



GFAR

**GLOBAL FORUM ON AGRICULTURAL RESEARCH
FORUM MONDIAL DE LA RECHERCHE AGRICOLE
FORO GLOBAL DE INVESTIGACION AGROPECUARIA**

The ARD Web Ring

A Draft Proposal

The ARD Web Ring

1. Introduction

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 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. This 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);
- by simply pointing to web pages in other cases.

Until recently, the Web Ring was seen as a service to be implemented on the EGFAR website. The Global.RAIS consultations and the ICM4ARD Global Partnership Program recommended that EGFAR should be a stakeholder-led platform and a subsidiary information service which has to be guided by the stakeholders in its development. It should also at the same time support and leverage the development of the Regional Agricultural Information Systems (RAIS), The EGFAR Task Force, composed by representatives of the Regional Fora, other stakeholder groups and GFAR partners has been established in 2007, as an oversight group of EGFAR. At its first meeting held in September 2007 in Rome, after positively evaluating the progress made by EGFAR and the RAIS, 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 Initiative in Agricultural Research for Development (CIARD; earlier International Information Systems for Agricultural Science and Technology, IISAST).

The ICM4ARD Inter-regional Consultation and EGFAR Task Force in its 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.

2. The Global ARD Web Ring Concept

2.1 Definition of the Global ARD Web Ring

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.

2.2 Rationale for the Global ARD Web Ring

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 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.

2.3 The Global ARD Web Ring 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 were 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).

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

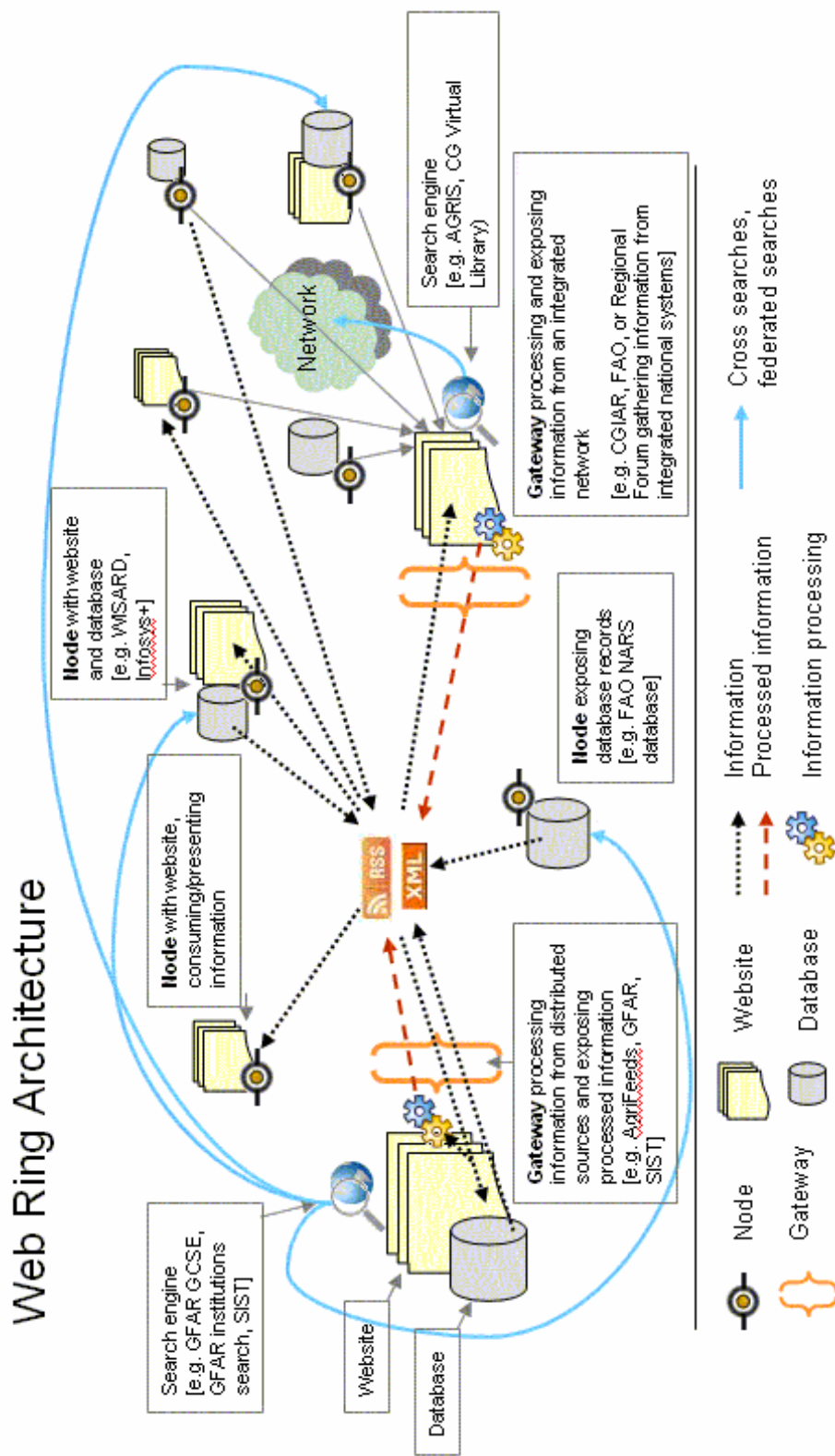
- Expose their own information
- Aggregate external information
- Further process and elaborate aggregated information
- Expose processed aggregated / elaborated information

