



A Review of the CIARD Movement

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1. CIARD – origins and purpose

CIARD's origins lie in previous collaboration between various leading international organizations, all with a long-standing role in enhancing the sharing of information and knowledge arising from agricultural research. Other influences predated CIARD, for instance GFAR's GLOBAL.RAIS and ICM4ARD¹ initiatives, the CGIAR's 'AAA' concept (see below) for opening access to agriculture research, and so on. Then several key organizations agreed to combine both experience and resources to address the issues of coherence, openness and related capacity in information management and communication in developing country research systems. FAO, GFAR, CGIAR, CTA, INASP and DFID organized two expert consultations on "International Information Systems for Agricultural Science and Technology" (IISAST) in 2005 and 2007. These events brought together representatives of the international organizations with those of regional institutions and other major actors, who produced a group of key recommendations to enhance various aspects of coherence in information.

The principal partners of IISAST met again in January 2008 to devise a shared identity, and they settled on the name CIARD (Coherence in Information for Agricultural Research for Development) for the initiative, and the following vision: **"To make public domain agricultural research information and knowledge truly accessible to all"**. The aim was to enable organisations and individuals that create or possess public agricultural knowledge to disseminate it more effectively. The principal themes and elements of the CIARD initiative were strengthened with a wider group of regional and international organizations during 2008 and 2009.

CIARD has been sustained mostly through the commitment of the principal organizations that decided to found, support and resource it. These comprised the major players in agricultural research and development at international and regional level, and two major governmental (donor) organizations, including the following:

- International: CGIAR, CIRAD, CABI, CTA, FAO, GFAR, IAALD
- Regional: AARINENA, APAARI, CACAARI, FARA, IICA, FORAGRO
- Governmental: DFID (UK), MAE (France).

The formation of this partnership was a prerequisite to the initiation and the sustainability so far of CIARD. In particular, the funding support from DFID through FAO for the early development of CIARD (2008-2010), and the continuing support from GFAR and its donors helped to provide the continuity that was necessary to establish the Movement in its current form.

¹ Information and Communication Management for Agricultural Research for Development

2. Timeline of Development of CIARD Resources and Activities

In the five years since its inception, CIARD has evolved by developing a range of activities aiming to create change to enhance the openness of public agricultural information and knowledge in its target constituencies. Some of these activities focus on the CIARD website and others are based in virtual communication and face-to-face working. This section of the Review presents a timeline showing the introduction and changes to these different activities. The timeline will provide context for the analysis and discussion in sections 3 and 4 of the Review.

Throughout this timeline a programme of workshops, meetings and promotional activities has been run by the founding partners, and in many cases with regional and national partners, to further the work of the Movement in all its strategic strands. The activities fall into the following categories: conferences/meetings (not specific CIARD workshops) with presentations, dedicated sessions, and exhibition stands/promotional materials; CIARD regional workshops; presentations at meetings of relevance to CIARD; communication of activities through dissemination of announcements by email via various lists; and dissemination of products through announcement by email via various lists. A compilation is provided in Appendix 1.

2.1 Phase I: 2008 Inception

Several principal partners (CABI, CGIAR, CTA, FAO, GFAR, IAALD and MAE) of the IISAST initiative met in Paris in January 2008, and agreement was reached to relaunch the initiative under the banner of CIARD, with a new and challenging Manifesto and Values. The rest of 2008 was predominantly a period of advocacy amongst the founding partners aimed at the clarification of the CIARD vision, with the formal launch of CIARD at an international level at the IAALD World Congress held in Japan in August 2008.

The **Manifesto**, **Values** and **Checklist** drew on the CGIAR's 'AAA' concept (Availability, Accessibility and Applicability) of research outputs, but they were developed with inputs from hundreds of CIARD stakeholders. The Manifesto, entitled '**Towards a Knowledge Commons on Agricultural Research for Development**', has since held a prominent position on the website, and in marketing materials, where it describes the rationale for CIARD's existence and the values that drive it. The Checklist of Good Practices transforms the statements and aspirations of the Manifesto into a set of actions which the organization and the individual can use to help to achieve the aims of CIARD. The recommended actions of the Checklist are not prescribed, they are presented as options through which progress towards openness and coherence can be achieved.

It was agreed that CIARD would work to achieve its' aims through three strategic strands in the form of Task Forces, on which the major partner organizations and other key constituents would be represented. The three **Task Forces**² are Advocacy, Capacity Building and Content Management. The Task Forces aim to coordinate activities within the CIARD Movement. Their mode of operation is to conduct collaborative activities and foster active communication, either face to face or through virtual collaboration.

The **Advocacy Task Force (ATF)** was established to secure commitment and participation from important members of the various stakeholder constituencies in agricultural science and technology (local, national, regional, and international), through consultations, case studies, and so on. The **Capacity Building Task Force (CBTF)** was intended to develop international and regional actions to

² <http://www.ciard.net/ciard-task-forces>

support national level capacity building. The **Content Management Task Force (CMTF)** was intended to assess and communicate on methodologies and tools for opening up information access, and on interlinking different information types.

These different elements of CIARD's vision and activity were brought together in the first version of the **CIARD website**³, which was developed to act as a focal point of CIARD's presence where activities would be seeded, stimulated and/or reported on. This would be one of the CIARD Movement's direct interfaces with potential partners and users. Initially the key elements were the Manifesto and Values⁴ and the Checklist⁵ though over time other elements would be added.

During 2008, several **National Case Studies**⁶ were also completed by FAO and appropriate national organizations. This was the start of a programme of studies of real practice and experience at country level which could inform (through both their successes and failures) the development of other initiatives. These early case studies included Peru (AGRORED), Egypt (NARIMS), Ghana (GAINS), Kenya (KAINet), Laos (Lao Agriculture Database), the Philippines (PhilAgriNet) and Thailand (Thai AGRIS Centre). Each of the studies was summarised in a consistent way, addressing the organizational and information environments for the development of the national system, the degrees of success, and the issues which arose from these developments. The cases were made available on the CIARD website.

2.2 Phase II: 2009 Formulation - 1

CIARD development during 2009 is shown in the three areas of the Task Forces.

Advocacy

Advocacy and outreach into CIARD's constituencies moved into a new stage through the **regional stakeholder consultations** co-organized by regional forums and many of the international partners, with financial support from DFID. The aims of the consultations were to promote CIARD, and to validate the Manifesto and Values and the Checklist in relevant languages. The consultations brought together more than 150 experts from almost 70 countries in five regions, and reports of each are available on the CIARD website⁷:

- CIARD Near East and North Africa Regional Consultation, Cairo.
- CIARD Africa Regional Consultation, Accra.
- CIARD Latin America and the Caribbean Regional Consultation, Lima.
- CIARD Regional Consultation for Russian-Speaking Countries, Moscow.
- CIARD Regional Consultation for Asia and the Pacific, Hyderabad.

Consultations became a key element of CIARD's development. They have fulfilled multiple roles, bringing together interested parties to discuss CIARD, its mission in national and international information environments, and action plans for its future. They have naturally also provided fora for the activities of the Task Forces and for marketing in the broadest sense.

These early consultations led to a strong endorsement of the CIARD agenda, with the contributions resulting in revision of the CIARD Manifesto, Checklist and Pathways where necessary. The layout of

³ <http://www.ciard.net/>

⁴ <http://www.ciard.net/ciard-manifesto>

⁵ <http://www.ciard.net/checklist-good-practices>

⁶ <http://www.ciard.net/cases>

⁷ <http://www.ciard.net/expert-consultations-archive>

the CIARD website was enhanced with appropriate alterations to the main elements of text. The consultations also identified a number of common concerns and challenges:

- How to identify the resources, both technical and in other skills, needed to make the changes necessary to achieve the Checklist.
- How to persuade and mobilise the three key groups of stakeholders in institutions, namely researchers, policy-makers and information managers, into communicating their research outputs.
- The need for CIARD to harmonize with the agendas of national and sub-regional organizations (and vice versa) attempting to address the same issues.
- The richness of the CIARD agenda provides a context within which institutional and national developments can take place. But how can the best alignments be created?
- The challenges of turning the Checklist and Pathways into action.

Capacity Building

The inaugural meeting of the CBTF was convened in mid-2009 in Wageningen, and the participants agreed that the CBTF should have the following primary objective *“to facilitate the compilation and dissemination of training and learning resources that would support global activities in building individual and institutional capacities in information and communication management (ICM) matters related to CIARD”*. On that basis, it was clear that much of responsibility of the CBTF could be vested in IMARK (Information Management Resource Kit) which was developing learning resources in many key areas for CIARD. IMARK is an e-learning initiative for training individuals and supporting institutions and networks worldwide in the effective management of information. This was especially relevant given that several of the CIARD partners were/are also members of the IMARK Steering Group (e.g. CTA, CIRAD, FAO, IICA and INASP). It should be noted that CIARD’s direct involvement in capacity building activities at country level was not foreseen at that time.

Content Management

Three key content management developments were:

- The **CIARD Pathways**⁸ were developed and launched through the work of a large number of partners and stakeholders. The Pathways were brief, practical guides to achieving progress toward openness and coherence of research outputs, each one being an introduction to a specific area of activity. Each is linked to other Web resources which offer more detail, explanation and guidance. This first model of the Pathways divided them into three groups: Group 1 – Developing Institutional Readiness; Group 2 – Collection and Preservation; Group 3 – Making Content Widely Accessible on the Web.
- The **CIARD-RING**⁹ was developed and launched by GFAR, with input from many of the CIARD partners. The RING (Routemap to Information Nodes and Gateways) is a global registry of web-based services that facilitates the discovery of sources of agriculture-related information across the world. The RING was intended to be the principal global technical platform for accessing, sharing and exchanging information through web services. The launch in 2009 comprised the development of the Registry -where institutions could register and describe their current publicly-accessible information sources and services in various categories according to specific criteria. Detailed instructions were composed on how the featured services can be "interoperated" to build advanced services that draw on the registered resources.
- A community-style development took place under the umbrella of CIARD. The **AIMS** (Agricultural Information Management Standards) website and community, facilitated by FAO, started to offer access to tools, methodologies and standards and to deliver a platform for

⁸ <http://www.ciard.net/ciard-pathways-opening-agricultural-knowledge-all>

⁹ <http://www.ciard.net/ciard-ring-0>

discussion and support for users. AIMS explored technical standards and public domain tools for interoperability in agricultural information systems. The essential standard on which others were based was the Agricultural Metadata Element Set (AgMES), developed by FAO before the FAO-DFID programme, and the related AGRIS Application Profile used by the international information system for agricultural research documents. Under the FAO-DFID programme, standards for collecting and disseminating information related to various types of information object were developed by the CMTF as follows: AgriFeeds - news and events; AgriOrg – organizations; AgriProject – projects; AgriJobs - employment opportunities; AgriLOM - learning objects.

2.3 Phase III: 2010 Advocacy - 1

Advocacy

Advocacy activities were at the centre of CIARD development in 2010, as a result of the outcomes of the various 2009 activities.

A major revision of the website was implemented by FAO, GFAR, CIRAD and IICA, and it was relaunched in three languages at the 1st Global Conference on Agricultural Research for Development (GCARD), France. Advocacy activity resulted in the recommendation by the GCARD for stakeholders to "use the potential of a multi-partner movement such as CIARD to facilitate availability and access to information and knowledge in innovative ways".

