

# Agricultural Information Worldwide

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## **Agricultural Information Worldwide:**

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# — Agricultural Information Worldwide —

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Deputy editor: Barbara Hutchinson  
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# From the Editor's Desk

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**T**his issue of *Agricultural Information Worldwide* focuses on the growing concern of information professionals to make sure that information and knowledge are as widely accessible as possible.

Traditionally, many information specialists have seen their role as helping to identify and bring relevant information into an organization or community, providing information services to distinct groups.

With the emergence of the Internet and other new forms of communication, these same specialists are more and more called on to maximize the visibility and access of the knowledge produced by their organization or community. This calls for new mindsets and new toolkits, and offer new opportunities to put public knowledge and information to work.

This issue brings together a range of contributions on this emerging 'accessibility' agenda.

Peter Ballantyne's paper explores a range of agricultural information and knowledge sharing opportunities, including open access and the wider accessibility agenda.

In recent years, international agricultural research institutes forming the Consultative Group on International Agricultural Research (CGIAR) have started to pay more systematic attention to the impact of their research outputs, especially peer-reviewed journals and the like.

The contributions by Meena Arivananthan et al and Edith Hesse et al (in Spanish) both report on recent efforts to assess or benchmark the availability, accessibility and applicability of the various outputs produced by some CGIAR centers. They report wide differences between Centers and among different types of outputs. The paper by Chris Addison and Luz Marina Alvaré, also of the CGIAR, shows how the visibility and marketing of a specific research output can benefit from the use of new

social media like Twitter, blogs, and video.

A longer-standing project is AGRIS, facilitated by FAO as a global database providing access to agricultural information. Angela Fogarolli et al explain how such a bibliographic resource is being turned into a 'semantic data service' that cleverly links related content.

In Sophie Treinen's paper, we move beyond databases into the realm of communities and networks and how communication and information exchange among researchers and extension workers can be enhanced through a 'VERCON' (Virtual Extension and Research Communication Network).

The last article dives into the very new, and explosive, world of mobile devices and phones that is transforming the lives and livelihoods of farming communities worldwide. Pete Cranston and Kevin Painting report on discussions at a recent meeting on mobile devices where experts examined the potential applications and impact of the mobile revolution in agriculture.

Many of these ideas and approaches have been promoted and pioneered by IAALD and other partners in the CIARD (Coherence in Information for Agricultural Research for Development). Find more information at [www.ciard.net](http://www.ciard.net).

We conclude by mentioning that this issue is also a first for IAALD — it is the first one published only in digital form on our new open access platform. We hope this will increase the accessibility of the articles published — that they will reach a wider audience. We hope it will also make it more economically feasible for IAALD to continue publishing a professional journal of this type.

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# Agricultural Information and Knowledge Sharing: Promising Opportunities for Agricultural Information Specialists

Peter Ballantyne

*NOTE:* Originally presented at the XV Meeting of the Inter-American Association of Agricultural Librarians and Information Specialists (RIBDA), Lima, Peru, October 27–29, 2009

**ABSTRACT:** The recent food crisis has pushed agriculture and food security back on to national and development agenda's. Additional international funds have been mobilized, national and regional initiatives have been strengthened, and a wide range of new and innovative instruments and approaches have been promised. Most of these efforts call for greater investment in knowledge creation, information access, and the wider use of information and communication technologies (ICTs).

This paper explores what this renewed interest might mean for information and communication specialists working in agriculture. Starting from an 'innovation systems' perspective, it highlights some promising opportunities for information and communication specialists. These include: working with farmer knowledge, using information and communication technologies (ICTs) to enable agricultural development activities, ensuring that public investments result in public goods whose benefits can travel, making agricultural content open and accessible, using the power of the 'social' web, and transforming the roles of library and information centers.

**RÉSUMÉ:** La récente crise alimentaire a remis l'agriculture et la sécurité alimentaire sur les programmes nationaux et de développement. Des fonds internationaux supplémentaires ont été mobilisés, des initiatives nationales et régionales ont été renforcées, et une grande variété d'instruments et d'approches nouveaux et innovateurs a été promise. La plupart de ces efforts demande un plus grand investissement pour la création de connaissance, l'accès à l'information, et un usage plus large des technologies d'information et de communication (TICs).

## Opportunity 1: Agricultural Innovation Systems

According to Hall (2006), an innovation systems perspective recognizes that the determinants of innovation, as a process of generating, accessing and putting knowledge into use, are the interactions of different people and their ideas, and the social setting of these interactions.

This is different to earlier linear thinking that saw research institutes as the creators of knowledge and technology, extension as the diffusers of advice, and farmers as the adopters of new practices. Innovation systems recognize that the relations among people and organizations are the key to knowledge sharing and application. "Innovation processes can be enhanced by creating more possibilities for actors to interact" (Waters-Bayer et al., 2006).

Cet article explore ce que cet intérêt renouvelé pourrait signifier pour les spécialistes de l'information et de la communication, qui travaillent dans l'agriculture. Commencant par la perspective «systèmes d'innovation», il souligne quelques occasions prometteuses pour ces spécialistes. Parmi celles-ci: travailler avec la connaissance des agriculteurs; utiliser les technologies d'information et de communication (TICs) pour permettre le développement d'activités agricoles; s'assurer que les investissements publics aboutissent à des biens publics dont les bénéficiaires peuvent voyager, rendre le contenu agricole ouvert et accessible; utiliser le pouvoir de la toile «sociale», et transformer les rôles des bibliothèques et des centres d'information.

**RESUMEN:** La actual crisis alimentaria ha reinstalado la agricultura y la seguridad alimentaria en las agendas nacionales y de desarrollo. Se han movilizado recursos internacionales adicionales, se han reforzado las iniciativas nacionales y regionales y se han propuesto una serie de instrumentos y enfoques nuevos e innovadores. La mayoría de estos esfuerzos requieren de mayor inversión en la generación de conocimientos, el acceso a información y el uso más amplio de tecnologías de información y comunicación (TIC).

Este artículo explora lo que este renovado interés podría implicar para los especialistas en información y comunicación agraria. Partiendo de la base de una perspectiva de "sistemas de innovación", se destacan algunas oportunidades promisorias para los especialistas en información y comunicación. Estas incluyen: aprovechar los conocimientos de los agricultores, emplear tecnologías de la información y comunicación (TIC) para fomentar actividades de desarrollo agrícola, asegurar que las inversiones públicas generen bienes públicos cuyos beneficios puedan desplazarse, permitiendo que los contenidos agrícolas sean abiertos y accesibles, aprovechado el poder de la web 'social' y transformando el papel de las bibliotecas y centros de información.

The 'collective' aspect of this thinking is emphasized in a report promoted by the FORAGRO Technical Secretariat at IICA IICA (Salles-Filho, 2007): "Overcoming the linear view of the innovation process has led to an understanding that innovation is an entirely collective process, because: (i) it involves different actors with different perspectives; (ii) it looks at a common objective with different concepts, tools and perspectives; (iii) it requires a division of work; (iv) it requires the distribution of property rights; v) it has economies of scale and scope; (vi) it requires coordination."

Kristjanson and colleagues (2009) applied such an innovation framework to livestock research projects in Africa and Asia. They concluded that 'linking knowledge to action' can be improved by attending to 7 principles, including: "combining different kinds of knowledge,

learning and bridging approaches, strong and diverse partnerships that level the playing field, and building capacity to innovate and communicate.”

What does this mean for information and communication management in agriculture? The CGIAR Science Council (2005) suggests that “all actors in the R&D process—from research design through to those who will apply the outcomes in the field—should communicate with each other and should have equal access to knowledge.” We need inclusive, participatory approaches to knowledge-sharing.

This knowledge has to be mobilized from a diverse set of sources. It is not sufficient, for example, that research institutes only access each others’ reports. They must tap into many other information flows, including farmers, and find ways to document and provide access to this knowledge. They must design information products and services for more diverse audiences. They must devise different, collaborative, interactive ways to share and exchange information.

There are opportunities here for new ‘communicators’ who are skilled at supporting collaboration and interactive processes that involve different types of stakeholders, and can help people harvest and share different kinds of knowledge.

There are also opportunities to contribute to ‘user generated innovation’—where specialist skills will help make the innovation systems work.

### **Opportunity 2: Connecting to Farmer Knowledge**

Ann Water-Bayer (2006) and colleagues from the PROLINNOVA project argue that farmers and local communities are key actors in agricultural innovation systems—“the type of innovation that ultimately makes the difference is what farmers decide to do.” However researchers tend to under-value the indigenous knowledge of farmers. Farmers and outside advisers tend to see farmers “as receivers of technologies, information and instructions, instead of people who have something to offer.”

PROLINNOVA therefore promotes participatory innovation development with farmers, by encouraging ‘farmer-led experimentation’ and the integration of farming communities into innovation systems. The idea is to foster knowledge sharing among farmers and other innovation actors, encouraging farmers to compare and share their experiences and to more critically experiment. They also support ‘Farmer Led Documentation’ in which rural communities express their own knowledge, experiences and practices in their own words—often using a mix of traditional and modern media: text, drawings, photography, video and audio recordings.<sup>1</sup>

There are many initiatives like this—Bioversity International<sup>2</sup> works with local communities looking at how their traditional knowledge is documented, while IFAD

and FAO support a ‘Linking Local Learners’ project<sup>3</sup> in East Africa where groups of farmers learn together, exchanging ‘know-how’ and organizing their own knowledge networks and sharing. The ICT for development community looks at these issues as part of a concern for ‘local content’ on the Internet.<sup>4</sup>

A really interesting aspect is the experimentation taking place with different knowledge sharing formats, from drawings to the Internet, and from databases to participatory video.<sup>5</sup>

There is an opportunity here for information specialists to explore ways to connect their activities into the existing rural and farmer knowledge systems. How do we support their autonomous exchanges? How do we help bring this into the mainstream of agricultural science and development?

We also need to recognize that valuing the knowledge of farmers poses significant challenges to traditional research and extension ‘experts’ and information professionals. Our new role is perhaps more about catalyzing communication and knowledge sharing among farmers and other groups than it is to bring modern technology and knowledge to backward communities.

### **Opportunity 3: ICTs for Rural Communities and Livelihoods**

We are seeing a transformation in the ways that rural communities interact with information, ICTs, mobile phones and the delivery of services. It is an enormous challenge to keep up with all the developments.<sup>6</sup>

One major driver of change is the increasing use of information and communication technologies (ICTs)—including mobile phones—to link farmers and producers to markets and credit as well as government services. Increasingly, farmers can receive timely information on markets, prices, and weather as well as technical advice; these services often draw in experts to answer questions.<sup>7</sup> Farmers, researchers and extension workers are also coming together through various ICT-based systems and portals.

In 2006, information and communication specialists working in agriculture met online ([www.dgroups.org/groups/inars](http://www.dgroups.org/groups/inars)) to explore different dimensions of this revolution, exchanging experiences on “knowledge management and sharing in agriculture”. Some key points arising were:

- ‘Ordinary communication’ is as important as more sophisticated ‘knowledge sharing.’ Mobile phones are widely used because they satisfy ordinary communications needs.
- Local service providers and telecenter operators play an important role in mediating communications between rural communities and information providers. Extension systems need to also transform themselves to make effective use of new ICTs.

- The Internet is no replacement for traditional information sources for farmers. Best results come from a mix of media such as phones, radio, television, computer based information kiosks, computers, video and digital cameras and through the Internet, the web and e-mail services.
- Farmers have information and communication needs beyond those related to agriculture. We need to look holistically at rural community needs for information exchange and sharing.
- To successfully use ICTs to support farmers and rural communities, the first step is to empower farming communities to define their own needs.

Using ICTs at the interface between farmers, extension and research is one area where we can observe much experimentation and innovation.

Francisco Proenza<sup>8</sup> has brought together a number of interesting reports and project material from Latin America and Asia. In terms of projects, VERCON in Egypt<sup>9</sup> uses the Internet to strengthen research-extension linkages so that agricultural advisory services to farmers can be improved. The Open Academy for Philippine Agriculture has set up the Pinoy Farmers' Internet<sup>10</sup> as the country's first Internet-based extension support system. Something similar is also being developed in the USA<sup>11</sup> where a National eXtension Initiative is developing an interactive learning environment that will deliver knowledge and "connect knowledge consumers with knowledge providers."

Another promising area associates the use of ICTs with the availability of credit and financial services in rural communities.

In the Philippines, e-commerce provider b2bpricenow.com<sup>12</sup> established an 'E-commerce for farmers program' comprising an e-marketplace where agricultural commodities can be bought and sold online, local 'b2b' (business-to-business) centers in rural areas, and mobile commerce to help cooperatives and farmers move money around. In India, a 'Lifelong Learning for Farmers'<sup>13</sup> project brings together community associations in rural villages, ICT 'kiosk' operators, an IT company, agricultural universities, and the State Bank of India. The project combines access to information, learning, and credit opportunities, seeking to improve local livelihoods by enhancing capacities (knowledge and skills), providing affordable credit, and generating employment.

Countries like India are experimenting on a large scale with rural telecenters that provide a wide range of services—both from the government and the private sector. In Africa and Latin America, there are also active telecenter movements.<sup>14</sup> A growth area is the use of ICTs to improve agricultural markets, marketing systems and commodity exchanges.<sup>15</sup> By making, particularly, price information available to farmers they can be empowered to make better decisions—and earn better returns on their produce.

In 2008 and 2009, we are seeing massive interest and increasing investments in the use of mobile phones to support farmers with information.

While it is challenging to keep up with all these developments, they offer a fast-growing set of opportunities for information specialists. In particular, there is scope to reach new markets and customers with our information and content (it probably needs to be adapted). New services that draw on different types of content and technology carriers will emerge. Since, as we know, information does not flow on its own, new roles as catalysts, facilitators and brokers of information and knowledge are emerging. While the innovators and business people in these projects often have strong technological and business capacities, there is a great need for people with skills in accessing, organizing, and packaging content of all kinds.

#### Opportunity 4: Public Goods

There is an ongoing international debate on the 'public good' nature of research, and the steps needed to achieve this. This discussion on the positioning of research vis-à-vis other development activities is also important for the information and communication agenda.<sup>16</sup>

Research institutes traditionally produce a variety of 'goods,' typically new knowledge and technology for others to use. Depending how a research activity is sponsored and designed, these outputs may or may not be a 'public good'—in that the output is non-excludable<sup>17</sup> (when provided for one person, it is provided for all) and non-rival (one person's consumption does not diminish its consumption by any other person).

The CGIAR is particularly active in these discussions.<sup>18</sup> A recent document (CGIAR, 2006) sets out the arguments why the CGIAR should pursue international public goods, defined by Ryan (2006) as:

International public goods are taken to mean research outputs of knowledge and technology generated through strategic and applied research that are applicable and readily accessible internationally to address generic issues and challenges consistent with CGIAR goals.

The key is the ready international applicability and accessibility as essential features of public knowledge and technology outputs. In the same report, Pardey argues that "most research products are not intrinsically public." They "can be made more or less public (or not) through policy and practical actions" (CGIAR, 2006).

This last point is very important. It suggests that information and knowledge are not born 'public.' We must work on them to make them public, i.e., that they are available, accessible, and applicable.

The way that a research output is made accessible thus helps to determine whether it will become a public good. A classic example is where public research outputs are disseminated in limited-access scientific journals that exclude some users, or where outputs are only available



on web sites that are not accessible to people with low bandwidth. This logic also applies to outputs in one language only, written in a 'scientific' style, published in a proprietary format or with restricted intellectual property licenses. These all result from choices we make, or are forced to make. No matter what the policies say, these practical choices will shape whether or not a good is a public good or not.

To make data, information and knowledge public, we need to manage them so they are created and deposited in formats and systems that allow perpetual access; are licensed to allow and encourage widespread use; are described and indexed to allow easy finding and dissemination; and are optimized to encourage widespread adoption.

These tasks are what most information specialists already do. The opportunity now is that we can anchor these tasks in the heart of policy debates happening in science and agricultural research policy. We can show a scientist or research leader exactly how his or her work can become a public good... by investing in our work!

In 2008, these challenges were taken up by a new effort—the Coherence in Information for Agricultural Research for Development (CIARD) initiative.<sup>19</sup> Facilitated by FAO, the multi-agency group has agreed a manifesto “to make public domain agricultural research information and knowledge truly accessible to all.” It is working on a set of ‘pathways’ that individuals and organizations can use to make their information more accessible.

## Opportunity 5: The Social Web

One key feature of the innovation systems perspective is that many actors are involved. It follows that many different sources, types and forms of knowledge and information need to be circulated, communicated and aggregated to support ‘new-style’ agricultural research and innovation for development.

We can see similar trends on the Internet. Ten to fifteen years ago, few organizations had a website. Their libraries held collections of paper documents indexed in electronic catalogues. Researchers, policy makers and practitioners communicated by letter, fax and perhaps by e-mail, and sometimes met face-to-face. ‘Content’ was mainly text-based, and shared through printed reports, press releases and newsletters. Producing, publishing and disseminating content were expensive, and much was priced to recover costs. Communities communicated through networks and associations that offered well-defined meeting spaces (conferences) and exchange mechanisms (newsletters and journals).

Today, this information flows in different ways. The collections of information, in electronic as well as paper form, are still there. There is also online access to library and other databases, and many organizations publish full text reports and documents on their websites, without charge. Communities have become virtual networks

and e-communities. More and more people seem to have at least one email address, every organization has its own website, and publishes a variety of digital content—audio, visual and text-based. It is becoming technically more and more easy for an organization, group or individual to publish and disseminate digital content.

We also see more and more use of ‘social’ media or ‘web 2.0’ applications such as blogs, wikis, RSS, and social networking.<sup>20</sup> Like innovation systems, this ‘social’ web 2.0 offers a range of opportunities for participatory knowledge-sharing, where the knowledge is sourced from many people. It can act as a catalyst for people to interact and for knowledge-sharing and communication to flourish.

The changes are widespread. Blogs<sup>21</sup> are appearing, organizations are making content available as RSS feeds<sup>22</sup>—and more and more are publishing such feeds from partners on their own web sites.<sup>23</sup> We also see the emergence of completely new approaches powered by these new media: In the USA and the Philippines, ‘e-extension’ connects farmers with science and advice.<sup>24</sup>

What does it mean for agricultural information specialists? These media undoubtedly offer many opportunities. They can help get messages out, they can help bring messages in, they enrich our knowledge base, they speed up communication and the spread of ideas, they can be used within organizations to reinforce knowledge sharing and information exchange, and they can be good ways to work collaboratively. They can also be demanding, difficult to ‘control’ and they require that we learn a new toolset and have a different mindset.

In a recent book, Charlie Leadbetter (2008) summed up the changes very well:

The spread of the web invites us to look at the future from a different vantage point, to see that what we share is at least as important as what we own; what we hold in common is as important as what we keep for ourselves; what we choose to give away may matter more than what we charge for. In the economy of things you are identified by what you own: your land, house, car. In the economy of ideas that the web is creating, you are what you share ... The biggest change the web will have on us is to allow us to share with one another in new ways and particularly to share ideas.

## Opportunity 6: Rethinking Future Roles for Libraries

What do some of these developments mean for traditional information management practitioners such as libraries?

In January 2009, a session on the future of agricultural libraries was held at the ‘Knowledge Share Fair for Agricultural Development and Food Security’. Participants reflected on the future roles and added value of agricultural libraries.<sup>25</sup>

Key points highlighted in the discussions included:

- Future libraries will play a wider range of roles. They will be more active in opening access to information and knowledge, in disseminating — not just collecting and documenting) global goods, in catalyzing knowledge sharing among people, in providing integrated platforms for information and knowledge management, and in providing a range of targeted services and products.
- Future libraries will be more and more ‘e-libraries’, providing access to current and archival knowledge in a wide range of digital formats.
- Future libraries will increasingly be places to exchange and interact, they will manage and facilitate processes of organizing and sharing and collaborating.
- Future libraries will be part of wider information and knowledge exchange systems in which ‘users’ will increasingly become ‘collaborators’ and librarians will become knowledge sharing catalysts and brokers.

These changes are likely to require substantial re-positioning of traditional information centers — away from mainly ‘collecting’ roles towards more ‘connecting’ ones. Such libraries will need to add skills from knowledge management, social media, participatory communication, and information technology to their existing core focus on agricultural content.

## Postscript

Like in innovation systems, this paper is a personal collection of areas where agricultural information and communication managers may find opportunities.

The choice of topics reflects changes I see in the agricultural information and communication ‘business’ — as new actors join and as technologies transform processes, products, services, and expectations. ‘Business as usual’ is likely to become the exception rather than the norm.

In the past, information and knowledge management in agriculture was rather linear, with processes managed by specialists. Tomorrow’s harvests will come from more organic approaches where agricultural innovators will join us as active creators and managers of information and knowledge, and information managers will become innovators and brokers. Such ‘infovation’ is already happening around us: Researchers become bloggers, scientists publish websites, farmers form learning networks, extension workers build wiki’s, and librarians become film-makers. We can be at the heart of these developments, creating new opportunities — and sharing them with our colleagues.

One route I have used to track and benefit from such opportunities is the professional association. Groups like IAALD provide spaces and networks to meet, connect, share experiences, and especially to better understand how to realize the benefits of these opportunities. They are opportunity number 7.

## Notes

1. See [www.prolinnova.net/fld.php](http://www.prolinnova.net/fld.php)
2. See [www.biodiversityinternational.org/Themes/Communities and Livelihoods](http://www.biodiversityinternational.org/Themes/Communities_and_Livelihoods)
3. See [www.linkinglearners.net/](http://www.linkinglearners.net/)
4. See <http://communitycontent.maneno.org/> and: Ballantyne, P.G. 2002. ‘Collecting and propagating local development content’. The Hague: IICD. [www.iicd.org/articles/IICDnews.import1878](http://www.iicd.org/articles/IICDnews.import1878)
5. See the work of Paul Van Mele at WARDA: [www.warda.org/warda/newsrel-videopower-jun09.asp](http://www.warda.org/warda/newsrel-videopower-jun09.asp) / <http://iaald.blogspot.com/search/label/warda>
6. Franz Martin from FAO tracks many interesting developments in Latin America and The Caribbean on the IAALD blog: see [http://iaald.blogspot.com/search/label/latin\\_america](http://iaald.blogspot.com/search/label/latin_america)
7. There are many places to find information. FAO facilitates a global platform — <http://www.e-agriculture.org/>. E-ForAll documents efforts to use ICTs to empower the rural poor — [www.e-forall.org](http://www.e-forall.org). FAO’s ‘Bridging the Rural Digital Divide’ web site has cases and good practice — [www.fao.org/rdd/](http://www.fao.org/rdd/). The i4donline web site has news on ICTs in agriculture — [www.i4donline.net/news/news.asp?catid=1](http://www.i4donline.net/news/news.asp?catid=1)
8. See: [www.e-forall.org](http://www.e-forall.org)
9. See: [www.vercon.sci.eg/Vercon\\_en/vercon.asp](http://www.vercon.sci.eg/Vercon_en/vercon.asp)
10. See: [www.openacademy.ph](http://www.openacademy.ph)
11. See: <http://about.extension.org>
12. See: [www.b2bpricenow.com](http://www.b2bpricenow.com)
13. See: [www.col.org/L3Farmers](http://www.col.org/L3Farmers)
14. See [www.telecentre.org](http://www.telecentre.org) for information and updates from around the globe.
15. A national governmental example is <http://dacnet.nic.in/>; a private example is [www.kacekenya.com](http://www.kacekenya.com); regional examples are [www.esoko.com/](http://www.esoko.com/) and [www.wa-agritrade.net/](http://www.wa-agritrade.net/). The ‘ICT Update’ newsletter of CTA reports on developments worldwide — <http://ictupdate.cta.int/>. See also <http://iaald.blogspot.com/search/label/markets> and <http://iaald.blogspot.com/search/label/phones> for more resources.
16. The section draws on work commissioned by the CGIAR ICT-KM Program. See: Ballantyne, P.G. 2008. Making CGIAR Research Outputs Available and Accessible as IPGs. Paper for CGIAR Agricultural Research Public Goods Workshop, Maputo, Mozambique, 27 November. [www.sciencecouncil.cgiar.org/fileadmin/user\\_upload/sciencecouncil/EVENTS/AGMo8IPG\\_WRKS\\_HOP/BallantyneW.ipg4sciencecouncil.pdf](http://www.sciencecouncil.cgiar.org/fileadmin/user_upload/sciencecouncil/EVENTS/AGMo8IPG_WRKS_HOP/BallantyneW.ipg4sciencecouncil.pdf)
17. See [http://en.wikipedia.org/wiki/Public\\_good](http://en.wikipedia.org/wiki/Public_good) for further elaboration of the terms.
18. See the CGIAR ICT-KM Program ‘triple-A’ initiative: <http://ictkm.wordpress.com/tag/aaa/>
19. See <http://www.ciard.net>
20. GTZ. 2008. The Participatory Web: New Potentials of ICT in Rural Areas. [www.gtz.de/en/themen/laendliche-entwicklung/15081.htm](http://www.gtz.de/en/themen/laendliche-entwicklung/15081.htm). See also [http://iaald.blogspot.com/search/label/social\\_media](http://iaald.blogspot.com/search/label/social_media).
21. See for instance the news blogs of IAALD (<http://iaald.blogspot.com>), ILEIA (<http://familyfarming.typepad.com/>) and CABI

([http://cabiblog.typepad.com/hand\\_picked/](http://cabiblog.typepad.com/hand_picked/)); the agricultural biodiversity blog at <http://agro.biodiver.se/>; or the science blogs of Nature at [www.nature.com/blogs/](http://www.nature.com/blogs/).