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.

Fig. 1 ARD Web Ring architecture



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.

2.4 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 or in the Open Archive Initiative labeling their repositories or records as ARD related and possibly using common vocabularies.
- Building advanced services exploiting the ARD Web Ring framework such as providing wikis, white papers and reviews, indexes, catalogues, 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.

The Global ARD Web Ring is one of GFAR's activities that cuts across both the ICM4ARD GPP and EGFAR. It also 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. As the ARD Web Ring will be part of CIARD, all projects started under the Global ARD Web Ring will fall under the umbrella of CIARD, and projects started under CIARD, if they fit into the above-defined scope, can be part of the ARD Web Ring.

A logo will be designed that can be used by all participating organizations to label and indicate their participation in the Global ARD Web Ring. The GFAR Secretariat will initially maintain a registry of web spaces that are participating in the Global ARD Web Ring. The registry at some stage will be made responsibility of the CIARD initiative through an appropriate structure.

2.4.1 Roles played by the partners

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. The establishment of EGFAR, GFAR's web space, has been GFAR's core activity in facilitating information on critical issues related to ARD.

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).

In order to participate and contribute to the Web Ring, the regional and national systems have to further strengthen their information services and participate in the process towards coherence in information management. An additional role for GFAR has been identified in this during the EGFAR Task Force meeting: "GFAR is expected to contribute to the creation and further development of the webring by strengthening EGFAR and the Regional Agricultural Information Systems (RAIS) webspaces to act as both gateways and nodes, improving integration of information systems and contributing to coherence of information and strengthening the governance of ARD related information flows" (GFAR, 2007).

The roles that GFAR's partners can play in the ARD Web Ring are more or less up to them. It is of course desirable that different roles are played according to each partner's mandate, scope, capacities and strengths. Within GFAR, for instance, the role of the RAIS has always been identified in enabling "improved and value added access to information held digitally such as on their 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.

Other partners may decide to define their roles precisely and have them added to a revised version of this Concept Note, or they may just want to participate in Web Ring common activities as they come along.

An overview of the current activities carried on by the potential partners in the the ARD Web Ring and some realistic sample scenarios of how the different partners can participate in the Web Ring are provided in section 3, "Who is doing what and next steps".

2.5 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 information type etc.)
- Providing advanced services like digests, bibliographies, best practices, surveys etc.