A few months later a side-event was organized to promote CIARD during the 5th African Agriculture Science Week and FARA General Assembly, held in Burkina Faso in July 2010. The General Assembly endorsed CIARD with the following statement:

"The FARA Assembly recognized that the key challenge for agricultural research in Africa is that too few of its outputs are truly accessible and applicable. Participants called on the two principal initiatives in Africa facilitating greater accessibility of agricultural research outputs – namely the FARA-RAILS and CIARD:

- *to advocate with all national actors in agricultural research the need for more coherent approaches to knowledge sharing and communication of the outputs of agricultural research in support of innovation*
- *to support development of national capacities by sharing sound institutional strategies and policies, providing tools and practices, and offering learning resources and events for all types of individual stakeholders."*

Also in 2010, a CIARD 'Marketplace' was organized and assembled by a large number of CIARD partners for the IAALD World Congress in Montpellier, France, to allow participants involved in the documentation, management and communication of research outputs to explore questions about how research can be communicated digitally. The Marketplace was considered very successful, and a virtual form of the event was constructed for the CIARD website and launched later in the year as the CIARD Fair¹⁰.

Capacity Building

This area was progressed in the context of the launch of a new IMARK Module on 'Digital Libraries, Repositories and Documents', which was a valuable resource that covered many areas highly relevant to the CIARD Pathways. The module was adapted in 2011-12 by CIARD partners from English into French (CIRAD) and Spanish (IICA).

¹⁰ <http://www.ciard.net/ciard-fair>

Content Management

The CIARD-RING continued to be promoted at various international workshops on knowledge management¹¹, and also at the CGIAR workshop for National Agricultural Research Information Systems in the Asia-Pacific Region. Vocabularies, data registration forms, and search mechanisms in the RING were revised and enhanced.

The successful Marketplace held at the IAALD World Congress (see above) led to the development and launch of the Virtual Fair on the main CIARD website, comprising a series of pages for 'services' linked to 'service providers' and Pathways. The Virtual Fair was contributed to by all of the partners that had developed the Marketplace for Montpellier.

Another important event for content management was the "Tools Workshop" also at the IAALD World Congress. As a result of this workshop, the CMTF worked on designing a "tools wiki" to describe not only tools for content management, but also to document decisions, guidance, and lessons learned. Although this development was not completed because of lack of resources, the resulting information was integrated into the AIMS "VEST" Registry¹².

2.4 Phase IV: 2011 Formulation - 2

Advocacy

Advocacy was again a key strand of CIARD activity through the year, where consolidation of some major themes was achieved.

The outputs of various events and meetings were used to develop an online global survey of '*Researcher Attitudes and Behaviour Towards the 'Openness' of Research Outputs in Agriculture and Related Fields*', which was carried out in March 2011 by the CGIAR, FAO and GFAR on behalf of CIARD. There were almost 1,500 responses to the survey. The full results are available on the CIARD website¹³ and some detail of this analysis will be presented later in section 3 of this Review.

The partners also organized two international consultations in 2011 on the theme of "Building the CIARD Framework for Data and Information Sharing", under the leadership of GFAR and FAO, with the intention of launching the Framework at GCARD-2 (see below). A global online consultation hosted on the e-Agriculture community site was followed by an Expert Consultation held in June in Beijing and co-organized with the Chinese Academy of Agricultural Sciences (CAAS). The specific objectives of the Consultations were:

- To take stock of the current collaborative bilateral, multilateral, global coherence frameworks and collaboration in management and sharing of information;
- To share experiences of national, regional and global collaboration in managing, sharing and exchange of agricultural research information in the context of new challenges to agriculture;
- To chart future action, strategies and activities for action to further enable collaboration and partnerships involving fast growing economies in global agricultural research information sharing and exchange.

¹¹ International Joint Conference on Artificial Intelligence; International Joint Conference on Knowledge Discovery, Knowledge Engineering and Knowledge Management; International Conference on Knowledge Engineering and Knowledge Management

¹² <http://aims.fao.org/vest-registry/browse-by-tools>

¹³ ([http://www.ciard.net/sites/default/files/CIARD%20-%20Researchers%20Survey%20Paper%20\(EN\)_0.pdf](http://www.ciard.net/sites/default/files/CIARD%20-%20Researchers%20Survey%20Paper%20(EN)_0.pdf))
Also published in the journal *Agricultural Information Worldwide* Volume 4 No.2.

These objectives of the Beijing Consultation had a ‘content management’ flavour, but the outcomes expressed as ‘Action Areas’ have broad strategic importance for CIARD across all of its areas of activity and will continue to inform and drive CIARD’s future development. Action Areas include:

Technical issues and technologies

- Services, Tools and Infrastructure
- Standards and Systems Architecture

Institutional and Organizational Aspects

- Policies, Strategies and Institutional Structures
- Development of Skills and Competencies
- Appropriate Organizational Structures and Work Practices
- Global Improvement of Data and Information Flows

Championing change in policy and practice

- Advocacy and Evidence

Strengthening the CIARD community and its role

- Partnerships and Information Managers

The full report of the Beijing Consultation can be accessed on the CIARD website¹⁴. The regional and international partners then organized a series of regional expert consultations and workshops to promote and discuss the Framework (see Appendix 1).

The development of **The Advocacy Toolkit**¹⁵ began in 2011 supported by FAO, GFAR and CGIAR. It is a resource to support organizational and individual efforts to advocate for, influence others towards, and raise awareness about the value of ‘opening up agricultural knowledge for all’. The Toolkit provided information, ideas, tools and resources to provide support to activities to achieve these aims. The draft elements of the toolkit were formulated and tested through the regional consultations and workshops (see above).

Content Management

A survey on Open Access Repositories was conducted¹⁶, and the repositories evidenced in this survey were added to the CIARD RING.

Most significantly, activities around content management continued to strengthen AIMS in disseminating standards and good practices in information management, attracting users through community-like resources such as newsfeeds and interest groups, and providing significant underpinning of CIARD in areas related to content management.

The CMTF also produced a good practices guide on selection and use of different information management software tools, and developed two case studies to demonstrate the use of Free Open Source Software (FOSS) using DSpace and Drupal. A major achievement was the consolidation of the work on metadata standards for textual resources (AgMES and related Application Profiles) with new guidelines “Linked Open Data Enabled Bibliographical Metadata”¹⁷ aimed at overcoming the restrictions of the AgMES application profiles, and to give more flexible guidelines to produce rich metadata on textual information. In addition there was a complete overhaul of AGROVOC, one of the thesauri most used by CIARD partners. AGROVOC was changed into a concept-based Knowledge Organization Scheme and later published as “Linked Open Data”. AGROVOC has now been adapted

¹⁴ <http://www.ciard.net/expert-consultations-archive>

¹⁵ <http://www.ciard.net/advocacytoolkit/opening-agricultural-knowledge-all>

¹⁶ <http://aims.fao.org/news/survey-open-access-repositories-agricultural-domain-state-art-2010>

¹⁷ <http://aims.fao.org/lode/bd>

into more than 20 languages, and mapped against various other vocabularies to assure interoperability.

Two important developments took place in relation to content management systems. Collaborative efforts adapted DSpace (CGSpace and AgriOceanDspace) and Drupal to the specific needs of the CIARD community. Between various CIARD partners (Condesan, FAO, Cornell, various CG centers), a community was developed that continues to collaborate in adaptation of Drupal.

2.5 Phase V: 2012 Advocacy - 2

Advocacy

Advocacy was again the key strand of activity in 2012, particularly in promoting the CIARD Framework, developed through the international consultations initiated in 2011, which was completed in the first half of the year. The Chinese Academy of Agricultural Sciences (CAAS) also conducted a series of National Consultations and Workshops (see Appendix 1).

The Advocacy Toolkit was launched under the banner “Opening Agricultural Knowledge to all”. In relation to the Toolkit, a draft Policy Brief on “Opening Access to Agricultural Knowledge” was developed initially by FARA and then with a wider group of partners before it was launched and is available on the website¹⁸. The first version of the Policy Brief was distributed at 2nd FARA Ministerial Dialogue in April 2012.

In order to support advocacy, further evidence of the experience of real implementations was gathered from a new set of **National Case Studies**¹⁹. These studies were carried out by local experts, under the guidance of FAO and GFAR. They used a standardised, structured approach to questioning which was mapped conceptually to the CIARD Checklist. The consultants’ reports are provided in full on the CIARD website and present cases for Oman (MAFNET), Jordan (NAIS), Kenya (KAINet), Ghana (GAINS), and China (the introduction of CIARD and RING concepts to the agricultural sector). A study in Brazil (EMBRAPA) is currently in progress. More detail of the outcomes of these studies is given in section 3 below.

In addition, two major global fora were used as advocacy platforms. CIARD featured at the first G20 Meeting of Chief Agricultural Scientists (MACS), held in Mexico in September 2012, where it was presented as the principal mechanism for the proposed Global Research Collaboration Platform on “Access to scholarly publications and technical information”. Several G20 members and international organizations gave strong supporting statements.

Then, the ‘Second Global Conference on Agricultural Research for Development’ (GCARD2) on “Access, Sharing and Transformation of Agricultural Data and Information” featured CIARD. Priority actions were identified at national, regional, and global level, which relate to actions identified by the 2011 Beijing Consultation referred to above. Several members of the CIARD Advocacy Task Force and representatives of CIARD partners attended the session, as chair, panelists, facilitators, and participants. The message sent forward from the session to the final plenary comprised three recommendations for action for all GCARD stakeholders to:

- “continue to engage with the CIARD movement to enhance the coherence and effectiveness of access and use of agricultural information and data;

¹⁸ <http://www.ciard.net/sites/default/files/CIARD%20Policy%20Brief%20EN.pdf>

¹⁹ <http://www.ciard.net/cases>

- *call on managers and policy-makers to lead the development of enabling strategies and policies for more effective access and use of information and data;*
- *to collaborate on development of methodologies and indicators for measuring the outcomes of enhancing access to information and data.”*

Further details of priorities for action identified in 2011 and 2012 can be found in Appendix 7.

Capacity Building

The principal activity in 2012 was the revision of the IMARK “Investing in Information for Development” Module into a refocused theme of “Strategic Approaches to Information” lead by INASP. The new module will be published in 2013 in English, and adaptations into French and Spanish are being prepared by CIRAD and IICA respectively. Further, this resource is aligned and linked with CTA’s ‘Information & Communication Management Strategy Development User’s Manual’ and ‘Facilitator’s Guide’.

Content Management

The CIARD RING underwent important developments in its technical backbone to improve usability, and the number of registered services continued to increase. The RING was strengthened through firmer ties with China’s agricultural information systems. GFAR and FAO in collaboration with the Chinese Academy of Agricultural Sciences initiated the development of a CHINA.CIARD site and a specific RING to provide an avenue for a nationally and internationally federated system for more open sharing of agricultural information in China. A report on this development can be seen on the CIARD website²⁰.

In preparation for the October GCARD2 meeting, there was a reappraisal of the organization of the Groups of Pathways and their coverage. The Pathways had not been reviewed since their initial development in 2009. The passage of time and the accumulation of feedback from various CIARD stakeholders and communities suggested that a review was necessary. As a result the organization of the Pathways was altered, and the new proposed groupings²¹ (to be discussed in the 2013 Global Consultation) are as follows:

- Enabling the institutional environment for openness and sharing of research information and knowledge;
- Making research information and data more available and accessible;
- Fostering knowledge exchange amongst different stakeholders.

The agINFRA project, which had been conceived to strengthen the content management capacities of CIARD, became fully operational with funding from the European Commission. agINFRA aims to create elements of a technical infrastructure that will help CIARD partners to manage their content. Three CMTF members, FAO, CAAS and the Indian Statistical Institute, are principal participants in agINFRA.

In 2012, the ties between AIMS and CIARD were strengthened by increased linkage between the AIMS and CIARD websites. The AIMS community has grown and coverage of topics has been increased. The largest AIMS interest groups are on “open access” and “metadata”, but there are others on tools and other more specific topics. In partnership with IICA and IAALD, AIMS has organized webinars on open access and Linked Open Data.

