# Agricultural Information Worldwide

AN INTERNATIONAL JOURNAL FOR INFORMATION SPECIALISTS IN AGRICULTURE, NATURAL RESOURCES, AND THE ENVIRONMENT

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# Agricultural Information Worldwide:

## An International Journal for Information Specialists in Agriculture, Natural Resources, and the Environment

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# From the Editor's Desk

## Welcome to *Agricultural Information Worldwide: An International Journal for Information Specialists in Agriculture, Natural Resources, and the Environment!*

**This first issue** of *'AgInfo World'* represents the culmination of some three years of planning, strategizing, and plain hard work, to create a journal that embodies the spirit of the new and improved IAALD and more accurately reflects the nature of agricultural information today. Featuring a broader subject scope, a more applied slant, and a greater balance between full articles and short selections than its predecessor, we hope that *AgInfo World* will meet both your approval and your needs.

In considering a theme for the inaugural issue of *AgInfo World*, we looked no further than 'e-Agriculture.' e-Agriculture is not only one of the hottest things happening in our field today — the future is now! — but also dovetails perfectly with IAALD's mission (see the inside back cover) — and by extension, presents IAALD with an opportunity to play a pivotal role in that future. IAALD is a partner in several key initiatives that either support the e-Agriculture movement, or build upon it, most notably the IISAST (International Information Systems for Agricultural Science and Technology) initiative, and its successor (as of January 2008), 'Coherence in Information for Agricultural Research for Development,' or CIARD. Other key partners in these efforts include CABI, CGIAR, CIRAD, CTA, FAO, GFAR, and the British and French development agencies. Watch for the launch of CIARD's *Information for Agricultural Research for Development Manifesto* at the IAALD World Congress in Japan this August.

So what exactly is e-Agriculture? According to e-agriculture.org, it is defined as "an emerging field for enhancing sustainable agriculture and food security through improved processes for knowledge access and exchange using information and communication technologies. With each passing day during e-Agriculture Week (September 2007 in Rome), I came to understand a little more about what 'exactly' that means — and how important it is. There was electricity in the air as the participants shared experiences and found new and interesting ways forward. There was no shortage of synergy, as spontaneous discussions yielded promising new opportunities and directions. What stood out the most to me was that, for a group in which many are used to thinking on a very broad level, it was the most basic and direct user interactions that resonated with most of the participants. There was terrific buzz about Ednah Karamagi's presentation — as can be understood from this excerpt from the Web2forDev blog:

> I came to this conference to find people who are really ***doing*** participatory web — not just using the technology, but facilitating real empowerment and positive change… Well, yesterday I was lucky enough to see Ednah Karamagi give her presentation, 'Enhancing Knowledge Sharing in the Rural Community through Adoption of Web 2.0 Tools.' I felt like I had found a magic bean. Ednah works for a Ugandan NGO, Busoga Rural Open Source & Development (BROSDI) — a not-for-profit organization that works with government and civil society in improving rural livelihoods. Within BROSDI is a project called Collecting and Exchanging of Local Agriculture Content (CELAC).
>
> Both BROSDI and the CELAC project make extensive use of Web 2.0 approaches, but it's a real combination of Web 2.0 and grassroots participation… Essentially, it's a great combination of the ***online*** — Blogs, Google Maps, Wikis, online documentation, chatrooms — and the ***offline*** — a weekly mobile phone SMS farmers' information service, village knowledge brokers, monthly farmer forum meetings, village meetings, radio, and hard copy documentation … There was a long list of real life examples — not just the different technologies — but how the technology has made a real, positive change to peoples' lives.
>
> — Holly Ashley[1]

The wealth of information, expertise, and experiences that was shared during e-Agriculture Week could not be fully captured in this issue, but we do provide a summary of the activities and links to many of the presentations and reports that came out of a week that generated much excitement and extensive to-do lists, but no one really minded because of those 'magic beans' that popped up throughout.

For me, one of those magic beans was hearing a simple story told by one of the Web2forDev conference keynote speakers, Ethan Zuckerman, during the closing session. A self-described geek, Zuckerman is a fellow at the Berkman Center for Internet and Society at Harvard Law School. His research focuses on the distribution of attention in mainstream and new media, and on the use of technology for international development. With Rebecca MacKinnon, he leads a project called 'Global Voices' that focuses on using weblogs around the world to close gaps in mainstream media coverage. In 2000, Ethan founded Geekcorps, a technology volunteer corps that sends IT specialists to work on projects in developing nations, with a focus on West Africa.

The point of his story was a simple but powerful one. A few years back, he had decided to plant some blueberry bushes. Not knowing anything about growing blueberries, he turned to the web and found what he needed from the AgNIC Blueberry website.[2] The next year, he ran into a problem that was a little tougher — some sort of disease was attacking his bushes! When he turned once again to the web for answers, he wasn't able to find exactly what he was looking for. So he walked down the road a bit and talked to a farmer who'd been growing blueberries for years — and got exactly the help he needed. Zuckerman stressed the importance of finding a new way of using technology to help farmers — to open things up so that there's a whole host of farmers 'down the road.' That's the magic of the web: your community might be a lot bigger than you think — the farmer down the road may be in New Zealand!

In a fascinating recent development, CTA Director Hansjörg Neun is promoting a concept that is genius in its simplicity. The One Laptop Per Child (OLPC) program — which aims to make available their XO laptop to all children between the ages of 6 and 12 in developing countries — has received a great deal of attention over the past year or so. CTA is interested in the XO laptop and similar technologies for the benefit of ACP farmers and rural populations and is developing an initiative dubbed One Laptop Per Farmer (OLPF) to exploit these technologies to the full. Neun points out that, "the challenges are numerous and there are a lot of 'ifs' but we can make it happen!"[3]

There are so many wonderful things happening right now, and with the explosion of Web 2.0 applications, so much to read and do and learn. It will be next to impossible to keep up with all the progress and the myriad of activities and applications that make up e-Agriculture. We offer a humble beginning with this issue, but with many pointers outward to the web — where the way forward beckons.

It is with great pleasure that I now turn things over to Dr. Anton Mangstl, Director of the Knowledge Exchange and Capacity Building Division of FAO, whose introductory essay launches this, the inaugural issue of *Agricultural Information Worldwide*. Many thanks to all of our contributors for their willingness to share their thoughts, expertise, and experiences with us. Special thanks go to FAO for their generous sponsorship of this issue and their considerable contribution to its content. I hope you enjoy the issue, and as always, please feel free to contact me at the address below if you have any questions, comments, or concerns.

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## Notes

**1. Holly Ashley, "BROSDI: what we can all learn from these Ugandan Web 2.0 pioneers." Weblog entry, Web2forDev, September 27, 2007, http://blog.web2fordev.net/2007/09/27/brosdi-what-we-can-all-learn-from-these-ugandan-web-20-pioneers/**

**2. AgNIC Blueberry Page, Michigan State University Extension, http://web1.msue.msu.edu/msue/iac/agnic/blueberry.html**

**3. Hansjörg Neun, "One Laptop Per Farmer." Weblog entry, Live with the Director of the CTA, March 20, 2008, http://neun.cta.int/2008/03/one-laptop-per-farmer.html**

# e-agriculture.org

The e-agriculture.org Community has over 3,000 members from more than 145 countries.
Members – including policymakers, rural service providers, development practitioners, farmers, researchers and ICT specialists – who exchange opinions, experiences, good practices and resources related to e-agriculture, ensuring that the knowledge created is effectively shared and used worldwide.