3. Who is doing what and next steps

The activities summarized in tables 1 and 2 are examples of what GFAR and other organizations are up to at the moment, but any other project from any other organization fitting into the Web Ring scope can be added to the tables.

In this overview, only activities that can contribute to the ARD Web Ring, either because of their scope or because of the way they process information, are considered. Only if ARD-specific services can be created, the nodes and gateways involved in some flow of information can be considered part of the ARD Web Ring.

3.1 Next steps: what the NARS can do

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.

In describing scenarios in which national nodes can interact with regional and global gateways it is useful to identify the types of information managed by the NARS and which regional and global organizations / services can be the reference gateways.

- STI, scientific publications
 - participate in the AGRIS network (FAO Waicent) by providing metadata of their publications in the AGRIS AP format;
 - participate in the Open Archive Initiative by creating an OAI repository of their publications; using additional agriculture-specific metadata sets would help to create an agriculture community within the OAI.
(AGRIS is going to adopt an OAI architecture and the whole database will probably become an OAI repository, so the two options above might become one)
In both the above cases, coordination and the creation of a Web Ring registry would help to create an ARD community within both the AGRIS network and the OAI, thus allowing to create ARD specific gateways to these services; also, coordination with and active involvement of the RAIS would allow to create regional gateways to the same services..
Also, national systems can come together and create sub-regional or regional systems and participate as such in AGRIS or OAI.
 - adopt more traditional forms of submission to large catalogs and publishing / indexing services (NAL, CABI), if these services agree to play a gateway role for ARD information.

- Research data (geospatial, crop models etc.)
 - adopt standard taxonomies and export data in standard formats;
 - coordinate with the RAIS in order to contribute both to regional databases and global scientific databanks;

Table 1. Information management and sharing in agriculture: who is working on what

	Metadata Standards	Semantics, Ontologies	Repositories, Databases, Registries	Database Integration / Cross-searches / Open Archives	Information Services Assessment
FAO	<ul style="list-style-type: none"> Scientific and Technical literature: AGRIS AP TOrganizations: AgOrg AP (with GFAR and Wageningen Int.) Projects: projects metadata set (AIDA) (with GFAR and Wageningen Int.) Events: Event AP (with GFAR and GFIS) Learning objects (with University of Athens) Geospatial 	<ul style="list-style-type: none"> Thesauri: Agrovoc → Agrovoc Concept Server Ontologies: Technical Knowledge, Fisheries... Tools: Agrovoc Workbench, NeOn Folksonomies: AgriFeeds 	<p>Repositories</p> <ul style="list-style-type: none"> Documents: Corporate Document Repository (CDR), Library Catalog Multimedia: FAO Mediabase <p>Databases</p> <p>Statistics (FAOSTAT), Projects (CARIS), Fisheries, Institutions (NARS database), Technologies (TECA)...</p> <p>Registries</p> <ul style="list-style-type: none"> AGRIS centers, CARIS centers Upcoming registries of organizations and projects (with GFAR) 	<ul style="list-style-type: none"> Scientific and Technical Information: WebAGRIS, AGRIS Projects: CARIS → CARIS-WISARD FAOBIB in OAI 	
GFAR	<ul style="list-style-type: none"> Organizations: AgOrg AP (with FAO and Wageningen Int.) Projects: projects metadata set (AIDA) (with FAO and Wageningen Int.) Events: Event AP (with FAO and GFIS) 	<ul style="list-style-type: none"> GFAR ontology mapped to Agrovoc 	<p>Repositories</p> <ul style="list-style-type: none"> GFAR Document Repository Upcoming Multimedia Repository <p>Databases</p> <ul style="list-style-type: none"> Organizations database <p>Registries</p> <ul style="list-style-type: none"> Upcoming AgriOrg Upcoming registry of projects 	<ul style="list-style-type: none"> Institutions databases: cross-searches on GFAR, FAO/NR NARS database, Wisard, Infosys+ Projects databases: planned cross-searches on CARIS, WISARD, AIDA 	
CGIAR	<ul style="list-style-type: none"> Research data: IBPGR Descriptors Geospatial: CGIAR-CSI Learning objects: LOM 		<p>Repositories</p> <ul style="list-style-type: none"> Documents: CG Centers Libraries (→ Virtual Library) Learning objects: Online Learning Resources (OLR) repository <p>Databases</p> <ul style="list-style-type: none"> Research data: Genebanks, SINGER, ICIS... ASTI 	<ul style="list-style-type: none"> CG Virtual Library: cross-searches on CG Centres Libraries SINGER: cross-searches on CG Centres genetic resources databases 	Guide on Evaluating the Impact of Your Website
Regional Fora		NERAKIN ontology mapped to Agrovoc	<ul style="list-style-type: none"> AARINENA (NERAKIN - NARIMS databases on: Scientific and technical Documents/Publications, Projects, Experts and Institutions, and News and Meetings and Events), APAARI (publications, institutes), FARA (Infosys+ organizations and projects), FORAGRO (documents, institutions, experts) 		