²⁰ [http://www.ciard.net/sites/default/files/RAP%20\(China\).pdf](http://www.ciard.net/sites/default/files/RAP%20(China).pdf)

²¹ <http://www.ciard.net/ciard-pathways-opening-agricultural-knowledge>

In collaboration with Cornell University, GFAR has taken up the VIVO system of expertise discovery, and has developed an AGRIVIVO prototype to demonstrate the possibilities of increasing accessibility of information on agricultural experts worldwide.

3. Outcomes of CIARD Activities

The activities and resources described in section 2 indicate the ongoing participation in CIARD by a range of organisations and individuals. Many initiatives and branches of activity have been seeded over the last 5 years. This section presents an appraisal of the outcomes of these activities.

3.1 Participation in CIARD

The total number of organizations registered as partners/participants is now 449, including those in the RING, and the numbers registering with CIARD on a monthly basis are shown in Figure 1.

Of the total, 55 organizations have registered directly on the main website, and these include the founder partners and a range of important actors in agricultural innovation (Appendix 2).

It should be noted however that whenever a service is registered in the CIARD-RING, the data provider is also registered as a participant in the CIARD Movement. The peaks of registration of new participants relate to major CIARD-related events such as the CIARD Fair (April 2010) and the build-up to the GCARD2 meeting (October 2012). Some peaks also coincide with periods when many new services were added to the RING by FAO and GFAR-related activities.

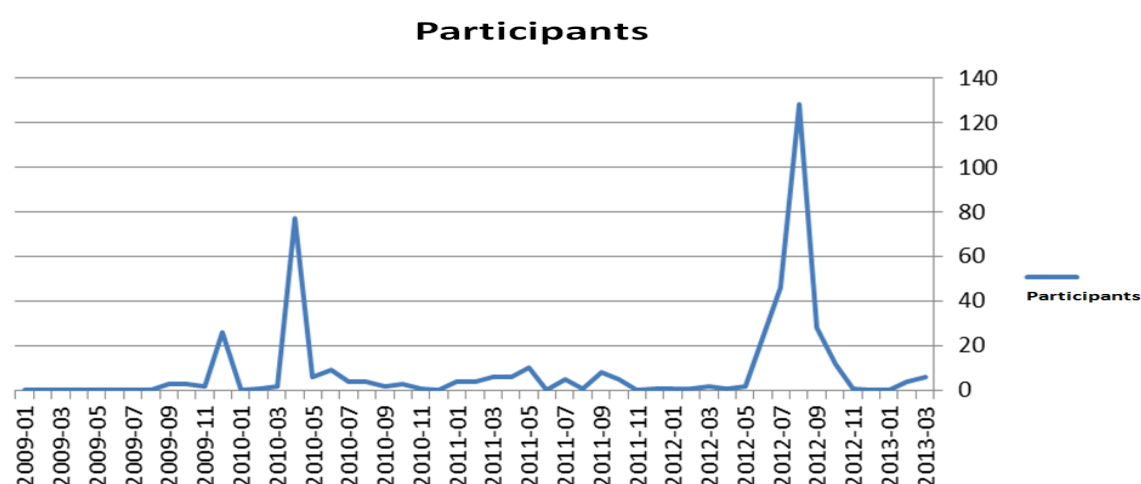


Figure 1: CIARD Participants joining (September 2009-March 2013)

3.2 Activity on the CIARD website (www.ciard.net)

The CIARD website can be seen as an indicator of the overall 'visibility' of CIARD with its target stakeholders and beyond. Figure 2 shows the number of page views over time.

The overall level of page views has not grown significantly since early 2010. The average number of visits per month was 1,124 during 2012.

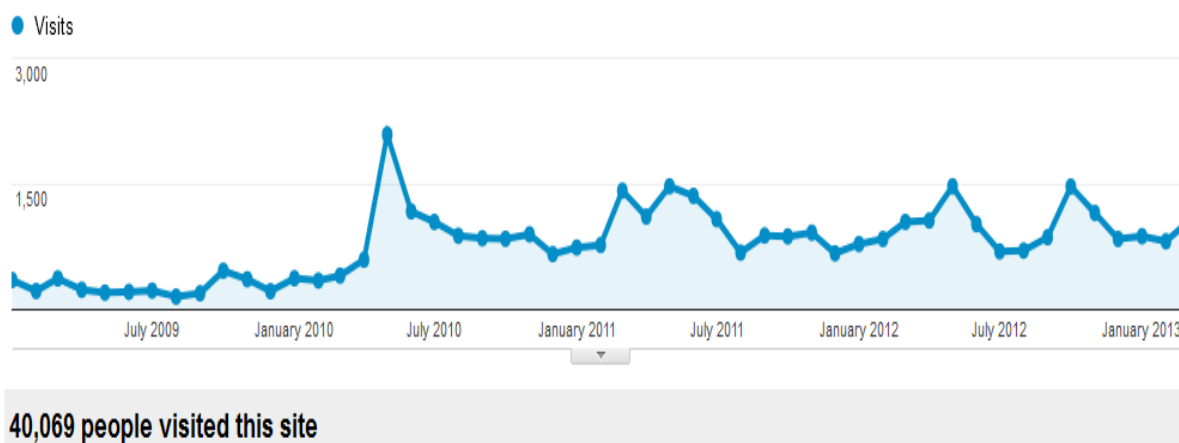


Figure 2: Total page views at www.ciard.net (July 2008 to March 2013)

Distinct peaks of activity can be seen to correlate with significant CIARD-related events, and indicate the usefulness and importance of a continuing strategic and practical presence for CIARD. The relevant CIARD-related events are:

- April 2010 – GCARD-1 and CIARD Fair at the IAALD World Conference
- April 2011 – CIARD Virtual Consultation
- June 2011 – CIARD Consultation (Beijing)
- May 2012 – Launch of the Advocacy Toolkit
- September 2012 – G20 Meeting of Agricultural Chief Scientists
- October 2012 – GCARD-2

Figure 3 shows the most frequently visited sections of the CIARD site since January 2009, which clearly reflect the importance of the Home Page as an introduction to the Movement and of the Pathways as important resources.

Further details on page visits and views of individual Pathways are included in Appendices 3 and 4.

In relation to activity on the main CIARD site, it is important that visitors had opportunities to contribute inputs to CIARD-related products and services. Two principal ways of contributing were created:

- **Input on Pathways:** however no comments/suggestions were received through the "Comment" feature on Pathways pages, or indirectly through the CIARD mailbox;
- **Input on Virtual Fair:** however no inputs were received through the website page on "Propose a new service for the CIARD Fair", or indirectly through the CIARD mailbox.

The reasons for this lack of contributions are unclear, but could include the obscurity of some of the pages.

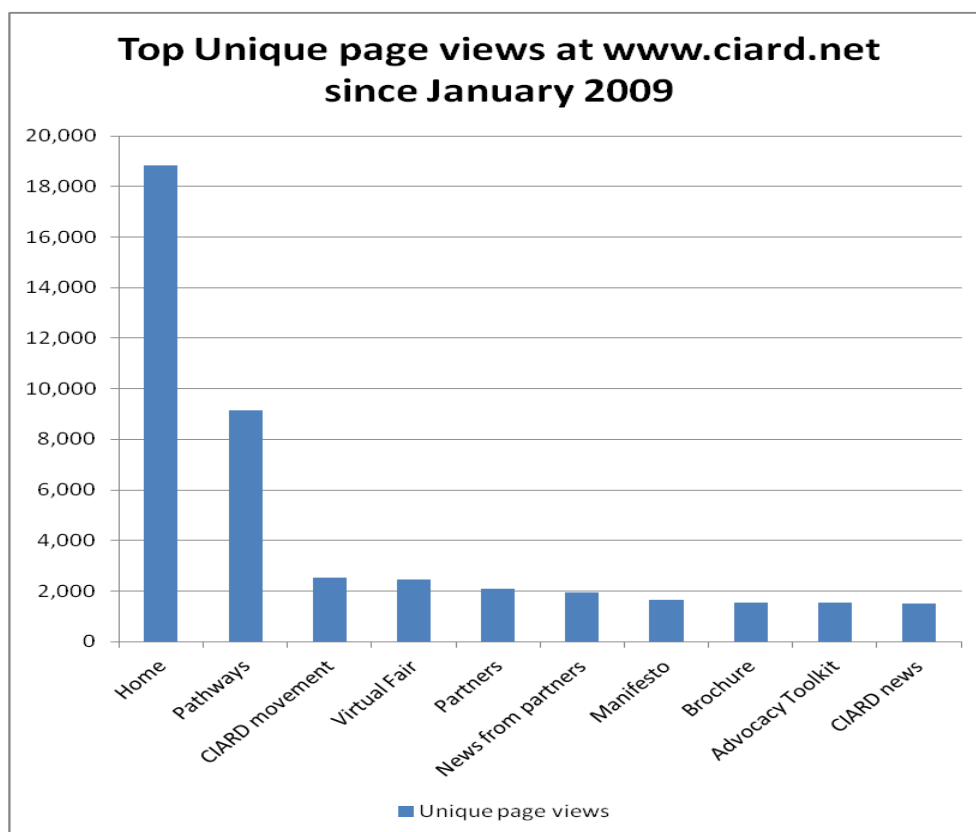


Figure 3: Greatest unique views for pages at www.ciard.net (January 2009-March 2013)

3.3 Activity on the CIARD-RING website (ring.ciard.net)

A total of 641 services have been registered to April 2013 on the CIARD-RING. Of these, the largest single group of 56% relates to document-like objects.

Not all of these services have been registered directly by the content owners. In fact 248 were registered by the AGRIS Secretariat and relate to services provided by the “AGRI centers”. The Secretariat informed the owners of the registration and requested them to take ownership of the record. In addition, around 90 services were imported from feedback to the global survey of open access resources conducted through the RING website.

Visits to the CIARD-RING website are shown on a monthly basis in Figure 4, below. The increase in visits has been steadily, though slowly, increasing since early 2010. There has been a more rapid increase since August 2012, though this coincides with the AGRIS international database starting to request data from the RING through an XML feed, which thus raised the visit numbers.

The number of services registered in the RING over time are shown in Figure 5. Again, increased activity can be seen to be correlated with activities and events discussed above.

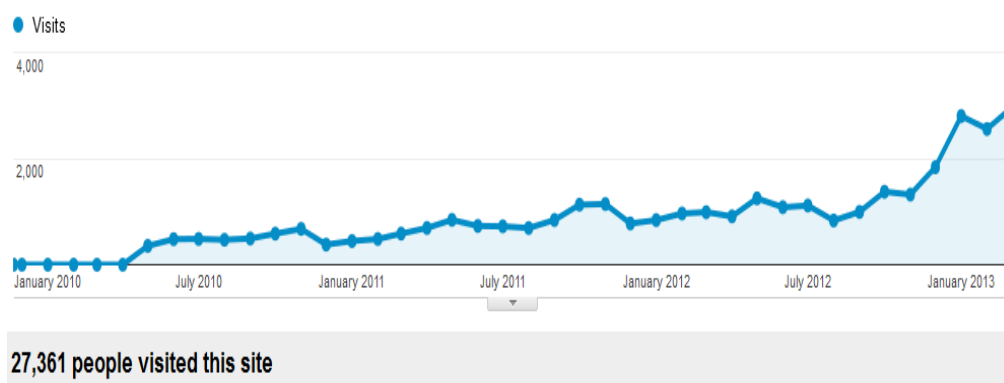


Figure 4: Visits to the RING pages since launch (November 2009-March 2013)

