists, 
browsing, advanced searches etc.

In a situation like this, the flow of information is not uniform and not necessarily coherent: the 
boundaries between original and secondary source, provider and consumer, owner and value 
adding service are not always clear and the information, from the source to the end user, 
undergoes elaborations that are not always traceable. Consequently, the Web Ring has to be a flexible framework, capable of giving access to the 
various resources at the best level possible, from simple hyperlinks to harvesting to advanced 
unified searches depending on the extent to which partner websites agree on and comply to 
protocols, standards and mapping of taxonomies. 
This makes the implementation of the Web Ring an ever ongoing and ever improving process, 
based on a layer of information sources that is always changing and growing and ready to adopt 
new protocols and standards to improve access to different sources.

Contents and Value Addition

In identifying what the contents and value added of the Web Ring should be, the questions to be 
kept in mind are how the ARD Web Ring can satisfy the information needs of the ARD 
community at the global level and how, by doing so, it can contribute to innovation in 
agriculture for development.

The main information needs of the ARD community have been identified as exact, timely, 
reliable, accessible and semantically rich information on:

- organizations working in ARD;
• experts working in ARD;
• past, ongoing and planned projects in ARD;
• relevant documents in general and project outputs and outcomes in particular;
• donors and funding opportunities.

Many organizations store information of this kind, and most of them publish at least part of it in some electronic form (directories, document repositories, simple web pages etc.). The Web Ring can give access to these information sources gradually, starting with separate links/searches to the partners’ websites and databases and then proceeding to advanced access paths (unified searches, ontology-based browsing, catalogs etc.) as the partner websites agree on and comply to protocols, standards and vocabularies.

The aim is that of improving accessibility of this information and adding value to it, e.g. by:

• selecting and filtering the sources ensuring quality, thematic relevance and broad coverage;
• offering a common browsing or searching interface to different sources;
• interfacing the different knowledge organization systems (KOS) used by the various sources;
• providing integrated services linking entities (organizations, projects, experts, documents) through hyperlinks and relations;
• providing multiple ontologies (thematic - even using different vocabularies -, geographic, by type of organization, by type of information etc.);
• providing advanced services like digests, bibliographies, specialized harvesting, custom alert services etc.

**Participation**

The Global ARD Webring is proposed to be developed as a network of cooperating partners that enable sharing and exchange of information in a coherent and integrated manner. There can be several forms of participation in the Web Ring, all voluntary and independent of formal agreements. Examples of ways in which partners participate in the ARD Web Ring are:

• being included in the common Directories (organizations, projects etc.) now under development in the context of the Content Management Taskforce (CMTF) of CIARD: these directories, though more generic in scope than the ARD Web Ring, provide information that is core to agricultural research management;
• making their information searchable through common search engines;
• providing RSS feeds and, more in general, XML or RDF exports of information based on agreed metadata sets.
• providing advanced web services to dynamically generate RSS feeds and, more in general, XML or RDF exports of information;
• sharing their documents participating in the new AGRIS\(^4\) or in the Open Archive Initiative labelling their repositories or records as ARD related and possibly using common vocabularies;
• building advanced services exploiting the ARD Web Ring framework such as providing indexes, catalogues, bibliographies, digests, specialized search engines, bookmarking services, object repositories, alerts etc.

Services built on the Global ARD Web Ring framework can be provided by any of the partners, and all partners can be providers of information and value-added services and consumers, or all of these. There will be no hierarchy in the network.

Of course the partners in this initiative will shape their role according to their mandate, scope, capacities and strengths.

The Global Forum on Agricultural Research with a global mandate to develop collaboration and partnerships in ARD has a facilitating role in the global implementation of the ARD Web Ring. Facilitating access to information resources managed by ARD stakeholders is one of the main objectives of GFAR. The privileged position of the Global Forum with all actors and stakeholders involved in ARD, including the civil society and the private sector being its members gives it a special role in the design of stakeholders-driven services for the Web Ring. There are three main roles that GFAR with its regional forums plays in the ARD Webring, mainly through the ICM4ARD GPP and the EGFAR Taskforce:

• promote and support the adoption of standards that facilitate availability, accessibility and use of information (and knowledge) to improve ARD and its impact: as agreed in the EGFAR Task Force meeting, “the role of the EGFAR Taskforce is not seen as a normalizing role in a top-down approach, but rather as a facilitating role in harmonizing policies and strategies through the exchange and promotion of best practices in information management and sharing among GFAR stakeholders and the ARD community at large” (GFAR, 2007);
• understand and fulfill the information needs of the GFAR stakeholders by improving accessibility of information from the point of view of its users;
• add value to information related to global policy, strategy and critical issues in ARD, which fall within the specific scope of GFAR
• maintain and enable effective access to a meta-directory of agriculture related organizations who participate in the ARD web ring and have presence on the Internet.

Since many ARD stakeholders usually need information that is strongly characterized geographically and that integrates with other relevant local information, the Web Ring will provide both global and local information and will fulfill its global “mandate” towards ensuring wide and balanced geographic coverage and access. A very important role in this is played by the Regional Agricultural Information Systems (RAIS) and, within the RAIS, by the National Agricultural Research Systems (NARS). The role of the RAIS has always been identified in enabling “improved and value added access to information held digitally such as on their

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4 the international information system for the agricultural sciences and technology designed by FAO: [http://www.fao.org/AGRIS/](http://www.fao.org/AGRIS/)
websites by the NARS and Institutes within the NARS” (GFAR, 2007), which could very well define their role in the Web Ring. This would give the RAIS a very broad range of domains to cover at the regional level: management (institutions, projects etc.), science technology and innovation (STI), extension, education etc.

As for the NARS and research institutes, information stored in the research institutes is crucial to the progress of agricultural research worldwide and its dissemination to other regions can be highly facilitated by gateways at the regional, commodity and global levels.

The roles that other partners can play in the ARD Web Ring are more or less up to them.

The Food and Agriculture Organization of the United Nations (FAO) has always played a leading role in improving access to scientific publications, especially through AGRIS, and the Open Archive architecture foreseen for the new AGRIS can be a very important component of the Web Ring, as well as all the work on standards documented and promoted on the Agricultural Information Management Standards (AIMS) website\(^5\).

The Consultative Group on International Agricultural Research (CGIAR) can play a big role in providing global access to commodity and scientific discipline information through gateways based with the CGIAR International Agricultural Research Centers (IARCs) according to the Centres’ mandates.

Other potential partners are the managers of services, tools and databases that own or give access to relevant information related to agriculture. For instance, the Wisard\(^6\) and Infosys\(^+\)\(^7\) information services, giving access to a large amount of data about agricultural management (organizations, projects, experts), could participate in the ARD Web Ring by improving access to their data through web services, while flexible platforms for aggregating and querying information from different sources like SIST\(^8\) could be enhanced and customized for specialized usage with agricultural ontologies and standards.

The Global ARD Webring has been proposed as a project under the Coherence in Information in Agricultural Research for Development (CIARD) initiative.

\section*{References}


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