Become part of this growing community,
and help direct future development of
the use of information and communication technology
in support of agriculture and rural development.

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# Emerging Issues, Priorities and Commitments in e-Agriculture

*Dr. Anton Mangstl, Director of FAO's Knowledge Exchange and Capacity Building Division,*
*explains that only through the commitment of policy makers can we truly realize the benefits of e-Agriculture for the developing world — and in particular, the rural poor.*

**Knowledge exchange today** is like it has never been before. It is true that throughout history, people have used knowledge from family and friends to grow crops or raise livestock. However, today, new digital systems globally exist with the purpose of sharing information on agricultural innovations and markets. The problem is that most of these systems are inaccessible to poor farmers in developing countries.

In this new century, Information and Communication Technologies (ICT) can and should be a key agent for changing people's lives by improving access to information and sharing of knowledge. The international community agrees that rural livelihoods would be greatly enhanced by improvements in areas such as: access to agricultural markets; improved agricultural practices; and information on weather, including extreme events.

Unfortunately, despite all the advances in how the developed world exchanges knowledge today, there still exists a profound digital dilemma. The divide between those who can and cannot access ICT will continue to widen unless efforts are made to ensure that digital technology and information is accessible —as well as affordable —at a local level. As computer technology becomes more sophisticated and often more expensive, developers should ensure compatibility with older hardware still in use. Furthermore, information on the Internet is often not available in local languages, which seriously constrains rural people's access to otherwise relevant information. Approaches need to be developed to overcome these constraints, and the value of local knowledge emphasized in systems focused on farmers and rural communities.

This focus on the interaction between ICT and agriculture has globally become known as **e-Agriculture**. More precisely, e-Agriculture has been defined as an emerging field for enhancing sustainable agriculture and food security through improved processes for knowledge access and exchange using information and communication technologies (ICT).

e-Agriculture continues to advance at a spectacular rate. The Internet, for example, has many advantages as a medium of information and knowledge exchange, but limited access and poor connectivity continue to constrain many individuals, particularly in rural areas in developing countries. The most successful use of ICT in agriculture development has proved to be mobile telephony, which has been a major breakthrough in communications and as a means of accessing market prices, weather and other advice. It is currently the most accessible ICT available, allowing access to a broad spectrum of people, including marginalized people in remote rural areas. The technology is adaptable, being capable of handling voice and data, and the cost of advanced features continues to fall. The mobile telephone and the hand-held computer are becoming almost indistinguishable. In Tanzania, fishermen are using mobile phones to communicate among themselves regarding weather forecasts, where to get the best catch, local market information, and to coordinate pick-up of catches.

It is clear that the needs and the services required by rural communities will determine how ICT are used, adapted and thus evolve. To enable and empower these communities to improve their livelihoods is likely to involve a mix of traditional communication channels (neighbors/family, local news, announcement boards, etc.), as well as new ones (Internet, mobile phones, etc.). An example of this mix can be seen in Peru, where, due to the region's dialect preference, radio is the most important information source for farmers in the Cajamarca region. The NGO *Soluciones Prácticas*[1] is using a mixture of old and new technologies to reach these farmers, by disseminating important agricultural information through podcast radio programmes, which are saved in digital format, recorded in discs and distributed to the local radio stations.

The focus of e-Agriculture is a major priority for the development community, and is one of the action lines identified in the declaration and plan of action of the World Summit on the Information Society (WSIS).[2] FAO has been assigned the responsibility of organizing activities related to this action line,[3] and in collaboration with 12 major institutions, launched an international platform in 2007, the e-Agriculture Community of Expertise. This is a global initiative to enhance sustainable agricultural development and food security by improving the use of information, communication, and associated technologies in the sector. The Community is lead by its members, currently from over 135 countries, spanning a

diverse range of actors: researchers, extensionists, farmers, international development practitioners, as well as information/knowledge intermediaries. As a global initiative, the ***e-agriculture.org*** platform enables members to exchange opinions, experiences, good practices and resources related to e-Agriculture, and to ensure that the knowledge created is effectively shared and used.

It is through the input and guidance of these Community members, through various online forums and face-to-face events held in 2007, that the priority requirements for strengthening information and knowledge systems for e-Agriculture emerged. These include:

**Market Chains** – The growth of communication networks among actors in the market chain (farmers, transporters, buyers, traders, etc) needs to be supported in order to ensure more equitable, timely, and collaborative access to markets for smallholders.

**Farming/Production** – Investment is needed to repackage technical information for farmers and make it available in local languages. Existing channels for technical information (e.g. extension services, radio stations) should be integrated with new communication technologies that are accessible to farmers. Financial sustainability must be built into all systems.

**Research & Innovation** – Technical information systems in agriculture need to incorporate local knowledge, be integrated into regional and international systems, and maintain links to policy makers. More investment in infrastructure and skilled human resources is needed for such systems. Researchers and extensionists require continued training in how to interact and share knowledge more effectively using the new digital technologies.

So, how can e-Agriculture really have an impact? Leadership has to be shown by national policy makers, who will need to make some commitments. Firstly, a commitment is needed for ***investment*** in communication infrastructure, which has to focus on financially viable and socially acceptable approaches that are accessible to the rural poor. Secondly, a commitment is needed to transform the existing one-way information flows from "producer" to "user", so that a wide range of actors, in communities and institutions, can develop ***networks*** for sharing information and knowledge. Lastly, a commitment should be made to appropriate ***incentives*** for information sharing, so that it can be developed at all levels. Only through such commitments by policy makers can we truly realize the benefits of e-agriculture for the developing world – and in particular, the rural poor.

## Notes

**1. For more information on *Soluciones Prácticas (Practical Action)*, go to: http://www.solucionespracticas.org.pe/ (Spanish), or http://practicalaction.org/?id=home (English).**

**2. For more information on the World Summit on the Information Society, go to: http://www.itu.int/wsis/index.html**

**3. For more information, read the FAO Report, *Follow-up to C.7 ICT Applications — e-Agriculture World Summit on the Information Society (WSIS)*, http://www.itu.int/wsis/implementation/docs/consultations/may2007/report-e-agriculture.doc.**

**Dr. Anton Mangstl is the Director of the Knowledge Exchange and Capacity Building Division of the Food and Agriculture Organization of the United Nations (FAO).**

# Questions nouvelles, priorités et engagements dans le secteur de l'e-Agriculture

*M. Anton Mangstl, Directeur de la Division de l'échange des connaissances et du renforcement des capacités, explique que, sans la détermination des décideurs, le monde en développement et, en particulier les populations rurales pauvres, ne pourront pas réellement profiter des avantages de l'e-Agriculture.*

**Jamais le partage des connaissances** n'a atteint une telle ampleur. Il est vrai que tout au long de l'histoire, les peuples ont puisé dans les connaissances de la famille et des amis pour cultiver la terre ou faire de l'élevage. Aujourd'hui cependant, il existe de nouveaux systèmes numériques dans le monde qui permettent de partager l'information sur les nouveautés agricoles et sur les marchés. Le problème est que la plupart de ces systèmes sont inaccessibles pour les agriculteurs démunis dans les pays en développement.

Dans ce siècle nouveau, les technologies de l'information et des connaissances (TIC), en améliorant l'accès à l'information et le partage des connaissances, peuvent et doivent être un agent fondamental de changement pour la vie des populations. La communauté internationale s'accorde à penser que des améliorations dans des domaines tels que l'accès aux marchés agricoles, les pratiques agricoles et l'information sur les conditions météorologiques, notamment les épisodes climatiques extrêmes, doivent permettre d'améliorer considérablement les modes de subsistance en milieu rural.