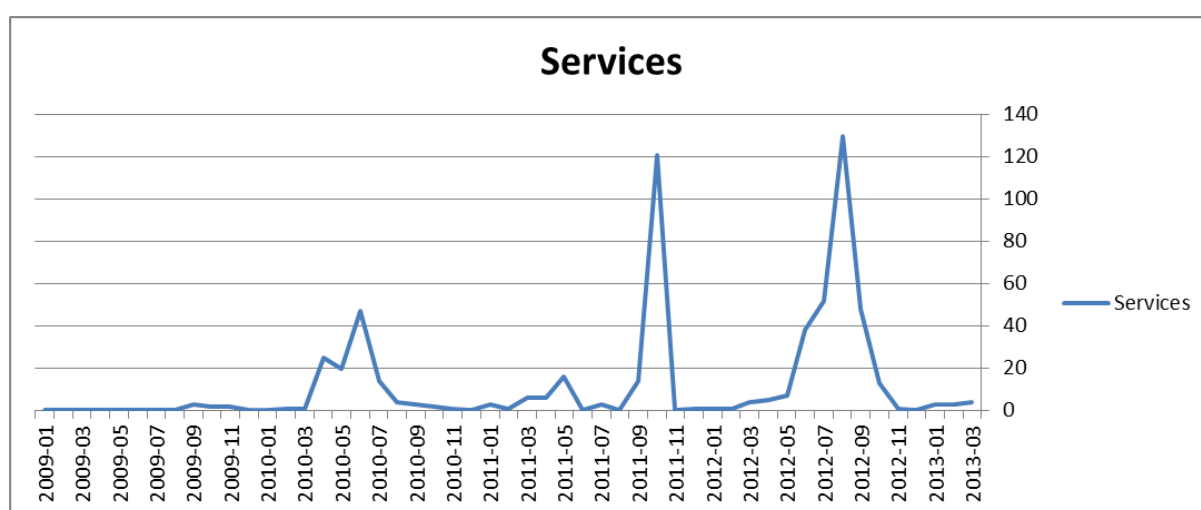


Figure 5: Registration of services in the RING (September 2009-March 2013)

3.4 National Case Studies - key findings

Case studies on national experiences in achieving the CIARD checklist were developed in coordination with FAO and GFAR by national organizations/networks in China, Egypt, Ghana, Jordan, Kenya, and Oman; a case on Brazil was also initiated in 2012, in coordination with FAO, by EMBRAPA and IICA Office in Brazil. The full case studies can be accessed online²².

The outcomes of these case studies show some common features which have significance for CIARD as a whole. The observations relate both to development at the institutional and national level, as well as to more granular activity at the level of the individual and the specific catalysts for and barriers to creating sustainable change. The studies provide a number of insights into the challenges of creating sustainable national systems/networks and into how CIARD might support them most effectively. Key findings are summarized below:

²² <http://www.ciard.net/cases>

- **Institutional, network and national policy, and information management strategy.** The Case Studies indicate that where policy frameworks at whatever level are weak, progress is inhibited. They also show the difficulty of obtaining formal approval for policies.
- **Advocacy** aimed specifically at senior management and policy makers is an ongoing necessity.
- **Sustainability of resources, skills and organizational commitment** is an important issue.
- **Technical capacity and information management.** Activities such as digital repository development, the use of international standards, interoperability of data, and so on, all presented some challenges.
- **Linking the outputs of research to rural advisory services and farmers** (whether through repackaging, communication and/or innovation systems, or all of them) is a major challenge.
- **Organizational cultures and behaviours** form barriers to effective progress toward greater openness for information and knowledge.

Further details on the above findings are also included in Appendix 5.

3.5 Study on Researcher Attitudes and Behaviour Towards the ‘Openness’ of Research Outputs in Agriculture and Related Fields – key findings

An online survey, focusing particularly in Latin America, Africa and Asia, was carried out in 2011 in order to gain greater understanding of researcher behaviours and attitudes in relation to communicating research outputs and making such outputs open and accessible. The results brought many valuable insights into current perceptions of researchers into the communication of their outputs. These findings can be considered by senior managers in agricultural research systems as they review their organizational policies. The survey was managed by the CGIAR, FAO and GFAR, and a paper summarizing the findings was published on the CIARD site²³, and disseminated widely.

The study shows that, although researchers are driven in their work by many different and interacting motivations, institutional/organizational factors are very important and have much influence over individuals’ behaviour. Often, making a research output freely and openly available can be in the hands of the individual, and some will act in this way. However, for many others there are perceived barriers to this, such as the lack of required resources and of institutional policies to drive these activities. Further, current behaviours in choosing routes to communicate research results were still strongly biased toward the traditional routes of publishing in journals and books and appearing at conferences, though the availability and increasing use of digital formats was starting to broaden the spread of communication pathways used. A more detailed summary of the main findings is also included as Appendix 6 of this Review.

3.6 Global survey (implemented April 2013)

A survey was carried out of 380 individuals who had been associated with CIARD-related events over the past three years. The aim was to find out about the information environment they currently work in, their interaction with and attitude towards the CIARD movement, their perceptions of how the CIARD movement is affecting their organization and information environment, and what the movement needs to do to help both them as an individual and their organization to progress toward greater openness of information. The survey was offered in English, Spanish and French. Of the 380 individuals, the responses were 108 in English, 25 in Spanish and 20 in French – an overall response

²³ <http://tiny.cc/31n3vw>

rate of 40.3%. The full analysis of the survey is to be published on the CIARD website, and some brief points are made below.

The general picture was one of a survey base of people who work predominantly in research, ICTs and information management, who are concentrated in research establishments, and who work at levels ranging from local to national, regional and international. The results suggested that they work in organizations and working environments where there is already some familiarity and alignment with the CIARD agenda. Nevertheless, visits to the CIARD website and its various resources are not frequent, with the majority (63%) visiting 5 times or less.

The perception of the role that CIARD plays in their work and organizations was mostly very positive, though the least positive attitude refers to the success of CIARD in supporting initiatives at the national level.

Finally, questions were asked on what CIARD can do which would be of most benefit to: 1) the respondent (you); and 2) the respondent's (your) organization. These questions concerned the future of CIARD, so the analysis can be found in section 4 below.

3.7 Survey of Partners (implemented April 2013)

A survey of the principal international and regional CIARD partners was carried out in April 2013, asking for responses to six questions about the CIARD movement, its achievements and future. In total, responses were received from 18 out of 20 people approached. The following is a summary of the key points to emerge from the responses.

3.7.1 CIARD Manifesto and Values as a strong platform for CIARD

Responses were divided between 15 generally supportive and 8 suggesting improvements could be made, with some respondents replying in both contexts. The generally supportive responses identified the role and style of the Manifesto and Values; that it works well as a global picture; and particularly for advocacy at the levels of senior management and policy makers. Additional comments were that regular revisiting and reassessment of these outputs are necessary; and that they should make clearer connections with other global initiatives such as the Open Access movement. They stated that the validation and support for the Manifesto by core partners and stakeholders should be more explicit, and that it should be used to bring some major funding agencies into the partnership.

Three of the responses suggesting improvement stated that there is no global solution as implied by CIARD and that messages need to be adapted to the local, even institutional, level. There was concern that the CIARD messages are too anglophone, and that direct translation into French or Spanish does not always work well in cultural terms – particularly at a local level. Another suggestion was that there should be another 'A' added to the three As, on Appropriation (or use) by the local community. Several respondents commented that the Manifesto is too long, and its focus is unclear with a message that is too complex, referring to 'coherence' and 'openness' which are different things. This complexity was also associated with insufficient translation into clear actions and usefulness. One respondent commented that there has not been enough focus on the role of the individual. Finally, the issue was raised of measuring impact and how that should be done.

3.7.2 Checklist and Pathways as a framework for translation of CIARD's mission into actions

Responses were divided between 13 generally supportive and 10 suggesting improvements, with some respondents replying in both contexts. Further, in some cases the Checklist and Pathways were discussed separately, and in some cases they are combined. The supportive responses identified the role and the style of both resources. Some comments are added, such as: there should be more Pathways and the Checklist should be more detailed; asking about usage statistics for the Pathways; and also stressing that there should be more local emphasis in the Pathways, more Pathways on communication and knowledge exchange (Group 3), more case studies, and more availability in other languages.

The responses suggesting improvements stated that the Pathways are: too wordy, too complicated, not practical enough, that they should link out much more to other resources and tools and therefore become more dynamic, and that it should be clear that they are all options to be approached with flexibility. Comments on the Checklist were that: the CIARD agenda is too complex to be addressed through a single benchmarking tool like the Checklist; the Checklist has too much emphasis on researchers as opposed to other stakeholders; and that it lacks an element of rigour in having no requirement for a business case.

3.7.3 The most significant change achieved by the CIARD movement in the last 3 years

There are 15 detailed responses to this question, which in some cases addressed more than one issue.

The 14 generally supportive responses/issues converged on two areas:

- **A higher profile for information, information management, openness and Open Access.** This new environment for information is now becoming established worldwide. One respondent makes the point that now the issues for CIARD of creating change at the level of national systems will become more complex. Another expresses concerns about the barriers faced in attempting to change institutional cultures.
- **Greater sharing, collaboration and cooperation in networks and services, such as the RING.** Also a global feeling of community that has helped to motivate individuals.

Three other responses were that the information environment is changing but it is not easy to relate that directly to CIARD. This is a complex issue which relates to how to develop evidence of the impacts of CIARD over time, and in different ways.

3.7.4 The elements going well in the CIARD movement

Many of the respondents to this question addressed multiple issues. These responses clustered into a number of areas that relate closely to the significant achievements identified in the previous section:

- **Success in advocacy and promoting openness at higher management levels (6 responses),** whether on a global (such as GCARD) or regional stage or with policy makers and senior management at national or institutional level.
- **Stimulation of collaboration at the global and/or regional level (3 responses).** An associated response also notes the growth of networks and communities, though this comment is focused on the Content Management Task Force, which is partly a manifestation of community development through the AIMS initiative. This latter point is supported by another response which notes progress with tools and standards, but that again this is only partially attached to CIARD.

Other comments related to:

- the strength of CIARD's conceptual framework;
- CIARD is in an area (openness) that is very active now;
- the success of the RING; the usefulness of the Pathways;
- the value of face-to-face meetings (such as the consultations);
- the involvement of partners from extension and advisory services.

3.7.5 The elements not going well in the CIARD movement

There was a broad range of responses to this question, with most respondents addressing multiple issues. Some clustering of issues was apparent:

- **Capacity at the national and institutional levels** (4 responses), and a perceived lack of impact and advocacy at these levels. The problem of institutional culture change is also raised. Lack of influence in knowledge exchange and ultimately on local communities is also stressed.
- **Training and 'how to do' needs to have a higher profile** (4 responses), particularly in information literacy and other aspects of content management.
- **The CIARD website is not active enough** (4 responses), and does not seem to be working as the central point of a community or communities.
- **CIARD is not action-oriented enough** (3 responses), that concepts and outcomes of various sorts are not translated into actions.
- **Languages other than English are a problem area** (3 responses), with not enough availability of content in Spanish and French (and other languages), and direct translation from English is sometimes not done well because it does not take account of subtler cultural differences.
- **Messages about CIARD (Manifesto, Checklist, etc) are too complex** (3 responses), and it's purpose and how to be involved are unclear.
- **The level of collaboration among partners is not good enough** (2 responses), with not enough evidence of 'CIARD at work'.

Other points made were:

- CIARD is a poor name – something more relevant is needed;
- so far the movement hasn't aimed beyond the organizations' core;
- some potentially important stakeholders are not involved in CIARD – from the USA and also large funders;
- impact at the level of information managers is low;
- better overall planning is required in the partnership – 'who does what, and when';
- there should be better linkage and conceptual overlapping with other initiatives such as Open AIRE and with Open Data initiatives;
- there should be more investment in CIARD and a better understanding of impact/outcomes related to cost.

The final question of the Partners Survey concerns the future of the balance of different types of activity within the CIARD Movement. This is dealt with in the next section on the future of CIARD.

4. General Issues and the CIARD of the Future

The CIARD resources and activities described and, where possible, evaluated above provide some insights into the progress and impact of CIARD since its inception. In this section these insights are brought together in order to focus on the future direction of CIARD. First, the final questions of both the Global Survey and the Partner Survey concerned what CIARD should be doing in the future, so the summaries of these responses are included here.