22. See [www.agrifed.org/](http://www.agrifed.org/) which provides an aggregation service.

23. FARA is a good example: [www.fara-africa.org/knowledge-base/international-news-feeds/](http://www.fara-africa.org/knowledge-base/international-news-feeds/); see also the DFID-funded research for development portal at [www.research4development.info/](http://www.research4development.info/)

24. See <http://about.extension.org> in the USA and <http://www.e-extension.gov.ph/> in the Philippines.

25. See [www.sharefair.net](http://www.sharefair.net); see also <http://iaald.blogspot.com/search/label/sharefair09> for more postings and comments.

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# La información agrícola y el intercambio de conocimientos: Oportunidades promisorias para los especialistas en información agraria

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**RESUMEN:** La actual crisis alimentaria ha reinstalado la agricultura y la seguridad alimentaria en las agendas nacionales y de desarrollo. Se han movilizado recursos internacionales adicionales, se han reforzado las iniciativas nacionales y regionales y se han propuesto una serie de instrumentos y enfoques nuevos e innovadores. La mayoría de estos esfuerzos requieren de mayor inversión en la generación de conocimientos, el acceso a información y el uso más amplio de tecnologías de información y comunicación (TIC).

Este artículo explora lo que este renovado interés podría implicar para los especialistas en información y comunicación agraria. Partiendo de la base de una perspectiva de "sistemas de innovación", se destacan algunas oportunidades promisorias para los especialistas en información y comunicación. Estas incluyen: aprovechar los conocimientos de los agricultores, emplear tecnologías de la información y comunicación (TIC) para fomentar actividades de desarrollo agrícola, asegurar que las inversiones públicas generen bienes públicos cuyos beneficios puedan desplazarse, permitiendo que los contenidos agrícolas sean abiertos y accesibles, aprovechado el poder de la web 'social' y transformando el papel de las bibliotecas y centros de información.

**ABSTRACT:** The recent food crisis has pushed agriculture and food security back on to national and development agenda's. Additional international funds have been mobilized, national and regional initiatives have been strengthened, and a wide range of new and innovative instruments and approaches have been promised. Most of these efforts call for greater investment in knowledge creation, information access, and the wider use of information and communication technologies (ICTs).

## Oportunidad 1: Sistemas de innovación agrícola

Según Hall (2006), la perspectiva de sistemas de innovación reconoce que la interacción que se genera entre distintas personas y sus ideas y el entorno social en el que se desarrolla esta interacción son factores determinantes de la innovación, como proceso de generación, acceso y aplicación de los conocimientos.

Esto difiere del viejo pensamiento lineal que planteaba que los institutos de investigación generan conocimientos y tecnología, la extensión difunde asesoría y los agricultores adoptan nuevas prácticas. Los sistemas de innovación reconocen que la clave para el intercambio y la aplicación de conocimientos está en el vínculo que se establece entre las personas y las organizaciones. "Los

This paper explores what this renewed interest might mean for information and communication specialists working in agriculture. Starting from an 'innovation systems' perspective, it highlights some promising opportunities for information and communication specialists. These include: working with farmer knowledge, using information and communication technologies (ICTs) to enable agricultural development activities, ensuring that public investments result in public goods whose benefits can travel, making agricultural content open and accessible, using the power of the 'social' web, and transforming the roles of library and information centers.

**RÉSUMÉ:** La récente crise alimentaire a remis l'agriculture et la sécurité alimentaire sur les programmes nationaux et de développement. Des fonds internationaux supplémentaires ont été mobilisés, des initiatives nationales et régionales ont été renforcées, et une grande variété d'instruments et d'approches nouveaux et innovateurs a été promise. La plupart de ces efforts demande un plus grand investissement pour la création de connaissance, l'accès à l'information, et un usage plus large des technologies d'information et de communication (TICs).

Cet article explore ce que cet intérêt renouvelé pourrait signifier pour les spécialistes de l'information et de la communication, qui travaillent dans l'agriculture. Commencant par la perspective «systèmes d'innovation», il souligne quelques occasions prometteuses pour ces spécialistes. Parmi celles-ci: travailler avec la connaissance des agriculteurs; utiliser les technologies d'information et de communication (TICs) pour permettre le développement d'activités agricoles; s'assurer que les investissements publics aboutissent à des biens publics dont les bénéficiaires peuvent voyager, rendre le contenu agricole ouvert et accessible; utiliser le pouvoir de la toile «sociale», et transformer les rôles des bibliothèques et des centres d'information.

procesos de innovación pueden enriquecerse creando mayores posibilidades de interacción entre los actores" (Waters-Bayer et al., 2006).

Un informe impulsado desde el Secretariado Técnico de FORAGRO en IICA (Salles-Filho, 2007) hace hincapié en el aspecto 'colectivo' de esta línea de pensamiento al señalar que: "La superación de la perspectiva lineal del proceso de innovación trajo el entendimiento de que la innovación es un proceso netamente colectivo, porque: i) involucra a distintos actores con distintas perspectivas; ii) apunta a un objetivo común con conceptos, herramientas y perspectivas distintos; iii) necesita división de trabajo; iv) necesita repartición de derechos de propiedad; v) tiene economías de escala y de alcance; vi) necesita coordinación."

Kristjanson y colegas (2009) aplicaron este marco de innovación a proyectos de investigación pecuaria en África

y Asia. La conclusión a la que llegaron fue que ‘la vinculación del conocimiento con la acción’ puede reforzarse si responde a siete principios, entre ellos: “combinando distintos tipos de conocimiento, aprendiendo y conectando enfoques, a través de asociaciones sólidas y heterogéneas que aseguren igualdad de condiciones y fortaleciendo las capacidades para la innovación y la comunicación.”

¿Qué implica esto para la gestión de la información y comunicación agraria? El Consejo de Ciencias de CGIAR (2005) sugiere que “todos los actores que participan en el proceso de I&D—desde quienes diseñan la investigación hasta quienes aplicarán el resultado de ésta en el campo—deben comunicarse entre ellos y tener acceso equitativo al conocimiento”. Se hace necesario contar con enfoques de intercambio de conocimientos que sean globales y participativos.

Estos conocimientos deben ser movilizados desde diversas fuentes. Por ejemplo, no basta con que los institutos de investigación accedan sólo a los informes que estos mismos publican. También deben aprovechar los innumerables flujos de información alternativos, incluidos los agricultores, y encontrar formas para documentar y ofrecer acceso a estos conocimientos. Deben desarrollar productos y servicios de información para públicos más diversos. Deben diseñar mecanismos nuevos, colaborativos e interactivos para compartir e intercambiar información.

Han surgido oportunidades en este ámbito para nuevos ‘comunicadores’ que cuenten con la capacidad técnica para facilitar la colaboración y los procesos interactivos en los que están involucrados los diversos participantes, y que permitan a las personas captar y compartir distintos tipos de conocimiento.

También han surgido oportunidades para contribuir a la ‘innovación generada por el usuario’—donde los conocimientos especializados permitirán que operen los sistemas de innovación.

## Oportunidad 2: Conectarse a los conocimientos de los agricultores

Ann Waters-Bayer (2006) y colegas del proyecto PROLINNOVA sostienen que los agricultores y las comunidades locales son actores clave en los sistemas de innovación agraria—“el tipo de innovación que a la larga marca la diferencia es el que los agricultores deciden llevar a cabo”. Sin embargo, los investigadores suelen subvalorar los conocimientos ancestrales de los agricultores. Los agricultores y los consultores externos suelen considerar a los agricultores simplemente como “receptores de tecnologías, información e instrucciones y no como personas que tienen algo que ofrecer”.

Por lo tanto, PROLINNOVA promueve el desarrollo de la innovación de manera participativa con los agricultores, fomentando la ‘experimentación dirigida por agricultores’ y la integración de las comunidades campesinas a los procesos de innovación. La idea es fomentar el intercambio de información entre los agricultores

y otros actores de la innovación, instando a los agricultores a comparar y compartir sus experiencias y a experimentar de forma más crítica. También promueve la ‘documentación dirigida por agricultores’ a través de la cual las comunidades rurales expresan sus conocimientos, experiencias y prácticas en sus propias palabras—empleando frecuentemente una combinación de medios tradicionales y modernos: texto, dibujos, fotografías, grabaciones en video y audio.<sup>1</sup>

Hay varias iniciativas como esta: *Biodiversity International*<sup>2</sup> trabaja con comunidades locales para documentar sus conocimientos tradicionales, en tanto IFAD y la FAO apoyan el proyecto ‘*Linking Local Learners*’<sup>3</sup> en África del Este donde grupos de agricultores aprenden juntos, intercambian sus conocimientos o ‘*know-how*’ y organizan sus propias redes de conocimientos e intercambio. La comunidad de TIC para el desarrollo aborda estos asuntos desde la perspectiva de la oferta de ‘contenido local’ en la Internet.<sup>4</sup>

Un aspecto muy interesante es la experimentación que se está llevando a cabo empleando distintos formatos de intercambio de conocimientos, desde dibujos hasta la Internet, y desde bases de datos hasta videos participativos.<sup>5</sup>

Surge una oportunidad aquí para que los especialistas en información exploren mecanismos que permitan conectar sus actividades a los sistemas de conocimientos rurales y campesinos actuales. ¿Cómo podemos facilitar el intercambio autónomo entre ellos? ¿Cómo podemos ayudar a incorporarlos a las ciencias y desarrollo agrícolas convencionales?

También necesitamos reconocer que valorar los conocimientos de los agricultores plantea un tremendo desafío para los ‘expertos’ en investigación y extensión tradicionales y para los profesionales de la información. Quizás nos corresponde cumplir la función de catalizadores de la comunicación e intercambio de conocimientos entre los agricultores y otros grupos, más que llevar la tecnología y conocimientos modernos a comunidades subdesarrolladas.

## Oportunidad 3: Las TIC para las comunidades y los medios de vida rurales

Estamos presenciando una transformación en la forma en que las comunidades rurales interactúan con la información, las TIC, los teléfonos móviles y la prestación de servicios. Mantenerse al tanto de todos los avances constituye un enorme desafío.<sup>6</sup>

Uno de los principales impulsores del cambio ha sido el uso cada vez mayor de las tecnologías de la información y comunicación (TIC)—incluidos los teléfonos móviles—para conectar a los agricultores y productores con los mercados y crédito, así como los servicios gubernamentales. Los agricultores ahora pueden recibir información oportuna sobre mercados, precios y el tiempo, así como asesoría técnica; estos servicios frecuentemente

disponen de expertos para responder las consultas.<sup>7</sup> Los agricultores, los investigadores y los extensionistas se están vinculando a través de diversos sistemas y portales basados en las TIC.

En 2006, los especialistas en información y comunicación agraria realizaron una reunión en línea ([www.dgroups.org/groups/inars](http://www.dgroups.org/groups/inars)) para explorar las distintas dimensiones de esta revolución, intercambiando experiencias sobre “gestión e intercambio de conocimientos agrícolas” Los siguientes son algunos de los puntos centrales que se trataron:

- ‘La comunicación común’ es tan importante como el ‘intercambio de conocimientos’ más sofisticado. Los teléfonos móviles son ampliamente utilizados porque satisfacen necesidades comunes de comunicación.
- Los proveedores de servicio local y los operadores de telecentros cumplen una función importante como intermediarios de las comunicaciones entre las comunidades rurales y los proveedores de información. Los sistemas de extensión también deben transformarse si han de hacer un uso efectivo de las nuevas TIC.
- La Internet no reemplaza las fuentes tradicionales de información para los agricultores. Los mejores resultados se producen si se combinan diversos medios como, por ejemplo, teléfonos, radio, televisión, kioscos de información interactiva, computadores, cámaras de video y digitales y a través de la Internet, la Web y los servicios de correo electrónico.
- Los agricultores tienen necesidades de información y comunicación que van más allá de lo que dice relación con la agricultura. Necesitamos abordar de manera holística la necesidad de las comunidades rurales de intercambiar y compartir información.
- Para emplear las TIC de manera eficaz en apoyo a los agricultores y las comunidades rurales, el primer paso es empoderar a las comunidades agrarias para que ellas mismas definan sus propias necesidades.

Emplear las TIC en la “interfaz”, es decir, el punto de contacto entre los agricultores, la extensión y la investigación, es uno de los ámbitos en los cuales se observa mucha experimentación e innovación.

Francisco Proenza<sup>8</sup> ha reunido varios informes y material interesantes sobre proyectos que se han llevado a cabo en Latinoamérica y Asia. Por ejemplo, el proyecto VERCON en Egipto<sup>9</sup> emplea la Internet para reforzar los vínculos investigación-extensión a fin de optimizar los servicios de asesoría agrícola. La *Open Academy for Philippine Agriculture* ha creado la *Pinoy Farmers’ Internet*,<sup>10</sup> el primer sistema de apoyo a la extensión del país basado en la Internet. También se está desarrollando algo similar en los EEUU<sup>11</sup> a través de la *National Extension Initiative* que está creando un entorno de aprendizaje interactivo que ofrecerá conocimientos y “conectará a los consumidores de conocimiento con los proveedores de conocimiento”.

Otra área promisoría vincula el uso de TIC con la

disponibilidad de servicios crediticios y financieros en las comunidades rurales.

En las Filipinas, el proveedor de *e-commerce* (comercio electrónico) *b2bpricenow.com*<sup>12</sup> desarrolló el ‘programa de *e-commerce* para agricultores’ que comprende un *e-marketplace* (mercado electrónico) donde se pueden comprar y vender *commodities* agrícolas en línea, centros locales en zonas rurales de ‘b2b’ (*business to business*’ o negocio a negocio) y comercio móvil para ayudar a las cooperativas y agricultores a realizar transacciones monetarias. En la India, un proyecto conocido como ‘*Lifelong Learning for Farmers*’<sup>13</sup> reúne asociaciones comunitarias en aldeas rurales, los operadores de “kioscos” de TIC, una empresa de TI, universidades agrícolas y el Banco del Estado de India. El proyecto combina el acceso a la información, el aprendizaje y las oportunidades de crédito con miras a mejorar las condiciones de vida a nivel local, fortaleciendo capacidades (conocimientos y aptitudes), ofreciendo créditos blandos y generando empleo.

Países como India están experimentando a gran escala con telecentros rurales que ofrecen una amplia gama de servicios, tanto gubernamentales como del sector privado. En África y América Latina también han surgido movimientos activos de telecentros.<sup>14</sup> Uno de los ámbitos en expansión es el aprovechamiento de las TIC para mejorar los mercados agrícolas, los sistemas de comercialización y el intercambio de *commodities*.<sup>15</sup> Ofrecer información, particularmente de precios, a los agricultores los empodera en su capacidad de tomar decisiones más efectivas — y obtener mayores ingresos por sus productos.

Hemos visto un interés masivo y mayores inversiones en la telefonía móvil en 2008 y 2009 para apoyar a los agricultores con información.

Mantenerse al tanto de todos estos avances plantea un gran desafío, sin embargo, han abierto una serie de oportunidades inéditas para los especialistas en información. En particular, existe un campo de aplicación para nuestra información y contenidos (que seguramente tendrán que ser adaptados) para acceder a nuevos mercados y clientes. Surgirán nuevos servicios basados en distintos tipos de contenidos y portadores de tecnología. Dado que, como sabemos, la información no fluye por sí sola, están surgiendo nuevos roles como catalizadores, facilitadores e intermediarios de información y conocimientos. Los innovadores y los empresarios en estos proyectos suelen contar con conocimientos tecnológicos y empresariales, pero existe una gran necesidad de contar con personas con capacidades técnicas para acceder a, organizar y empaquetar contenidos de todo tipo.

## Oportunidad 4: Bienes públicos

El carácter de ‘bien público’ aplicado a la investigación, y los pasos necesarios para que efectivamente sea considerada como tal, ha estado al centro del debate mundial. Este debate respecto del posicionamiento de la investigación

frente a otras actividades de desarrollo también es importante para la agenda de información y comunicación.<sup>16</sup>

Los institutos de investigación tradicionalmente producen una diversidad de ‘bienes’, especialmente nuevos conocimientos y tecnologías para ser usados por otros. Dependiendo de quién patrocina y cómo se diseña la investigación, estos productos podrían o no ser considerados un ‘bien público’—en el sentido de que el producto es ‘no excluyente’<sup>17</sup> (si se ofrece a una persona, se ofrece a todos) y ‘no rival’ (el consumo del bien por parte de una persona no afecta al consumo de los demás).

El CGIAR ha participado activamente en este debate.<sup>18</sup> Un documento publicado recientemente (CGIAR, 2006) plantea las razones detrás de la necesidad de que el CGIAR aborde la cuestión de los bienes públicos mundiales, que Ryan (2006) ha definido de la siguiente manera:

Se consideran bienes públicos mundiales los conocimientos y tecnologías generados a partir de la investigación estratégica y aplicada, que sean aplicables y se encuentran fácilmente disponibles mundialmente, para abordar cuestiones y desafíos genéricos en consonancia con las metas de CGIAR.

La clave está en la aplicabilidad y accesibilidad mundial como aspectos esenciales del conocimiento público y los productos tecnológicos. En el mismo informe, Pardey sostiene que “gran parte de los resultados de las investigaciones no son intrínsecamente públicos”. Estos “pueden llegar a ser más o menos públicos (o no) a través de políticas y acciones prácticas” (CGIAR, 2006).

Este último punto es sumamente importante. Sugiere que la información y el conocimiento no son intrínsecamente ‘públicos’. Es necesario adaptarlos para que lo sean, es decir, hacer que estén disponibles y que sean accesibles y aplicables.

Por lo tanto, la forma en que se accede al resultado de una investigación nos permite determinar si se convertirá en un bien público. Un ejemplo clásico serían aquellos resultados de investigaciones públicas que son difundidos a través de revistas científicas de acceso restringido que excluyen a algunos usuarios, o resultados que sólo están disponibles a través de sitios web a los que no tienen acceso quienes no cuentan con una conexión de banda ancha. Esta lógica también se ve reflejada en los resultados que se encuentran disponibles en un solo idioma, están escritos en un lenguaje ‘científico’ o están publicados con propiedad exclusiva o licencias restringidas de propiedad intelectual. Todo esto producto de decisiones que tomamos o estamos obligados a tomar. Independiente de lo que dicten las políticas, estas decisiones prácticas determinarán si un bien es o no es un bien público.

Para hacer públicos los datos, la información y el conocimiento, tenemos que gestionarlos para que sean creados e ingresados a depósitos en formatos y sistemas que permitan el acceso perpetuo; estén licenciados para permitir y fomentar su uso masivo, contengan descrip-

tores y estén indexados para facilitar su búsqueda y difusión, y hayan sido optimizados para fomentar su utilización masiva.

Estas son tareas que la mayoría de los especialistas en información ya realizamos. Ahora tenemos la oportunidad de posicionarlas al centro del debate en torno a las políticas a adoptarse en el ámbito de las ciencias y la investigación agraria. Podemos mostrarle a un científico o a un investigador exactamente cómo su trabajo puede convertirse en un bien público... ¡invirtiendo en nuestra labor!

En 2008, surgió una nueva iniciativa para abordar estos desafíos—Coherencia en la Información para la Investigación Agraria para el Desarrollo (CIARD, por su sigla en inglés).<sup>19</sup> Este grupo multiagencial, creado con el apoyo de la FAO, ha suscrito un Manifiesto en el que se comprometen a: “Hacer que la información y conocimientos de la investigación agraria de dominio público sean verdaderamente accesibles a todos”. Este grupo está abocado a desarrollar un conjunto de ‘vías’ que puedan aprovechar tanto individuos como organizaciones para ofrecer mayor acceso a la información que poseen.

## Oportunidad 5: La Web social

Uno de los aspectos fundamentales de la perspectiva de los sistemas de innovación es que son muchos los actores involucrados. Por ende, son muchas las fuentes, tipos y formas de conocimiento e información que deben circular, ser comunicados y agregados para ir en apoyo de un ‘estilo nuevo’ de investigación agrícola e innovación para el desarrollo.

En la Internet se observan tendencias similares. Diez a quince años atrás, pocas organizaciones contaban con un sitio web. Sus bibliotecas almacenaban colecciones de documentos impresos indexados en catálogos electrónicos. Los investigadores, los responsables de formular las políticas y los profesionales se comunicaban por carta, fax y, quizás, por correo electrónico, y a veces se encontraban ‘cara a cara’. El ‘contenido’ estaba basado principalmente en texto y se compartía a través de informes escritos, comunicados de prensa y boletines informativos. Producir, publicar y difundir contenidos era caro, y lo que se cobraba generalmente era para cubrir los costos. Las comunidades se comunicaban a través de redes y asociaciones que ofrecían espacios de encuentro bien definidos (conferencias) y mecanismos de intercambio (boletines y revistas).

Hoy, esta información circula de otra manera. Los acervos de información, tanto en formato electrónico como impresos, aún existen. También contamos con acceso en línea a bibliotecas y otras bases de datos, y muchos organismos publican informes y documentos en texto completo en sus sitios web, sin costo para los usuarios. Las comunidades se han convertido en redes y comunidades virtuales. Cada día son más las personas que tienen a lo menos una cuenta de correo electrónico,

toda organización tiene su sitio web y publica contenidos digitales en diversos formatos—audio, video y texto. Técnicamente se está haciendo cada vez más fácil para una organización, grupo o individuo publicar y difundir contenidos digitales.

También hemos visto cómo se ha ido extendiendo el uso de los medios sociales o aplicaciones ‘Web 2.0’ como los blogs, las Wikis, las fuentes de contenido RSS y las redes sociales.<sup>20</sup> Tal como ocurre con los sistemas de innovación, esta Web 2.0 ‘social’ ofrece una gama de oportunidades para el intercambio participativo de conocimientos, donde el conocimiento es obtenido de diversas personas. La Web social puede actuar como catalizador de la interacción entre las personas y el intercambio fructífero de conocimientos y la comunicación.

Se han producido cambios de gran magnitud. Están surgiendo los blogs,<sup>21</sup> las organizaciones están ofreciendo contenidos a través de fuentes de contenido RSS<sup>22</sup>—y un número cada vez mayor de éstas están publicando fuentes de contenido de organismos asociados en sus propios sitios web.<sup>23</sup> También vemos cómo han surgido enfoques completamente nuevos impulsados por estos nuevos medios: en los EEUU y Filipinas, la ‘*e-extension*’, o extensión digital, conecta a los agricultores con las ciencias y la asesoría.<sup>24</sup>

¿Qué implica esto para los especialistas en información agraria? Estos medios indudablemente abren muchas oportunidades. Pueden ayudar tanto a transmitir mensajes como a recibirlos, refuerzan nuestra base de conocimientos, agilizan la comunicación y la propagación de ideas, pueden emplearse dentro de la organización para reforzar el intercambio de conocimientos e información, y pueden ser una buena forma de trabajo colectivo. También pueden ser exigentes, difíciles de ‘controlar’ y requieren del aprendizaje de un nuevo conjunto de herramientas y una predisposición mental distinta.

Charlie Leadbeater (2008) en su libro publicado recientemente, resume muy bien estos cambios:

La expansión de la Web nos invita a vislumbrar el futuro desde otro punto de vista, para comprender que lo que compartimos es tan importante como lo que poseemos; lo que tenemos en común es tan importante como lo que nos reservamos para nosotros mismos; que lo que optamos por regalar podría valer tanto o más que lo que cobramos. En la economía de las cosas, te identificas por lo que posees: tus tierras, tu casa, tu auto. En la economía de las ideas que la Web está generando, eres lo que compartes... El mayor cambio que provocará la Web en nosotros es que nos permitirá compartir con los demás de manera distinta y, particularmente, compartir ideas.

## Oportunidad 6: Reconsiderar la función futura de las bibliotecas

¿Qué implican algunos de estos avances para los profesionales en gestión de información tradicionales como las bibliotecas?