	Metadata Standards	Semantics, Ontologies	Repositories, Databases, Registries	Database Integration/ Cross-searches / Open Archives	Information Services Assessment
NARS		Examples : <ul style="list-style-type: none"> India : IIT Kanpur : Agropedia Italy : CNR ontology/wiki 	Repositories <ul style="list-style-type: none"> Document repositories Multimedia repositories Databases / Registries <ul style="list-style-type: none"> Research data Institutions, projects, experts Market data 		
Others	<ul style="list-style-type: none"> AIDA: metadata set for describing projects Commonwealth of Learning (COL): learning objects Scientific disciplines (Soil, Pest, Genetic traits) 	<ul style="list-style-type: none"> CABI, NAL: thesauri Cornell University: VIVO ontology Euforic: Folksonomies 	Repositories <ul style="list-style-type: none"> IARCs, Science Council, World Bank, SciDEV, Commonwealth of Learning (COL): learning objects CTA: repository catalog, anancy Databases / Registries <ul style="list-style-type: none"> IARCs: research data WISARD: database of organizations and projects Infosys+: database of organizations and projects AIDA: registries of projects and organizations 		<ul style="list-style-type: none"> CTA: Smart Toolkit for evaluating information products and services DFID: Impact of communication in development: agriculture section

Table 2. Web 2.0: who is working on what

	Web search engines	News and events	Forums, Wikis, Blogs	Q&A	Social web, Mashups
FAO	WAICENT Information Finder	<ul style="list-style-type: none"> News feeds, Events feeds AgriFeeds (under CIARD) 	DGroups	AskFAO	
GFAR	ARD Google Custom Search Engine	<ul style="list-style-type: none"> News feeds, Events feeds News aggregator 	<ul style="list-style-type: none"> EGFAR Collaborative Website EGFAR forums 		
CGIAR	CGIAR Google Custom Search Engine	News feeds	ICT-KM Blog		
Reg. Fora	FARA Google Custom Search Engine APAARI ARD Information Gateway AARINENA - Nerakin Knowledge and Information Gateway	<ul style="list-style-type: none"> News feeds: APAARI, FARA, EFARD, AARINENA (upcoming Nerakin feeds) News aggregators: FARA, AARINENA (upcoming Nerakin feeds) 	<ul style="list-style-type: none"> FARA blogger AARINENA: Upcoming Nerakin Wiki, Nerakin Forum, and Nerakin Blog 		
NARS					
Others	<ul style="list-style-type: none"> SIST: customisable federated searches 	<ul style="list-style-type: none"> CTA: MyHeadlines NAL AgNic 	<ul style="list-style-type: none"> IAALD Blog e-agriculture forums CTA Brussels blog 	<ul style="list-style-type: none"> Infosys+: RUN CTA Q&A 	<ul style="list-style-type: none"> Del.icio.us: IAALD, Euforic, e-agriculture... Mashups: Euforic