4.1 2013 Global Survey – Future Perspectives

The final two questions in the Global Survey asked the respondent what CIARD could do which would be of most benefit: 1) “for yourself”; and 2) “for your organization”. The responses are divided into those from respondents from national organizations, and those from international ones. The most common responses from each category are shown in Figures 6 and 7, and others in Tables 1 and 2, below.

4.2 2013 Partner Survey – Future Perspectives

The final question in the Partner Survey asked respondents about the future balance between different CIARD-related activities, and the types of activity that would lead to greater impact. There was a broad range of responses to this question, with most respondents addressing multiple issues. Some points were identified frequently, which overlap greatly with the most popular themes emerging from the 2013 Global Survey. The most frequently cited points were:

- **More emphasis on advocacy to the major actors in agricultural research etc** (*8 responses*), reaching outside the current core of research, and information/knowledge management. To support this advocacy, more evidence from case studies, surveys, statistics, etc, would be required, with analysis of outcomes/impacts.
- **Increased activities in capacity building** (*6 responses*), at regional and institutional levels. Mentioned in particular are management and information literacy. One respondent proposes a peer to peer training system because of the high cost of centralised training activities.
- **The need to develop the CIARD website as a centre of community activity** (*6 responses*), with awareness-raising, learning and interaction with other communities and global actors.

Other issues identified were:

- more collaboration and support is needed between the partners;
- more consultations – probably annually, to maintain direction of CIARD;
- ‘low entry cost’ routes to information management and communication;
- delivery of services and apps produced by CIARD partners;
- more analysis of value for money in the CIARD movement.

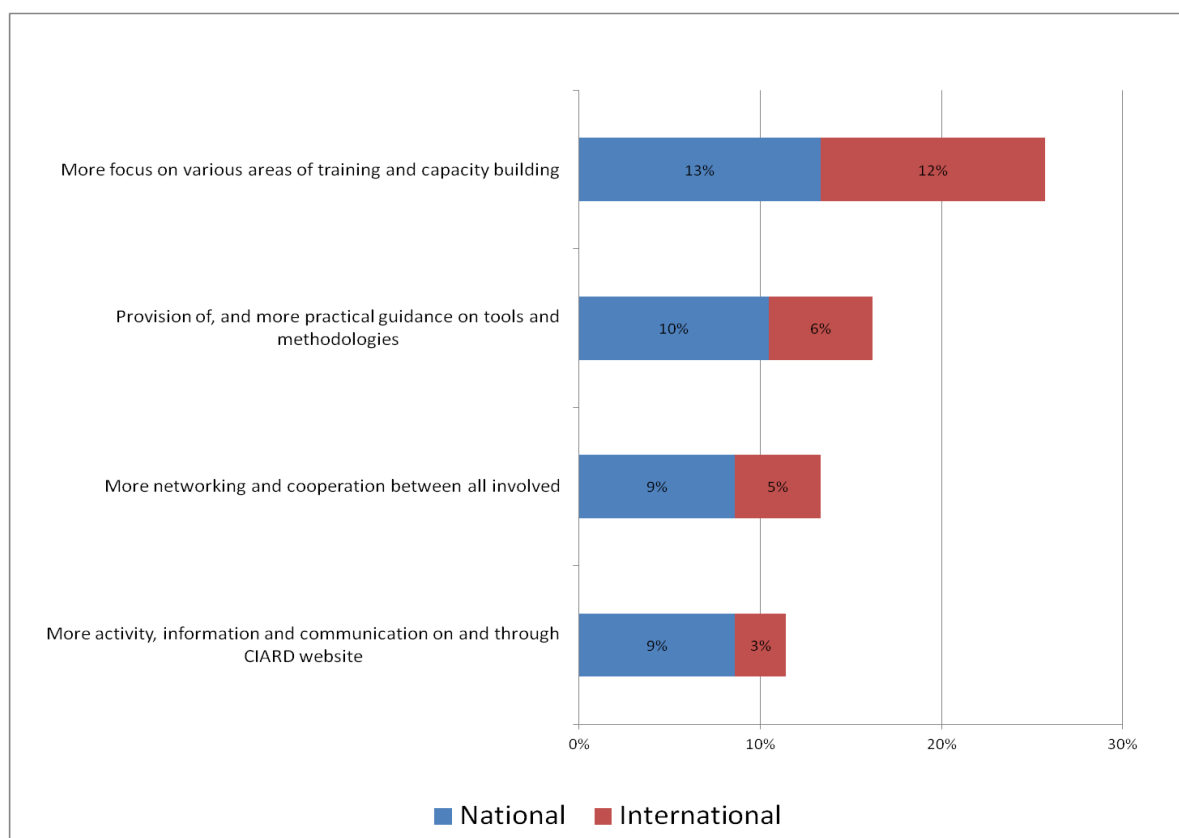


Figure 6: Most frequent responses from Global Survey “for yourself” (valid responses = 105)

National	No.	International	No.
<ul style="list-style-type: none"> More advocacy or guidance on advocacy within institutions. Better documentation of best practice and success stories. More cooperation and sharing in a CoP environment. Sharing data and open data. 	3 2 2 2	<ul style="list-style-type: none"> More advocacy or guidance on advocacy within institutions. Better documentation of best practice and success stories. 	2 2
Single responses (11): Provide free publications; Capacity development for farmers; Provide equipment; Greater variety of languages needed; Fund research students; More access to info. resources; Simple way needed to join the RING; Knowledge dissemination; Provide technical support; Social media training; Online directory of contacts.		Single responses (11): Need translation to more languages; Individuals should sign a personal pledge to achieve 3As; Need more clarity of principles; More access to info. resources; Link regional and international info.; Need educational resources; Need more visibility of information; Need more focus – too much information; Broader support for coherence; Social media training; Review website – not fit for purpose	
responses were void (5)		responses were void (8)	

Table 1: Additional responses from Global Survey “for yourself”



Figure 7: Most frequent responses from Global Survey “for your organization” (valid responses = 116)

National	No.	International	No.
<ul style="list-style-type: none"> Improve dissemination and accessibility of information. Provide support on strategy development. Provide financial support. Training for policy development 	7 5 3 2	<ul style="list-style-type: none"> More communication of case studies/best practice. CIARD to carry on in its current mode. Help to provide or identify funding. Develop and build services onto the RING. Develop a common information and communication platform. Coordinate support for national and regional platforms. Support participatory work and local networks. Improve website – more communication on current progress needed. CIARD should not keep partners who do not implement openness. 	3 3 3 2 2 2 2 2 2
Single responses (14): Collaboration on content development; CIARD to develop a common platform; More development of Pathways; Support national/regional communication; Support global/regional communication; More case studies/best practice; Better communication on CIARD website; Information on OA policies; Use key ‘sharing’ staff in organizations; Fund provision of hardware; Target least developed countries; OA to research data; Project management training; Assess user demand.		Single responses (12): Training for policy development; Dissemination and access of information; Translation into more languages; CIARD to act as an ‘observatory’; Provide tools to support financial proposals; CIARD to be an advisory centre; Provide Open Educational Resources; CIARD relevance at organization level needs to be clearer; Open Access to and exchange of research data; Enhance knowledge sharing; Clarify IPR issues; More evidence of impact.	
Responses void (7)		Reponses void (2)	

Table 2: Additional responses from Global Survey “for your organization”

4.3 Some General Issues

The findings from the various surveys, case studies, and so on, provided some insights into the information and knowledge environments that CIARD must address in the future. In the following section these are grouped into issue areas.

4.3.1 Global and Regional dimensions

Advocacy

The Partner Survey suggests that CIARD is working well at advocating for change, particularly at the levels of senior management and policy makers, and in a regional and global context. It is not so clear that this success is being seen in the national and institutional environments. The Global Survey also indicates that, with advocacy, more case studies and examples of best practice are needed. Resourcing, advocacy, and capacity building, should also be mentioned here. In the Global Survey these are the elements most requested by respondents because of their importance to sustainable development toward openness. The National Case Studies, the researcher attitudes study, the Consultations and the Partner Survey have all confirmed this.

CIARD as a community/communities

Is CIARD a community? Was it ever intended to be? Are there communities operating within CIARD? If not, should they be? Is CIARD, first of all, a partner-based movement and should it stay that way?

The indications are that CIARD as a whole is not operating as a community *of individuals*. The overall levels of traffic entering the CIARD website are low compared to comparable facilities which serve communities of practice, such as the AIMS website (see Website Activity in Section 3. above). This is mainly because, from the beginning of CIARD, the website has been seen as a source of information rather than a place for interaction and communication. The opportunities for interaction on the website are scarce. The information is there for back-stopping rather than as a generator of community activity. Other factors support this view – the time spent by users on most pages is short, at the most 2-3 minutes. So the site isn't very 'sticky', which is something that all websites aim for. Both the Partner Survey and Global Survey indicate demand for a more active website that would be a centre of community activity for both organizations and individuals. This need for interactivity is expressed also in the Global Survey as an appreciation of the elements of the CIARD philosophy that ask for networking, cooperation and sharing.

Coherence and Openness

These two themes are at the core of what CIARD aims to do, though they are somewhat different. The question is whether CIARD focuses sufficiently on both of these concepts. Both are supported in a technical sense by the Content Management Task Force, and the parallel growth of the AIMS community. Because of lack of resources the CMTF now exists mostly as an integral element of the AIMS website and online community²⁴ and AIMS continues to play its role as the virtual platform for the categorization, description and evaluation of standards and tools, and bringing its outputs to the online global community of practice. The AIMS community now has over 1000 members and its activities span: the CIARD RING; metadata standards; the AGROVOC vocabulary; the AGRIS database; promotion of Open Access; and so on. There is also a large and established global corpus of best practice guidance available.

²⁴ <http://aims.fao.org>

From the Surveys, it seems to be a generally held view that the overall perception of the importance of information management has been heightened across all communities by CAIRD's activity. But this could have been achieved through advocacy more than through the development of content management awareness and skills.

Domains of Information and Knowledge

The issues for CIARD of what are its key domains of influence and who are its key targets have appeared in a number of the elements of this Review. The Partner Survey, and also to some extent the Global Survey, showed some concern that the reach and impact of the movement into the wider innovation arena, and especially in the extension/farmer interface, is quite weak. Linking research with rural advisory services and farmers is represented to some extent in the current statements and guidance of the CIARD Movement, though the wording of both the Manifesto and the Checklist are rather tangential to innovation at the local level. Both the researcher attitudes study and the 2011/12 National Case Studies indicate the need for effective knowledge exchange and knowledge transformation in all parts of the innovation system, but a sense that communicating and working effectively with farmers and their representatives is still a problematic area for researchers and their institutions. Then there is the area of Open Educational Resources, which is now well established and growing fast. How far and in what ways should CIARD be addressing these domains?

4.3.2 National/Organizational dimensions

Information strategy and policy, and institutional culture

The outcomes of the 2010 FARA Assembly, and the 2009 and 2011/12 National Case Studies, all summarized in this Review, confirm that effective organizational information strategy and policies are necessary for the sustainable development of information management in the digital world. The 2011/12 National Case Studies in particular show that institutional policy frameworks within which individuals are enabled to pursue their work are an important part of achieving openness. The study of researcher attitudes also confirms this. The 'culture' of an institution, network, or even Ministry, cannot be changed overnight – advocacy over a prolonged period will almost certainly be necessary to achieve sustainable change.

The role of the organization (or network) and the role of the individual

The introduction to the Checklist of Good Practices says: "The Checklist represents a set of items through which organisations, research systems and individuals can progress towards achievement of the CIARD Manifesto and Values. It is not a set of requirements. There are many different ways in which the Checklist agenda can be achieved, according to the specific scope of an organisation's work. So everyone will be able to develop their own route through the Checklist."