En enero de 2009, se realizó un encuentro sobre el futuro de las bibliotecas agrícolas en el evento ‘*Knowledge Share Fair for Agricultural Development and Food Security*’ (Feria ‘compartiendo conocimientos para el desarrollo agrícola y la seguridad alimentaria’). Los participantes evaluaron el futuro papel y el valor agregado de las bibliotecas agrícolas.<sup>35</sup>

Algunos de los puntos centrales que se abordaron fueron los siguientes:

- Las bibliotecas a futuro asumirán funciones más amplias. Cumplirán un papel más activo en la apertura del acceso a la información y el conocimiento, en la difusión—no sólo la recopilación y documentación—de bienes globales, convirtiéndose en catalizadores del intercambio de conocimientos entre las personas, ofreciendo plataformas integradas para la gestión de la información y el conocimiento y proporcionando una gama de servicios y productos focalizados.
- Las bibliotecas a futuro se irán convirtiendo cada vez más en ‘*e-libraries*’ o bibliotecas digitales, ofreciendo acceso al conocimiento actual y de archivo en una amplia gama de formatos digitales.
- Las bibliotecas a futuro se irán convirtiendo cada vez más en lugares de intercambio e interacción y administrarán y facilitarán procesos de organización y de difusión y colaboración.
- Las bibliotecas a futuro formarán parte de sistemas más amplios de información e intercambio de conocimientos en los cuales los ‘usuarios’ se convertirán cada vez más en ‘colaboradores’ y los bibliotecarios en catalizadores e intermediarios del intercambio de conocimientos.

Estos cambios probablemente obligarán a cambiar considerablemente la orientación de los centros de información tradicionales—alejándose de sus habituales actividades de ‘recopilación’ para asumir otras más relacionadas con la ‘conexión’. Estas bibliotecas tendrán que incorporar las capacidades de gestión de conocimientos, medios sociales, comunicación participativa y tecnologías de la información a su actual enfoque central en contenidos agrícolas.

## Comentarios finales

Así como en los sistemas de innovación, este artículo es un compendio personal de los ámbitos en los cuales existirían oportunidades para los gestores de información y comunicación agrícola.

La selección de temas refleja los cambios que he observado en el ‘negocio’ de la información y comunicación agraria—a medida que se van incorporando nuevos actores y las tecnologías van transformando los procesos, productos, servicios y expectativas. El escenario de ‘*business as usual*’ seguramente será la excepción y no la norma.

La gestión de la información y el conocimiento agrícola inicialmente era bastante lineal y sus procesos eran



administrados por especialistas. Lo que se cosecha a futuro brotará de enfoques más orgánicos en los cuales los innovadores agrícolas se unirán a nosotros como creadores y gestores activos de información y conocimientos, y los gestores de la información se convertirán en innovadores e intermediarios. Esta 'infovación' ya se está dando a nuestro alrededor: los investigadores se han convertido en 'bloggers', los científicos publican sitios web, los agricultores crean redes de aprendizaje, los extensionistas construyen "Wikis" y los bibliotecarios se han convertido en cineastas. Nosotros podemos ubicarnos al centro de estos avances, creando nuevas oportunidades y compartiéndolas con nuestros colegas.

Una de las vías que he encontrado para explorar y aprovechar dichas oportunidades es a través de la agrupación profesional. Grupos como IAALD ofrecen espacios y redes para encuentro, conectarse, intercambiar experiencias y especialmente para descubrir los beneficios que nos brindan estas oportunidades. Estos constituyen la oportunidad número 7.

## Notas

1. Véase [www.prolinnova.net/fld.php](http://www.prolinnova.net/fld.php)
2. Véase [www.bioversityinternational.org/Themes/Communities and Livelihoods](http://www.bioversityinternational.org/Themes/Communities_and_Livelihoods)
3. Véase [www.linkinglearners.net/](http://www.linkinglearners.net/)
4. Véase <http://communitycontent.maneno.org/> y: Ballantyne, P.G. 2002. 'Collecting and propagating local development content'. La Haya: IICD. [www.iicd.org/articles/IICDnews.import1878](http://www.iicd.org/articles/IICDnews.import1878)
5. Véase el documento de Paul Van Mele en WARDA: [www.warda.org/warda/newsrel-videopower-jun09.asp](http://www.warda.org/warda/newsrel-videopower-jun09.asp) / <http://iaald.blogspot.com/search/label/warda>
6. Franz Martin de la FAO hace un seguimiento de muchos avances interesantes en América Latina y El Caribe en el blog de IAALD: véase [http://iaald.blogspot.com/search/label/latin\\_america](http://iaald.blogspot.com/search/label/latin_america)
7. Existen varias fuentes de información. La FAO facilita una plataforma global — <http://www.e-agriculture.org/>. *E-ForAll* documenta iniciativas sobre el uso de las TIC para empoderar a la población rural pobre — [www.e-forall.org](http://www.e-forall.org). El sitio web de la FAO 'Disminuyendo la Brecha Digital en el Medio Rural' incluye casos y buenas prácticas — [www.fao.org/rdd/](http://www.fao.org/rdd/). El sitio web *i4donline* publica noticias sobre las TIC en el ámbito agrícola — [www.i4donline.net/news/news.asp?catid=1](http://www.i4donline.net/news/news.asp?catid=1)
8. Véase: [www.e-forall.org](http://www.e-forall.org)
9. Véase: [www.vercon.sci.eg/Vercon\\_en/vercon.asp](http://www.vercon.sci.eg/Vercon_en/vercon.asp)
10. Véase: [www.openacademy.ph](http://www.openacademy.ph)
11. Véase: <http://about.extension.org>
12. Véase: [www.b2bpricenow.com](http://www.b2bpricenow.com)
13. Véase: [www.col.org/L3Farmers](http://www.col.org/L3Farmers)
14. Véase [www.telecentre.org](http://www.telecentre.org) para más información y los últimos avances alrededor del mundo.
15. El sitio <http://dacnet.nic.in/> es un ejemplo gubernamental nacional; [www.kacekenya.com](http://www.kacekenya.com) es un ejemplo del sector privado;

entre los ejemplos regionales, encontramos [www.esoko.com/](http://www.esoko.com/) y [www.wa-agritrade.net/](http://www.wa-agritrade.net/). El boletín 'ICT Update' de CTA informa sobre avances alrededor del mundo — <http://ictupdate.cta.int/>. Véase también <http://iaald.blogspot.com/search/label/markets> y <http://iaald.blogspot.com/search/label/phones> para otros recursos.

16. Esta sección se basa en el documento encargado por el Programa CGIAR ICT-KM. Véase: Ballantyne, P.G. 2008. *Making CGIAR Research Outputs Available and Accessible as IPGs*. Ponencia para el taller "CGIAR Agricultural Research Public Goods Workshop", Maputo, Mozambique, 27 de noviembre. [www.sciencecouncil.cgiar.org/fileadmin/user\\_upload/sciencecouncil/EVENTS/AGMo8IPG\\_WRKSHOP/BallantyneW.ipg4sciencecouncil.pdf](http://www.sciencecouncil.cgiar.org/fileadmin/user_upload/sciencecouncil/EVENTS/AGMo8IPG_WRKSHOP/BallantyneW.ipg4sciencecouncil.pdf)

17. Véase [http://en.wikipedia.org/wiki/Public\\_good](http://en.wikipedia.org/wiki/Public_good) para mayor información sobre los términos.

18. Véase el Programa CGIAR ICT-KM Iniciativa 'triple-A': <http://ictkm.wordpress.com/tag/aaa/>

19. Véase <http://www.ciard.net>

20. GTZ. 2008. *The Participatory Web: New Potentials of ICT in Rural Areas*. [www.gtz.de/en/themen/laendliche-entwicklung/15081.htm](http://www.gtz.de/en/themen/laendliche-entwicklung/15081.htm). Véase también [http://iaald.blogspot.com/search/label/social\\_media](http://iaald.blogspot.com/search/label/social_media)

21. Véase, por ejemplo, el blog de noticias de IAALD (<http://iaald.blogspot.com>), el blog de ILEIA (<http://familyfarming.typepad.com/>) y el de CABI ([http://cabiblog.typepad.com/hand\\_picked/](http://cabiblog.typepad.com/hand_picked/)); el blog de biodiversidad agrícola en <http://agro.biodiver.se/>; o los blogs de ciencias de *Nature* en [www.nature.com/blogs/](http://www.nature.com/blogs/).

22. Véase [www.agrifed.org/](http://www.agrifed.org/) que ofrece un servicio de agregación de contenidos.

23. Un buen ejemplo de esto es FARA: [www.fara-africa.org/knowledge-base/international-news-feeds/](http://www.fara-africa.org/knowledge-base/international-news-feeds/); véase también el portal de investigación para el desarrollo, financiado por DFID en [www.research4development.info/](http://www.research4development.info/)

24. Véase <http://about.extension.org> en los EEUU y <http://www.e-extension.gov.ph/> en Filipinas.

25. Véase [www.sharefair.net](http://www.sharefair.net); véase también <http://iaald.blogspot.com/search/label/sharefair09> para más publicaciones y comentarios.

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# Benchmarking CGIAR Research Outputs for Availability and Accessibility

Meena Arivananthan, Peter Ballantyne, Enrica M. Porcari

**ABSTRACT:** To better understand ways that CGIAR Centers make their published research outputs available and accessible, a benchmarking study of six Centers was carried out in 2008 and 2009. The study scored several typical 'pathways' that could be used to identify and obtain research outputs published in 2006. Results indicate that these outputs are generally available—they can be identified—in various pathways but that they are much less openly accessible in full text. The results also show differences between the approaches of the six Centers, differences in performance between pathways, and differences in the accessibility of different types of outputs.

**RESUMÉ:** Pour mieux comprendre comment les centres du GCRAI rendent leurs publications des résultats de recherche disponibles et accessibles, une étude des standards de six centres a été exécutée en 2008 et 2009. L'étude a marqué plusieurs «chemins d'accès» typiques qui pourraient être utilisés pour identifier et obtenir la publication des résultats de recherche en 2006. Les résultats indiquent que ces produits sont généralement disponibles—ils peuvent être identifiés—sous divers

chemins d'accès mais qu'ils sont beaucoup moins accessibles publiquement en plein texte. Les résultats montrent aussi des différences entre les approches des six centres, différences de performance entre les chemins d'accès, et différences d'accessibilité de différents types de produits.

**RESUMEN:** En el 2008 y 2009 se hizo un estudio comparativo de seis centros del Grupo Consultivo para la Investigación Agrícola Internacional (CGIAR) para conocer más a fondo los medios que dichos centros utilizan para asegurar la disponibilidad y accesibilidad de los resultados de investigación que publican. El estudio calificó diversos 'medios' típicos que se podrían utilizar para identificar y obtener resultados de investigación publicados en el 2006. Los resultados indican que dichos resultados están, en general, disponibles—es decir se pueden identificar—en diferentes medios pero que su accesibilidad como texto completo es mucho menos abierta. Los resultados también muestran diferencias entre los enfoques de los seis centros, diferencias de desempeño entre los medios y diferencias en la accesibilidad de diferentes tipos de productos.

## Introduction

**Knowledge generated by scientists** in the CGIAR plays an important role in delivering solutions for the poor—sustainable agricultural growth to help reduce poverty. Established in 1971, the CGIAR, an alliance of 15 agricultural research centers with 8,000 researchers and technicians in 200 locations, has a strong legacy, producing impacts in agricultural production, germplasm improvement and collection; and policy, with notable examples like the Green Revolution in South Asia, New Rices for Africa and Quality Protein Maize.<sup>1,2</sup>

A recent independent review of the CGIAR stressed the need for centers to make their research available and useful for development science.<sup>3</sup> With a mandate to create international public goods from their research, the CGIAR is aware that research outputs need to be made widely available and accessible and shared with individuals and partner organizations who may apply and deliver on-the-ground impacts.

For these international public good outputs of research to have impact, each research output:

- Needs to be helped to 'travel' across boundaries
- Should be described and stored for posterity
- Should be easily found and be accessed
- Needs to be configured and licensed to be easily shared and re-used
- Has to be as affordable as possible

In short: they need to be Available, Accessible and Applicable without restrictions.<sup>4</sup>

Traditionally, CGIAR research outputs are disseminated through close collaborative efforts with a wide range of research partners—international, regional, national and local. They are usually shared via scientific journals, conferences, books, networks and other traditional communication methods.

In recent years, the CGIAR Science Council has promoted and rewarded the production of 'high impact' articles in academic journals. Collaboration is also evolving and is now multi-pronged, and includes not only national agricultural partners, but NGOs, universities, the private sector and many other players. The knowledge generated is no longer the property of an exclusive scientific audience.

These knowledge products include data, improved germplasm, training programs, international best practices; policy and management advice; information systems; models and technologies. To become international public goods, these products or outputs need to be made available and accessible, increasing the potential for them to be applied by an increasingly diverse range of partners and users.

Building on an earlier initial analysis,<sup>5</sup> in 2009 the CGIAR ICT-KM program launched a benchmarking exercise with six CGIAR Centers. The aim was to assess the actual availability and accessibility of their published research

outputs. The study also aimed to take stock of current pathways<sup>6</sup> used by the six Centers to disseminate their research outputs, identifying promising ways to enhance future efforts in this area.

### Methodology

For the purpose of this study, we used the definitions below based on the ICT-KM Triple-A framework<sup>7</sup>:

- Availability: research outputs stored in open digital formats and described using public metadata standards so they can be found through structured search and access systems;
- Accessibility: research outputs publicly available online so they can be queried, viewed and obtained in full.

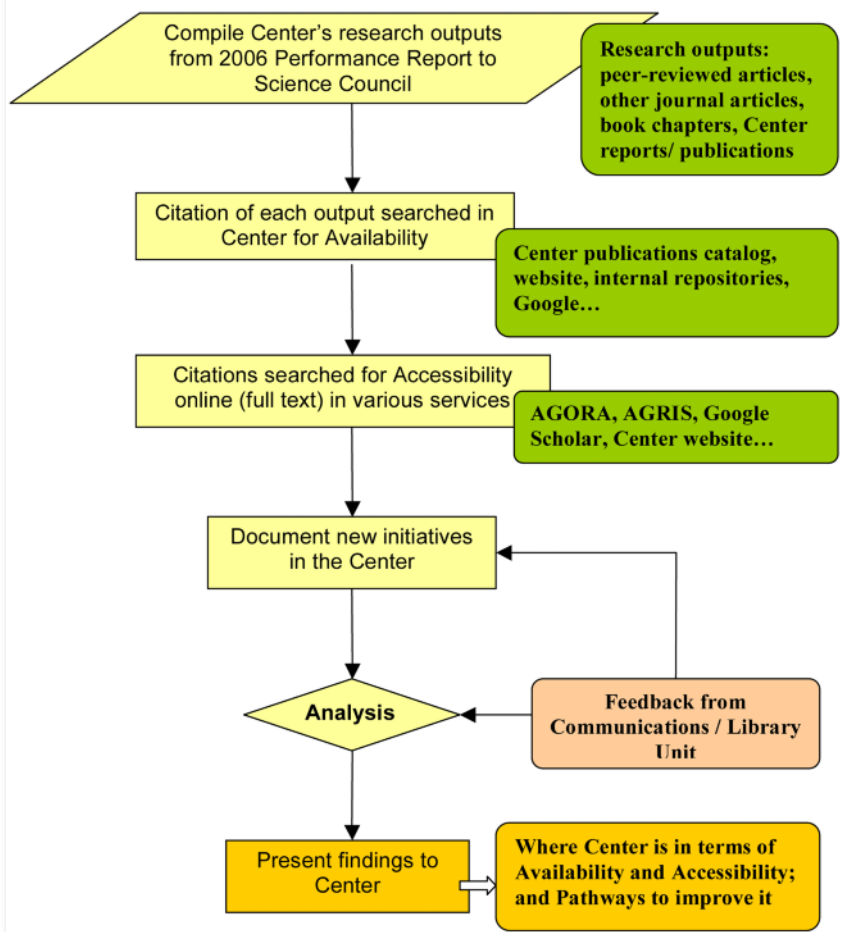
The study used a simple bibliometric approach initially developed and tested by Peter Ballantyne for the ICT-KM Program in 2008. The starting point (see Figure 1) was to compile a list of published research outputs for each of the six Centers. The 2006 Performance Report submitted by each Center to the CGIAR Science Council was used as an ‘official’ list. In total, 1088 research outputs were identified, comprising peer-reviewed journal articles indexed in Thomson/ISI, externally published books and book chapters, articles in other journals (not indexed by Thomson/ISI) and publications published by each Center.

The availability and accessibility of each of the outputs was tested by searching for them in a range of standard ‘pathways’ used by each Center (Table 1). It should be noted that not all Centers use all the pathways; and that other potential pathways were identified but were not tested across all the Centers due to lack of access (eg CAB database) and time.

TABLE 1 – Availability and Accessibility Pathways

AVAILABILITY (citation/ abstract)	ACCESSIBILITY (full text)
Center library catalogue	Center website
Center publications catalogue	AGORA database
Center ‘institutional archive’	CGVlibrary search engine
Center website	AGRIS database
Center web search function	Google Scholar search
Google general search	Google Books search

FIGURE 1 – Methodology to study the availability and accessibility of research outputs



An online search was carried out for each output and if the citation or abstract was found, it was marked as being available through the respective pathway, be it the Center’s library catalogue or Google. For a research output to be marked as accessible, it would have to be available in full text for public use. Access would not require any password or subscription fee.

Data was collected in the same way an external user would try to access a document. Insider know-how was deliberately avoided. This was an important aspect to maintain since the study hinges on the accessibility of research outputs to individuals outside the CGIAR.

### Results

The study provided each Center with an overview of where they are in terms of research output dissemination and how and where they could improve this. Data collected from each Center was shared with the Center’s information or library unit. They were also requested to provide any additional ways in which they disseminated their research outputs. A comprehensive analysis was then shared with each center with recommendations for future steps.

TABLE 2 – Overall Availability and Accessibility per Center and Pathway

Center	Availability pathways					Accessibility pathways									
	center library catalog	center publications catalog	Institutional archive	FT institutional archive	listed center website	FT center website	FT online	FT online open	FT online agora	center web search indexed	CGIAR VLibrary	AGRIIS catalog	Google scholar	Google all	FT online Google books
1	100	95	80	59	100	19	75	43	38	0	4	13	32	70	17
2	77	9	45	45	38	13	59	49	32	27	30	8	48	63	34
3	27	31	91	75	31	35	63	51	26	31	6	40	53	87	8
4	99	20	19	23	93	50	91	61	26	94	90	100	61	94	38
5	100	100	0	0	100	41	76	71	30	99	100	0	53	87	2
6	92	17	92	27	78	24	51	40	27	79	47	3	9	77	8
<b>Average</b>	<b>83</b>	<b>45</b>	<b>55</b>	<b>38</b>	<b>73</b>	<b>30</b>	<b>69</b>	<b>53</b>	<b>30</b>	<b>55</b>	<b>46</b>	<b>27</b>	<b>43</b>	<b>80</b>	<b>18</b>

Availability pathways  
 Accessibility pathways  
 Average of 6 Centers for a pathway  
 Center scores above the average

Table 2 gives an overview of the results for each pathway, for each Center. The average score for each pathway across all the centers is highlighted in yellow.<sup>8</sup> The percentages highlighted in green show values above the average. From this table, Centers 4 and 5 are out in front, scoring above the average for the six Centers on 11 of the 15 pathways. Outputs of these two Centers are more accessible across the pathways studied than the others.

Many of the Centers make their research outputs readily available through their library catalogue, institutional archive or website. Based on the average, 69% of their journal articles, book chapters and own reports/publications were available in full text (FT) in the catalogues or on websites, however only 53% were accessible to anyone outside of the center via the CGIAR Virtual Library, AGORA,<sup>9</sup> AGRIS<sup>10</sup> or Google.

Figure 2 shows the same data for selected pathways, with more availability pathways on the left and more accessibility pathways on the right. Overall, Centers are

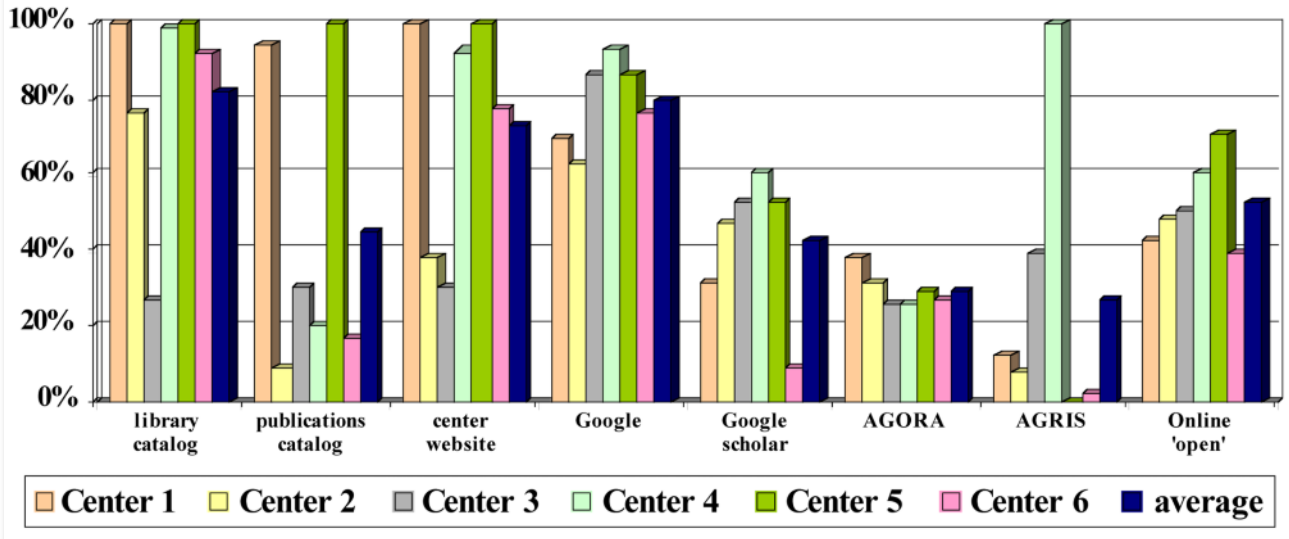
doing better at making their outputs available than they are at making them accessible.

With regard to availability, the library catalogue, publications catalogue and Center website scored on average 83%, 45% and 73% respectively. Two of the Centers scored 100% availability of their 2006 inputs in these pathways. Only 19% of Center 1 research outputs are available full text via its website while Center 5 scores 41%. It is clear that Centers make different use of different pathways.

General Google search services as a pathway to accessibility cast a wide net by tapping into countless websites including open access journal sites and Center and project websites. Searches made here lead to citations, abstracts or full text. They also lead to accessibility through Google Scholar and Google Books. The 80% average score shows that Center outputs are well-indexed by Google; Center 4 scores highest with 94% of its outputs accessible through Google.

Accessibility of outputs in a specialized service like

FIGURE 2 – Availability and Accessibility in Selected Pathways, per Center



AGRIS however reveals another pattern. Center 4 research outputs are 100% accessible in AGRIS, while none could be accessed from Center 5. Since contribution to AGRIS is voluntary and requires additional efforts from each Center, this is a pathway where up to 100% accessibility could be possible, depending on the commitment of each Center and their valuation of the extra services provided by AGRIS.

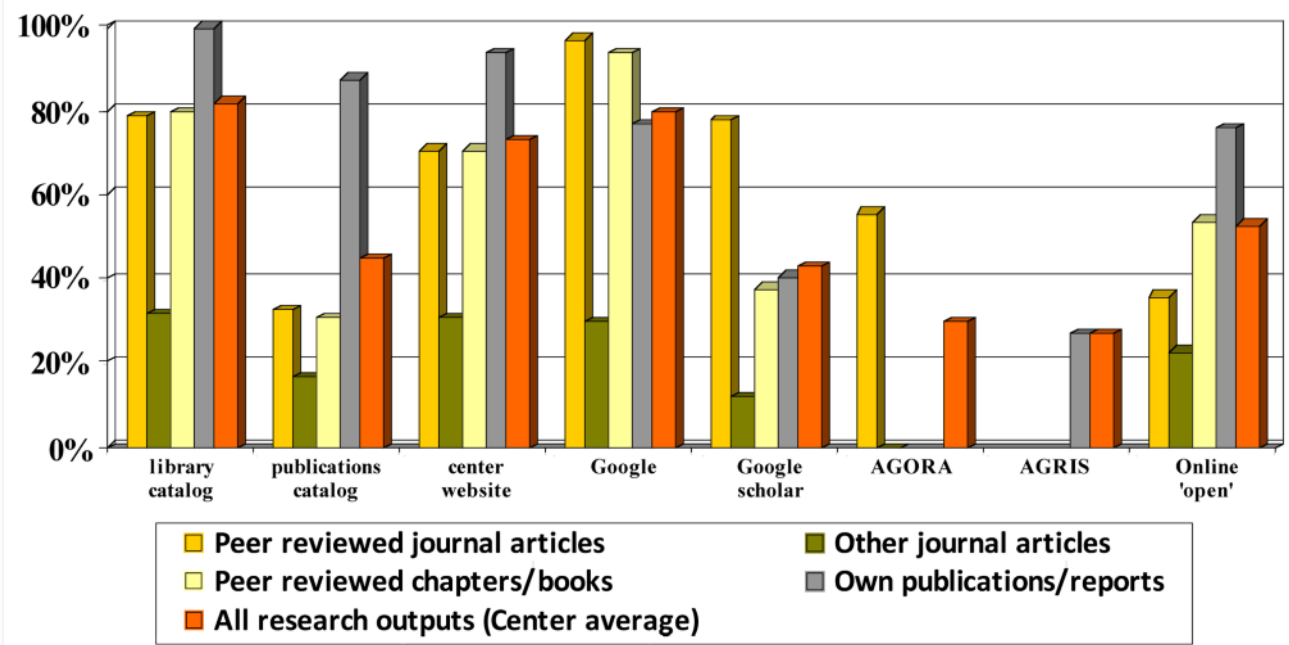
Most telling perhaps is the score for outputs being 'online open.' Here Centers score between 40% (Center 6) and 71% (Center 5) for the full text 'open' accessibility of their research outputs, with an average of 53% for all the 6 Centers.