Malheureusement, malgré les progrès accomplis dans la manière dont le monde développé échange les connaissances aujourd'hui, il existe toujours un profond dilemme numérique. Le fossé entre ceux qui peuvent et ceux qui ne peuvent pas accéder aux TIC continuera de se creuser tant que des efforts ne seront pas déployés pour garantir que la technologie numérique et l'information sont accessibles et abordables au niveau local. Étant donné que la complexité et, souvent, le coût des technologies informatiques augmentent, les développeurs de logiciels devraient assurer la compatibilité avec les matériels plus anciens encore en usage. Par ailleurs, l'information sur l'Internet est rarement disponible dans les langues locales, ce qui restreint considérablement l'accès des populations rurales à l'information par ailleurs utile. Il faut élaborer des approches pour surmonter ces obstacles et mettre l'accent sur la valeur des connaissances locales incluses dans les systèmes axés sur les agriculteurs et les communautés locales.

L'interaction entre les TIC et l'agriculture, et la place qu'on lui accorde, est connue globalement comme l'**e-Agriculture**. Plus précisément, l'e-Agriculture a été définie comme un domaine émergeant axé sur le renforcement de l'agriculture durable et de la sécurité alimentaire grâce à de meilleurs processus d'accès aux connaissances et de partage de celles-ci utilisant les technologies de l'information et des communications (TIC).

L'e-Agriculture continue de progresser à un rythme spectaculaire. L'Internet, par exemple, présente de nombreux avantages comme moyen d'information et d'échange de connaissances, mais le manque d'accès et de connectivité continue d'être un obstacle, notamment dans les zones rurales des pays en développement. La technologie dont l'utilisation a rencontré le plus de succès dans le développement de l'agriculture s'est révélée être la téléphonie mobile, qui constitue une avancée majeure dans les communications en permettant notamment d'accéder aux prix du marché et aux prévisions météorologiques. Il s'agit actuellement de la TIC la plus accessible dont on dispose, permettant d'accéder à toute une gamme de personnes, y compris les personnes marginalisées dans les zones rurales éloignées. La technologie est adaptable, étant à même de traiter les données et les voix, et le coût des fonctions avancées continue de baisser. Il devient presque impossible de faire une distinction entre un téléphone mobile et un ordinateur de poche. En Tanzanie, les pêcheurs utilisent le téléphone mobile pour se transmettre les prévisions météorologiques, l'emplacement des meilleures captures, des informations sur le marché et pour coordonner les lieux de débarquement des captures.

Il est évident que les besoins des communautés rurales et le type de services qu'elles requièrent détermineront l'utilisation, l'adaptation et donc l'évolution des TIC. Il est probable qu'il faudra associer des voies de communication traditionnelles (voisins/famille, nouvelles locales, affichages de communiqués, etc.) et des voies nouvelles (Internet, téléphones mobiles, etc.). On peut citer à ce titre l'exemple du Pérou où, du fait de la préférence pour le dialecte dans la région, la radio est la source d'information la plus importante des agriculteurs de la région de Cajamarca. L'ONG *Soluciones Prácticas*[1] utilise un mélange de technologies anciennes et nouvelles pour communiquer avec ces agriculteurs, en diffusant d'importantes informations agricoles par le biais de programmes radio

sur fichiers balados (podcast), qui sont sauvegardés en format numérique, enregistrés sur disques et distribués aux stations de radios locales.

L'objectif de l'e-Agriculture est une priorité majeure pour la communauté du développement, et c'est l'une des lignes d'action identifiées dans la déclaration et le plan d'action du Sommet mondial sur la société de l'information (SMSI).[2] La FAO s'est vue confier la responsabilité d'organiser des activités en rapport avec cette ligne d'action[3] et, en collaboration avec 12 grandes institutions, elle a lancé une plateforme internationale en 2007, la Communauté d'expertise sur l'e-Agriculture. Il s'agit d'une initiative mondiale visant à renforcer le développement agricole durable et la sécurité alimentaire en améliorant l'utilisation de l'information, de la communication et des technologies apparentées dans le secteur. La Communauté est dirigée par ses membres, appartenant à plus de 135 pays, avec des compétences très variées: chercheurs, vulgarisateurs, agriculteurs, praticiens du développement internationaux ainsi que des intermédiaires de l'information et des connaissances. En tant qu'initiative mondiale, la plateforme ***e-agriculture.org*** permet aux membres d'échanger leurs opinions, leurs expériences, leurs bonnes pratiques et leurs ressources en relation avec l'e-Agriculture, et de s'assurer que la connaissance ainsi créée est réellement partagée et utilisée.

C'est grâce aux contributions et aux orientations des membres de la Communauté, par le biais de différents forums en ligne et de manifestations qui se sont tenus en 2007, que les exigences prioritaires pour le renforcement des systèmes d'information et de connaissances pour l'e-Agriculture ont pu être déterminées. Il s'agit notamment des priorités suivantes:

**Chaînes commerciales** – La croissance des réseaux de communication entre les acteurs de la chaîne commerciale (agriculteurs, transporteurs, acheteurs, négociants, etc..) doit être appuyée afin de garantir un accès plus équitable, rapide et coopératif aux marchés pour les petits agriculteurs.

**Culture/Production** – Des investissements sont nécessaires pour reconditionner l'information technique destinée aux agriculteurs et la proposer dans les langues locales. Les voies existantes de transmission de l'information technique (services de vulgarisation, stations radio) doivent être intégrées aux nouvelles technologies de la communication qui sont accessibles aux agriculteurs. La durabilité financière doit faire partie intégrante de tous les systèmes.

**Recherche & Innovation** – Les systèmes d'information technique dans l'agriculture doivent prendre en compte le savoir local, être intégrés dans les systèmes régionaux et internationaux et maintenir des liens avec les décideurs. Ces systèmes ont besoin d'investissements plus importants dans l'infrastructure et les ressources humaines qualifiées. Il faut assurer la formation continue des chercheurs et des vulgarisateurs sur la manière d'interagir et de partager les connaissances plus efficacement en utilisant les nouvelles technologies numériques.

Ainsi, comment l'e-Agriculture peut-elle avoir un impact réel? C'est aux décideurs de politiques nationales qu'il revient de montrer la voie. Ils devront pour cela prendre des engagements. Tout d'abord, un engagement d'***investissement*** dans l'infrastructure des communications, qui doit privilégier des approches viables sur le plan financier et acceptables sur le plan social qui sont accessibles pour les populations rurales pauvres. Ensuite, un engagement de transformer les flux d'information à sens unique "du producteur" à "l'utilisateur" qui existent actuellement, afin qu'une gamme étendue d'acteurs, dans les communautés et les institutions, puisse établir des ***réseaux*** pour partager information et les connaissances. Enfin, un engagement de mettre en place des ***incitations*** appropriées pour le partage de l'information, afin qu'il puisse être organisé à tous les niveaux. Ce n'est que par ces engagements des décideurs, que le monde en développement — et en particulier les populations rurales pauvres — pourront bénéficier des avantages de l'e-Agriculture.