This flexible approach to the role of the organization is important. The organization is a necessary target for advocacy, and advocating the development of strategic policy frameworks is an important part of this. The researcher attitudes survey showed the importance of the forces driving individual researchers to achieve their ends, as well as the organizational/network framework they work within. Other international movements have seen the dual importance of the individual and the network/organization (see the development of the Open Access movement worldwide) as have the marketing strategies of many businesses (as in the marketing campaigns of international scholarly publishers). Note, though, the most visited Pathway is 'Using social media to communicate research outputs', which suggests that the individual has an important role to play in creating change.

Information Technologies, technical dimensions and skills

The National Case Studies indicate that the national systems studied have been quite successful in the area of technical implementation, though it has to be said that they were significantly back-

stopped by external partners in these developments. The researcher attitudes study indicates, though, that technical infrastructure inadequacies are still a barrier to many individual researchers. The Partner Survey suggests that this ‘content management’ strand has worked satisfactorily. However, the Global Survey shows that training in general and in the area of tools, standards and technologies in particular, is one of the most demanded areas for support across all constituencies. The key question for CIARD strategy is “how fast and how far”? CIARD as a movement does not have the resources to develop and deliver a global programme of skills development. Should key CIARD partners at international and regional level be leading its constituents worldwide into, for instance, the new and exciting areas of open data management and linked data? Or is there a danger of encouraging some communities, who are hindered by weak skills and technical infrastructure, to do too much, too soon? The partners at all levels need to reflect what could/should be done and how it should be resourced.

4.3.3 Results and indicators – the measures for CIARD’s success

Ultimately CIARD must be judged by the results it achieves. But what do the results look like and what are the indicators by which CIARD’s achievements can be measured? Any discussion of results needs to take account of the complexity of the many elements that CIARD is attempting to influence or change.

At the level of direct output, the following indicators have been or could be used:

Indicators of the span of the Movement:

- Number of partners registered on the main CIARD website
- Number of services and service providers registered in the CIARD-RING
- Number of participants in CIARD-related events
- Number of participants registered in the AIMS community (proxy indicator)
- Number and nature of references and links to CIARD, including use of the logo, in partners’ websites
- Inclusion of CIARD in major initiatives related to agricultural innovation (e.g. G8, G20, GCARD)

Indicators of uptake of outputs – use of CIARD resources:

- Visits to the CIARD website
- Downloads of CIARD resource materials
- Visits to the CIARD-RING website
- Downloads of CIARD-sponsored standards and tools through AIMS (proxy indicator).

At the level of outcome, there are two domains in which the effects of CIARD could be measured which relate to the principal arenas of access to information/knowledge. The suggestions for indicators are set at the level of organizations/institutions, because this is the most practical level of measurement.

1. Indicator of **openness** of organization’s outputs:

- Existence of an institutional policy/mandate on open access to information/knowledge
- % of agriculture-related research documents and data openly accessible on the web in repositories or other facilities

2. Indicator of **coherence** of organizations’ outputs:

- % use of CIARD-sponsored international standards and tools (as distributed through AIMS).

The potential impacts at the sectoral level shift the analysis to the use (and effects of use) of the information and knowledge and the effectiveness of flows of information/knowledge amongst stakeholders in agricultural innovation systems. But this is where attribution of effects to the CIARD

movement becomes difficult to prove, for instance for increases (or not) in agricultural productivity in country/ies due to use of knowledge.

It is likely that the discussions at this 2013 Global Consultation will provide examples of results and indicators which are real and verifiable. The role of case studies and other evidence will be central to the proof of outcomes/impact.

4.4 CIARD - the Future and Sustainability

CIARD has made very significant progress since its inception in 2008. The results to date suggest some commitment from a range of organizations and individuals, and a greater degree of collaboration between key movers in this environment than was previously the case. But what next, and how? The results of both Partner Survey and Global Survey, and other elements of CIARD activity addressed in this Review, suggest that some things are going well, and some require more focus. These areas of focus fall into the following domains and it is proposed that any strategic plan for the CIARD Movement should address them. For clarity of strategic continuity the relationships with the Action Areas of the CIARD Framework for Action, reproduced in Appendix 7, are also noted below. The mapping between the two is direct in some cases, though the scope of the Framework development and of this Review have been somewhat different.

1. Capacity building. Capacity building within the CIARD Movement took on the approach of sponsoring development of learning resources through the IMARK initiative, following the inaugural and only meeting of the Capacity Building Task Force in 2009. It was decided in 2009 that the CIARD Movement could not and should not embrace intervention directly at national level, and CIARD partners have focused resources into development of e-learning modules in the major areas of CIARD's mandate. However, capacity building is the most requested area of future support in the Global Survey, particularly at the national and organizational levels. All types of capacity building are requested, including the areas of tools/standards/technologies, advocacy, and strategy/policy development. These demands cannot be met directly by CIARD as it is currently established, and the future approach has to be determined.

['Action Area 3 - Policies, Strategies and Institutional Structures', 'Action Area 4 -Development of Skills and Competencies', and 'Action Area 5 - Appropriate Organizational Structures and Work Practices' of the CIARD Framework for Action all relate to this item.]

2. Content management. The Content Management Task Force has changed over time, especially with the end of external funding support from DFID. In fact, the AIMS portal has taken over the role of the CMTF, and has embraced a wider set of topics and a wider group of stakeholders. More than 1,000 practitioners worldwide are registered with the AIMS community. Some confusion has been expressed as to why they are separate. The issue should be addressed of whether AIMS and CMTF are now effectively synonymous and proposals for future development based on this assessment. This might also provide support for initiatives related to capacity building.

['Action Area 1 – Services, Tools and Infrastructure', 'Action Area 2 – Standards and Systems Architecture', and 'Action Area 6 – Global Improvement of Data and Information Flows' of the Framework for Action all relate to this item.]

3. The CIARD message. What is the core message that CIARD is claiming for itself? Is it about both coherence and openness? Is it too complex? The presentations of the Manifesto, the Checklist, and the Pathways are quite complex. Would the whole approach of how CIARD gets its messages out through the website and elsewhere benefit from simplification?

[This item was not within the scope of the CIARD Framework for Action and is not directly related to any Action Areas.]

4. The CIARD website as a focus for activity. Both the Partner Survey and Global Survey indicate demand for a more active website that would be a centre of community and/or partner activity, for both organizations and individuals. The role of the AIMS community in this respect is important. *[This item was not within the scope of the CIARD Framework for Action and is not directly related to any Action Areas.]*

5. Advocacy. Advocacy is proving successful at the regional and global levels, but not so clearly at the national, organizational and individual levels. Strategies to meet the needs of these constituencies should be addressed. Influencing organizational culture is also of key importance. *[‘Action Area 7 – Advocacy and Evidence’ of the Framework for Action relates directly to this item.]*

6. Evidence. To strengthen advocacy at all levels, continuing case studies and evidence of impact are required. *[‘Action Area 7 – Advocacy and Evidence’ of the Framework for Action relates directly to this item.]*

7. Knowledge powering innovation: the links through extension to farmers. CIARD began its work with a focus on the information management of research outputs. The national case studies and the surveys indicate that this is not enough and that knowledge management and knowledge exchange in an innovation context may be required to create/support change in national agricultural systems. Is this move toward ‘local’ impact the direction CIARD should go in? *[This item was not directly within the scope of the CIARD Framework for Action and is not directly related to any Action Areas.]*

8. Languages. Concerns have been expressed by non-anglophone survey respondents that CIARD has an anglophone bias, and that direct translations into Spanish and French (and presumably other languages as well) do not necessarily translate well culturally. This effect probably becomes stronger the more ‘local’ the target groups. How should this be addressed? *[This item was not directly within the scope of the CIARD Framework for Action and is not directly related to any Action Areas.]*

9. Broader support for CIARD. It has been suggested that the current profile of CIARD partners should be bolstered by bringing in other ‘big hitters’ from outside the present scope of CIARD, for instance from the worlds of innovation and/or openness. It has also been suggested that some major funding agencies should be involved. Certainly the CIARD Movement can only develop over time with commitment from the current, and new, partners – partners who are prepared to share the resource burdens of developing a global movement. *[The section on ‘Strengthening the CIARD community and its role’ and the associated ‘Action Area 8 - Partnerships and Information Managers’ of the Framework for Action relates directly to this item.]*

Resources and Sustainability

The development of CIARD has been supported in financial terms to a great extent by the major international partners, with additional contributions from regional partners. However, considerable in-kind resources have been forthcoming from partners at all levels.

The sustainability of a Movement such as CIARD is a complex matter depending on strategic decisions on future role(s) made at the 2013 Global Consultation and beyond. Prioritization is critical as, clearly, CIARD cannot be everything to everyone, and cannot do everything.

The effectiveness and sustainability of CIARD on the paths chosen by the partners will be greatly enhanced through broadly-based proactive collaboration amongst them to achieve the agreed outcomes.

Appendix 1: CIARD Promotion at Meetings and Workshops

Conferences/Meetings (not specific CIARD workshops): with presentations, dedicated sessions, and exhibition stands/promotional materials

- Uruguay (July 2008) V FORAGRO International Meeting: parallel session on "*Institutional innovations - challenges for KM: Management of Technological Information for Innovation*"
- Kenya (August 2008): "*Access to Agricultural Sciences and Technology (AS & T) Information in Kenya: Challenges and Opportunities*", organized by KAINet
- Kenya (November 2008): Presentation on "*Coherence in Information for Agricultural Research for Development (CIARD) Initiative and Manifesto*" at the 11th Kenya Agricultural Research Institute (KARI) Biennial Scientific Conference (BSC) and 3rd Agricultural Forum, organized by KARI
- Ghana (February 2009): Presentation on CIARD at the Council for Scientific and Industrial Research (CSIR) Committee of Directors Meeting, organized by CSIR
- Ghana (July 2009) IAALD Africa Conference, and South Africa, May 2012
- Peru (August 2009) International Meeting of Agricultural and Environmental Information Specialist. <http://www.slideshare.net/RIBDA/ciard-informacin-accesible-para-todos-ingls>
- Ghana (December 2009): "*Sensitization seminar on Open Access and CIARD*" at the Animal Research Institute organized by FAO-RAF and CSIR-INSTI.
- India (December 2009) International Consultation on Agricultural Research for Development and Innovation: Addressing emerging challenges and exploiting opportunities through Information and Communication technologies. At ICRISAT.
- China (2010). Annual Conference on innovation and development of the digital library and CIARD advocacy in Nanchang, Jiangxi province.
- France (March 2010) GCARD-1, France.
- China (2010) Annual Conference on innovation and development of the digital library and CIARD advocacy in Nanchang, Jiangxi province.
- Ghana (March 2010: Half-day seminars on open access to public domain agricultural scientific and technical information at the Cocoa Research Institute of Ghana (CRIG) and the Animal Research Institute (ARI), organized by the CSIR-Institute for Scientific and Technological Information (INSTI)
- France (April 2010) IAALD World Conference.
<http://www.slideshare.net/CIARD/2010-05-ciard-general-presentation-french-v20>
- USA (May 2010) USAIN Conference, USA.
<http://www.slideshare.net/CIARD/201005-ciard-detailed-presentation-english>
- Africa (July 2010) FARA 5th Africa Agriculture Science Week, Burkina Faso
<http://www.slideshare.net/CIARD/2010-05-ciard-general-presentation-english-v20>
- Brazil (November 2010) II International Conference on Digital and Social Inclusion. Brasilia.
<http://www.slideshare.net/CIARD/2010-11-ciard-ibict-conference-brasilia-inclusao-digital-portugues>
- Ghana (November 2010): Half-day seminar on open access to public domain agricultural scientific and technical information at the Food Research Institute, organized by the CSIR-Institute for Scientific and Technological Information (INSTI).
- Thailand (May 2011) Asia-Pacific Regional Forum for ICT Applications, Bangkok, Thailand (in the ICT application in agriculture session).
- China, 2011. The International Expert Consultation on "Building the CIARD Framework for Agricultural Research Data and Information Sharing" June 20-23 in Beijing. Launched the CIARD CN Chinese version website in IEC.