Figure 3 below gives a more detailed look at the availability and accessibility of different types of research outputs across the various pathways.

Peer-reviewed journal articles, book chapters and books are subject to copyright by publishers and as such, full accessibility is a major issue. While these are available as citations and abstracts via the Center website or Google, the percentage of full text accessibility is low with less than 40% for peer-reviewed journal articles and 54% for peer-reviewed books and chapters.

AGORA is an accessibility pathway for journal articles and is targeted to eligible institutes in developing countries. The results show that close to 60% of the Centers'

FIGURE 3 – Availability and Accessibility by Type of Output



articles are accessible in full through AGORA to this developing-country community, as opposed to less than 40% of journal articles to global audiences. We do not know the extent to which a journal's accessibility affects journal selection choices of authors; an article in an 'AGORA' journal has a 20% higher accessibility score, for researchers in the eligible institutions.

A Center's (own) publications and reports score highly in terms of availability in library catalogues, publications catalogues and on Center websites, yet some 24% of them do not yet seem to be accessible online in full, on any site. Since these outputs are totally under the control of a Center, it is reasonable to expect them all to be available AND fully accessible on the Internet.

## Conclusion

With some exceptions, published outputs of the 6 Centers are available (indexed) across several different pathways.

Library and publications catalogues seem particularly strong and widely used. External services like Google Scholar index much of the Centers' outputs, and are particularly strong on external mainstream journals and books.

It is not difficult to identify online the journal articles that are so revered and valued by the CGIAR as a measure of scientific quality. It is quite another challenge to actually get access to these articles, particularly for people with limited online access or financial resources.

Accessibility, in terms of getting to the full content without login restrictions is much lower. Reports published by the Centers score highest in this regard, journal articles score lowest. For eligible users, AGORA bridges the gap to access journal articles somewhat.

For all types of outputs, improvements can be achieved to a greater or lesser extent by adopting and investing in some promising pathways.

These include:

- Capture all scientific publications in a library or similar unit, ensuring that they are properly indexed.
- Deposit full text outputs in a state-of-the-art repository that is harvested and indexed by other services.
- Make sure all Center-produced reports and publications are available and publicly accessible full text in an institutional repository or web platform.
- Pay attention to copyright and licenses for all outputs; paying particular attention to any that are published by third parties in journals, books or other formats. Negotiating open access, republishing and reuse rights increases their accessibility.
- Make authors aware of 'quality-accessibility' choices and tradeoffs so they can find the right balance between outputs that are more or less accessible, and concrete ways they can maximize both.
- Promote open content, open access and open licenses across the institute.

- Promote learning and exchange across professionals working with information, publications and communication in different Centers, passing on good practices that work.
- Use social media<sup>11</sup> to promote research outputs in different formats and with wider networks.

## Notes

1. We acknowledge the assistance of Maria Garruccio (Bioversity International), Michael Hailu (ICRAF), Edith Hesse (CIAT), Reinhard Simon (CIP), Petr Kosina (CIMMYT) and Helen Leitch (WorldFish), for their support and cooperation throughout this study.

2. See: Snapshot of CGIAR Impacts brochure[o] [www.cgiar.org/pdf/cg\\_impact\\_brochure\\_may2005.pdf](http://www.cgiar.org/pdf/cg_impact_brochure_may2005.pdf)

3. CGIAR Independent Review Panel. 2008. Bringing Together the Best of Science and the Best of Development. Independent Review of the CGIAR System. Report to the Executive Council. Washington, DC: CGIAR. [http://www.cgiar.org/pdf/agmo8/agmo8\\_independent\\_review\\_synthesis\\_report.pdf](http://www.cgiar.org/pdf/agmo8/agmo8_independent_review_synthesis_report.pdf)

4. See the CIARD initiative for more information: [www.ciard.net](http://www.ciard.net)

5. Ballantyne, P.G. 2008. Making CGIAR Research Outputs Available and Accessible as IPGs. Paper for CGIAR Agricultural Research Public Goods Workshop, Maputo, Mozambique, 27 November. [http://ictkm.cgiar.org/document\\_library/program\\_docs/ICT-KM%20AAA\\_complete.pdf](http://ictkm.cgiar.org/document_library/program_docs/ICT-KM%20AAA_complete.pdf)

6. The term 'pathway' is used to describe any system, service or tool that is designed to help someone identify, locate, obtain and re-use a research output. From a producer perspective, a pathway is also a service, system or tool designed to share and disseminate a research output. Examples of pathways include: a library catalogue, Google search service, Google Scholar, Scirus, a specialized database such as AGRIS, a blog, or a creative commons license. They are normally used in combination by individuals and information centers to achieve certain objectives.

7. See the CGIAR ICT-KM Program 'triple-A' initiative: <http://ictkm.cgiar.org/what-we-do/triple-a-framework/>. A series of related articles and stories is on the ICT-KM and IAALD blogs: <http://ictkm.wordpress.com/tag/aaa/> and <http://iaald.blogspot.com/search/label/aaa>

8. A pathway is 'scored' according to how well it performs when searched for a specific output. Finding all journal articles from 2006 in the library catalogue gives a score of 100%. Finding none of the identified outputs in a pathway scores zero. Scores and percentages mentioned were right at the time the different Center analyses were done. They are likely to have changed based on improvements and other actions taken by the Centers in the meantime.

9. AGORA (Access to Global Online Research in Agriculture) set up by FAO with major journal publishers enables developing countries to access extensive scientific library collections. Providing a collection of 1278 journals to institutions in 107 countries, membership is limited to countries listed as either band 1 or 2 in the FAO list.

10. AGRIS contains over 2.5 million bibliographic references which provide access to international literature covering agricultural sciences and technology, including grey literature. It is

part of the CIARD (Coherence in Information for Agricultural Research for Development) initiative, in which the CGIAR, GFAR (Global Forum on Agricultural Research) and FAO collaborate to create a community for efficient knowledge sharing in agricultural research and development.

11. See the ICT-KM Program's series on social media tools: <http://ictkm.cgiar.org/2009/07/29/social-media-the-next-revolution/>

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# Learning to Swim: How IFPRI Uses Multiple Web Channels to Communicate Research Outputs

Chris Addison and Luz Marina Alvaré

**ABSTRACT:** Social media are transforming the way that research information is created, shared and communicated. This paper describes how the International Food Policy Research Institute (IFPRI) used multiple web channels to promote and market a new book: *Millions Fed: Proven Successes in Agriculture* ([www.ifpri.org/millionsfed](http://www.ifpri.org/millionsfed)). Ten major lessons and implications are drawn from the experience.

**RESUMÉ:** Les médias sociaux transforment la manière de créer, partager et communiquer les informations sur la recherche. Cet article décrit comment l'Institut international de recherche sur les politiques alimentaires (IFPRI) a utilisé les multiples canaux de la toile pour promouvoir et mettre sur le marché un nouveau

livre: *Nourrir des millions: succès assurés en agriculture* ([www.ifpri.org/millionsfed](http://www.ifpri.org/millionsfed)). Dix leçons et implications majeures sont tirées de cette expérience.

**RESUMEN:** Los medios sociales están transformando la manera de que se crea, intercambia y comunica la información de investigación. Este artículo describe cómo el Instituto Internacional de Investigaciones sobre Política Alimentaria (IFPRI) utilizó múltiples canales de la Web para promover y comercializar un libro nuevo: *Millions Fed: Proven Successes in Agriculture* ([www.ifpri.org/millionsfed](http://www.ifpri.org/millionsfed)). A partir de esta experiencia se sacaron 10 lecciones y conclusiones importantes.

## Introduction

**How can research and policy institutes** make the most of all the web channels available? Are these transforming the ecosystem of online communications? This paper describes how the International Food Policy Research Institute (IFPRI) used multiple web channels to promote and market a new book: *Millions Fed: Proven Successes in Agriculture* ([www.ifpri.org/millionsfed](http://www.ifpri.org/millionsfed)).

The project was aimed at diverse audiences—media, agriculture and development policy workers, researchers, and the public—and we had to create a suite of products that all of them could embrace while still meeting the needs of each group. To achieve this, we integrated different media approaches and products from each communications unit and research area into one campaign.

The core product is a **book**, which describes 20 success-story cases from around the world, backed up by a series of discussion papers providing the evidence that the interventions in each case study worked.

To communicate these issues to a broader audience and to reinforce the communications process, three further products were developed:

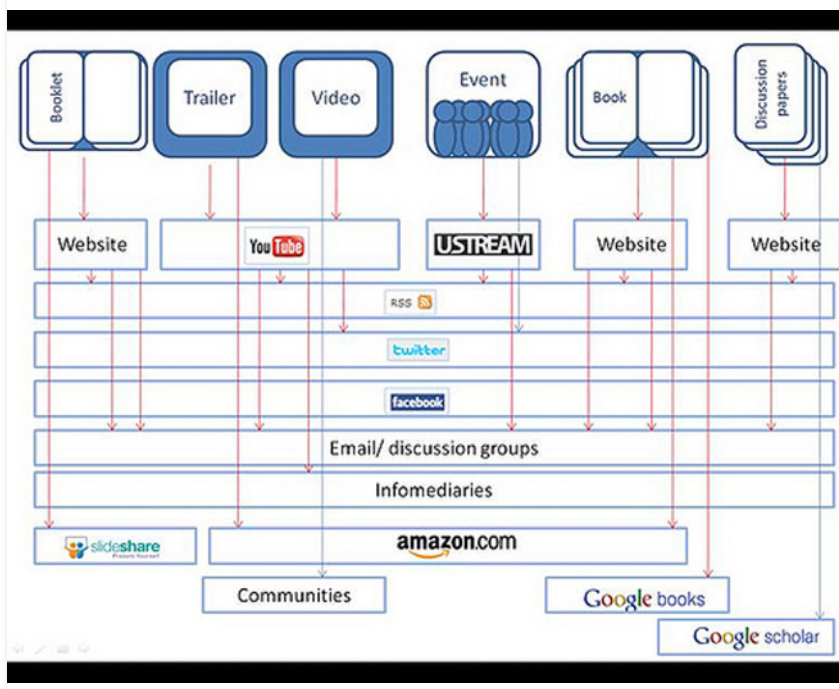
1. a **booklet** highlighting the project as a whole and some of the key findings,
2. a **video trailer** to accompany the book and draw attention to it, and

3. a **full video** summarizing the book as a whole and providing the most powerful presentation of key messages.

To get the messages out as widely as possible, our plan—outlined in Figure 1—called for us to use a wide variety of social media tools and products, including Twitter, YouTube, Google, Facebook, Slideshare, Amazon, and RSS.

Following the launch we evaluated how well the different channels had worked and examined where our

FIGURE 1 – IFPRI's plan for using multiple web channels for promotion and marketing



visitors came from and how they visited the various materials.<sup>1</sup>

Overall, we found that traditional web channels are still the most important for many of our audiences. The IFPRI website was used as the main repository of the products, and featuring the products in key locations on the IFPRI website appear to be the most important actions we took. E-mail campaigns appear to be the next most successful in bringing visits. Looking ahead, we see great potential to work with ‘infomediaries’ to help promote our products to communities we cannot reach directly. Social media is also increasingly important.

## Lessons learned and implications for IFPRI

In analyzing this campaign, we have learned the following lessons.

**1. Most visitors come from e-mail or direct publicity** – Analysis of the visitors to the website and online materials suggests that most visitors came through direct links or Google searches (for the phrase “Millions Fed”). Direct typing of Millions Fed web addresses or clicking in e-mails brought 6,524 visits, or roughly one-quarter of the 24,000 total number of visitors.

Following the result that most of our visitors come through e-mail or direct publicity, we have been looking more closely at how the e-mail “New at IFPRI” is used by its recipients. By looking at both opening and click-through rates, we can get an idea of the interest in the different materials. So far, we have found an increased click-through rate for images over text and more interest in shorter materials.

In the future, we will increase our focus on e-mail campaigns, analyzing, and changing formats to suit different products.

**2. Social media use is growing** – A few posts about the project from IFPRI Twitter accounts brought 163 visits, ‘retweeting’ by the One Foundation and BMGF increased the spread. However, since this project marked one of the first times we used Twitter, we weren’t expecting a huge uptake. IFPRI now has around 1,448 followers on Twitter. We also learned that a separate Twitter account created solely for the Millions Fed project did not gather as many followers as IFPRI’s main account.

We were surprised to see how quickly social media is building an audience for our materials. Different products are more suited to the audience than others. Hence, the Millions Fed video was widely ‘retweeted’ on Twitter, but the book itself was not. It is also critical to make the best use of tags to attract new audiences, to follow more people or groups with the IFPRI Twitter account in order to build our own followers, and to attract ‘retweets’ from other Twitter users. We also observed more interest in the Millions Fed materials when we related them to other news and stories.

**3. Publishing video on YouTube attracts more users** – Putting the Millions Fed videos on YouTube brought

views and more visitors to the Millions Fed pages on the IFPRI website. The videos on YouTube were viewed more than 2,000 times, and one-quarter of those who viewed the video came to the website from the YouTube link.

The success of the video in attracting more users and raising awareness shows the importance of considering multimedia products. We are increasingly developing presentations to explain new findings, products, or services. Essential to the success of these types of promotions is that we post them where users are already looking for them. We therefore make extensive use of YouTube and Slideshare. In the future, we will develop explanatory materials as presentations or interactive products.

**4. The IFPRI website plays a key role** – The IFPRI website is still important in bringing visitors. Fifteen percent of visitors to the Millions Fed pages arrived via referrals from other parts of the IFPRI website. More attention should be paid to linking and relating similar research areas and outputs on the Institute’s website because such links play an important role in resource discovery.

With everyone emphasizing the importance of Web 2.0 and social media tools for Internet communication, it was interesting to see our analysis results underscore the value of the website itself in bringing an audience to IFPRI products. Keywords used to access the website argue for a continued focus on the topical interests of the user rather than on the organizational structure of IFPRI. In the future, we will further develop topic pages and a subscribe options

**5. The web front page is less important than we expected** – Being on the front page of our institutional website is perhaps not as important as we might think: Only 25 percent of visitors to the website viewed the Millions Fed materials despite their being extensively featured on the front page. Some 75 percent of people found the project materials via other landing pages on the website. It appears that 1% of our visitors started with the IFPRI front page. The website is instead a series of landing pages, and in this case the Millions Fed page became the front page for more users. More than in the past, we see that social media and our presence in Google play greater roles in attracting visitors than prominent placement on the IFPRI front page.

**6. Social networking platforms extend our messages** – Facebook and LinkedIn brought similar numbers of viewers, but LinkedIn had more loyal visitors. This reflects the user groups for the two platforms. LinkedIn has focused on alumni of IFPRI whereas Facebook is open to anyone. Of the Facebook users, 83 were returning visitors compared with 47 who were new. Of the LinkedIn visitors, 107 were returning and only 2 were new. In the future, we will continue to use LinkedIn and Facebook to reach IFPRI alumni and other audiences that prefer these spaces. It seems that networking on these social spaces expands to other spaces quite fast.

**7. Beyond numbers, we need to understand reach –**

Visitors can be counted and discussed in absolute numbers or in amounts that are adjusted for the total percentage of the Internet population actually reached. Our usual way of quoting shows that visitors to the website were predominantly from the United States, India, and the United Kingdom. Adjusting these figures, however, based on the reach—that is, dividing the audience by the number of people actually connected to the Internet in a particular country—gives a very different view. This shows that countries with the greatest reach (in relation to their potential total audience) were Ethiopia, Ghana, Rwanda, Uganda, Mali, Zambia, Cambodia, Nigeria, Bangladesh, and Nepal. In the future, we would like to develop this idea and compare it with experiences from other organizations.

**8. Connectivity and bandwidth less critical than before –** One intriguing part of our analysis concerned the origin of dial-up connections to the website. Overall it accounted for less than 1 percent of visitors, from Germany, India, the United States, and Australia.

In the future, we will continue to ensure fast load times and caching of our materials. We will also provide more guidance to low bandwidth users and promote more e-mail delivery rather than a very low bandwidth version of the site.

**9. Mobile phones, still a small element –** Few people saw Millions Fed on our website using their mobile phones. iPhone users made 28 visits out of 24,000 during the time analyzed, Android phones made only two visits in the same time, Nokia phones just one, and BlackBerries none. In the future, we will look into the option of providing services through the use of mobile phones by simplifying services' accessibility, not strictly by duplicating the site for phones.

**10. Measuring success, we need to compare with others –** By our own standards, we were very successful in raising awareness of the product (the Millions Fed materials). The strategy of using more social media and web 2.0 tools to get the message out clearly worked. However, in terms of readership of the final product, other web-based publications produced during the year were more widely read. In the future, we want to tap into the experiences of others in the sector—exploring how their experiences compare with ours.

IFPRI on the social web:

Website: [www.ifpri.org](http://www.ifpri.org)

Twitter: [www.twitter.com/ifpri](http://www.twitter.com/ifpri)

Slideshare: [www.slideshare.net/ifpri](http://www.slideshare.net/ifpri)

YouTube: [www.youtube.com/user/ifpri](http://www.youtube.com/user/ifpri)

RSS feeds: [www.ifpri.org/rss](http://www.ifpri.org/rss)

## Notes

1. More details are available as IAALD blog stories: 'The Plan' (<http://iaald.blogspot.com/2009/11/communicating-new-research-output-ifpri.html>) and 'The Analysis' (<http://iaald.blogspot.com/2009/12/millions-fed-update-on-ifpri.html>). Also read 'The action' (<http://blog.webtastings.net/2010/01/22/ten-actions-to-take-from-our-latest-web-marketing-campaign>) on the WebTastings blog.

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# AGRIS—From a Bibliographic Database to a Semantic Data Service on Agricultural Research Information

Angela Fogarolli, Johannes Keizer, Stefano Anibaldi, and Dan Brickley

*NOTE:* Originally presented at the 13th IAALD World Congress held in Montpellier, 26–29 April 2010.

**ABSTRACT:** AGRIS has for many years provided a huge collection of bibliographic references, such as research papers, studies and thesis, each including metadata such as conferences, researchers, publishers, institutions, and keywords from different thesauri as AGROVOC.

With the rise of full text search and online availability of more research material, the role for bibliographic metadata can appear redundant. When considered instead as a form of modeling that emphasizes relationships, connections and links, bibliographic metadata grows in value as the Web grows in connectivity, and can provide researchers with a map of the global research community, linking formal outputs (papers, data) with a wider grey literature (preprints, drafts) and with communication platforms (blogs, forums) that help researchers put formal findings into a wider context.

This paper describes the evolving role of the AGRIS bibliographic database as it becomes a hub of agricultural research literature. The huge silo of 3 million agricultural resources, collected by more than 150 institutions over the last 35 years, becomes the starting point to access the diverse knowledge in agricultural science and technology available globally on the Web.

**RESUMÉ:** Depuis des années AGRIS offre une énorme collection de références bibliographiques, notamment des documents de recherche, des études et des thèses, toutes accompagnées de métadonnées, telles que conférences, chercheurs, éditeurs, institutions, et de mots-clés provenant de différents thésaurus comme AGROVOC.

Avec l'accroissement de la recherche en texte intégral et la disponibilité en ligne de documents de recherche de plus en plus nombreux, le rôle des métadonnées bibliographiques peut paraître superflu. En revanche si on les considère comme une forme de modélisation qui met en évidence les relations, les connexions et les liens, leur valeur augmente en même temps que la connectabilité sur le Web, et elles peuvent offrir une carte de la communauté mondiale des chercheurs, établissant le lien entre

## Introduction

Through exploration of the evolving role of databases such as AGRIS, it has become clear that the connectivity patterns among the things described in such a database (researchers, topics, institutes, places) can be better reflected online through a more explicit representation both in Web metadata and in user-facing Web sites. The distributed nature of the world described by AGRIS naturally fits a 'linked data' deployment model, in which AGRIS becomes more than a document discovery portal—it

les produits conventionnels (documents, données) et une littérature grise plus abondante (publications préliminaires, projets de textes) et des plateformes de communication (blogues, forums), qui aident les chercheurs à présenter des résultats officiels dans un contexte plus large.

Le présent document cherche à décrire le rôle en pleine évolution de la base de données bibliographiques AGRIS qui devient un centre de documentation scientifique agricole. Le réservoir gigantesque de 3 millions de sources d'informations agricoles, rassemblées par plus de 150 institutions depuis 35 ans, devient le point d'entrée pour accéder à la diversité des connaissances dans le domaine des sciences et technologies agricoles qui sont disponibles à l'échelle mondiale sur le Web.

**RESUMEN:** AGRIS dispone desde hace varios años de una extensa colección de referencias bibliográficas, como por ejemplo artículos de investigación, estudios y tesis, que contienen metadatos tales como conferencias, investigadores, editoriales, instituciones y palabras clave extraídas de varios tesauros, entre ellos el Tesauro AGROVOC.

El uso cada vez mayor de búsquedas de texto completo y la creciente disponibilidad de material de estudio en línea ha llevado a que los metadatos bibliográficos sean considerados cada vez más redundantes. Sin embargo, si estos metadatos bibliográficos son vistos como una forma de modelación que destaca las relaciones, conexiones y enlaces, el valor de éstos aumenta a medida que crece la conectividad Web, ofreciendo a los investigadores un mapa de la comunidad de investigación mundial, enlazando los productos formales (artículos, datos) con la literatura gris más amplia (tiradas preliminares, borradores) y con las plataformas de comunicaciones (blogs, foros) que permiten a los investigadores situar los resultados formales dentro de un contexto más amplio.

Este artículo busca describir la evolución y función de la base de datos bibliográfica AGRIS y cómo se ha convertido en el eje de la producción bibliográfica en materia de investigación agraria. El enorme silo de tres millones de recursos agrarios, reunidos por más de 150 instituciones a lo largo de los últimos 35 años, es el punto de acceso a múltiples conocimientos agrarios científicos y tecnológicos disponibles mundialmente a través de la Web.

becomes an entry point and map of the entire research landscape around some topic or theme.

Linked-data (Bouquet et al., 2008) techniques foster links between resources through the Web. This approach requires an emphasis on sharing identifiers, names and descriptions of real-world and abstract objects other than the bibliographic materials themselves: conferences, workshops, research centres, researchers, subject themes, homepages.

None of this is news to the bibliographic professional: Such concerns have been at the heart of metadata work for

years. What is new today is the presence of tools (standards, software) and community trends (open linked data, open archives, RSS/Atom syndication) that allow the full potential of such link-oriented metadata to be exploited.

## An entity centric approach to data aggregation

The idea to shift the web from a huge graph of documents to a huge graph of data has become more and more popular since the days when Tim Berners-Lee proposed the idea of the Semantic Web. Since then, scientists and practitioners have invested a lot of effort to realize this vision, often trying to adapt and reuse models and techniques originating in more traditional areas like databases and artificial intelligence. However, there is a very important difference between traditional knowledge-based systems, and current work that aims to reach semantic computing at web scale: The notion of global interlinking of distributed pieces of knowledge.

At the base of such interlinking—and the resulting semantic interoperability of fragments of data—is the notion of identity of and reference to entities. Systems that manage information about entities (objects/individuals/instances...) commonly issue identifiers for these entities, in the same way that relational databases issue primary keys for records. If these identifiers are generated by the information systems themselves, several issues arise that hinder interoperability and integration: (i) it can lead to a proliferation of identifiers because the same object is potentially issued with a new identifier in several information systems; (ii) one-to-one relations between identifiers and an entity cannot be achieved, i.e. one identifier can denote different entities in different information systems; (iii) reference to entities across information systems is very complicated or impossible because there is no way to know how an entity is identified in another system.

To overcome this lack of data-level integration, OKKAM (Heath et al., 2009) proposes a global, public infrastructure, called Entity Name System (ENS), which fosters the systematic creation and reuse of identifiers for entities in the global space of information and knowledge. This a-priori approach enables systems to reference the entities which they describe with a globally unique identifier, and thus create pieces of information that are semantically pre-aligned around those entities. Semantic search engines or integration systems are then able to aggregate information from distributed systems around entities in a precise and correct way. We call this the ‘entity-centric approach’ to semantic interoperability, and the resulting information/knowledge space is called the ‘Web of Entities.’