## Notes

**1. On trouvera des informations sur *Soluciones Prácticas (Practical Action),* à l'adresse suivante: http://www.solucionespracticas.org.pe/ (espagnol), ou http://practicalaction.org/?id=home (anglais).**

**2. On trouvera des informations sur le Sommet mondial sur la société de l'information, à l'adresse suivante: http://www.itu.int/wsis/index.html.**

**3. Pour plus d'informations, consulter le rapport de la FAO, *Follow-up to C.7 ICT Applications — e-Agriculture World Summit on the Information Society (WSIS)*, http://www.itu.int/wsis/implementation/docs/consultations/may2007/report-e-agriculture.doc.**

**M. Anton Mangstl est Directeur de la Division de l'échange des connaissances et du renforcement des capacités, Organisation des Nations Unies pour l'agriculture et l'alimentation (FAO).**

# Aspectos Nuevos, Prioridades y Compromisos Necesarios en la Agricultura Transmitida por Medios Electrónicos

*El Dr. Anton Mangstl, Director de la División de Intercambio de Conocimientos y Desarrollo de Capacidades de la FAO, explica que sólo mediante el compromiso de quienes diseñan la política, podemos hacer realidad, verdaderamente, los beneficios que la agricultura comunicada por medios electrónicos trae al mundo en desarrollo y, en especial, a la población rural pobre.*

**Nunca antes había ocurrido** un intercambio de conocimientos como el que presenciamos hoy en día. Sabemos que, a través de la historia, la gente ha usado los conocimientos guardados por sus familias o sus amigos para cultivar plantas o criar animales. Ahora bien, hoy existen nuevos sistemas digitales dirigidos a compartir información sobre las innovaciones y los mercados que aparecen en el sector agrícola. El problema consiste en que la mayoría de tales sistemas no está al alcance de los agricultores pobres en los países en desarrollo.

En este nuevo siglo, las Tecnologías de la Información y de la Comunicación (TIC) pueden ser (y deberían serlo) un agente clave en la transformación de la vida de la gente ya que pueden proporcionar un mejor acceso a la información y una mayor participación del conocimiento. La comunidad internacional acepta que las formas de ganarse la vida en el campo se desarrollarían mucho si mejoraran las siguientes áreas: el acceso a los mercados agrícolas, las prácticas agrícolas desarrolladas, y la información meteorológica (incluso sobre eventos extremos).

Lamentablemente, a pesar de todos los progresos logrados en los métodos con que el mundo desarrollado comparte hoy sus conocimientos, persiste aún un serio dilema en el campo digital. La brecha que separa a quienes pueden acceder a las TIC de quienes no pueden hacerlo continuará ensanchándose mientras no se hagan esfuerzos para garantizar que la tecnología y la información digitales sean accesibles a la gente de las localidades y que éstas pueden financiarlas. A medida que la tecnología de los computadores se vuelva más refinada y, a menudo, más costosa, los técnicos que la desarrollan deben garantizar que será compatible con el equipo físico ('hardware') que está todavía en uso. Asimismo, la información contenida en la Internet no suele estar disponible en idiomas locales, lo que restringe seriamente el acceso de la gente del campo a una información que podría ser importante para ellos. Hay que desarrollar enfoques para superar estas limitaciones, y debe hacerse énfasis en el valor de los conocimientos locales en los sistemas que se centran en los agricultores y en las comunidades rurales.

Este interés en la interacción entre las TIC y la agricultura se ha hecho conocer en todo el mundo como **e-agricultura**. La e-agricultura se ha definido, en términos precisos, como un campo nuevo en que se promueven la agricultura sostenible y la seguridad alimentaria mediante procesos mejorados de acceso al conocimiento y de intercambio de conocimientos, que emplean tecnologías de la información y de la comunicación (TIC)

La e-agricultura sigue avanzando a pasos agigantados. La Internet, por ejemplo, ofrece muchas ventajas como medio de información y de intercambio de conocimientos, aunque las limitaciones para acceder a ella y las deficiencias en la conectividad siguen obstaculizando a muchos individuos, especialmente en las zonas rurales de los países en desarrollo. Se ha demostrado que la aplicación más exitosa de las TIC al desarrollo agrícola ha sido la telefonía móvil, que se considera un punto de inflexión crucial en las comunicaciones como medio para acceder a los precios del mercado, a datos meteorológicos y a diversas recomendaciones. Esta telefonía, que es actualmente la TIC más usada, permite llegar a un amplio espectro de la población en el que se incluye la gente marginada en áreas rurales muy alejadas. Esta tecnología es adaptable, puede manejar voz y datos, y el costo de los modelos avanzados sigue bajando. Se está haciendo casi imposible distinguir entre un teléfono móvil y un computador de mano. Los pescadores de Tanzania usan el teléfono móvil para comunicarse entre ellos respecto a los pronósticos del tiempo, a los sitios en que estarán los mejores bancos de peces y a las noticias del mercado local, y para coordinar la recolección de la pesca obtenida.

Está claro que las necesidades de las comunidades rurales y los servicios que éstas requieren determinarán la forma en que las TIC se empleen, se adapten al medio y, por tanto, evolucionen. Es probable que la acción de capacitar esas comunidades y de despertar en ellas su poder decisorio para mejorar los medios con que se ganan la vida implique una mezcla de canales de comunicación tradicionales (los vecinos o la familia, las noticias locales, las carteleras de avisos, etc.) y nuevos

(Internet, los teléfonos móviles, etc.). Un ejemplo de esta combinación de canales se observa en Perú donde, dada la preferencia de varias regiones por sus dialectos, la radio es la fuente de información más importante para los agricultores en la región de Cajamarca. La ONG *Soluciones Prácticas*[1] emplea una mezcla de tecnologías nuevas y viejas para llegar a estos agricultores, y está diseminando información agrícola importante mediante programas de radio de tipo 'podcast' (o sea, transmisión sintonizada en ipods), que se conservan en formato digital, se graban en discos y se distribuyen a las estaciones locales de radio.

El propósito que orienta a la e-agricultura es una de las principales prioridades de la comunidad dedicada al desarrollo, y es una de las líneas de acción contenidas en la declaración y el plan de acción de la Cumbre Mundial sobre la Sociedad de la Información (WSIS).[2] Se le asignó a la FAO la responsabilidad de organizar actividades relacionadas con esta línea de acción[3] y, con la colaboración de 12 importantes instituciones, lanzó una plataforma internacional en 2007: la Comunidad de Ciencia y Experiencia de la e-agricultura. Es esta una iniciativa global para impulsar el desarrollo agrícola y la seguridad alimentaria sostenibles mediante un mejor uso, en el sector agrícola, de la información, la comunicación y las tecnologías asociadas. La Comunidad es dirigida por sus miembros, que provienen de 135 países y exhiben un amplio espectro de actividad profesional: hay entre ellos investigadores, extensionistas, agricultores, profesionales del desarrollo internacional e intermediarios entre el campo del conocimiento y el de la información. Como iniciativa global, la plataforma ***e-agriculture.org*** les permite a los miembros intercambiar opiniones, experiencias, prácticas útiles y recursos relacionados con la e-agricultura, y sentirse seguros de que los conocimientos desarrollados se comparten y se usan de manera efectiva. Gracias al aporte y a la guía proporcionada por los miembros de esta Comunidad, y mediante diversos foros en línea y eventos presenciales celebrados en 2007, salieron a la luz los requisitos prioritarios para el fortalecimiento de los sistemas de información y de conocimientos ideados para la e-agricultura. Entre dichas prioridades están las siguientes:

**Cadenas de mercado** – Hay que apoyar el desarrollo de redes de comunicación entre los actores de la cadena de mercado (agricultores, transportadores, compradores, comerciantes, etc.) con el fin de garantizar a los pequeños propietarios rurales un acceso equitativo, oportuno y solidario a los mercados.