- Research management (institutions, projects, experts)
 - contribute to sub-regional or regional systems by using the same management software and / or common standards so that directories of institutions, projects and experts can be created at the regional level;
 - make the data that they have available in a common format (Applications Profiles for these types of information are already available or under development in FAO);
 - participate in the initiatives promoted by GFAR under its mandate to lead efforts in managing and sharing information on research management, e.g.:
 - the AgriOrg Registry, implemented in strict collaboration with FAO and also promoted by the Regional Fora, IAALD, Wageningen International and the CGIAR;
 - the Registry of projects, still under development;
 - the future registries of experts

- Extension / outreach / education
 - contribute to sub-regional or regional systems by using the same management software and / or common standards so that good information systems can be created at the regional level;
 - contribute to global information services built by international organizations or communities like CTA, the Community of Learning (COL), the NRR Division at FAO etc.

3.2 Next steps: what the RAIS can do

RAIS play a major role in promoting coherence among the NARS and in providing regional gateways to and from the global services and the national systems.

- STI, scientific publications
 - support NARS' participation in the AGRIS network or in the Open Archive Initiative, coordinate efforts, promote tools, play a subsidiary role where NARS cannot play their role;
 - create regional gateways (e.g. language-based services, or services based on regional critical issues);

- Research data (geospatial, crop models etc.)
 - promote standard taxonomies and standard formats for exchanging (e.g., promote geospatial indexing according to GIS format and create geospatial regional information services);
 - create regional databases accessible through web services;
 - contribute to global databanks;

- Research management (institutions, projects, experts)
 - promote a common management software and / or common standards and implement solutions to create directories of institutions, projects and experts at the regional level;
 - make the data that they have available in a common format (Applications Profiles for these types of information are already available or under development in FAO), possibly through web services;

- promote NARS' participation in the initiatives promoted by GFAR under its mandate to lead efforts in managing and sharing information on research management (the above mentioned AgriOrg Registry, the Registry of projects, the future registries of experts);
- Extension / outreach / education
 - promote common tools and standards and implement solutions to create information services at the regional level;
 - contribute to global information services built by international organizations or communities like CTA, the Community of Learning (COL), the NRR Division at FAO etc.

3.3. Next steps: what the CGIAR and the CG IARCs can do

In general, provide global access for commodity and scientific discipline information through gateways based with the CGIAR International Agricultural Research Centers (IARCs) according to the Centre's mandates

- STI, scientific publications
 - participate in the AGRIS network (FAO Waicent) and / or in the Open Archive Initiative by creating an OAI repository of their publications; (at the Workshop on Opening Access to CGIAR Research and Knowledge there was a strong demand for open access repositories of CGIAR research documents, especially project outputs)
- Research data (geospatial, crop models etc.)
 - adopt standard taxonomies and make data available in standard formats, possibly through web services;
- Research management (institutions, projects, experts)
 - make the data that they have available in a common format (Applications Profiles for these types of information are already available or under development in FAO), possibly through web services;
 - encourage organizations in their network to participate in the initiatives promoted by GFAR under its mandate to lead efforts in managing and sharing information on research management (the above mentioned AgriOrg Registry, the Registry of projects, the future registries of experts);

3.4 Next steps: what FAO can do

- STI, scientific publications (Waicent)
 - allow the creation of an ARD subset within the AGRIS network;
 - make AGRIS records accessible through web services;
- Research data (geospatial, crop models etc.)
 - provide web services for accessing their databases;
- Research management (institutions, projects, experts) (NRR)
 - make the data that they have available in a common format and when possible switch to using the Registries now under development;

- encourage organizations in their network to participate in the global initiatives for managing and sharing information on research management (the above mentioned AgriOrg Registry, the Registry of projects, the future registries of experts);
- Extension / outreach / education (NRR)
 - leverage on national and regional systems rather than collect information manually;
 - coordinate and share information with global information services built by international organizations or communities like CTA, the Community of Learning (COL) etc.