### The OKKAMization Process

‘OKKAMization’ is the process necessary to include an entity in existing information sources in the total web of entities. It involves the identification of entities inside

existing repositories and the creation of unique identifiers (OKKAM ID) for entities which are not already present in the ENS system.

Creating an OKKAM ID for an object involves getting a unique identifier which is a non-ambiguous way to refer to that object without ambiguity. An OKKAM ID is a well formed URI which enables a resource to be semantically connected to other global resources.

To allow the correct creation of an OKKAM identifier, it is necessary to collect a minimal set of information about an entity. This minimizes the risk of ambiguities (imagine creating an OKKAM ID about Mr. John Smith, just using his name. The result will be an OKKAM ID that refers to a person, but OKKAM will not be able to identify uniquely this entity because there are many ‘John Smiths’ in the world. Building an OKKAM ID with more information, such as state, city, work, allows the system to better recognize the right ‘John Smith.’)

The OKKAMization process of the AGRIS repository comprises four phases:

1. **Corpus entity recognition.** This focuses on entity recognition inside the AGRIS repository and related sources.
2. **Association of OKKAM IDs to extracted entities.** This task matches extracted entities against the OKKAM ENS. If a match can be found for an entity, then the identifier is reused. Otherwise a new entity profile is created and thus a new unique identifier is created for the extracted entity.
3. **Enrichment of the AGRIS repository with OKKAM identifiers.** The OKKAM identifier generated in phase two are included in the XML files of the repository as another type of metadata. This allows automatic identification and aggregation of entities inside the repository. The objective of this phase is to enable entity-based retrieval and to semantically connect entities in different contexts. Thus, from the user point of view, this will translate in an efficient retrieval that avoids information overload.
4. **RDF enrichment of the AGRIS repository.** During this step, the AGRIS repository is described using RDF notation. Publishing the repository using RDF makes the content of the repository understandable by external semantic search engines (SIG.MA, Google Project...). The hidden semantic connections among entities can be discovered and displayed to the users. Entities form the AGRIS repository can be described in RDF or microformats in other web resources such as the FAO website, and this will increase the semantic information that can be aggregated for the same entity.

### The AGRIS Linked-data Model

The AGRIS repository is a large and rich collection of bibliographic references encoded in a qualified Dublin Code XML format. Each XML document is structured in a metadata description for a publication which is sometimes available in a PDF format.

FIGURE 1 – Semantic Search by OKKAM id for a journal

**SIG.MA**  
SEMANTIC INFORMATION MASHUP

http://www.okkam.org/ens/id01dff3a2-cf11-4471-905d-18f9403493a2 Add More Info Start New

**artifact name:** Savremena poljoprivredna tehnika (Serbia), Contemporary Agricultural Engineering [?]

**country:** SERBIA [?]

**citation [2006]:** [?]

**chronology:** [2005] [?]

**citation identifier:** 0350-2953 [?]

**is citation of:** show 31 values [?]

**identifier:** www.okkam.org/ens/id01dff3a2-cf11-4471-905d-18f9403493a2

**is citation of:**

- Obrada zemljišta kombinovanim sredstvima [?]
- Efikasnost rada pneumatske rejalice, pri setvi oronog luka [?]
- The results of parallel testing of soy bean seed drill in strips and row [?]
- Otpornost rasplivkača na petrosnju i značaj njihovog testiranja [?]
- Contemporary combines in conditions of Vojvodina [Serbia] [?]
- Mogućnost za identifikaciju korena secerne repe u zemljištu pomoću radarskog senzora [?]
- Optimization of transport in harvesting [?]
- Universal frame with elements for autumn-winter tillage of lasting planted [?]
- Estimation of necessity heat energy quantum for plastic house heating of 0.5 ha in real conditions [?]
- Test results for a 250 kW biomass energy boiler and suggested technical and organizational measures boiler installations [?]
- Štopljanje, transport i skladištenje hala slame [?]
- Ušteda energije kod panelnog sistema za grejanje prasadi [?]
- Microclimate automatic control in goal to increase energetic and ecological efficiency of building and
- Mikroprocesorski termo-regulacioni sistem za održavanje temperature [?]
- Geometrijski pokazatelji rada rotacione sibilnice sa suprotnosmernim okretanjem radnih organa [?]
- Neke mehaniske metode zastite bilja u kontrolisanim uslovima za gajenje [?]
- Technological and technical aspects of young potato production [?]

FIGURE 2 – AGRIS data linked to other web resources

Optimization of transport in harvesting Add More Info Start New Order Options Use It

**Optimization of transport in harvesting**

**comment:** From theoretical point of view for determination of optimal harvest model, for transport and storage theory of mass serving closed type with complex analysis among all of three manifolds is applied. In the beginning harvest and serving of carriers by combine harvester are being observed. Because of comparison of simulated parameters, software for simulation of problems is made on PC computer. [?]

**availability:** COBISS.SR-ID 5117698 [?]

**number:** [?]

**location:** RS [?]

**arn:** RS2007000008 [?]

**creator personal:** Turan, J. [Poljoprivredni fakultet, Novi Sad (Serbia)] [?]

**citation number:** v. 31(3) p. 136-142 [?]

**creator:** Simpozijum Poljoprivredna tehnika, 31, Zlatibor (Serbia), 22-29 Jan 2005 [?]

**conference:** [?]

**citation:** http://www.okkam.org/ens/id01dff3a2-cf11-4471-905d-18f9403493a2 [?]

**description notes:** Summaries (En, Sr) [?]

- 4 ref. [?]
- 2 graphs [?]
- 1 table [?]
- 1 ill. [?]

**date issued:** hide value just this value which sources reject sources [?]

**identifier:** agris.fao.org/agris-search/search/display.do?f=2007/RS/RS0701.xml;RS2007000008 [?]

**Sources (7) Approved (0) Rejected (0)**

- Untitled document 39 facts | 2010-02-03  
http://okkam2.din.com.rs:8080/Agri/RS0701.rtf
- Produktschap Tuinbouw - ... 1 facts | 2010-02-19  
http://www.narcis.info/organisation/Rece...
- Appropedia talk:Village ... 1 facts | 2010-01-30  
http://www.appropedia.org/Appropedia\_talk...
- Untitled document 1 facts | 2010-02-19  
http://www.acribd.com/doc/2364844/Comm...
- Untitled document 1 facts | 2010-02-19  
http://groups.yahoo.com/group/NTPD-EP/line...
- Alinate Bachelor thesis 1 facts | 2010-02-19  
http://www.acribd.com/doc/14933792/Alpina...
- Untitled document 1 facts | 2010-02-19  
http://groups.yahoo.com/group/barita-bh...

**AGRIS record**

**Record number:** RS2007000008

**Titles:** Optimization of transport in harvesting

**Original title:** Optimizacija transporta u zetvi

**Personal Authors:** Turan, J. [Poljoprivredni fakultet, Novi Sad (Serbia)]

**Conference:** Simpozijum Poljoprivredna tehnika, 31, Zlatibor (Serbia), 22-29 Jan 2005

**Publication Date:** [2005]

**AGRIS Subj. Cat. AGRIS Terms:** Handling, transport, storage and protection of plant products; Agricultural machinery and equipment; HARVESTING, COMBINE HARVESTERS, TRANSPORT, COSTS, COMPUTER APPLICATIONS, RECOLTE, MOISSONNEUSE BATTEUSE, TRILLADORAS, TRANSPORTS, COSTOS, APLICACIONES DEL ORDENADOR

**Language notes:** Summaries (En, Sr), 1 ill., 2 graphs, 1 table, 4 ref.

**English Abstract:** From theoretical point of view for determination of optimal harvest model, for transport and storage theory of mass serving closed type harvest and serving of carriers by combine harvester are being observed. Because of comparison of simulated parameters, software for simulation of problems is made on PC computer.

**Type:** Conference, Summary

**Availability:** RS;RS (Serbia)

**Availability number:** COBISS.SR-ID 5117698

**Serial Title:** Savremena poljoprivredna tehnika (Serbia); Contemporary Agricultural Engineering

**Serial ID - ISSN:** 0350-2953

**Serial number:** v. 31(3) p. 136-142

**Serial Date:** [2005]

**For document availability, please contact:**  
AGLRS (Serbia)  
Atelice vrsake 2  
21000 Novi Sad, Serbia  
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**Web:** +381-21-525 859  
**Fax:** +381-21-525-859  
**Email:** zorica@bina.na.ac.rs

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In this section, we report about a first experience enabling linked data in AGRIS using the OKKAM ENS infrastructure.

To create a linked-data model for AGRIS, we followed the OKKAMization steps described above. We initially focused on the journal entity type in order to show the immediate advantage of applying a linked-data model to the AGRIS corpus. Second, through the OKKAM ENS search API, we obtained unique identifiers for each journal. Third, we show how the unique identifiers are introduced in the original repository files and then how each file is translated in RDF format and submitted to a Semantic Web Search Engine.

Assigning unique identifiers to entities in the AGRIS repository leads to a light-weight data integration of entities and in this way enables inter-linkage among entities which can come from different information sources (see Figures 1 and 2). The result is that efficient information retrieval will be enabled within the AGRIS repository and globally by interlinking with other information sources.

Figure 1 shows the result of a search by unique identifier for a journal. The interface shows different statements about the journal resource; some of the attributes are clickable to enter a deeper level of detail.

In the example, clicking on the citation attribute displays all the article titles for that journal. Clicking on one of the article titles displays the details of the article (see Figure 2).

Information about the OKKAMized resource can be aggregated through different sources. These are displayed on the right side of the figure — a click on an attribute allows the user to explore more details of the attribute itself. If the value of an attribute is a URL, this can connect with external information sources. In Figure 2, the article details provide many ways to navigate the AGRIS website or to other external related sources.

The volume of inter-linkages with external resources grows with the use of the same unique identifier across the web.

As mentioned before, references in the AGRIS repository are encoded in a XML format. This type of file can be enriched with unique identifiers, allowing the future representation of the unique identifier on the AGRIS web page and to the wider Web of entities.

Below we present a snapshot of the XML of an AGRIS resource with an OKKAM unique identifier for the journal in which the article appears:

```
<ags:citation>
  <ags:citationTitle>Savremena poljoprivredna tehnika Serbia)
  </ags:citationTitle>
  <ags:citationTitle>Contemporary agricultural engineering
  </ags:citationTitle>
  <ags:citationIdentifier scheme="ags:ISSN">0350-2953
  </ags:citationIdentifier>
  <ags:citationNumber>v. 31(1-2) p. 29-37</ags:citationNumber>
  <ags:citationChronology>(2005)</ags:citationChronology>
  <OkkamID>http://www.okkam.org/ens/ida53b7142-5880-4684-aab3-f83c2a6d0ea8/</OkkamID>
</ags:citation>
```

Below is an example of the automatically-generated RDF file for an AGRIS resource article. The unique identifier for the journal is highlighted in bold. The journal attributes are described inside the *rdf:Description* tag for the resource with a specific unique identifier (*.rdf:about="okkam\_id value"*).

Whenever the journal is cited within the AGRIS record, the unique identifier is used to describe it. The link to the original AGRIS website is also displayed. This will connect through the AGRIS web search interface from any Semantic Web search engines.

```
<?xml version="1.0"?>
<rdf:RDF
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:j.0="http://models.okkam.org/ENS-core-vocabulary.owl#"
  xmlns:j.1="http://purl.org/dc/terms/"
  xmlns:dc="http://purl.org/dc/elements/1.1/"
  xmlns:j.2="http://purl.org/agmes/1.1/">
  <rdf:Description rdf:about="http://www.okkam.org/ens/id01dff3a2-cf11-4471-905d-18f9d03d93c7">
    <j.2:citationChronology>(2006)</j.2:citationChronology>
    <j.0:artifact_name>Savremena poljoprivredna tehnika (Serbia),
      Contemporary Agricultural Engineering</j.0:artifact_name>
    <j.2:citationChronology>(2005)</j.2:citationChronology>
    <j.2:citationIdentifier>0350-2953</j.2:citationIdentifier>
    <j.0:country>SERBIA</j.0:country>
  </rdf:Description>
  <rdf:Description rdf:about="http://agris.fao.org/agris-search/search/display.do?f=2007/RS/RS0701.xml;RS2007000023">
    <j.2:subjectThesaurus>PROPIEADADES TECNICAS
    </j.2:subjectThesaurus>
    <j.2:subjectThesaurus>TRITICUM</j.2:subjectThesaurus>
    <j.2:subjectThesaurus>http://www.fao.org/aos/agrovoc#c\_2572
    </j.2:subjectThesaurus>
    <j.2:subjectThesaurus>http://www.fao.org/aos/agrovoc#c\_2386
    </j.2:subjectThesaurus>
    <j.2:creatorConference>Simpozijum Poljoprivredna tehnika, 32,
      Zlatibor (Serbia), 28 Jan-4 Feb 2006</j.2:creatorConference>
    <j.1:abstract>The paper shows presentation of the exploitational
      examination results for the wheat drill sowing aggregates.
      Some technical-technological drill solutions and the results of
      the working quality (norm, drilling depth) and the exploitational
      parameters (working speed, output) have been shown.
    </j.1:abstract>
    <j.2:creatorPersonal>Mehandzic, R.(Poljoprivredni fakultet, Novi
      Sad (Serbia). Departman za poljoprivrednu tehniku)
    </j.2:creatorPersonal>
    <j.2:creatorPersonal>Malinovic, N.(Poljoprivredni fakultet, Novi
      Sad (Serbia). Departman za poljoprivrednu tehniku)
    </j.2:creatorPersonal>
    <j.2:subjectThesaurus>SEMIS EN LIGNE</j.2:subjectThesaurus>
    <dc:type>K</dc:type>
    <j.2:subjectThesaurus>SEMOIR</j.2:subjectThesaurus>
    <j.2:ARN>RS2007000023</j.2:ARN>
    <j.2:descriptionNotes>3 tables</j.2:descriptionNotes>
    <j.2:subjectThesaurus>TECHNICAL PROPERTIES
    </j.2:subjectThesaurus>
    <j.2:descriptionNotes>2 ref</j.2:descriptionNotes>
  <j.2:citation rdf:resource="http://www.okkam.org/ens/id01dff3a2-cf11-4471-905d-18f9d03d93c7"/>
```

## Conclusions

In the AGRIS 2010 work, we have been prototyping a redesign for AGRIS that brings these concerns to the core of the system. Both in our data modelling, and in the Web presence, AGRIS will better emphasise the networked, linked nature of the things it describes.

AGRIS has for many years provided a huge database of bibliographic references, such as research papers and theses, each including metadata such as conferences, researchers, institutions, and keywords from different thesauri as AGROVOC.

The solutions presented allow information retrieval systems to perform stronger automatic elaboration offering data identification and aggregation. OKKAM allows the AGRIS repository to acquire the added value of making its full content available to the global web and at the same time to combine and aggregate information between and outside organizational boundaries.

It offers an effective and innovative solution to diffuse global knowledge through semantic web technologies.

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# Disponibilidad, accesibilidad y aplicabilidad de los resultados de investigación de los Centros del Grupo Consultivo para la Investigación Agrícola Internacional (CGIAR)

Edith Hesse, Peter Ballantyne, Mariano Mejía

*ARTÍCULO PRESENTADO* en la XV Reunión Internacional de Especialistas en Información Agraria y Ambiental (RIBDA), Lima, Perú, octubre 27-29 de 2009.

**RESUMEN:** El Grupo Consultivo para la Investigación Agrícola Internacional (CGIAR, por sus siglas en inglés), creado en 1971, es una alianza estratégica de 64 miembros que respaldan a 15 centros internacionales, los cuales colaboran con numerosos organismos oficiales y organizaciones de la sociedad civil, además de empresas privadas de todo el mundo.

Los 15 Centros del CGIAR tienen como mandato generar bienes públicos—es decir, sus resultados de investigación deberían estar disponibles sin restricciones legales, financieras y/o tecnológicas a un público amplio y diverso.

En mayo de 2009, el Programa ICT-KM del CGIAR inició un estudio para determinar la disponibilidad (citación o presencia) y accesibilidad (texto completo en línea) de los resultados de investigación de los centros del CGIAR. En este artículo se presentan los datos y análisis preliminares aportados por seis Centros, y un análisis más detallado de los resultados del CIAT.

**ABSTRACT:** The Consultative Group on International Agricultural Research (CGIAR), established in 1971, is a strategic partnership, whose 64 members support 15 international centers, working in collaboration with many hundreds of government and civil society organizations as well as private businesses around the world.

## Introducción

El **Grupo Consultivo** para la Investigación Agrícola Internacional (CGIAR, por sus siglas en inglés), creado en 1971, es una alianza estratégica de 64 miembros que respaldan a 15 centros internacionales,<sup>1</sup> los cuales colaboran con numerosos organismos oficiales y organizaciones de la sociedad civil, además de empresas privadas de todo el mundo. Entre los miembros del CGIAR se encuentran 21 países en desarrollo y 26 países industrializados, cuatro copatrocinadores y otros 13 organismos internacionales. Hoy en día hay más de 8.000 científicos y miembros del personal del CGIAR trabajando en más de 100 países del mundo.

Estos centros de investigación producen conocimientos científicos y tecnologías para fomentar el crecimiento agrícola sostenible en beneficio de los pobres, mediante el fortalecimiento de la seguridad alimentaria, el mejoramiento de la nutrición y la salud humanas, el aumento de

The mandate of the 15 CGIAR Centers is to generate public goods—in other words, their research outputs should be available to a broad, diverse audience, without legal, financial, and/or technological restrictions.

In May 2009, the ICT-KM Program initiated a study to determine the availability (citation or presence) and accessibility (full text online) of the research outputs of the CGIAR centers. The data and preliminary analysis provided by six CGIAR centers are presented herein, as well as a more exhaustive analysis of the results for CIAT.

**RÉSUMÉ:** Le Groupe consultatif pour la recherche agricole internationale (GCRAI), créé en 1971, est une alliance stratégique de 64 membres qui soutiennent 15 centres internationaux, travaillant en collaboration avec des centaines d'organismes gouvernementaux et organisations de la société civile, ainsi que des entreprises privées du monde entier.

Les 15 centres du GCRAI ont pour mandat de produire des biens publics—en d'autres termes, leurs résultats de recherche devraient être disponibles sans restrictions légales, financières et/ou technologiques à une audience large et diverse.

En mai 2009, le programme d'ICT-KM a entamé une étude pour déterminer la disponibilité (citation ou présence) et l'accessibilité (plein texte en ligne) des résultats de recherche des centres du GCRAI. Les données et l'analyse préliminaire fournie par six centres de GCRAI sont présentées dans cet article, ainsi qu'une analyse plus approfondie des résultats pour le CIAT.

los ingresos y la mejora de la gestión de los recursos naturales. Las nuevas variedades de cultivos, los conocimientos y otros productos derivados de la investigación colaborativa del CGIAR se ponen ampliamente a disposición de las personas y organizaciones que trabajan por el desarrollo agrícola sostenible en todo el mundo.

## Bienes públicos internacionales y el concepto 'Triple A'<sup>2</sup>

Los 15 Centros del CGIAR tienen como mandato generar bienes públicos—es decir, sus resultados de investigación deberían estar disponibles sin restricciones legales, financieras y/o tecnológicas a un público amplio y diverso. En los años 60 a 80, los centros diseminaron los resultados de investigación primordialmente a través de la colaboración estrecha con los respectivos programas nacionales de investigación agropecuaria. Además,

publicaron los resultados en revistas científicas, libros, memorias, etc., y llevaron a cabo numerosos programas de capacitación. Desde los años 90, cuando los centros ya no contaron con el financiamiento completo por parte de los donantes, empezaron a generar proyectos especiales en colaboración con diversos socios que incluyeron, además de los programas nacionales, universidades, ONG, asociaciones de productores, el sector privado y otros actores, que desempeñaron papeles importantes en los procesos de desarrollo e innovación.

El trabajar con tantos socios diferentes ha conllevado a creaciones innovadoras de conocimiento y valiosos circuitos de retroinformación durante el proceso investigativo. El conocimiento que ahora es generado por múltiples socios es también propiedad de múltiples socios; en otras palabras, no es propiedad de nadie y debe considerarse público y ser ampliamente accesible.

Sin embargo, se continúa animando a los investigadores del CGIAR a que produzcan resultados de alta calidad, y divulgados en publicaciones arbitradas, las cuales a menudo circulan en sistemas cerrados o de acceso limitado. De esta manera, a menudo se obtiene una alta calidad a expensas de la accesibilidad amplia al conocimiento del CGIAR, especialmente en los países en desarrollo.

En este contexto, la nueva Dirección General del CIAT recomendó explícitamente que el CGIAR debe buscar diversos caminos y opciones para lograr una mayor “disponibilidad, accesibilidad y aplicabilidad” (Triple A)<sup>3</sup> de sus resultados de investigación, y que deben tomarse acciones adicionales para convertir dichos resultados en bienes públicos internacionales (BPI). Sólo de esta manera serán ampliamente accesibles para ser utilizados, cuestionados y aplicados por el público en general. En este proceso, el Programa ICT-KM del CGIAR<sup>4</sup> está desempeñando un papel catalizador, no solamente en cuestiones de racionalización de la infraestructura informática de los centros sino también en la gestión del conocimiento. Este esfuerzo abarca los resultados de investigación que son tangibles (datos, información y software) y también el conocimiento intangible (tácito). Para que estos conocimientos lleguen a los múltiples y diversos socios se requiere de métodos innovadores y el empleo de nuevas estrategias y procedimientos. En este esfuerzo, el Programa ICT-KM se ha aliado con CIARD<sup>5</sup>, una iniciativa colaborativa entre varios socios incluyendo la FAO, que apunta hacia la coherencia en la información para la investigación agrícola para el desarrollo.

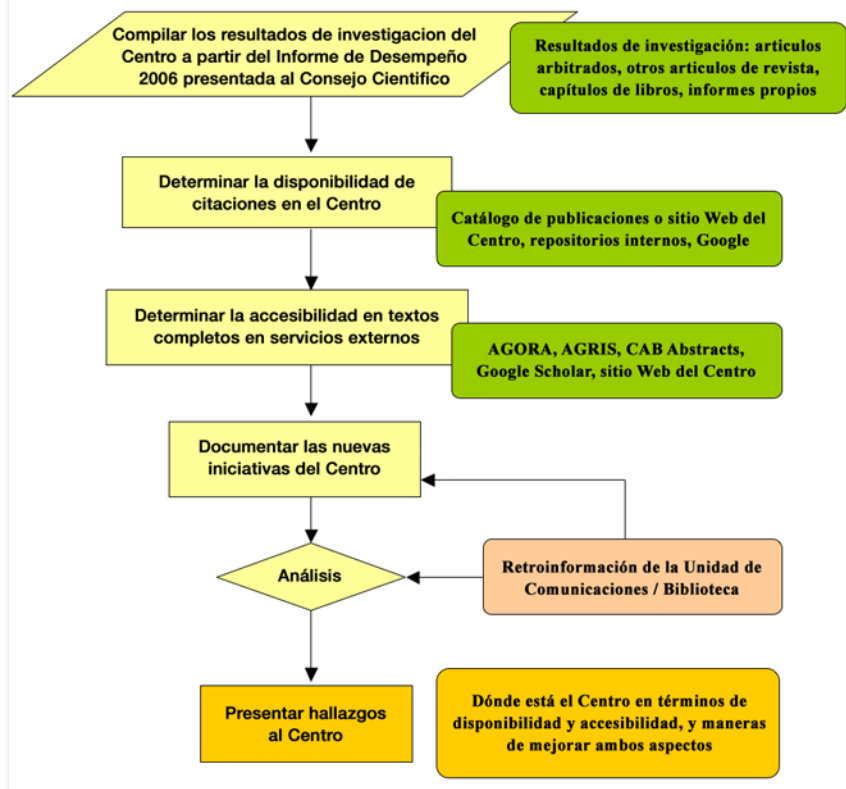
## Metodología del estudio

En mayo de 2009, el Programa ICT-KM inició un estudio para determinar la disponibilidad (citación o presencia) y accesibilidad (texto completo en línea) de los resultados de investigación de los centros del CGIAR. La metodología del estudio consistió en tomar como fuente de información las lista de referencias de las publicaciones de los Centros presentadas en el 2006 al Consejo Científico del CGIAR para evaluación del desempeño (Figura 1). En este artículo se presentan los datos y análisis preliminares aportados por seis Centros del CGIAR,<sup>6</sup> y un análisis más detallado de los resultados del CIAT.

Para los seis Centros del CGIAR, el análisis se hizo con base en el porcentaje de disponibilidad y accesibilidad de artículos publicados en revistas internacionales arbitradas indexadas en Thomson/ISI, y en libros e informes publicados por los Centros. Para el CIAT se determinó la disponibilidad y accesibilidad de artículos publicados en revistas arbitradas y no arbitradas, capítulos en libros, documentos presentados en conferencias y talleres internacionales, y en libros e informes publicados por el Centro.