**Explotación agrícola y Producción** – Es necesario invertir en el rediseño de la información técnica dirigida a los agricultores y hacerla accesible en idiomas locales. Los canales de información técnica que ya existen (p. e., servicios de extensión, estaciones de radio) deberían integrarse a nuevas tecnologías de comunicación que sean accesibles a los agricultores. En todos estos sistemas hay que desarrollar una sostenibilidad financiera.

**Investigación e Innovación** – Es necesario que los sistemas de información técnica del sector agrícola incorporen los conocimientos locales, queden integrados en sistemas regionales e internacionales, y mantengan los vínculos que los unen a los diseñadores de la política. Estos sistemas necesitan más inversión en infraestructura y en recursos humanos capacitados. Los investigadores y los extensionistas necesitan capacitarse continuamente en la forma de interactuar y de compartir conocimientos entre ellos con más efectividad cuando emplean las nuevas tecnologías digitales.

Así pues, ¿cómo puede la e-agricultura hacer un impacto real? Los diseñadores nacionales de la política deben mostrar su liderazgo y tienen que llegar, por tanto, a algunos compromisos:

En primer lugar, necesitan comprometerse a ***invertir*** en la infraestructura de comunicaciones, inversión que debe concentrarse en enfoques que, siendo viables en lo financiero y aceptables en lo social, sean accesibles a la población pobre del campo. En segundo lugar, necesitan comprometerse a transformar el flujo actual de la información — que tiene una sola dirección, o sea, del 'productor' al 'usuario' — de manera que una gran diversidad de actores, tanto en las comunidades como en las instituciones, puedan desarrollar ***redes*** para compartir la información y los conocimientos. Por último, tienen que comprometerse a crear ***incentivos*** apropiados para la participación de los conocimientos, de manera que esta participación pueda desarrollarse en todos los niveles. Solamente si los diseñadores de la política asumen estos compromisos, podremos hacer realidad los beneficios de la e-agricultura en el mundo en desarrollo y, especialmente, en la población rural pobre.

## Notas:

**1. Si desea más información sobre *Soluciones prácticas (Practical Action)* consulte: http://www.solucionespracticas.org.pe/ (en español), o http://www.practicalaction.org (en inglés).**

**2. Si desea más información acerca de la Cumbre Mundial sobre la Sociedad de la Información (World Summit on Information Society), consulte: http://www.itu.int/wsis/index.html.**

**3. Si desea más información, lea el Informe FAO *Follow-up to C.7 ICT Applications: e-Agriculture World Summit on the Information Society (WSIS)*, situado en: http://www.itu.int/wsis/implementation/docs/consultations/may2007/report-e-agriculture.doc.**

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# Analysis of e-Agriculture Survey

Charlotte Masiello-Riome, Nathaniel Heller, Stephen Rudgard, and Roberto Schneider

ABSTRACT: **In late 2006, an online global survey to determine the scope and priorities for the WSIS Action line on e-Agriculture was conducted by an inter-agency Working Group. Most of the over 3400 respondents were unfamiliar with the term 'e-Agriculture,' but nearly all respondents had suggestions on potential definition and benefits, as well as on priority areas for action. Perceptions of e-Agriculture focused on information and communication processes more than on technologies and tools. Subject areas mentioned included farming practices, market information, training, statistics, and science/research. Stakeholder groups identified included producers, rural service providers, scientists, and policy-makers. Benefits included both generally enhanced information exchange and communication processes and specifically agriculture-related benefits such as market access and food security. e-Agriculture was also seen to contribute to broader development goals. Future priorities included developing virtual communities and networks, capacity building in the use and application of ICT, and defining and advocating e-Agriculture initiatives.**

RESUMÉ: **Fin 2006, une enquête mondiale en-ligne a été menée par un Groupe de travail inter-agence pour déterminer les objectifs et les priorités pour le Plan d'action du SMSI en cyberagriculture. La plupart des plus de 3400 répondants n'était pas familier avec le terme « cyberagriculture », mais presque tous les répondants avaient des suggestions pour la définition et les avantages potentielles, ainsi que pour les domaines prioritaires pour action. Les perceptions de la cyberagriculture sont focalisées sur les procédures de la communication et de l'information, plus que sur les technologies et les outils. Les domaines thématiques cités comprennent les méthodes de culture, l'information du marché, la formation, les statistiques et la science/recherche. Les groupes des parties prenantes identifiées incluent les producteurs, fournisseurs de services ruraux, scientifiques et décideurs. Les avantages incluent aussi bien l'amélioration généralisée des échanges d'information que des procédures de communication, et spécialement les avantages liés à l'agriculture tels que accès aux marchés et sécurité alimentaire. La cyberagriculture est aussi vue comme contributeur aux objectifs plus larges du développement. Les priorités futures comprennent les communautés et réseaux virtuels, le développement des capacités dans l'utilisation et l'application des TICs, et la définition et le lobbying des initiatives cyberagricoles.**

RESUMEN: **A finales del 2006, se realizó una encuesta global en línea para determinar el alcance y las prioridades para la Línea de Acción de la Cumbre Mundial sobre la Sociedad de la Información (CMSI) sobre agricultura electrónica por un grupo de trabajo interinstitucional. La mayoría de los más de 3400 entrevistados estaban poco familiarizados con el término 'agricultura electrónica', pero casi todos los entrevistados tenían sugerencias acerca de una posible definición, beneficios potenciales y áreas prioritarias para acción. La agricultura electrónica se enfoca más hacia los procesos de información y comunicación que hacia tecnologías y herramientas. Las áreas temáticas escogidas incluyeron prácticas agrícolas, información de mercado, capacitación, estadística y ciencia/investigación. Los grupos de interesados directos identificados incluyeron productores, proveedores de servicios en zonas rurales, científicos y formuladores de políticas. Los beneficios incluyeron, en general, procesos mejorados de intercambio de información y de comunicación y, a nivel específico, beneficios relacionados con la agricultura como acceso a mercados y seguridad alimentaria. También se observó que la agricultura electrónica contribuye a metas de desarrollo más amplias. Las prioridades futuras incluyeron el desarrollo de comunidades y redes virtuales, el fortalecimiento de capacidades en el uso y aplicación de tecnologías de información y comunicación (TIC), y la definición y promoción de iniciativas de agricultura electrónica.**

## Introduction

**Background** – The Food and Agriculture Organization of the United Nations (FAO) accepted the role and responsibilities of facilitating activities related to the action line under *C.7 ICT Applications — e-Agriculture* at the World Summit on the Information Society (WSIS) follow-up meetings held in February 2006 in Geneva. FAO hosted the first e-Agriculture workshop in June 2006, bringing together representatives of leading development organizations involved in agriculture. The meeting served to initiate development of an effective process to engage as wide a range of stakeholders involved in e-Agriculture as possible in the follow-up to WSIS, and resulted in the formation of an inter-agency e-Agriculture Working Group (EAWG).

**Objective of the e-Agriculture Working Group (EAWG)** – The objective of the EAWG is to create multi-stakeholder, people-centered, cross-sectoral platform(s) that will bring together stakeholders representing relevant constituencies of e-Agriculture.

The EAWG members decided that the definition of e-Agriculture contained in the WSIS documentation on Action Line *C.7 ICT Application — e-Agriculture* was inadequate and required revision. On that basis, the first major activity of the EAWG was to establish an initial engagement of stakeholders through an open survey on e-Agriculture.