- Namibia (July 2011): Briefing of senior officers in the Directorate of Research and Training of the Ministry of Agriculture, Water and Forestry, on CIARD/AGRIS and IMARK initiatives, organized by FAO-RAF.
- China (October 25-27, 2011). CN jointly organized the Annual Conference of Chinese Agricultural Libraries Society (CALS) in Changsha, Hunan Province.
- Ghana (April 2012) FARA 2nd Annual Ministerial Dialogue
<http://www.slideshare.net/CIARD/2012-04-ciard-improving-productivity-through-access-to-knowledge-resourcespresentation-fara-english>
- USA (May 20102) AGNIC Conference.
- South Africa (2012) IAALD Africa Conference. <http://www.slideshare.net/CIARD/2012-05-ciard-paper-presented-for-iii-iaaldafrica-chapter-conference>
- China (May 8-10, 2012). The National Symposium of Agriculture Data/Information Sharing System Development in Hangzhou, Zhejiang Province.
- Peru (August 2012) VI FORAGRO International Meeting.
<http://www.slideshare.net/CIARD/2012-08-ciard-opening-access-vi-foragro-peru>
- Mexico (September 2012) G20 Meeting of Chief Agriculture Scientists.
<http://www.slideshare.net/CIARD/2012-09-ciard-using-information-to-power-innovation-macs-mexico>
- Uruguay (November 2012) GCARD-2. <http://www.slideshare.net/CIARD/2012-10-ciard-gcard2-uruguay>
- S Korea (March 2013) Expert Consultation on Knowledge and Capacity Needs for Sustainable Development in Post Rio+20 Era, Incheon.

CIARD Regional Workshops

- Regional Training Workshop on “Building National Capacities in Information and Knowledge in Support of Agricultural Research for Development in Near East Region”, May 2009.
- CIARD Africa Advocacy Consultation, FARA Secretariat, Accra & FARA-RAILS meeting on Opening Access to Agricultural information and Knowledge: Sharing Experiences of the National Agricultural Research Systems (NARS), July 2009, Ghana
- Workshop on ICT/ICM for National Agricultural Research Information Systems in Asia-Pacific Region & AgriDrupal Technical Workshop, September, 2010, Thailand
- Training Workshop on Coherence in Information for Agricultural Research for Development (CIARD) and Strengthening of RAIS in the SAARC Countries, May 2011, Bangladesh
- June 20-23, 2011 China. The International Expert Consultation on “Building the CIARD Framework for Agricultural Research Data and Information Sharing” in Beijing. Launched the CIARD CN Chinese version website in IEC.
- Workshop on Information and Communications Management for Agricultural Innovation in Southeast Asia, September 2011, Thailand.
- Moving Beyond Strategy to Improve Information and Knowledge Management for Agricultural Development in the Pacific Islands Countries and Territories, Fiji, 2011.
- International Workshop on Opening Pathways to Knowledge in Agricultural Innovation for Development. Brazil, 2011
- WANA Regional Training of Trainers Workshop on Coherence in Information for Agricultural Research for Development, 2011.
- Zambia (October 2011): "*Seminar on Opening Access to Agricultural Sciences and Technology Research*" at the Zambia Agricultural Research Institute (ZARI), organized by ZARI.
- Tanzania (December 2011): Briefing of the Director, Division of Research and Development and the Principal Agricultural Research Officer & Head, Information and Documentation Services at the Ministry of Agriculture, Food Security and Cooperatives, organized by FAO-RAF.

- Africa Regional Expert Consultation on Opening Access to Agricultural Information in Africa, June 2012, Ghana
- June 5-6, 2012. Training workshop on CIARD&CIARD.RING function and registration in Beijing for young and backbone staffs of agricultural institutions from zhejiang, jiangsu, Henan, Hebei, Shandong, Shanxi, Tianjin and Beijing.
- July 9-10, 2012. China. Training workshop of CIARD RING China and the National Agricultural Scientific Data Sharing Center service promotion meeting in Changchun, Jilin Province.
- October 20-22, 2012. China. Training workshop of CIARD RING China in Kunming, Yunnan Province.
- Expert Consultation on "Collective Actions for Opening Access to Agricultural Information and Knowledge in the Asia-Pacific Region" on December 2012, Bhutan

Communication of Activities: through dissemination of announcement message by email via various lists

- Launch and promotion of Survey on Researcher Attitudes, May 2011

Dissemination of Products: through dissemination of announcement message by email via various lists

- Launch of the CIARD Ring, November 2009
- Launch of the CIARD website (English, French and Spanish), May 2010
http://www.future-agricultures.org/other-news/1931-ciard-launches-new-website#.UWbNI_IY78E
- Launch of the CIARD website (Chinese), June 2011
- Launch of CIARD Virtual Fair, July 2011
- Dissemination of Paper on Researcher Attitudes, December 2011
- Dissemination of Issues Paper on CIARD Framework, May 2012
- Launch of CIARD Policy Brief, October 2012
- Launch of Advocacy Toolkit, October 2012

Other events where CIARD was presented –

- ICM Strategy Workshop – Eastern Africa, October 2010, Ghana
- Asia-Pacific Regional Forum for ICT Applications, May 2011, Thailand
- Ink4Dev Week West Africa, Uganda, November 2011
- Regional expert consultation the establishment of Consortium of Farmers Organizations for Agriculture Research for Development in West Asia-North Africa Region, January 2012, Egypt
- Regional Research4Life (AGORA - OARE-HINARI) Trainers Workshop, Morocco, April 2012
- Regional ICM/ICT expert consultation meeting on potential collaboration between FAO, IFAD and IDRC regarding KARIANET Network Evolution, Egypt, April 2012.
- Regional training workshop for Regional Agricultural Biotechnology Network (RABNENA), July 2012.
- Regional consultation meeting of the Coordinating Board of the Near East and North Africa Plant Genetic Resources Network (NENAPGRN), September 2012
- Regional training workshop for Near East Plant Protection Network (NEPP-NET), Egypt, November 2012.
- Expert Consultation on Knowledge and Capacity Needs for Sustainable Development in Post Rio+20 Era, South Korea, March 2013

Appendix 2. CIARD Partners registered on CIARD Main site (www.ciard.net)

- Agricultural Scientific Information & Documentation Center (ASIDC)
- AJOL (African Journals OnLine)
- Asia-Pacific Association of Agricultural Research Institutions (APAARI)
- Association of Agricultural Research Institutions in the Near East and North Africa (AARINENA)
- CAB International (CABI)
- Central Asia and the Caucasus Association of Agricultural Research Institutions
- Central Institute of Post Harvest Engineering and Technology
- Centre de coopération internationale en recherche agronomique pour le développement (CIRAD)
- Centre de Formation Professionnelle Horticole
- Centre d'Appui à l'Exploitation des Technologies de l'Information et de la Communication et au Développement (CAETIC Développement)
- Centre for Research Communications (CRC), University of Nottingham
- Centro Internacional de Agricultura Tropical (CIAT)
- China National Rice Research Institute
- Co-Capacity BV
- Consultative Group on International Agricultural Research (CGIAR)
- Cornell University Albert R. Mann Library
- Department for International Development, (DFID)
- Fap-UNIFESP (Fundação de Apoio à Universidade Federal de São Paulo)
- Food and Agriculture Organization of the UN (FAO)
- Forum for Agricultural Research in Africa (FARA)
- Forum for the Americas on Agricultural Research and Technology Development (FORAGRO)
- Georgian Institute for scientific and technical information (Techinformi)
- Ghana Agricultural Information Network Systems (GAINS)
- Global Forum for Rural Advisory Services (GFRAS)
- Global Forum on Agricultural Research (GFAR)
- Global Horticulture Initiative (GlobalHort)
- Guangxi Academy of Agricultural Sciences
- Guru Arjan Institute of Development Studies
- Haramaya University
- Harry Oppenheimer Okavango Research Centre (HOORC)
- Indian Agricultural Research Institute
- Institut National de la Recherche Agronomique (INRA)
- Institute of Forestry Policy and Information, Chinese Academy of Forestry (CAF)
- Institute of Intelligent Machines, Chinese Academy of Sciences
- Institute Techinformi
- Institution de la Recherche et de l'Enseignement Supérieur Agricoles (IRESA)
- Inter-American Institute for Cooperation in Agriculture (IICA)
- International Association of Agricultural Information Specialists (IAALD)
- International Network for the Availability of Scientific Publications (INASP)
- International Rice Research Institute (IRRI)
- International Water Management Institute (IWMI)
- Joseph Ayo Babalola University, Ikeji Arakeji
- Lab. of Chinese Agricultural Ontology Services (CAOS)
- Lund University Libraries
- Medicinal and Aromatic Plants Association of India
- Ministère des affaires étrangères, France (MAE)
- National Centre for Agricultural Economics and Policy Research
- Near East and North Africa Rural & Agricultural Knowledge and Information Network (NERAKIN)
- Sampada Foundation
- Tamil Nadu Agricultural University
- Technical Centre for Agriculture (CTA)
- Technology & Sustainability Research Institute (TSRI)
- The Livelihood School

Appendix 3: Top unique page views on www.ciard.net (January 2009-March 2013)

	Path	Name	Pageviews	Unique Pageviews
Home	/ and /home	Home	24,107	18,846
Products	/advocacytoolkit/	Advocacy toolkit	2,655	1,540
	/case-studies	Case studies	1,260	1,076
	/checklist	Checklist	1,300	1,089
	/ciard-brochure	Brochure	2,110	1,547
	/ciard-documents	Documents	1,095	888
	/ciard-manifesto	Manifesto	2,038	1,656
	/pathways/	Pathways	11,493	9,131
	/ciard-virtual-fair	Virtual Fair	4,429	2,443
Participation	/the-ciard-ring	The RING	1,095	915
	/partners/	Partners	3,084	2,097
	/partners-checklist/	How partners implement the checklist	1,780	1,352
	/partners-ring/	RING partners	1,366	1,153
	/register-partner	Register as partner	693	481
	/contact	Contact form	1,124	852
About	/global-ciard-community	Community main page	3,952	2,527
	/about-ciard-0	About CIARD	643	480
	/history	History	440	338
Updates	/harvested-news/	News from partners	2,203	1,955
	/updates	All updates (CIARD and partners)	1,405	1,081
	/news/	CIARD news	2,017	1,506
	/events/	CIARD events	872	729
	/expert-consultations	Expert consultations	474	309

Note: Pages not shown in this list have less than 100 visits.