Los datos se obtuvieron a través de búsquedas de cada tipo de publicación en diversas fuentes y sistemas de información, tanto propias de cada Centro como externas a ellos,<sup>7</sup> y que fueran de fácil consulta para todo tipo de usuarios de Internet.

FIGURA 1 – Metodología para estudiar la disponibilidad y accesibilidad de los resultados de investigación de los centros del CGIAR.



## Resultados

Los datos obtenidos para los seis Centros, en cuanto a la disponibilidad de revistas arbitradas (Cuadro 1), muestran alta disponibilidad en los catálogos de las bibliotecas (79%) y en la Biblioteca Virtual del CGIAR (“CGVlibrary”; 48%), en los archivos o repositorios institucionales (49%) y en los sitios web institucionales (71%). La accesibilidad, por el contrario, fue relativamente baja en los sitios web institucionales (21%), en la web de acceso libre sin restricciones (36%) y en los catálogos de publicaciones de los Centros (33%), moderadamente alta en los archivos o repositorio institucionales y en AGORA (56%), pero alta en Google Académico (78%) y muy alta en la web general (97%).

En cuanto a los libros y publicaciones institucionales (Cuadro 2), la disponibilidad fue muy alta en los sitios web institucionales (94%), en los catálogos de publicaciones de los Centros (88%), y en los catálogos de las bibliotecas (95%), y moderadamente alta en en la Bibli-

oteca Virtual del CGIAR (55%) y, pero baja en los archivos o repositorios institucionales (41%). De otra parte, la accesibilidad fue alta en Google (77%), en la web con restricciones (76%), en la web general de acceso libre sin restricciones (76%) y en los sitios web institucionales (70%), pero baja en Google Académico (41%), en AGRIS (27%) y en Google Libros (14%).<sup>8</sup>

En cuanto al CIAT (Cuadro 3), para las revistas arbitradas indexadas en Thomson/ISI se encontró alta disponibilidad en el catálogo de la Biblioteca (100%), en Google (96%) y en el sitio web institucional (88%); en cambio, la accesibilidad fue moderadamente alta en AGORA (55%), baja en Google Académico (32%) y en la web general (32%). Con respecto a los libros y publicaciones institucionales, la disponibilidad resultó muy alta en el sitio web institucional (100%), en el catálogo de la Biblioteca, en el catálogo de publicaciones y en el sitio web institucional (100%). En cuanto a la accesibilidad, ésta fue baja en Google Académico (0%), en AGRIS (6%) y media en la web de acceso libre sin restricciones de IP (76%).

CUADRO 1 – Disponibilidad y accesibilidad (%) de artículos arbitrados de seis Centros del CGIAR

Centros	Disp. en Catálogo Biblioteca	Disp. en Catálogo Publicaciones	TC en archivo institucionales	Disp. en sitio web institucionales	TC en sitio web institucionales	TC en web	TC en web acceso libre	TC en AGORA	Disp. en BVirtual del CGIAR	Disp. en Google Académico	Disp. en Google
1	100%	100%	98%	100%	24%	100%	22%	68%	2%	100%	95%
2	75%	0%	73%	43%	0%	90%	43%	51%	44%	93%	93%
3	2%	0%	88%	0%	0%	100%	22%	52%	0%	94%	100%
4	96%	0%	0%	92%	14%	90%	37%	53%	92%	59%	100%
5	100%	100%	0%	100%	38%	84%	62%	59%	100%	87%	100%
CIAT	100%	0%	49%	88%	50%	85%	32%	55%	51%	32%	96%
Prom.	79%	33%	51%	71%	21%	92%	36%	56%	48%	78%	97%

CUADRO 2. Disponibilidad y accesibilidad (%) de libros y publicaciones institucionales de seis Centros del CGIAR

Centros	Disp. en Catálogo Biblioteca	Disp. en Catálogo Publicaciones	TC en archivo institucionales.	Disp. en sitio web institucionales	TC en sitio web institucionales	TC en web	TC en web acceso libre	Disp. en BVirtual del CGIAR	Disp. en AGRIS	Disp. en Google Académico	Disp. en Google	TC en Google Libros
1	100%	100%	0%	100%	71%	75%	75%	4%	13%	4%	50%	0%
2	100%	45%	50%	64%	59%	59%	59%	41%	0%	45%	45%	27%
3	69%	100%	54%	100%	83%	85%	83%	15%	40%	40%	79%	4%
4	100%	81%	90%	100%	90%	90%	94%	97%	100%	77%	100%	48%
5	100%	100%	0%	100%	62%	81%	81%	100%	0%	78%	100%	3%
CIAT	100%	100%	52%	100%	56%	69%	67%	75%	6%	0%	90%	0%
Prom.	95%	88%	41%	94%	70%	76%	76%	55%	27%	41%	77%	14%

CUADRO 3. Disponibilidad y accesibilidad (%) de la investigación del CIAT

Resultados de la investigación en el 2006	Total (n=306)	Disponibilidad – Citación (%)				Accesibilidad – Texto completo (%)			
		Catálogo Biblioteca	Catálogo Publicaciones	Sitio web del CIAT	Google	Google Académico	AGORA	AGRIS	Texto completo en línea 'acceso libre'
Artículos en revistas arbitradas	84	100%	0%	88%	96%	32%	55%	n.a.	32%
Capítulos en libros arbitrados	47	81%	0%	94%	100%	11%	n.a.	n.a.	53%
Artículos en otras revistas	39	90%	0%	87%	92%	13%	0%	n.a.	54%
Libros y publicaciones institucionales	49	100%	100%	100%	90%	0%	n.a.	6%	76%

n.a. = no aplica.

## Conclusiones

Los datos obtenidos indican de manera general, que los artículos en revistas arbitradas tienen alta disponibilidad en los catálogos, repositorios y sitios web institucionales, pero relativa baja accesibilidad en texto completo, tanto en los sistemas internos como externos a los Centros. Las publicaciones institucionales de los Centros muestran una tendencia similar en cuanto a disponibilidad, pero una mejor accesibilidad en los sistemas externos.

De otra parte, el estudio muestra que el CGIAR en general y sus científicos están orientados hacia formas relativamente tradicionales de publicación y comunicación científica y que sus publicaciones y demás resultados de la investigación son menos accesibles de lo deseable.

Quizás la nueva generación de comunicación científica “ciencia 2.0” que faculta a los individuos y grupos a documentar y comunicar sus propias actividades en diferentes canales y medios sociales es la gran oportunidad de remediar esta situación. Esta ‘ciencia electrónica’ abarca los resultados de la investigación presentados en publicaciones arbitradas, de la manera tradicional, pero manejados de modo diferente, como ocurre en la actualidad. También abre una ‘ventana’ de posibilidades de comunicación y difusión más amplia empoderando a los individuos para que adapten estos resultados a sus propias necesidades y circunstancias.

De esta manera, la ‘ciencia 2.0’ transformará el flujo de información, conocimiento y comunicaciones dentro y alrededor del CGIAR; por lo tanto, es apremiante invertir en actividades y estrategias que ‘conviertan’ los resultados de investigación en bienes públicos internacionales (BPI).

Éstas son algunas estrategias y actividades para convertir resultados de investigación en bienes públicos internacionales:

- Promover la discusión y concertación de una visión de AAA para el CGIAR.

- Abogar por el pensamiento ‘Triple A’ para medir también el desempeño investigativo.
- Orientar y ayudar a los científicos a que adopten un pensamiento ‘Triple A’.
- Establecer repositorios de información científica que estén completos.
- Fortalecer la capacidad de publicación del CGIAR.
- Promover experimentos innovadores creativos.
- Hacer que los conocimientos del CGIAR sean visibles a través de sus socios.

Es preciso un mandato claro al respecto por parte de la gerencia del CGIAR y de cada centro, para que las cosas comiencen a moverse en la dirección deseada, ya que por lo general los investigadores por sí solos no tomarán acciones adicionales para hacer que dichos artículos y otros resultados sean más ampliamente accesibles. En este contexto, una buena colaboración entre las áreas de publicaciones, bibliotecas e infraestructura informática se vuelve más importante.

## Recomendaciones

Dado el porcentaje bajo de accesibilidad a muchos resultados de la investigación, sobre todo en aquellos artículos que se publican en revistas y libros de acceso restringido (por suscripción), el CIAT y otros centros del CGIAR ya están emprendiendo diversas iniciativas para remediar el problema:

A los *investigadores* se les está recordando que es preciso:

- Adherirse a las políticas existentes y depositar toda publicación científica y técnica en sus respectivas bibliotecas (Anexo 1).
- Negociar mejores acuerdos de transferencia de derechos de autor. Las casas editoriales en ocasiones son

## ANEXO 1 – Normas para depositar publicaciones científicas y técnicas del CIAT

Tipo de documento	Entregar a la Biblioteca <sup>11</sup>
Artículos publicados en revistas arbitradas y no arbitradas	∞ Reimpreso o fotocopia y/o copia electrónica de la versión final publicada. ∞ Copia electrónica del manuscrito final del autor (pruebas de página, pruebas de galera, pos-impresos; es el pdf que los autores reciben después de ser aceptado y revisado el artículo por expertos).
Artículos publicados en boletines técnicos	∞ Copia electrónica o fotocopia de la versión final publicada, con detalles bibliográficos.
Capítulos de libros	∞ Copia electrónica o fotocopia de la versión final publicada, con detalles bibliográficos y una fotocopia de la carátula del libro. ∞ De ser posible, la Biblioteca agradecería la donación del libro.
Libros publicados por proyectos del CIAT	∞ Tres copias impresas. ∞ Copia electrónica.
Documentos de trabajo publicados por proyectos del CIAT	∞ Tres copias impresas. ∞ Copia electrónica.
Artículos publicados en memorias de conferencias	∞ Copia electrónica o fotocopia de la versión final publicada, con detalles bibliográficos y una fotocopia de la carátula de las memorias. ∞ De ser posible, la Biblioteca agradecería la donación de las memorias.
Artículos presentados en conferencias	∞ Copia electrónica o fotocopia del manuscrito, facilitando detalles sobre el nombre de la conferencia, el lugar donde se realizó y la fecha. ∞ Copia electrónica del póster o de la presentación en PowerPoint, facilitando los detalles sobre el nombre de la conferencia, el lugar donde se realizó y la fecha.
Informes anuales de proyectos	∞ Copia impresa más copia electrónica tanto del resumen como del informe completo.
Tesis	∞ Copia impresa más copia electrónica; los supervisores pueden indicar si la tesis ha de colocarse en la web para el público en general o en la Intranet para uso interno solamente.
Herramientas, métodos o procedimientos en CD o DVD	∞ Dos copias del CD o del DVD.

flexibles con las organizaciones sin fines de lucro que trabajan en países en desarrollo y al solicitárselos ellos a menudo otorgan al investigador el derecho de colocar en línea el texto completo de la versión publicada y/o del manuscrito final.

- Enviar manuscrito final (prueba de imprenta) de todos los artículos, junto con su respectivo formato de transferencia de derecho de autor, a la Biblioteca. El personal de cada Biblioteca verificará las políticas de licencia para la revista y la casa editorial antes de colocarlo en línea (Anexo 2).
- Mantener al personal de la Biblioteca informado acerca de los permisos especiales que ellos negocian con las casas editoriales o los honorarios que pagan a las casas editoriales para tener acceso abierto permanente a sus revistas.
- Buscar alternativas de publicación en revistas de acceso abierto. ([www.ciat.cgiar.org/biblioteca/biblioteca\\_es/revistas\\_electronicas.htm](http://www.ciat.cgiar.org/biblioteca/biblioteca_es/revistas_electronicas.htm))
- Familiarizarse con los Medios Sociales (Web2.0 o Ciencia 2.0) para diseminar más ampliamente los resultados de investigación (Anexo 3).

El *personal de la Biblioteca* debe continuar sus esfuerzos para:

- Proveer tantos enlaces a texto completo como sea posible a los registros existentes de cada biblioteca.
- Solicitar permisos de las casas editoriales.
- Mantener informados a los investigadores sobre reglamentos de derecho de autor de casas editoriales y revistas científicas.
- Permitir que los repositorios públicos utilicen las publicaciones en línea del CIAT y de la Biblioteca Virtual del CGIAR.
- Mantener información actualizada sobre revistas de acceso abierto relevantes en el contexto de su centro.<sup>10</sup>
- Familiarizarse con los Medios Sociales (Web2.0 o Ciencia 2.0).

ANEXO 2 – Permisos de autoarchivo de artículos del CIAT publicados en revistas arbitradas de enero–septiembre de 2009

Casas Editoriales / Revistas	Permisos para colocar <sup>12</sup>				Puede aplicar una tarifa para acceso abierto
	Pre-impresiones <sup>13</sup> en el sitio web del autor	Post-impresiones <sup>14</sup> en los siguientes sitios web			
		Del Autor	Institucional	Del Donante	
<b>American Chemical Society</b> Journal of Agricultural and Food Chemistry	no	no	no	no	sí US\$3000
<b>American Society for Nutrition</b> Journal of Nutrition	no	no	no	no	sí US\$3000
<b>American Society of Agronomy</b> Soil Science Society of America Journal	no	no	no	no	no
		Debe colocar únicamente título, autor, resumen. Debe enlazar el artículo en el sitio de HighWire.			
<b>BioMed Central</b> International Journal of Health Geographics	sí	sí	sí	sí	no
<b>Blackwell Publishing</b> Journal of Food Science Review of Agricultural Economics		sí	sí	sí	sí
		Pueden aplicar embargos de 6-12 meses.			
<b>Cambridge University Press</b> British Journal of Nutrition Experimental Agriculture	sí	sí	sí	sí	sí
		La versión del editor en pdf puede usarse en el repositorio institucional o en PubMed Central después de un embargo de 12 meses.			
<b>Crop Science Society of America</b> Crop Science	no	no	no	no	no
		Se puede colocar únicamente título, autor y resumen y se debe enlazar el artículo en el sitio de HighWire.			
<b>Earthscan</b> International Journal of Agricultural Sustainability	Situación poco clara				
<b>Elsevier</b> Agricultural Ecosystems and Environment Agricultural Systems Food Policy Journal of Food Engineering Pedosphera	sí (excepto para la revista "Cell Press")	sí	sí	sí	sí
<b>Entomological Society of America</b> Journal of Economic Entomology	no	Después de 24 meses			no
<b>International Society for Horticultural Science</b> Acta Horticulturae	Situación poco clara	sí	Después de 12 meses		no
<b>National Academy of Science</b> Proceedings	sí	sí	sí	sí	sí US\$1200
<b>Springer Verlag</b> Agroforestry Systems Biology and Fertility of Soils Euphytica European Journal of Plant Pathology In Vitro Cellular and Developmental Biology Plant Molecular Breeding Nutrient Cycling in Agroecosystems Theoretical and Applied Genetics	sí	sí	sí	Después de 12 meses	sí
<b>Taylor and Francis</b> Journal of Development Studies	sí	Después de 12 meses para revistas de CTM <sup>15</sup> . Después de 18 meses para revistas de CSH.			
<b>WFL Publisher</b> Journal of Food Agriculture and Environment	No está incluido en SHERPA/RoMEO				

ANEXO 3 – Utilización de los medios sociales para disseminar los resultados de investigación del CIAT (páginas visitadas desde 1 de mayo hasta 17 de septiembre 2009)

Medio social	Contenido	No. De visitas
CIAT Blog en inglés	Noticias en inglés con enlaces a artículos, fotos, sitios web, etc.	6,016
CIAT Blog en español	Noticias en español con enlaces a artículos, fotos, sitios web, etc.	3,008
SlideShare	Presentaciones PowerPoint	24,216
	Documentos en PowerPoint	36,402
Flickr	Fotos	59,257
Blip.TV	Videos	1,256
<b>Total</b>		<b>130,155</b>

Los *encargados de la informática* deberían:

- Animar al personal para que utilicen las nuevas herramientas Web 2.0 y/o Ciencia 2.0.
- Eliminar, en lo posible, las restricciones de uso de medios sociales que podrían existir por:
  - categorías de personal
  - razones de seguridad
  - razones de ancho de banda

Los *encargados de publicaciones* deberían:

- Gestionar licencias abiertas (“Creative Commons”).
- Producir las publicaciones en formatos fácilmente ajustables y adaptables.

Aparte de buscar una accesibilidad más amplia a los resultados de la investigación a través de las publicaciones tradicionales, los centros del CGIAR están emprendiendo varias estrategias e iniciativas para que estos resultados lleguen de manera apropiada (ver Anexo 4).

#### ANEXO 4 – Maneras adicionales para incrementar la accesibilidad

<b>Repositorios abiertos</b>	En la actualidad hay cuatro Centros del CGIAR (IFPRI, Bioversity International, ICRISAT, ILRI) que ya han establecido repositorios abiertos que pueden ser utilizados por repositorios públicos seleccionados. Se está trabajando para asegurar que ciertos componentes de la Biblioteca Virtual del CGIAR sean “cosechados” por otros servicios.
<b>Licencias abiertas</b>	El IIRRI ha sido pionero en establecer una licencia de “Creative Commons” para todo el contenido disponible en su sitio web (ver <a href="http://iaald.blogspot.com/2009/05/irri-science-more-accessible-with-open.html">http://iaald.blogspot.com/2009/05/irri-science-more-accessible-with-open.html</a> ). El CIAT y otros centros están colaborando con CAS-IP (Servicio Central de Asesoría para Derechos de Propiedad Intelectual del CGIAR) para establecer directrices y tomando en cuenta casos especiales.
<b>Mayor aprovechamiento de servicios de terceros (AGRIS, Google, INFOTEC, etc.)</b>	La mayoría de los centros están registrando sus publicaciones en otros sistemas, tales como la base de datos de AGRIS de la FAO. El CIAT participa además en AGRIS2000 de SIDALC, coordinado por la Biblioteca Orton del CATIE, ayudando así a dar visibilidad adicional a sus. Asimismo, participa el sistema noticiero INFOTEC, coordinado por IICA.
<b>Libros de los Centros en Google Libros</b>	En meses recientes prácticamente todos los centros del CGIAR han enviado sus libros a Google para digitalización. Los 320 libros del CIAT ahora ya deberían estar digitalizados.
<b>Medios sociales</b>	Co-patrocinado por el Programa ICT-KM del CGIAR durante los últimos años, el CIAT ha tenido numerosas experiencias útiles con medios sociales. El equipo de comunicaciones está haciendo esfuerzos para integrar los métodos y enfoques más relevantes y, junto con el personal de investigación, encontrar formas significativas de emplearlos para disseminar los resultados de investigación. Por ejemplo, durante la Semana para Compartir Conocimiento Anual del CIAT, todas las presentaciones en PowerPoint fueron accesibles mediante SlideShare, todos los pósters científicos mediante Flickr, mientras que las historias se compartieron por medio del blog del CIAT (uno en inglés, uno en español), acompañadas de imágenes colocadas en Flickr. La retroinformación, especialmente de los científicos más jóvenes y aquellos que trabajan en las regiones, fue de mucho entusiasmo (ver algunas de las estadísticas de acceso, Anexo 3).
<b>Video participativo</b>	Varios centros han experimentado con videos participativos para adaptar conocimientos científicos para agricultores y otros intermediarios (ver WARDA <a href="http://delicious.com/iaald/warda">http://delicious.com/iaald/warda</a> ).
<b>SIG de acceso libre</b>	Varios centros han aunado fuerzas y ahora están ofreciendo datos geográficos mediante el Consorcio para la Información Espacial (CGIAR-CSI). Con el apoyo del Programa ICT-KM del CGIAR, dicho Consorcio ya ha refinado datos que ya están disponibles. Ahora cualquier usuario puede tener libre acceso a datos espaciales del Consorcio y utilizarlos para su propia aplicación.

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## Notas

1. Tres de los 15 centros tienen su sede en América Latina: el Centro Internacional de Agricultura Tropical (CIAT) en Colombia; el Centro Internacional de Mejoramiento de Maíz y Trigo (CIMMYT) en México; y el Centro Internacional de la Papa (CIP) en Perú ([www.cgiar.org](http://www.cgiar.org)).
2. Triple A por su significado en inglés: “availability, accessibility, applicability”.
3. Presentación del Dr. Ruben Echeverría, en la Semana para Compartir Conocimiento en el CIAT (junio de 2009). <http://ciatlibrary.blogspot.com/2009/05/science-for-impact-extending.html>
4. Sitio web Programa ICT-KM (<http://ictkm.cgiar.org/>).
5. Sitio web de CIARD (<http://www.ciard.net/>).
6. WorldFish, World Agroforestry Centre, Bioversity International, CIP y CIAT.
7. Catálogos de Bibliotecas, Catálogos de publicaciones, sitios web de los Centros, CGVLibrary, Google, AGORA y otras.
8. En meses recientes prácticamente todos los centros del CGIAR han enviado sus libros a Google para digitalización.

9. Como un ejemplo reciente, véase el servicio Mendeley <http://ictkm.wordpress.com/2009/09/27/a-fusion-of-itunes-and-last-fm-can-mendeley-change-the-face-of-science/>

10. El CIAT preparó una lista de revistas de acceso abierto en el área de investigación agropecuaria con indicaciones de cuáles de estas revistas están incluidas en Thomson/ISI, ya que éste es un criterio importante para la evaluación de desempeño del Consejo Científico del CGIAR [www.ciat.cgiar.org/biblioteca/biblioteca\\_es/revistas\\_electronicas.htm](http://www.ciat.cgiar.org/biblioteca/biblioteca_es/revistas_electronicas.htm)

11. El personal de la Biblioteca del CIAT actuará con la debida diligencia cuando coloque copias electrónicas, ya sea en la web o en Intranet, teniendo en cuenta las normas existentes de derechos de autor y las instrucciones dadas por los investigadores.

12. En la mayoría de los casos aplican las siguientes condiciones: a) El derecho de autor y la fuente deben ser reconocidos. b) Debe proporcionarse el enlace al sitio web de la revista o al DOI del artículo. c) El servidor debe ser no comercial.

13. Antes de la revisión por pares (pre-revisión).

14. Después de la revisión por pares (post-revisión, pruebas de imprenta, el manuscrito final del autor o el borrador).

15. CTM = Ciencia, Tecnología, Medicina; CSH = Ciencias Sociales, Humanidades.

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# VERCON: The Virtual Extension and Research Communication Network

Sophie Treinen

*NOTE:* Originally presented at the 13th IAALD World Congress held in Montpellier, France, 26–29 April 2010.

**ABSTRACT:** Too often, technology-based rural information and communication systems put the emphasis on the technology rather than the human dimension. Technology alone cannot be a panacea, and rural communication and information systems are doomed to failure unless there is active information management and knowledge exchange, with appropriate support to all communication aspects. The human component and the technological components need to be combined appropriately. The human factor is crucial because the needs of the people should be at the heart of any system. The system should be convenient for their use. On the other hand, digital technologies provide potential for innovative approaches that make production, storage, and exchange of information easier, faster, and more accessible to geographically dispersed populations.

In the last ten years, the FAO has supported national initiatives related to rural information and communication based on new information and communication technologies (ICTs) in seven countries, spread across four regions (Africa, Asia, Middle East and Latin America). Conceptual models, methodologies and tools have been developed to strengthen linkages among rural institutions and individuals using Internet-based ICTs, such as the Virtual Extension and Research Communication Network (VERCON). Such initiatives involve different types of stakeholders: agricultural researchers and extension agents, small-farmers, non-governmental organizations, private or public agricultural service suppliers and the media, such as rural radio. The aim is to harness new ICTs in combination with traditional communication channels to enable these rural stakeholders to be better informed, to manage information and also to share their knowledge; complementing, enriching and reinforcing existing pathways with new ICTs.

**RÉSUMÉ:** Trop souvent, les systèmes de communication et d'information en milieu rural faisant appel à la technologie mettent fortement l'accent sur l'aspect technologique au détriment de la dimension humaine. La technologie à elle seule, n'est pas une panacée. Les systèmes de communication et d'information en milieu rural sont voués à l'échec si l'information n'est pas gérée activement et les connaissances véritablement échangées, et si un appui adéquat n'est pas donné à tous les aspects de la communication. Les composantes humaines et technologiques sont deux aspects décisifs qui doivent s'allier judicieusement. L'élément humain est fondamental, dès lors que les besoins des personnes sont au cœur de tout système. Celui-ci doit être facile à utiliser. Quant à la dimension technologique, elle est importante étant donné que les technologies numériques offrent la possibilité de rendre la production, l'échange et l'archivage d'informations plus faciles, plus rapides et plus accessibles pour les personnes dispersées géographiquement.