**Goal of the Survey** – The goal of the survey was to:

- analyze stakeholders' familiarity with the term "e-Agriculture";
- identify activities stakeholders would include in a definition of e-Agriculture;
- identify examples of potential e-Agriculture activities already taking place;

- identify potential benefits of e-Agriculture as perceived by stakeholders, and identify the barriers that prevent them from receiving those benefits;
- identify stakeholders' priority activities to be included in an international forum on e-Agriculture; and
- identify stakeholders interested in participating in a virtual e-Agriculture knowledge forum.

## Methods

**Approach** – The survey (Annex I) was designed by the EAWG members and comprised eight main questions and one optional question, and was offered in three languages (English, French and Spanish). More than 4,000 people from 135 countries visited the survey website. More than 3,400 responded to the survey, although many of those did not complete all of the questions. Participants were also invited to express interest in joining a virtual e-Agriculture Knowledge Forum, which secured over 2,100 positive responses.

The survey, which ran from October 1 through November 15, 2006, was extensively promoted through by EAWG members, their partners, and a variety of international development networks, such as those coordinated by the Development Gateway, the European Federation for Information Technology in Agriculture, Food and the Environment (EFITA), and Oneworld International.

**Data Analysis—Open Questions** – A team was formed at FAO (see Acknowledgements) to analyze the more than 3,000 responses to each of the three open questions (numbers 5, 6 and 7) in the survey across the three languages. Initially, frequencies of use of key words were calculated, taking into account plurals, tenses, and spelling mistakes. Then, broad categories of response were developed after reviewing the key word frequencies and examining the contexts of key word usage. Finally, individual responses were placed into these larger categories before calculating absolute frequencies. Data covering the three languages were analyzed together for those questions where patterns of response were found to be similar.

## Results

**Profile of Respondents** – Respondents to the survey were asked to identify the categories of organization that best described the one in which they worked, as well as the region(s) in which they worked. Some respondents identified more than one type of organization and/or region. The two types of organization that respondents indicated most often across all regions were *"University/ Centre of Learning"* and *"Government"* (Table 1.1). However, significant proportions (9–12%) of respondents indicated *"Farmer Organization"*, *"NGO/CBO"*, *"International Organization"*, and *"Rural Service Provider"*. The remaining three categories were each selected by 3% or less of the respondents. In terms of respondents' regions of work, there were significant numbers of responses from all regions of the world, with the most heavily represented regions being Latin America and Africa (Table 1.2).

**Familiarity with e-Agriculture** – The survey responses showed that an overall majority (57%) were unaware of the term e-Agriculture (Table 2.1). There were also comments in the responses to other survey questions indicating that people had never encountered the term before. Latin America and the Caribbean and North America had the greatest number of respondents indicating that they were not familiar with e-Agriculture, at 63% and 61%, respectively. The Near East had the lowest proportion of negative answers at 46%, with Africa and Asia-Pacific both at 48%.

The French and Spanish translations of the term e-Agriculture in the survey were those used in WSIS, namely *cyberagriculture* and *cyberagricultura,* respectively. Analysis of the survey responses in the three languages (Figures 1.1–1.3) showed that the proportion who stated that they were not familiar with the term in their language was 44% for English, 66% for French, and 66% for Spanish.

**Barriers to e-Agriculture** – Respondents were asked to indicate which of seven suggested barriers affected their ability to benefit from e-Agriculture, or to describe any other barriers (Table 3.1). Half of all respondents were affected by the barrier of restricted access to digital

Table 1.1 – Respondents' organization affiliation

| Type of organization | % |
|---|---|
| University/Centre of Learning | 24 |
| Government (National or Local) | 20 |
| Farmer Organization | 12 |
| NGO/CBO | 11 |
| International Organization | 11 |
| Rural Service Provider (public or private) | 9 |
| Youth Organization/ Student | 3 |
| Donor/Sponsor Organization | 2 |
| Media | 2 |
| Other | 10 |

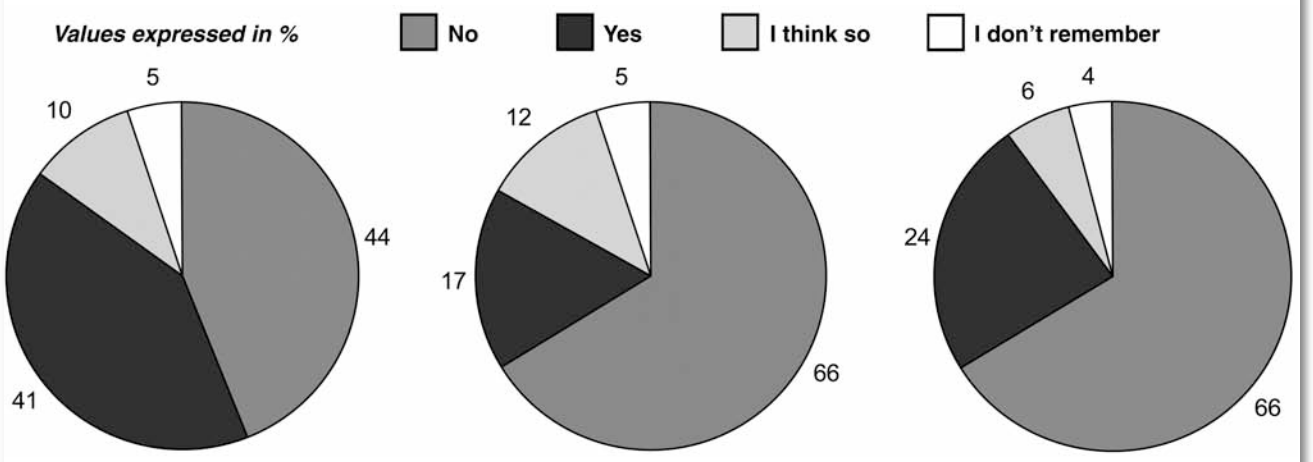
Table 1.2 – Respondents' regional involvement

| | Region | | | | | |
|---|---|---|---|---|---|---|
| Type of organization | L. America & Carib. | Africa | Asia/ Pacific | Europe | North America | Near East |
| Total responses | 2588 | 1176 | 792 | 576 | 505 | 269 |

Table 2.1 – Familiarity with the term "e-Agriculture"

| | Region (%) | | | | | | |
|---|---|---|---|---|---|---|---|
| **Degree of familiarity** | **Global results** | **L. America & Carib.** | **Africa** | **Asia/Pacific** | **Europe** | **North America** | **Near East** |
| Yes | 31 | 26 | 36 | 37 | 32 | 29 | 40 |
| No | 57 | 63 | 48 | 48 | 56 | 61 | 46 |
| I think so | 9 | 7 | 10 | 12 | 9 | 8 | 12 |
| I don't remember | 5 | 4 | 7 | 5 | 3 | 2 | 2 |
| **Total responses** | ***3196*** | ***1868*** | ***862*** | ***568*** | ***387*** | ***371*** | ***157*** |