3.5 Next steps: what services like Wisard and Infosys can do

- Research management (institutions, projects, experts)
 - contribute to the adoption of standards;
 - make the data that they have available in a common format through web services and when possible switch to contributing to and using the Registries now under development;

3.6 Next steps; what services like SIST can do

- STI, scientific publications
 - OAI module: harvest AGRIS and OAI repositories;
 - further customize the mapping between harvested metadata and output metadata becoming AGRIS AP-aware;
- Research data (geospatial, crop models etc.)
 - provide access through custom federated searches;
- Research management (institutions, projects, experts) (NRR)
 - provide access through custom federated searches;
 - further customize the mapping between harvested metadata and output metadata, becoming aware of the Applications Profiles for organizations, projects etc.;
- Extension / outreach / education (NRR)
 - provide access through custom federated searches;

References

- Global Forum on Agricultural Research (GFAR) and Food and Agriculture Organization of the United Nations (FAO). 2002. *EGFAR: The Electronic Communication and Information System of the Global Forum on Agricultural Research* (GFAR). [Online] available: http://www.fao.org/docs/eims/upload/209333/EGFAR_2002_01_Project_Final_issue.pdf
- Global Forum on Agricultural Research (GFAR). 2007. *Proceedings of the 1st Meeting of the EGFAR Task Force held at FAO Headquarters Rome in the Forenoon of 26th September 2007*. [Online] available: http://www.egfar.org/egfar/digitalAssets/909_EGFAR_Taskforce_Proceedings_2nd_DRAFT.pdf

List of acronyms

AARINENA	Association of Agricultural Research Institutions of Near East and North Africa
AGORA	Access to Global Online Research in Agriculture
AgOrg AP	Agricultural Organizations Application Profile
AgriOrg	Agricultural Organizations Registry
AGRIS	International Information System for the Agricultural Sciences and Technology
AIDA	Accessible Information on Development Activities
AP	Application Profile
APARIS	Asia-Pacific Regional Information System
ARD	Agricultural Research for Development
CABI	Commonwealth Agricultural Bureaux (CAB) International
CACAARI	Central Asia and the Caucasus Association of Agriculture Research Institutions
CARIS	Current Agricultural Research Information System
CGIAR	Consultative Group on International Agricultural Research
CIARD	Coherence Initiative in Agricultural Research for Development
CLAES	Central Laboratory for Agricultural Expert Systems, Egypt
CMTF	Content Management Task Force
COL	Commonwealth of Learning
CTA	Technical Centre for Agriculture and Rural Cooperation
DCERN	Development Communication Evidence Research Network
DFID	UK Department for International Development
EFARD	European Forum for Agriculture Research for Development
EGFAR	Electronic GFAR

FARA	Forum for Agriculture Research in Africa
FORAGRO	Forum for Agricultural Research in Latin America and the Caribbean
GFAR	Global Forum on Agricultural Research
GFIS	Global Forest Information Service
IAALD	International Association of Agricultural Information Specialists
IARCs	International Agriculture Research Centres
ICM	Information and Communication Management
ICM4ARD	Information Communication Management for Agricultural Research for Development
ICTs	Information and Communication Technologies
IICA	Inter-American Institute for Cooperation in Agriculture
IISAST	International Information Systems for Agricultural Science and Technology
InfoSys+	Information System of EIARD
LOM	Learning Object Metadata
NAIS	National Agricultural Information System
NAL	National Agricultural Library of the United States
NARS	National Agricultural Research System
NARIMS	National Agricultural Research Information Management System
NARIs	National Agricultural Research Institutions
NeOn	Networked Ontologies
NRR	FAO Natural Resources, Research and Extension Division
OAI	Open Archive Initiative
RAIS	Regional Agricultural Information Systems
RDF	Resource Description Framework
RFs	Regional Forums
RSS	Really Simple Syndication, a family of Web feed formats

SINGER	System-wide Information Network for Genetic Resources
SIST	Systeme d'Information Scientifique et Technique
WAICENT	World Agricultural Information Centre
WISARD	Web based Information Services for Agricultural Research for Development
XML	Extended Meta Language