Au cours des dix dernières années, la FAO a appuyé des initiatives nationales utilisant les nouvelles technologies de l'information et de la communication (NTIC) dans le secteur de l'information et de la communication rurales et cela, dans sept pays

de cinq régions (Afrique, Asie, Moyen-Orient, Amérique latine, Europe orientale et centrale). Ainsi, des modèles, des méthodologies et des outils, destinés à renforcer les interactions entre les institutions rurales et les personnes, ont été développés en faisant appel aux technologies de l'information et de la communication. C'est notamment le cas du Réseau virtuel de communication pour la vulgarisation et la recherche (VERCON). Ces initiatives ont associé une variété de parties prenantes: des chercheurs et des services d'appui-conseil dans le domaine de l'agriculture, des agents de vulgarisation, des petits exploitants agricoles, des associations d'agriculteurs, des organisations non gouvernementales, des prestataires de services agricoles privés et publics, des professionnels de la communication et des médias, tels que les radios rurales. Le but est de permettre aux acteurs du monde rural d'être mieux informés, de mieux gérer l'information et de partager leurs connaissances, tout en optimisant et en enrichissant les moyens de communication existants grâce aux NTIC.

**RESUMEN:** Ocurre demasiado a menudo que los sistemas de información y comunicación en el medio rural basados en la tecnología, ponen el acento en la tecnología antes que en la dimensión humana. La tecnología, por sí sola, no es una panacea. Los sistemas de información y comunicación en el medio rural están condenados al fracaso a no ser que se promuevan activamente la gestión de la información y el intercambio de conocimientos, brindando el apoyo apropiado a todos los aspectos de la comunicación. Es preciso combinar adecuadamente el componente humano y el componente tecnológico. El factor humano es crucial, porque las necesidades de las personas deberían ser el eje de todo sistema. Además, los sistemas deberían ser prácticos de utilizar. Por otro lado, las tecnologías digitales ofrecen posibilidades de aplicar enfoques novedosos que hacen que la producción, el almacenamiento y el intercambio de información resulten más fáciles, rápidos y accesibles para las poblaciones geográficamente dispersas.

En los últimos diez años la FAO ha respaldado iniciativas nacionales relacionadas con la información y la comunicación rurales basadas en las nuevas tecnologías de la información y la comunicación (TIC) en siete países, repartidos en cinco regiones (África, Asia, Oriente Medio, América Latina y Europa Central). Se han desarrollado modelos conceptuales, metodologías y herramientas para fortalecer los vínculos entre las instituciones y las personas del medio rural que utilizan las TIC. Se trata entre otros de la red virtual de comunicación sobre la extensión y la investigación (VERCON). En esas iniciativas participan interesados de distintos tipos: investigadores agrícolas y extensionistas, pequeños agricultores, organizaciones no gubernamentales, proveedores de servicios agrícolas privados y públicos, profesionales de la comunicación y medios de comunicación, como emisoras radiofónicas rurales. El objetivo es poner a los actores del mundo rural en condiciones de ser mejor informados, manejar más fácilmente la información y compartir sus conocimientos, optimizando y enriqueciendo los medios de comunicación ya existentes gracias a las nuevas TIC.

## Introduction

In the last ten years, the FAO has supported national initiatives related to rural information and communication based on new information and communication technologies (ICTs) in seven countries, spread across four regions (Africa, Asia, Middle East and Latin America). Conceptual models, methodologies and tools have been developed for strengthening linkages among rural institutions and individuals using Internet-based ICTs, such as the Virtual Extension and Research Communication Network (VERCON). Such initiatives involve different types of stakeholders: agricultural researchers and extension agents, small-farmers or non-governmental organizations, private or public agricultural service suppliers and the media, such as rural radio.

## VERCON aims and challenges

Strong linkages between agricultural research and extension are essential for research to successfully contribute to agricultural and rural development. Similarly, access to information and knowledge on appropriate agricultural technologies is fundamental to improve small farmers' competitiveness and contribute to food security and sustainable development.

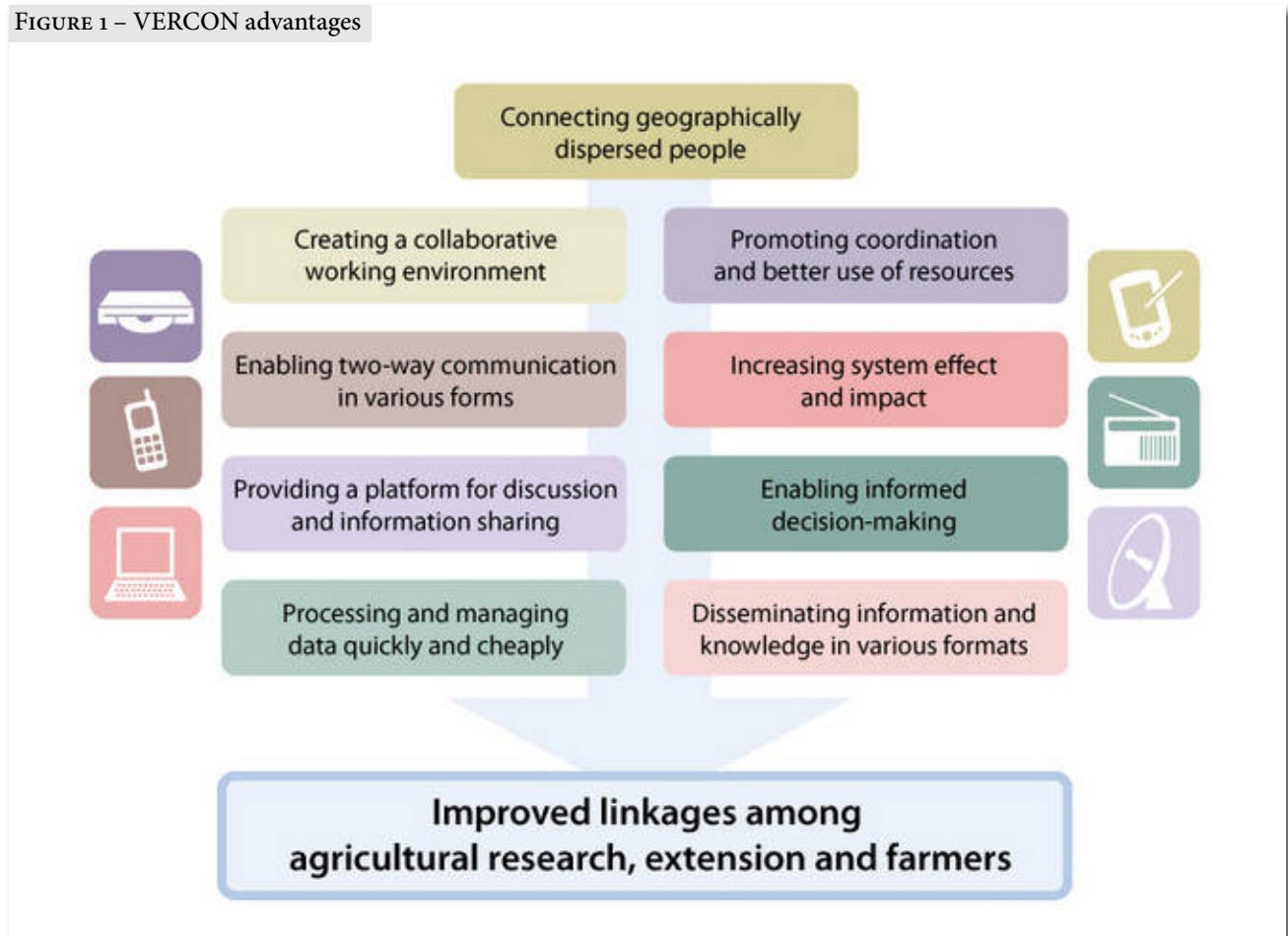
The challenge of VERCON-like projects is to improve access to agricultural information and enhance communication, knowledge-sharing and lesson learning among and within the human, institutional and social components of agricultural production systems. This is done using collaboration and innovative methods of communication such as Internet-based ICTs and addressing the needs and priorities of the farmer communities as a major concern.

VERCON's innovative nature (Figure 1) is its ability to achieve effective linkages by connecting geographically dispersed people and enhance two-way communication, managing large volumes of data, and rapidly collecting, processing and disseminating information in a variety of forms.

## The human and technological components of VERCON

Too often, technology-based rural information and communication systems put the emphasis on technological rather than human dimensions. If an information system is not enriched with content or is not used, it has no value. Technology alone is not a panacea, and rural communication and information systems are doomed to failure unless there is active information management

FIGURE 1 – VERCON advantages



and knowledge exchange, with appropriate support to all communication aspects. The human component and the technological components need to be combined appropriately. Two general aspects are worth mentioning. On one hand, the human element, the more complex aspect of any initiative, is crucial because the needs of the people should be at the heart of any system. The system should be convenient for their use. On the other hand, digital technologies provide great potential for innovative approaches that make production, storage, and exchange of information easier, faster, and more accessible to geographically dispersed populations.

Furthermore, these new digital technologies are exciting, intriguing, captivating, and full of opportunity. The interest and excitement they generate can be harnessed to bring together people with different roles and functions to explore ways to collaborate, share and improve agricultural systems. The technologies encourage such collaboration and sharing by providing new means to support and enhance such processes. The new technologies can also be combined with more traditional technologies and communication methods such as print media, rural radio, face-to-face dialogue, and many other approaches common to agricultural extension and communication for development.

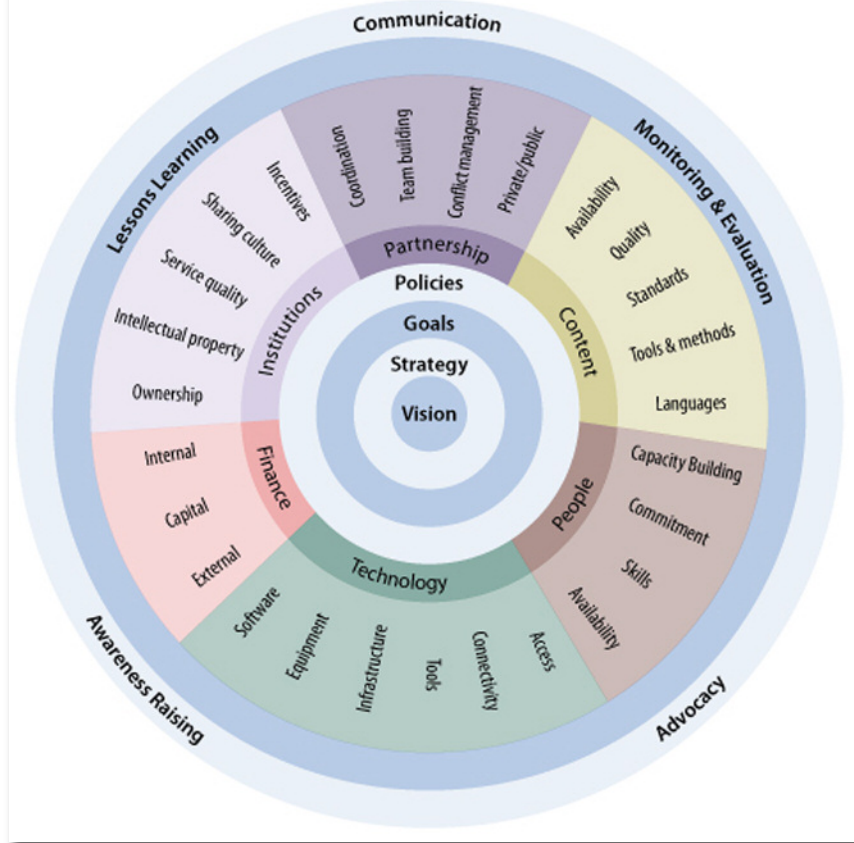
### Building a VERCON

From the formulation to the evaluation phase, building a VERCON is fundamentally about the personal determination and commitment of partner institutions who seek to overcome bureaucratic obstacles and administrative traditions in order to improve or establish a national agricultural knowledge and information system.

There is no magic 'VERCON-in-a-box' software package, and there is no one-size-fits-all VERCON solution for every developing country. The improved communication network is the result of extensive multi-stakeholder collaboration for planning, implementing, managing and evaluating practical processes and tools to improve communication linkages and information sharing.

Building a VERCON also involves finding creative and practical ways to harness new information and new ICTs, particularly the Internet and personal computers. However, finding effective and practical ways to harness the technologies is not accomplished by information

FIGURE 2 – VERCON Success factors



management professionals or software experts alone. Researchers and extension agents must find the spaces and mechanisms to assess, plan, implement and evaluate together what the network is offering while taking into account feedback from their rural counterparts.

### Success factors

As in many programmes and projects, a clear vision and strategy should be agreed on from the beginning. Members of the existing agricultural system should share the goals to enhance that system. The shared vision, strategy and related goals and policies need to be at the centre of the system to make it work. Advocacy and promotion are useful to guarantee support to the network.

In addition to these, other success factors have been identified in six interrelated categories: people, technology, institutions, partnership, content and finance.

As outlined in Figure 2, several key aspects need to be addressed for each category.

**People:** There should be sufficient human resources with appropriate skills to carry out the requested tasks, and they should be committed to the project. The time people will spend on a VERCON should be integrated in their daily work. There should be opportunities to develop the capacities of all stakeholders, as all of them should feel comfortable with changes proposed by the system.

**Technology:** Ensuring that all users can access the system is not a challenge, but a must. A capacity assessment will identify the limitations in terms of connectivity, infrastructure and equipment. The leading team should adopt a realistic approach to technology according to the actors' needs. The system should be built in collaboration with the users and be finalized after having received their feedback. The selection of appropriate tools should be done with them. If they are not comfortable with the system, they won't use it!

**Finance:** As several institutions are usually involved in a VERCON, the cost of building the network should be shared and respected. The budget should take into account the cost of equipment, travel, repackaging of content, maintenance, organization of meetings at apex and decentralized levels, etc. Funds can come from various sources: internal, external and partnerships.

**Institutions:** VERCON is part of a process of institutional strengthening, in terms of management, commitment, sharing culture, incentives and service quality. Ownership among the partners and within the institutions involved is key. The recognition of the intellectual property and the issue of individual contributions (such as pictures) should also be addressed.

**Partnership:** Diverse partners are involved in a VERCON. Building partnership requires considerable efforts. This is why it is important to adopt a win-win approach and start with a team building exercise. Openness and transparency will reduce the risks of conflicts.

**Content:** Without content there is no system. Whether digitized or not, a good information management system should be put in place, including the adoption of standards and peer review to guarantee the quality of content. Tools and methods of information management should be used to make search and retrieval of documents easy for the users. Content should be adapted to the local context and different users, in terms of language (national and local languages, level of complexity, illustrations, etc.). The same content can exist in several formats (written document, audio, video, image, etc.).

## Lessons learned

After several years of implementation of VERCON projects, the following main lessons have been identified:

**Enabling environment and connectivity** – An ICT policy that recognizes the value of connectivity in the country and the importance of telecommunications infrastructure is necessary before starting implementing a VERCON system. Connectivity, including in the rural areas, is essential to guarantee the network works. If these basic requirements cannot be met, it might be better to postpone the implementation of a VERCON until the situation improves.

**Institutionalization of VERCON networks** – A VERCON network should not be seen as a project, but as a new way of working within the institution. It needs to be

embedded at the institutional level. Institutionalization implies making sure that a VERCON is fully embedded in the procedures and ways of working, in staff work plans and budgets, as well as in the systems to monitor assess results and impact. Sustainability will not be possible if VERCON management and benefits are not fully recognized and the network institutionalized. Champions within the institution and at all levels are assets that help guarantee the success of a VERCON.

**Network facilitation** – Facilitation is needed to promote exchange and information flows between the system's stakeholders. A proactive coordination team or unit is thus essential to motivate, facilitate, promote, and encourage information exchange and communication among the VERCON actors. Face-to-face meetings to capitalize and stimulate exchange and new ways of working are also crucial. A dynamic human network is a fundamental aspect of VERCON.

A VERCON cannot rely on only one or two motivated individuals, in particular in countries with high staff mobility. Accountability will be improved if roles and responsibilities of the various actors are defined in a memorandum of understanding.

**A sharing and exchange culture** – At institutional and individual levels, the actors involved in a VERCON system put together their resources and share them with other stakeholders. Sharing is a win-win solution. However, it is often a real challenge because of the inclination to work in 'closed' environments. A knowledge sharing culture should be promoted and facilitated, through a specific strategy that might include capacity building in collaborative methods, tools in communication for development, exchange mechanisms, working in small network groups, etc.

A favorable environment and culture conducive to sharing is a necessity. This implies the commitment of senior management, collaborative planning, knowledge sharing, cross-functional teams and critical review of current systems.

**People not only technology** – The human and the technological components should be combined appropriately. Not only should the technology be user-friendly and accessible, but it also should serve the users' needs.

Networks such as VERCON work with people. People need trust to work together and share their information and knowledge. Trust, useful information and knowledge, with appropriate support from good communication, will make the network work. The system will have an added-value only if it is relevant to the needs of particular user groups.

## Learning more about VERCON

The VERCON website is available in several languages at <http://km.fao.org/vercon>. This contains information on the experiences of VERCON in Armenia, Bhutan,

Costa Rica, Egypt, Uganda and other similar projects in Nigeria and Colombia.

## About the Author

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**Union and the private sector before joining FAO. She is now in charge of the Knowledge Outreach team at the Food and Agriculture Organization of the United Nations. She is working on the introduction of new Information and Communication Technologies (ICTs) in agricultural and rural development programmes around the world. As facilitator, she uses and promotes knowledge sharing methods and tools through participatory approaches. She pays particular attention to gender issues. — [sophie.treinen@fao.org](mailto:sophie.treinen@fao.org)**

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# Mobile Services in a Wireless World: The CTA 2009 ICT Observatory Meeting

Pete Cranston and Kevin Painting

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**ABSTRACT:** The use of mobile phones currently dominates discussion among communities working with e-agriculture and ICTs for Development (ICT4D). Mobile telephony is a catalyst for social inclusion. It offers a wide range of services that support social networking and knowledge transfer. It enables small businesses to participate in the local economy more effectively by providing them with a channel of access to information on prices and useful marketing contacts. The runaway success of mobile banking (including microfinance and credit transactions) is shaking up the economic landscape in many countries. Mobile phones can also be used for social and political ends. Consequently, many organizations in developing countries now use mobile phones to support their activities in the fields of health, governance, agriculture and fisheries.

Mobile services were the focus for the 2009 CTA Observatory on Information and Communication Technologies (ICTs). This paper reports on the discussions held during the Observatory meeting where participants reviewed current technological trends, the wide range of channels through which content providers, 'infomediaries' and communities interact, examples of sustainable e-services which are already, or have the potential to deliver benefit over the medium to long term, and policy and strategy implications.

**RESUMÉ:** L'usage des téléphones mobiles domine actuellement la discussion parmi les communautés travaillant avec l'e-agriculture et les TICs pour le développement (ICT4D). Le téléphone mobile est un catalyseur pour l'inclusion sociale. Il offre une grande variété de services qui soutiennent les réseaux sociaux et le transfert de connaissance. Il permet aux petites entreprises de participer dans l'économie locale plus efficacement en leur fournissant un canal d'accès aux informations sur les prix et aux contacts utiles commercialement. Le succès rapide des opérations bancaires via le téléphone mobile (y compris les transactions de micro-finance et de crédit) secoue le paysage économique dans beaucoup de pays. Les téléphones mobiles peuvent aussi être utilisés dans un but social et politique. Par conséquent, beaucoup d'organisations dans les pays en voie de développement utilisent maintenant le téléphone mobile pour soutenir leurs activités dans les

## Introduction

**The use of mobile phones** currently dominates discussion among communities working with e-agriculture and ICTs for Development (ICT4D). Mobile telephony is seen to be a catalyst for social inclusion. It offers a wide range of services that support social networking and knowledge transfer. It enables small businesses to participate in the local economy more effectively by providing them with a channel of access to information on prices and useful marketing contacts. The runaway success of mobile banking (including microfinance and credit transactions) is shaking up the economic landscape in many countries. Mobile phones can also be used for social and political ends. Con-

domains de la santé, la gouvernance, l'agriculture et les pêches.

L'Observatoire 2009 du CTA sur les technologies d'information et de communication (TICs) s'est concentré sur les services d'information mobiles. Cet article fait le rapport des discussions tenues pendant la réunion de l'Observatoire où les participants ont réexaminé les tendances technologiques actuelles; la grande variété de canaux par lesquelles les fournisseurs de contenu, les « infomédiateurs » et les communautés interagissent; des exemples de services électroniques durables déjà profitables, ou qui sont prometteurs sur le moyen à long terme; et les implications politiques et stratégiques.

**RESUMEN:** El uso de teléfonos móviles actualmente domina la discusión entre las comunidades que trabajan con agricultura electrónica y tecnologías de información y comunicación (TIC) para el desarrollo, más conocidas por sus siglas en inglés ICT4D. La telefonía móvil es un catalizador para la inclusión social. Ofrece una amplia gama de servicios que apoyan el establecimiento de redes sociales y la transferencia del conocimiento. Permite a las pequeñas empresas participar en la economía local más eficazmente al proporcionarles un canal del acceso a la información sobre precios y contactos útiles en cuestiones de mercadeo. El éxito desbordado de la actividad bancaria móvil (incluyendo las microfinanzas y las transacciones crediticias) está trastornando el escenario económico en muchos países. Los teléfonos móviles también pueden utilizarse para fines sociales y políticos. En consecuencia, muchas organizaciones en países en desarrollo ahora utilizan los teléfonos móviles para apoyar sus actividades en los campos de salud, gobernanza, agricultura y pesca.

Los servicios móviles fueron el punto central del Observatorio de la CTA sobre TIC en el 2009. Este artículo informa sobre las discusiones sostenidas durante la reunión del Observatorio, donde los participantes examinaron las actuales tendencias tecnológicas, la amplia gama de canales mediante los cuales los proveedores de contenido, 'infomediarios' y las comunidades interactúan, ejemplos de servicios electrónicos sostenibles que ya han generado beneficios, o tienen el potencial de hacerlo, a mediano y largo plazo, y las implicaciones a nivel de políticas y estrategias.

sequently, many organizations in developing countries now use mobile phones to support their activities in the fields of health, governance, agriculture and fisheries.

There is a danger however that narrowly focusing on one technical platform such as the mobile phone, however versatile, runs the risk of failing to take into account the richness of the wider technical environment and past lessons learned about ICT use to support rural development. For instance, the majority of mobile phone services are based around SMS technologies. This technology has a number of inherent limitations which adversely affects its use in large scale, low cost, and easily deployable e-services. Web technologies on the other hand are much more powerful and flexible for e-service delivery but are little used in

developing countries for e-service delivery on mobile phones for reasons of cost, lack of high capacity networks and advanced handsets and, most important, the lack of suitable content.

Looking at the wider environment, personal computers (PCs) have widely been used (particularly in the developed North) for e-service delivery via the Web, indeed, because of the high cost for personal ownership, the provision of PCs together with Internet connections has commonly played a major thrust in the telecentre movement in developing countries. In a competitive and dynamic environment, however, the PC platform is evolving away from a fairly standard desktop configuration into a mix of low-cost laptops, netbooks and PDAs which commonly connect to wireless networks. The International Telecommunications Union (ITU) even predicts that within the next 5 years, more people will access the Internet from such mobile devices than from desktop computers (Whitney, 2010).

Accompanying these rapid changes are a growing set of wireless technologies (such as Wifi, WiMax, CDMA and HDSPA) which look to be of great benefit in connecting local users to a service provider. These technologies are seen as the forefront of introducing broadband Internet access to rural areas. More recently, there has been enormous interest in applications which work seamlessly in an on-line/off-line world and promise to be very useful in areas of poor or unreliable connectivity. This is a complex, evolving environment but clearly a promising one and one in which mobile devices (especially mobile phones) have a key role in e-service delivery.

Commercial interests have been central to the explosive growth of mobile telephony and innovation in hardware and services. In contrast to many earlier ICT4D initiatives, the sector is markedly more attentive to revenue and service models which meet the specific needs and contexts of both urban and rural populations. Given the complex, evolving technical environment of phones, computers and connectivity solutions it is clearly a promising area for e-service delivery and one in which mobile devices (especially mobile phones) have a key role to play.

It was in this climate of the convergence of mobile and wireless technologies along with media and e-services for development that the 10th consultative expert meeting of CTA's Observatory on Information and Communication Technologies was held 2–4 November 2009 in the Netherlands. It aimed to explore the potential of mobile devices in wireless environments to provide e-services for positive social and economic change in rural communities. It drew together the different strands already identified here, namely the development of mobile devices (e.g. mobile phones, netbooks, PDAs etc), the development of wireless environments, and the development of sustainable service models.

This paper reports on the discussions held during the Observatory where participants reviewed current technological trends, the wide range of channels through which content providers, 'infomediaries' and communities inter-

act, examples of sustainable e-services which are already, or have the potential to deliver benefit over the medium to long term, as well as any policy and strategy implications. The workshop was preceded by research into the communications and information context of rural communities in terms of their own capacity and their connections to the outside world. The outputs were captured in the Observatory wiki (<http://observatory2009.cta.int/wiki/bin/view>) and in a discussion paper (Cranston, 2009).

## Interacting Trends

Two major overarching trends were identified by participants as shaping developments in this area.