Figure 1 – Familiarity with the term "e-Agriculture" in three languages




**1.1** – Familiarity with term "e-Agriculture" in English

**1.2** – Familiarity with term "cyberagriculture" in French

**1.3** – Familiarity with term "cyberagricultura" in Spanish

Table 3.1 – Barriers to uptake of e-Agriculture by region

| | Region (%) | | | | | | |
|---|---|---|---|---|---|---|---|
| **Type of barrier** | **Global results** | **Africa** | **L. America & Carib.** | **Asia/Pacific** | **Europe** | **Near East** | **North America** |
| Restricted access to digital technologies | 50 | 52 | 52 | 47 | 40 | 37 | 37 |
| High cost of access to ICT | 44 | 55 | 39 | 44 | 39 | 32 | 35 |
| Insufficient digital content in my language | 39 | 30 | 42 | 36 | 36 | 30 | 31 |
| Lack of ICT equipment | 28 | 46 | 22 | 28 | 23 | 22 | 19 |
| Lack of power, telephone, network | 28 | 44 | 22 | 31 | 26 | 20 | 17 |
| Unreliable digital technologies | 19 | 21 | 20 | 17 | 16 | 14 | 16 |
| Lack necessary skills/knowledge | 17 | 23 | 13 | 21 | 17 | 17 | 14 |
| Other | 12 | 13 | 11 | 17 | 18 | 34 | 26 |
| **Total responses** | ***2523*** | ***1856*** | ***3317*** | ***1037*** | ***670*** | ***243*** | ***610*** |

media/technologies, but significant proportions (>25%) also selected high cost of access, insufficient content in the correct language, lack of equipment, and lack of power. These barriers were generally reported at the highest levels in Africa, although Latin America/Caribbean and Asia/Pacific also had relatively high incidences.

**A Definition of e-Agriculture** – Responses were extremely variable, and there were few clear trends. Analysis revealed that elements of responses could be placed into a small number of generic categories, which were:

(a) information-related process involved in e-Agriculture,
(b) information and communication technologies or tools,
(c) types of information,
(d) stakeholders who would benefit from e-Agriculture, and
(e) agricultural areas that could benefit from application of ICT.

In addition, some mentioned specific topics, specific ways in which processes could be improved, or development outcomes from the use of ICTs in agriculture. Many respondents included more than one of the above in their responses, both in terms of categories, and in terms of responses within a category. Therefore, responses were grouped according to which categories were mentioned, after which they were further analyzed for patterns.

***Information and Communication Processes*** – Some 46% of respondents identified one or more information and/or communication processes that they associated with e-Agriculture, and these processes fell into eight generic categories (Table 4.1).

***Information and Communication Technologies*** – Around one third (33%) of respondents mentioned types of technologies or tools. Of these, most did not mention a specific kind of technology, using terms like digital, ÍCT, or electronic. The tool mentioned most often was the Internet. Other tools mentioned were e-mail, personal computers, and mobile phones.

Table 4.1 – Types of information and communication process

| % of responses | Type of process |
|---|---|
| 46 | information transfer/dissemination |
| 28 | learning |
| 27 | communication (sharing/exchanging) |
| 16 | trade/transaction/commerce |
| 14 | research on ICT |
| 13 | information service delivery |
| 12 | information systems |
| 11 | information management |

Table 4.2 – Frequency of types of information

| % of responses | Type of process |
|---|---|
| 57 | farming techniques and practices |
| 33 | agricultural markets |
| 26 | training |
| 25 | data/statistics |
| 16 | science and research |

***Agricultural Information*** – Some 21 % of respondents mentioned a type of information as being relevant to e-Agriculture, with five specific types of information being mentioned (Table 4.2).

***Agricultural stakeholders*** – A total of 12% of respondents mentioned a specific stakeholder group they considered to be involved in e-Agriculture. The most frequently mentioned groups were those involved in the market chain, such as farmers, producers, traders, and buyers. The next most frequently mentioned group were those involved in science (researchers) and education (academics). Stakeholder groups occurring at lower frequencies were rural service providers (e.g. extension organizations and civil society organizations), and governments. Other stakeholders mentioned were women, youth, or rural communities.

***Agricultural processes*** – One or more agriculture-related processes that could be enabled by ICT were mentioned by 20% of respondents, with 73% of such processes being related to agricultural production, and 35% to agricultural markets and marketing.

***Other elements of e-Agriculture*** – A total of 8% of respondents identified the role of e-Agriculture in specific agricultural topics, though the range of topics was wide and none occurred frequently. Also, 5% of respondents mentioned ways in which information and communication processes in e-Agriculture could be enhanced, such as provision of more useful forms of information, more timely information, and wider dissemination or access. Finally, 9% mentioned development outcomes that they associated with e-Agriculture, such as increased capacities, new empowerment avenues, food security, and environmental protection.

**Potential Benefits of e-Agriculture** – Responses covered a wide range of topics across a wide scope of potential benefits, such as who benefits, the type of process improved, the way in which the process is improved, or access to a specific type of information or to a tool. Often respondents identified more than one type of benefit. Responses were analyzed and categorized according to a small number of broad categories, which were then examined in greater detail.

Five broad categories were identified, which then fell into two general groups. The two most frequently mentioned categories both referred to the potential of ICTs

to affect information and communication processes, which were applicable to any sector in which technology can play an enabling role, e.g. agriculture, health, education, governance, and so forth (Table 5.1). The other three main categories focused more specifically on the ways in which benefits could apply to agriculture and rural development.

***Major benefits in information and communication*** – Some 36% of respondents mentioned one or more information and communication processes as benefits of e-Agriculture, which could be separated into principal categories related to access, sharing, dissemination, and communication (Table 5.2). Other processes mentioned less frequently included information management, technology transfer, e-commerce, and specific applications such as question and answer services, expert systems, and early warning systems.

Six principal types of improvement were identified by the 45% of respondents who mentioned ways in which processes could be improved by the use of ICTs (Table 5.3).

***Agriculture/rural benefits*** – Approximately 16% of respondents mentioned specific stakeholder type(s) that they felt benefit from e-Agriculture. Of these, the most frequently mentioned group (81%) involved stakeholders in the market chain such as farmers, producers, traders, and buyers. The next most frequently mentioned (15%) group were those in science (researchers) and education (academics). Other stakeholder groups occurring at lower frequencies were rural service providers (e.g. extension and civil society organizations), and governments.

Some 18% of respondents mentioned benefits associated with a specific information type, and of those nearly one-half identified information on farming practices and techniques, with science and research and market information also mentioned frequently (Table 5.4).

The 15% of responses that identified broader benefits in which improved information and communication could play a role fell into two groups:

- increased capabilities, such as increased production, better decision-making ability, or more sustainable/improved rural livelihoods, and new empowerment avenues, such as awareness, participation, and policy input;
- financial benefits, such as increased prices/revenue, improved market access and marketing capabilities, and reduced transaction costs.

Other secondary benefits that were mentioned significantly often were increased food security, environmental protection, and food safety.

***Other benefits*** – Several other benefits were mentioned by less than 5% of respondents. These included improved access to various types of ICT (e.g. Internet, cell phone, computer), access to a wider variety of information

Table 5.1 – Categories of benefits

| Broad category | Benefits | % of responses |
|---|---|---|
| I | **Information and communication processes** | **81** |
| | Types of improvement | **45** |
| | Types of process | **36** |
| II | **Agriculture and rural development** | **41** |
| | Stakeholder | **16** |
| | Broader development goals | **15** |
| | Types of information | **10** |

Table 5.2 – Types of information and communication process

| % of responses | Types of process |
|---|---|
| **30** | information access (user-oriented) |
| **29** | information sharing or exchange |
| **15** | information dissemination (supplier-oriented) |
| **18** | communication |

Table 5.3 – Types of process improvement

| % of responses | Types of improvement |
|---|---|
| **37** | **faster** availability of information or other processes |
| **26** | access to **more timely** information |
| **12** | **wider** access/dissemination |
| **11** | **easier/more convenient** information/knowledge processes |
| **7** | **cheaper** processes/access to information |
| **6** | **more relevant** information |

Table 5.4 – Information types

| % of responses | Type of process |
|---|---|
| **55** | farming practices and techniques |
| **19** | science and research |
| **18** | market |

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sources, and specific information topics (crops, pollution, inputs, pests). Finally, 2% of respondents said they had no idea what benefits e-Agriculture could have.