Appendix 4: Top page views of Pathways on www.ciard.net (January 2009 – March 2013)

Path	Pageviews
/using-social-media-communicate-research-outputs	2334
/groups/	634
/develop-repository-digital-content	593
/using-video-communicate-research-outputs	485
/making-websites-content-visible-web	452
/repository-development-case-study-narims-national-agriculture-research-information-management-system	434
/repository-development-case-study-e-lis-e-prints-library-and-information-science	423
/using-web2-solutions	376
/advocate-benefits-digital-accessibility-content	370
/preservation-digital-documents-and-data	346
/analyse-how-your-websites-are-being-used-put-knowledge-use	318
/put-place-institutional-policies-enable-sustainable-development-repository	315
/maintaining-web-links-and-managing-broken-links	314
/list	311
/disseminating-research-outputs-international-databases	296
/repository-development-case-study-new-challenge-agricultural-knowledge-repository-thailand	281
/work-publishers-who-have-flexible-policies-open-access	196
/license-content-encourage-use-and-re-use	163
/set-added-value-services-query-across-platforms	157
/digitize-older-outputs-be-born-again-digital	138
/repository-development-case-study-way-wageningen-yield-repository-wageningen-university-and-research	117
/publish-and-promote-outputs-newsfeeds	114
/disseminating-research-outputs—international-research-collections-and-databases	63

Appendix 5: National Case Studies - Summary of key findings

1. *Institutional, network and national policy and information management strategy development.* The Case Studies indicate that where policy frameworks at whatever level are weak, progress is inhibited. They also show the difficulty of obtaining formal approval for policies. At every level, from the individual up to the nation, strategy and policy definition provides a framework within which organizations and researchers are able to operate. Strategy and policy should be embedded within networks and organizations, that is, they should be developed, understood, and agreed by all stakeholders if they are to prove fruitful. This 'embedding' can also help to address barriers between Senior and Middle management which were often noted in the Case Studies.
2. *Advocacy* aimed specifically at senior management and policy makers is an ongoing necessity. The benefits of openness and interoperability within an organization and beyond are sometimes difficult to communicate in information environments where the opposite has existed for many years. The Case Studies indicate that there is still cautiousness and concern about openness, Open Access, and particularly IPR (copyright and licensing), at all levels.
3. *Sustainability* of resources, skills and organizational commitment is an important issue. The GAINS study showed that a lack of direction and resourcing (business planning) can impact negatively on the long term health of a network. Sustainability is multi-faceted in this context, involving strategic, financial, organizational, capacity and infrastructural factors. In a project-funded environment (with revenue and other resource streams having a fixed term) there will always be the possibility that the support of resources will end - sustainability is not guaranteed.
4. The Case Studies also present more detailed issues related to *technical capacity and information management*. Activities such as digital repository development, the use of international standards, interoperability of data, and so on, all presented some challenges. But with significant capacity-building support and back-stopping (in these cases mostly from FAO, GFAR and Regional Forums) progress in the national systems has generally been good in creating the necessary infrastructure and skills to manage the information management systems while working with the negative effects of factors such as slow internet speeds.
5. *Linking research, rural advisory services and farmers* (whether through repackaging, communication and/or innovation systems, or all of them) is another major theme. Although all the Case Studies indicate a certain level of capability and success in achieving this sort of integration, it seems that this is also a potential area of activity and one that is identified as requiring further focus/attention.
6. Concerns are expressed in the case studies in relation to organizational cultures and behaviours which form barriers to effective progress toward greater openness for information and knowledge. This is a significant barrier for all countries, developing or not, and can only be addressed through advocacy, experience, and policy development.

Appendix 6: Study on Researcher Attitudes and Behaviour Towards the 'Openness' of Research Outputs in Agriculture and Related Fields (summary of the main findings)

During 2010 the CGIAR held a series of events, workshops, and focus group discussions, to investigate the motivations of researchers and research managers in communicating their research. In particular one was held during the 5th African Agriculture Science Week and FARA General Assembly, held in Burkina Faso in July 2010. The discussion was attended by more than 50 research communication specialists and research managers. The outputs of this meeting were used to develop an online global survey of researchers in agriculture and related fields which was carried out in March 2011 by the CGIAR, FAO and GFAR on behalf of the CIARD Movement. The full results can be found at: <http://tiny.cc/31n3vw>

The survey was spread globally, though with a significant concentration in Latin America (53%). It was predominantly male, and the majority were based either in national research institutes (37.5%) or university/educational institutions (>30%). A small but significant group was working with extension and advisory services (4.5%). A large proportion indicated their involvement in research (79.7%), with education and training also heavily represented (54.8%). Extension and advisory activities were also significant at 31.6%.

Effective communication of research outputs was rated highly by the respondents, with the most important targets being peers at NRIs, farmers and producers, and academic groups such as students and lecturers (see Figure 6 of the paper). The drivers for research communication are complex, though the most highly rated are shown to be institutional demands and commitments, and opportunities for career enhancement (Figure 7 of the paper).

The most important benefits of communication for the researchers tended to be altruistic, e.g. contributing to science and reaching important target audiences (Figure 8). Many factors were perceived to be acting as barriers to communication, in particular the lack of resource/support, the lack of funding, and poor access to end users (Figures 9 and 10). The researchers rated highly the need for support and training to increase effectiveness in communication, with the most highly scored being 'training in Web2.0 activities' and in 'participatory research methods' (Figure 11 of the paper).

The respondents saw journals and conferences, still, as the preeminent ways to communicate their research outputs (both at c.75%), with activities in virtual communication rated much lower but still significant at: social media (18.3%), e-newsletters (16.8%) and repository/websites (28.9%) (Figure 12). As authors, the respondents are still using predominantly print-based formats for communication through traditional routes, such as books and journals, but digital formats have now penetrated into all types of activity to varying degrees (Figures 13 and 14). Finally, the results suggest that the respondents are communicating the majority of their outputs through openly accessible, no-cost routes (Figure 15).

This analysis indicates that, although researchers are driven by many different and interacting motivations, institutional/organizational factors are important and have much influence over individual behaviour. Making a research output freely and openly available will often be in the hands of the individual, and many will act in this way. However, for many others, there are barriers to this, such as the lack of required resources and of institutional policies to drive these activities. Institutional/organizational behaviour can be changed by the development of relevant strategic and policy frameworks. In most cases individual behaviour will be significantly affected by organizational policies.

Appendix 7: CIARD Framework for Action - Priorities identified in 2011 and 2012

<u>2011 – Global Consultations</u>	2012 - GCARD2 (High priority actions in grey)
<u>CHAMPIONING CHANGE IN POLICY AND PRACTICE</u>	INVESTMENT IN POLICIES AND COHERENT APPROACHES
<u>Action Area 7 - Advocacy and Evidence</u> Advocacy initiatives at global and regional levels, especially regarding interoperability, need to be documented and a tailored advocacy toolkit should be developed through collaborative stakeholder action. Case-study evidence, including possible cost-benefit analyses of sharing and interoperability, would strengthen the case for increased data and information sharing. It is possible that evidence exists for outcomes that have impacted economic, social or environmental circumstances. These need to be documented and shared. Use should also be made of high-level events, such as GCARD (Global Conference on Agricultural Research for Development) in October 2012, to advocate data exchange and interoperability among senior decision-makers. Traditional donors and other potential investors should also become informed.	<u>Principal global/regional actions.</u> Collaborative development of particular elements of Advocacy Toolkit: <ul style="list-style-type: none"> • Develop standard methodologies and indicators for measuring the outcomes of enhancing access information and data • Develop case studies on economic, social, and environmental benefits of investment in ICM for global/inter-regional sharing (framework, methods, capacities/skills) <u>Principal national/local actions:</u> <ul style="list-style-type: none"> • Identify actors to lead advocacy from amongst researchers/managers, ICM managers, youth • Advocate for (a) revised policies at various levels, and (b) investment in capacity (see next items)
<u>INSTITUTIONAL AND ORGANIZATIONAL ASPECTS</u>	ORGANIZATIONAL CAPACITIES
<u>Action Area 3 - Policies, Strategies and Institutional Structures:</u> CIARD partners should continue promoting the CIARD manifesto for increased access to information and greater sharing. A review should be undertaken in support of national initiatives on: 1. Policies on access to public goods and copyrights; 2. Incentives and benefits of sharing data and information. International agreements and generic guidelines for policy design should be developed. Organizations should be encouraged to enact legislation that encourages open access to information and interoperability, and information sharing should be embedded in organizational systems and processes. In addition to making explicit the benefits from sharing data and information, with due consideration given to Creative Commons licensing, organizational copyright and IPR statements should be developed and made public.	<u>Principal global/regional actions:</u> <ul style="list-style-type: none"> • Develop a template for institutional policy/ies on opening/open access (e.g. World Bank, CGIAR, USDA) <u>Principal national/local actions:</u> <ul style="list-style-type: none"> • Develop enabling strategies and policies for more effective access and use of information and data with leadership by senior management and policymakers, ideally supported by locally-relevant evidence of impact • Strengthen institutional ICM capacities, including having a senior manager in charge of knowledge and information • Maintain profiles/needs of users of all types/levels • Modify reward systems for researchers' communication of their outputs (e.g. journals with wide readership as well as high impact factor) • Allocate resources (funding and staff time) to producing information in a variety of formats tailored to different audiences
<u>Action Area 4 - Development of Skills and Competencies:</u> Training needs require to be assessed	<u>Principal national/local actions:</u>

<p>at various levels and training programmes should be designed and implemented to improve better data and information sharing. All modern methods, including e-learning, should be employed in a coordinated effort among CIARD partners. Coordination should take place from the international level to the local level, making sure that the five steps listed in Box 2 are adhered to. Current platforms offering guidance to the CIARD community, including AIMS and IMARK (Information Management Resource Kit), should continue to be supported, and links should be forged among them.</p>	<ul style="list-style-type: none"> • Raise awareness of and train senior management and policy-makers on ICM • Using a variety of formats (including e-learning and communities of practice), train professional staff in effective ICM, adaptation of science outputs, and ICM project planning, monitoring and evaluation
<p><u>Action Area 5 - Appropriate Organizational Structures and Work Practices:</u> Adequate investment has to be made in computer hardware and software. In addition, skills and content should be developed in order to improve practices in data and information sharing. This is best accomplished by setting out and adhering to a series of norms, standards, rules and regulatory mechanisms within the setting of appropriate organizational structures.</p>	<p><i>[Not discussed at GCARD]</i></p>
<p><u>Action Area 6 - Global Improvement of Data and Information Flows:</u> Once the framework is designed, it should be used by the agricultural research and development community to improve data and information flows. This should take place at local, national, regional and global levels, realizing that organizations will be at various stages of development and will consequently have to adapt according to circumstance. There will be no single ideal approach to data and information sharing; flexibility and adaptability will have to be built into any system. Many organizations in the public domain, including the CGIAR (Consultative Group on International Agricultural Research), FAO and GFAR (Global Forum on Agricultural Research), will play a leading role in improving flows of data and information in important areas such as germplasm, agronomy and climate change.</p>	<p><u>General action for all stakeholders:</u></p> <ul style="list-style-type: none"> • Continue to engage with the CIARD movement to enhance the coherence and effectiveness of access and use of agricultural information and data.
<p><u>TECHNICAL ISSUES AND TECHNOLOGIES</u></p>	<p><u>TECHNICAL ISSUES AND TECHNOLOGIES</u></p>
<p><u>Action Area 1 - Services, Tools and Infrastructure:</u> CIARD partners need to engage more content providers so that the CIARD-RING becomes more comprehensive and the registries for agricultural information become easier to use. The user community should be able to add information on the quality and usefulness of information. If a 'Tools-Wiki' were to be set up on the web, it would allow less well endowed partners to contribute. The tools would include those most commonly needed by content providers. The CIARD community should also be able to provide plug-ins, customized versions of useful software and prototypes for information-sharing platforms in a variety of languages. The utility and value of cloud services could be assessed through</p>	

a survey of the CIARD community.	
<p><u>Action Area 2 - Standards and Systems Architecture</u></p> <p>Standards and systems architecture should be approached collaboratively, building on existing platforms such as AIMS (Agricultural Information Management Standards). Collaboration among the international community should endorse open standards for protocols, ontologies and vocabularies that are used across a wide range of domains. Descriptive templates need to be developed or adapted for high-priority information, and recommendations should be formulated for:</p> <ol style="list-style-type: none"> 1. Metadata; to describe datasets. 2. Data packaging and documentation formats. 3. An automatic tagging/indexing service. <p>Non-technical guidelines are also needed for producing LOD with an associated system of mapped vocabularies to enable better classification and organization of data and information. Automatic translation services are also needed. Other key requirements relate to digital conservation of data and information, and quality of data and information provided.</p>	