The first trend is *technological development* itself:

Considering the implications for rural development, one needs to recognise how the context is changing with a marked growth in the development and application of mobile and wireless technologies, especially in areas that have lagged behind in terms of Internet access. Over the next 5 years:

- Mobile phones will become ubiquitous across the globe, and the roll out of multi-function smarter phones will be well underway. Few people will remain completely unreachable and communities or individuals will have the opportunity to interact from anywhere and at any time.
- The economics of wireless vs. wired infrastructure will ensure the continued and accelerated spread of cheaper wireless networks.
- Netbooks are already the fastest growing computer sector, while the one laptop per child XO laptop ([www.laptop.org](http://www.laptop.org)) continues to make progress. The boundaries will continue to blur between low-cost computers and smart phones, putting all-purpose tools into people's hands.
- The mobile phone will be a key tool for the 'bottom of the pyramid' to gain access to the Internet. However the *mobile Internet* does not equate simply to increasing access to the Internet directly from mobile phones, since there is an increasing range of small, mobile devices that can provide Internet access (e.g. SIM-card dongles that provide access to specific services such as the Chumby — [www.chumby.com](http://www.chumby.com)).
- As functions converge onto single devices, leading to the 'Swiss Army Knife' nature of smart phones, there is a corresponding fusion of separate media channels and software services. Unlike previous events, the 2010 World Cup Football competition in South Africa will be watched through the Internet as well as on mainstream TV. Replays will be available over a range of traditional and digital channels; people will chat to each other during matches using Social Networks or Skype and information on the teams and stars will be available in all forms of media. Future content and service providers will have to adjust to this plural world.
- The runaway success of mobile phone applications (notably on the iPhone), has led to rapid acceptance of

both the value of single service applications and the use of location services, still a mainly mobile phone specific functionality.

- Voice technologies are still in their infancy and, as they mature, will both increase access and drive innovation. Voice technologies are widely seen as the future of mobile services.
- The fruits of five frenzied years of Web 2.0 development are making their way onto mobile platforms, enabling applications such as Ushahidi to demonstrate the power of real-time integration of location, interaction via SMS, Internet mapping and its global reach for emergency response situations, such as in Haiti (<http://haiti.ushahidi.com/main>).
- Traditional media such as radio will continue to play a critical role, especially when combined with the newer, convergent technologies.

The second trend is the *maturing of the mobile phone* in the development sector:

This is the start of a new phase in the implementation of mobile applications and services. The first phase was characterised by technology led, small scale pilots. This second phase is typified by the scale and ambition of *Esoko* or the

Google/Grameen application suite in Uganda as well as the growth of new services provided by trend-setters such as Frontline SMS. Many of these emerging leaders have directly addressed the sustainability issue and their progress will be more easily monitored as a result of the data they collect about usage. They are also located close to their markets in developing countries and represent a new wave of ‘Southern’ innovation that is typical of this sector.

### Patterns of access and channels for communication

To root the discussions in the realities of community life in ACP (Africa, Caribbean, and Pacific) countries, the preparatory research first looked at the routes through which information flows to and from people engaged in rural livelihoods. The aim was to understand how communications and knowledge sharing take place with and through the different channels, and then to examine the implications for service models.

Table 1 presents seven major means of access and associated communications channels. In each case there are examples and further information available from the Observatory wiki.

TABLE 1 – Major means of access and associated communications channels

Access Patterns	Communication Channels
<b>RADIO</b> Widest possible audience	<ul style="list-style-type: none"> <li>• Broadcasting</li> <li>• Community Radio</li> <li>• Feedback through mobile phone: SMS to radio</li> </ul>
<b>BASIC MOBILE PHONES</b> (Any Handset Any Network – AHAN) Most common mobile device in ACP countries.	<ul style="list-style-type: none"> <li>• Voice</li> <li>• Voice to text / Text to voice</li> <li>• Short Message (SMS)</li> </ul>
<b>MID-RANGE MOBILE PHONES</b> Mobile phones with additional features such as cameras and data transfers.	<ul style="list-style-type: none"> <li>• Data Transfer through GPRS Mobile Application (Java software)</li> <li>• Mobile WAP</li> <li>• Additional features such as camera or Bluetooth</li> </ul>
<b>SMART MOBILE PHONES</b> High end mobile phones with a wide range of features (mobile phone as a computer).	<ul style="list-style-type: none"> <li>• Sensor Rich Application (All Purpose Tool)</li> <li>• Location based services through Global Positioning System (GPS)</li> <li>• Social Network features</li> <li>• Mobile Web</li> <li>• Video and Audio recording and sharing</li> </ul>
<b>DIRECT SHARING DEVICES</b> Many different informal forms of content shared through different technologies.	<ul style="list-style-type: none"> <li>• CD, USB or iPod (Video, Audio, Text, Image)</li> <li>• Mobile (Video, Audio, Text, Image)</li> </ul>
<i>Two other categories of access were examined, not related to any particular technology:</i>	
<b>INDIRECT ACCESS</b> For people who do not have direct access to mobile phones, computers or the Internet.	<ul style="list-style-type: none"> <li>• ‘Infopreneur’ (using an intermediary to access information)</li> <li>• Village phone (rent a mobile phone)</li> <li>• Village Area Networks (VAN)</li> </ul>
<b>RURAL ACCESS</b> Specific approaches to offer access in rural and remote areas	<ul style="list-style-type: none"> <li>• Internet café</li> <li>• Telecentre</li> <li>• Rural kiosk</li> <li>• Local networks through Wifi and WiMax</li> </ul>



## Mobile Services – mServices

The domain marked out by the 2009 Observatory is an intersection of immense significance strategically (Figure 1). First, on the technology front, the centre of attention is at the junction of two critically important strands of rapid and convergent technical development in ICTs:

- multi and single function *mobile devices*, including mobile phones PDAs, MP3 players, netbooks, cameras and experiments such as the Talking Book (demonstrated at the Observatory)
- *wireless environments*, including wireless networking—Wifi, WiMax, Mesh; mobile phone channels— GSM, GPRS, 3G, Bluetooth; radio and TV

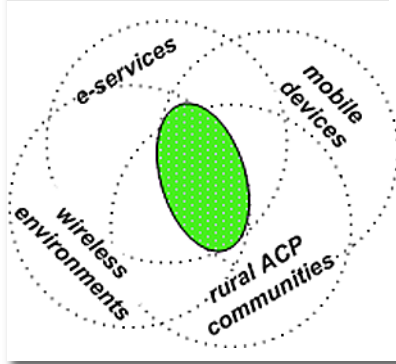
Second, it emphasises a user-centred approach derived from the focus on *e-services*. Since there is no commonly agreed definition of e-services, at the Observatory features were identified which could be included in a working definition: the supply to users of specific *functionality* such as packaged information or interactive content, *predictably* and consistently, that enables them to supply, exchange or use content which meets their needs.

In the commercial world there is intense competitive activity around the development and marketing of e-services. By contrast, while information dissemination continues to be a major development activity, far less attention is paid to developing e-services aimed at generating positive social and economic change in rural ACP communities.

The development of *Mobile Services* is the expression of this intersection and the Observatory focus on this area has two key benefits.

1. As research has shown, the upsurge in mobile phone projects risks repeating a major shortcoming of earlier phases in ICT4D, namely the proliferation of short-term, externally funded, expensive pilots of limited scope and application. The concept of *mService*, on the other hand, entails looking to the long-term, targeting particular audience segments and providing professionally developed information products in a cost-effective manner. Using this approach, services are more likely to be sustained through direct community support, government backing or commercial business models.
2. It is based on a more nuanced analysis of underlying trends and potential development impact in contrast to some of the investigations that accompany the rush to jump on the mobile phone bandwagon. Such projects are less likely to face the inevitable evaporation of funds that will happen as interest moves on to a newer technological development.

FIGURE 1 – The intersection of two strands of technical development in ICTs with a focus on e-services for rural ACP communities



## mService Business and Service Models

Discussing business or service models in a rural development context is problematic. The telecentre sector provides an interesting example. It has been widely recognised for some time that telecentres have, at least partially, to operate as commercial enterprises if they are to thrive. Like commercial cyber-cafés, telecentres generate revenue by charging users for access as well as associated printing, business administration or training services. To meet their wider development goals

however, telecentres also need to work with local and international partners to develop information and other services relating to livelihoods, health and other development domains.

Historically, these services have been provided within a public goods model—funded directly or through local intermediaries by government or international donors. There are obvious practical reasons to develop alternative sources of funding for development focused services such as the vicissitudes of development agendas and the competition for scarce public funds. However, there has also always been an ideological element in the drive, over the past 25–30 years, to develop self-supporting or financially sustainable services for the poor. For all of these reasons the telecentre sector, like many others, is trying to find practical ways to develop business models which include a range of revenue streams. This entails learning from the commercial sector how to develop and package services professionally so that they either generate direct revenue from users or attract public funding.

These issues are central to any discussion of mobile services, and so were an important component of the Observatory agenda. High quality information services, such as those provided by traditional Question and Answer (Q&A) services, have built professionally packaged information services for specific target groups, which have evolved over years of feedback and interaction with the audiences. However, it is questionable whether users would pay directly for these packages. In contrast, the Google/Grameen Applab services launched in Uganda in 2009 are based directly on such a revenue model. They are following trendsetting platforms such as *Esoko*, built explicitly on a commercial model, which have demonstrated the paying market for trade related information. The key question is whether similar revenue models can be found for services that do not have the rapid payback from improved margins that trade related systems can provide.

Recently, various service models have been developed for mobile phones. Often, these services evolve around the local context, where the majority of mobile communication

happens (Ling and Donner, 2009). Therefore, many services focus on locally relevant content such as:

- Job advertisements
- Commodity prices
- Health information
- Weather
- Agriculture information
- M-learning
- Public information
- News

In the Observatory wiki, a range of mService examples were categorised loosely according to their underlying business model (Table 2).

## The Policy Dimension

While problems of sustainable sources of energy and infrastructure continue to hinder the development of mobile telephony in rural areas, the policy environment also has a direct and determining impact on its development. It is not an easy task to develop policies that effectively address current ICT imbalances within the rural sector or determine viable communication cost structures. Investment in the ICT industry is high but—for ACP countries—the question is how investment decisions are being made.

Considerable attention has been given to the factors constraining the adoption of mobile services by organizations working within the agricultural and rural development sector. Barriers to using mobile and web technologies in ICT4D range from problems associated with cost at the organizational level to the well-known hurdles of illiteracy (especially amongst women and the elderly) isolation, poverty and the lack of exposure to technologies amongst community members.

**Service providers: decisions and tariffs** – Decisions made by service providers also have a direct effect on the extent to which development orientated projects can incorporate mobile devices into their activities. Considering costs and profitability, service providers are often reluctant to invest in service provision to remote, poor and sparsely populated regions. There are thus large areas within many ACP countries where signals are weak or non-existent making voice and Internet connections impossible. In addition, the high rates charged by some service providers for SMS and voice in many African countries means that using these services consumes a sizable proportion of the users' disposable income—a factor that discourages their widespread use.

**Where policy and advocacy help** – Research and development into mobile applications has tended to focus on the interests and preferences of urban and western consumers rather than on the needs of rural households and this is still a problem that needs to be addressed at the higher policy level. Government intervention is also needed to deal with legal and regulatory frameworks

that negatively impact on the development and deployment of mobile devices and the monopolistic practices of service providers. Weaknesses in the regulatory sector often result from a lack of policymakers not understanding the implications of new technologies and applications for development. In addition, problems of corruption seriously impact on the way regulation take place. In such situations advocating democratic, sensitized and motivated leadership is essential if appropriate regulations and legislation that support ICT4D initiatives are to be instigated.

## Mobile Services – facilitating change

The next three years will be a fast moving and crucial period to support the integration of mServices into development processes. Participants at the Observatory were asked to identify how intermediary organisations such as CTA could assist in this. The responses, summarised below, call for a substantial programme of activity at both strategic and more operational levels, and many are relevant to IAALD in its role as an intermediary.

**Support for Innovation** – Intermediary organisations play a key role in stimulating the development of mobile applications and services, especially those targeted at niche populations or sectors. It would be valuable to have a sector specific 'Idea Bay' where ideas are stored for projects that could be valuable elsewhere. Observatories also provide an opportunity for innovators. In Wageningen, Literacy Bridge demonstrated their *Talking Book* ([www.literacybridge.org](http://www.literacybridge.org))

**Integration of commercial approaches and stakeholders** – To ensure the full benefits of the changes taking place in the landscape of mobile telephony, the development sector should work to change the negative image that is often associated with the private sector. A new paradigm needs to include partnering with the private sector and other stakeholders who can support ICTs. Regions and localities are increasingly connected by infrastructure put in place by the private sector and cooperation between the private, public and civil sectors needs to be encouraged. The private sector together with other funders can, for example, play an important role in supporting practitioners and communities in pre-testing, implementing, operating and maintaining new devices and services. Such partnerships can also have a significant impact on the way potential risks are dealt with.

The rapid spread of mobile phone ownership means that people choose when and how they use their phones. They have not been given them as part of a development effort with specific criteria for use. In this changing context, commercial companies play an increasingly dominant role that rural development professionals need to adapt to. Specifically a business model approach is needed for market developments as well as further discussion on service models, their application and sustainability.

TABLE 2 – mService examples categorized by underlying business model

Applications and Uses	Examples
<b>POTENTIALLY PROFITABLE MOBILE SERVICES</b>	
Job board	<ul style="list-style-type: none"> <li>▪ Souktel (<a href="http://www.souktel.org/">www.souktel.org/</a>) is an SMS service that connects young people with jobs.</li> <li>▪ Kazi560 (<a href="http://www.kazi560.co.ke/">www.kazi560.co.ke/</a>) is a Kenyan job alert service through mobile phones.</li> </ul>
Local advertisement	<ul style="list-style-type: none"> <li>▪ CellBazaar (<a href="http://www.cellbazaar.com/web/">www.cellbazaar.com/web/</a>) in Bangladesh is a platform where people can sell and buy products via mobile phone.</li> </ul>
Market information system	<ul style="list-style-type: none"> <li>▪ Esoko (formerly TradeNet) <a href="http://www.tradenet.biz">www.tradenet.biz</a>. Offers market information through SMS in West Africa. It focuses on a sustainable business model and develops its approach towards business-to-business services.</li> </ul>
Information services	<ul style="list-style-type: none"> <li>▪ Nokia LifeTools (<a href="http://ictupdate.cta.int/en/Feature-Articles/Customized-information">http://ictupdate.cta.int/en/Feature-Articles/Customized-information</a>) is a paid SMS service, which offers market price, agriculture information and a weather service. It runs through a special application working on mid-range mobile phones. LifeLines (<a href="http://www.lifelines-india.net/">www.lifelines-india.net/</a>) is an initiative for information services delivery, which uses an innovative mix of Internet and telephony to provide critical and timely information to communities in rural India on a range of livelihood and related issues.</li> </ul>
News services	<ul style="list-style-type: none"> <li>▪ Inzawa – Freedom Fone Zimbabwe (<a href="http://www.kubatana.net/html/ff/ff_cont.asp">www.kubatana.net/html/ff/ff_cont.asp</a>) is an interactive news and general information service which is accessed through the mobile phone.</li> </ul>
Radio broadcasting	<ul style="list-style-type: none"> <li>▪ Connecting farmers through mobile phones with radio stations (<a href="http://farastaff.blogspot.com/2009/04/connecting-farmer-radios-to-mobile.html">http://farastaff.blogspot.com/2009/04/connecting-farmer-radios-to-mobile.html</a>)</li> </ul>
Social network applications	<ul style="list-style-type: none"> <li>▪ Mxit (<a href="http://en.wikipedia.org/wiki/MXit">http://en.wikipedia.org/wiki/MXit</a>) offers a mobile social network service and has over 5 million members in South Africa. The exchanges are on chats through data transfer – much cheaper than SMSs.</li> <li>▪ Sembuse (<a href="http://m.sembuse.com/">http://m.sembuse.com/</a>) is East Africa's first social networking service.</li> </ul>
Mobile banking	<ul style="list-style-type: none"> <li>▪ M-Pesa (<a href="http://en.wikipedia.org/wiki/M-Pesa">http://en.wikipedia.org/wiki/M-Pesa</a>) in Kenya</li> </ul>
<b>PUBLIC SERVICES</b>	
Health	<ul style="list-style-type: none"> <li>▪ Text to Change (<a href="http://ict4uganda.wordpress.com/2009/03/31/text-to-change-spreading-the-message-to-stop-the-virus/">http://ict4uganda.wordpress.com/2009/03/31/text-to-change-spreading-the-message-to-stop-the-virus/</a>) in Uganda uses quizzes sent by SMS to help spread information about HIV/AIDS.</li> <li>▪ MOTECH (<a href="http://www.grameenfoundation.applab.org/section/ghana-health-worker-project">www.grameenfoundation.applab.org/section/ghana-health-worker-project</a>) Monitoring and improving pre-natal health care for rural women.</li> </ul>
M-Learning/E-Learning	<ul style="list-style-type: none"> <li>▪ Different approaches around m-learning in South Africa by the Shuttleworth foundation (<a href="http://mlearningafrica.net/">http://mlearningafrica.net/</a>).</li> <li>▪ Bridge IT (<a href="http://mobileactive.org/bridgeit-mobiles-classroom">http://mobileactive.org/bridgeit-mobiles-classroom</a>) . Rural education project – making videos and sending them via mobile phones to schools.</li> </ul>
News service/ citizen journalism	<ul style="list-style-type: none"> <li>▪ African mobile reporters use a mobile toolkit to report from places around Africa (<a href="http://voicesofafrica.africanews.com/">http://voicesofafrica.africanews.com/</a>).</li> <li>▪ Jasmine News Service (<a href="http://www.jasminenews.com/english">www.jasminenews.com/english</a>) in Sri Lanka offers the latest news through SMS.</li> </ul>
Advocacy/Awareness	<ul style="list-style-type: none"> <li>▪ SMS campaigns such as Violence Against Women organised in Uganda by WOUGNET – the Women of Uganda Network. <a href="http://www.wougnet.org/cms/content/view/full/187/104/">www.wougnet.org/cms/content/view/full/187/104/</a> WOUGNET provides access to information for rural women using ICTs.</li> <li>▪ During the 2007 Nigerian elections, Frontline SMS was used to monitor voting booth activities (<a href="http://www.pambazuka.org/en/category/comment/41128">www.pambazuka.org/en/category/comment/41128</a>)</li> </ul>
<b>INTRA/INTER ORGANIZATIONAL SERVICE</b>	
Logistics and Coordination	<ul style="list-style-type: none"> <li>▪ FrontlineMedic (<a href="http://medic.frontlinesms.com/">http://medic.frontlinesms.com/</a>) provides a service to hospitals to coordinate mobile health workers for delivering more efficient healthcare to rural areas.</li> <li>▪ InSTEDD Geochat (<a href="http://instedd.org/geochat">http://instedd.org/geochat</a>). The application has been designed to address crisis situations and combine mobile phone telephony and geo-referencing. GeoChat allows teams to stay in touch in a variety of ways.</li> </ul>
Data collection, monitoring and evaluation	<ul style="list-style-type: none"> <li>▪ Stop Stock-Outs (<a href="http://stopstockouts.org/ushahidi/">http://stopstockouts.org/ushahidi/</a>) shows where medical supplies are not sufficient available. Citizens can send feedback through SMS from Kenya, Uganda, Malawi and Zambia and the results are presented on a website.</li> <li>▪ Monitoring child malnutrition in Malawi through RapidSMS (<a href="http://www.rapidsms.org/">www.rapidsms.org/</a>)</li> </ul>
Research – Collecting and disseminating data	<ul style="list-style-type: none"> <li>▪ Project Mashihambisane uses Populi.net (<a href="http://www.populi.net/mobileresearcher">www.populi.net/mobileresearcher</a>) to collect data on mother to child transmission.</li> </ul>

**Research and Documentation** – Observatory participants argued that intermediaries such as CTA—or IAALD—are ideally placed to develop an inventory of the different software available to support mobile devices, with an analysis of their advantages and disadvantages and examples of good practice.

**Training & Programme Development** – The speed of change within the mobile sector places considerable pressure on all the people involved, including those working in the government sector. A significant barrier to working with increasingly complex mobile devices results from limited capacity and the lack of well-targeted information about how to apply the new technologies and service models to rural development. Further, there is often a lack of creativity and innovation among top management that holds back efforts to explore the potential of new devices and effective complementarities between old and new ICTs.

There is much evidence-based information available from research and from the experience of organizations working with ICT4D. Linking technocrats and bureaucrats to this information is a first step to creating an environment that encourages the development of policy favourable to the further adoption of ICTs in the development process. Inter-sectoral workshops can play an important role in this sensitization process by bringing together health, education, government, civil society organization and the private sector to identify ways in which mobile devices can be used to facilitate the exchange of information and advice. By keeping in touch with the private sector, development organizations can create awareness of opportunities for cooperation.

Concretely, there is a need to:

- Create and build awareness in specific areas such as extension services or farmer's needs;
- Capacity building to address mobile skills barriers so more people can take part in creating innovations;
- Stimulation for the creation of consultancy services to help with development and implementation as well as assessment of projects;
- Mentorship: training, advocacy and help with information gathering and knowledge management.

**Assess impact** – The ICT4D sector has learnt, sometimes the hard way, how difficult it is to promote the use of appropriate tools in the absence of hard data available from robust programme evaluation. Participants therefore called for resources to undertake more in-depth impact evaluation including randomized sampling over a wide area as well as less expensive, smaller local surveys and assessments using participatory methodologies.

**Brokerage & Network Development** – Participants called for further such Observatories, maintaining the balance between informative presentations and stimulating the sharing of experiences, and perhaps including 'Trade fairs' to showcase technologies.

Finally, there is an urgent need for organisations such as IAALD to play a role in enabling organisations and individuals chart how these changes will impact their communities and how they can exploit the opportunities afforded by the new tools and the services they bring within the reach of the majority of rural populations.

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

*To further this mission:*

- IAALD **CONNECTS** agricultural information specialists worldwide, providing platforms and spaces for information dissemination, exchange and knowledge sharing;
- IAALD **CONVENES** agricultural information specialists worldwide, organising meetings and catalyzing dialogue among all agricultural information stakeholders;
- IAALD **COMMUNICATES** and advocates the value of knowledge and information to its members and others, improving the status and practice of agricultural information management and dissemination;
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*In this issue:*

3 FROM THE EDITOR'S DESK

ARTICLES

4 ***Agricultural Information and Knowledge Sharing: Promising Opportunities for Agricultural Information Specialists*** / Peter Ballantyne

Le partage des informations et de la connaissance agricoles:  
des occasions prometteuses pour les spécialistes de l'information agricole

10 ***La información agrícola y el intercambio de conocimientos: Oportunidades promisorias para los especialistas en información agraria*** / Peter Ballantyne

Le partage des informations et de la connaissance agricoles:  
des occasions prometteuses pour les spécialistes de l'information agricole

17 ***Benchmarking CGIAR Research Outputs for Availability and Accessibility*** / Meena Arivananthan, Peter Ballantyne, Enrica M. Porcari

Evaluación comparativa de los resultados de investigación del CGIAR  
en términos de disponibilidad y accesibilidad

Evaluation de la disponibilité et l'accessibilité des résultats de recherche du GCRAI

23 ***Learning to Swim: How IFPRI Uses Multiple Web Channels to Communicate Research Outputs*** / Chris Addison and Luz Marina Alvaré

Aprendiendo a Nadar: Cómo el IFPRI utiliza múltiples canales de la Web  
para comunicar resultados de investigación

Apprendre à nager ou comment l'IFPRI utilise les canaux multiples de la toile  
pour communiquer les résultats de recherche

26 ***AGRIS—From a Bibliographic Database to a Semantic Data Service on Agricultural Research Information*** / Angela Fogarolli, Johannes Keizer, Stefano Anibaldi, and Dan Brickley

AGRIS—De una base de datos bibliográficos a un servicio semántico de datos  
sobre información agrícola

AGRIS—D'une base de données bibliographiques à un service de données  
sémantiques sur l'information de recherche agricole

31 ***Disponibilidad, accesibilidad y aplicabilidad de los resultados de investigación de los Centros del Grupo Consultivo para la Investigación Agrícola Internacional (CGIAR)*** / Edith Hesse, Peter Ballantyne, Mariano Mejía

Availability, accessibility, and applicability of research results of the  
CGIAR Centers

La disponibilité, l'accessibilité et l'applicabilité des résultats de recherche des  
centres du Groupe consultatif pour la recherche agricole internationale (GCRAI)

39 ***VERCON—the Virtual Extension and Research Communication Network*** / Sophie Treinen

VERCON: Red virtual de comunicación sobre la extensión y la investigación

VERCON: Réseau virtuel de communication pour la vulgarisation et la recherche

44 ***Mobile Services in a Wireless World: The CTA 2009 ICT Observatory Meeting*** / Pete Cranston and Kevin Painting

Servicios móviles en un mundo inalámbrico: Reunión Observatorio sobre TIC  
de CTA 2009

Les services d'information mobiles dans un monde sans fil: la réunion 2009  
de l'Observatoire du CTA sur les TICs

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