**Priorities for an e-Agriculture Forum** – Most respondents indicated more than one priority. Analysis showed that the responses could be grouped into five broad categories. Many respondents mentioned more than one category, and some mentioned more than one subject within the same category. Nearly one-half (46%) of the responses identified priorities related to information and communication processes (Table 6.1). A total of 23% of responses in two categories identified the need to enhance the role of ICT, in providing access to information and in facilitating agricultural processes. A significant proportion noted the need to define the term e-Agriculture and to advocate its use.

***Information and communication processes*** – The information and communication processes could be separated into a few principal categories:

- information dissemination and sharing. i.e. one-way dissemination from providers to users including bulletins, news services and blogs, and two-way sharing of experiences or best practices, through activities such as extension and technology transfer;
- communication, participation, or community-building activities, such as the formation of networks, the creation of discussion forums, greater participation by rural stakeholders in policy and decision-making, and the creation of linkages between different stakeholders;
- activities focused on making information more accessible to users, such as increasing the amount of information easily searchable by rural stakeholders, reducing the costs of access, the development and repackaging of relevant content, the creation of question and answer services, and increasing scientists' access to journals;
- capacity building activities, especially ICT skills training and ICT-based (e-)learning systems or courses; and
- activities related to the collection of rural information, such as research, data collection, and documentation.

Processes mentioned that did not fit into the above categories were creation of libraries, repositories, and databases, development of Global Information Systems, development of information management standards, and ICT-based monitoring and evaluation.

***Stakeholder groups*** – Approximately 15% of responses mentioned a stakeholder group that they felt should be a priority in e-Agriculture. Of these, the most frequently mentioned group (more than 50%) involved stakeholders in the market chain such as farmers, producers, traders, and buyers. The next most frequently mentioned group were those involved in science (researchers) and education (academics). Other stakeholder groups occurring at lower frequencies were rural service providers (e.g. extension organizations and civil society organizations), and governments.

***Information Types*** – When respondents mentioned priorities around enhancing the role of ICT in the provision of information, those that highlighted a specific type most often identified market information and descriptions of farming practices and techniques. Statistics and indigenous knowledge were also identified by some.

***e-Agriculture as a concept*** – Respondents who felt definition of e-Agriculture as a concept should be a priority highlighted the need to develop a policy framework, and to identify stakeholders' needs properly. They noted the need to increase awareness and involvement of all stakeholders, as well as increase levels of funding/investment

Table 6.1 – Categories of priority

| % of responses | Priorities |
|---|---|
| 46 | information and communication processes |
| 15 | stakeholder groups |
| 14 | role of ICT in facilitating agricultural processes |
| 13 | addressing ICT barriers |
| 12 | defining and advocating e-Agriculture |
| 9 | role of ICT in provision of specific information types |

for e-Agriculture initiatives, and enhance linkages with other sectors. Lastly, some stressed the need to identify, develop, and scale up successful pilot projects.

***Technological barriers*** – Respondents identified the principal barriers as being those impeding improvement of rural communications infrastructure, the creation of rural telecentres, the development of more accessible hardware and software, and the greater use of alternatives to Internet-based online services through media such as CD-ROM.

***Agriculture-related processes*** – The most frequently mentioned priorities were felt to be enhancing the role of ICT in: market access; agribusiness; supply chain management; traceability of food; and environmental management.

***Other Responses*** – There were a range of responses that did not fall into the above categories. Almost 20% of respondents mentioned specific topics related to agriculture, such as crops, livestock, pests/diseases, water, weather/climate, gender, nutrition, biotechnology, and organic agriculture. These occurred at low frequencies and no particular topics appeared significant. Some 12% of the respondents expressed the need for e-Agriculture to address broader development goals, such as enhanced poverty reduction, food security, agricultural and environmental sustainability, international trade, conservation, empowerment, biodiversity, and biosecurity bridging the divide between rich and poor. There were also small numbers of respondents who identified quite generic priorities such as greater availability or accessibility of information or technology, access to more up-to-date information, and simpler or cheaper access.

## Conclusions

The conclusions of the analysis of the survey were:

- The survey sample covered a wide range of types of organization and with significant numbers of responses from all parts of the world.
- Only 41% of respondents were familiar with the term "e-Agriculture" in English, and French and Spanish versions of the term were even less well-known.
- Perceptions of the scope of e-Agriculture were immensely variable.
- e-Agriculture is perceived to comprise primarily information and communication processes, and secondarily technologies and tools.
- The principal subjects associated with e-Agriculture were firstly farming techniques and practices, secondly market/food chains, and then training, statistics/data, and science/research. A wide variety of other subjects were identified by small numbers of people.
- Key stakeholder groups associated with e-Agriculture were seen to be farmers/producers, rural service providers including traders/buyers, science and education, and policymakers.
- Benefits to be derived from e-Agriculture were principally in enhanced processes in information access/exchange and communication for the above stakeholder groups, and in terms of agriculture, more access to markets, improved household finances, and more sustainable livelihoods.
- e-Agriculture was widely seen to be a contributing factor to achievement of broader development goals, such as more secure livelihoods, enhanced poverty reduction, food security, agricultural and environmental sustainability, trade, conservation, etc.
- Priorities for consideration in the proposed e-Agriculture community were information exchange and communication processes in the following areas:
  - developing virtual communities/networks for information and knowledge exchange between rural stakeholders, as well as for their empowerment through participation;
  - capacity building of rural stakeholders in use and application of ICT;
  - enhancing farmer and producer access to markets and information on farming techniques and practices;
  - improving dissemination of and access to scientific and technical information;
  - enhancing access to statistics and other types of information for policy and decision-making.

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## Annex I — e-Agriculture Survey Questions

**1. Which region(s) does your work/research/activity focus on? Check all that apply.**

☐ North America ☐ Africa
☐ Asia and the Pacific ☐ Europe
☐ Latin American and the Caribbean ☐ Near East

**2. Please indicate the geographical scale of your work-related activities.**

☐ Local ☐ National
☐ Regional ☐ International

**3. Choose the category of organization that best describes the one in which you work:**

- ☐ Farmer Organization
- ☐ NGO/CBO
- ☐ University/Centre of Learning
- ☐ Youth Organization/Student
- ☐ International Organization
- ☐ Government (National or Local)
- ☐ Service Provider (public or private)
- ☐ Donor/Sponsor Organization
- ☐ Media
- ☐ Other

**4. Have you come across or used the term 'e-Agriculture' in your work?**

- ☐ Yes
- ☐ No
- ☐ I think so
- ☐ I don't remember

**5. What activities would you expect to be included in a definition of e-Agriculture?** [Open]

**6. Tell us the one most important potential benefit of e-Agriculture.** [Open]

**7. What two activities do you believe should be priorities for consideration by a new international forum on e-Agriculture?** [Open]

**8. What barriers do you face, if any, which prevent you from benefitting from e-Agriculture? Check all that apply:**

- ☐ Access to digital media/technologies is too restricted
- ☐ Not enough content or resources available in digital form in my language
- ☐ The cost of access is too high
- ☐ The digital technologies available are unreliable
- ☐ I don't have the necessary skills/knowledge
- ☐ Lack of equipment, such as hardware
- ☐ Lack of power, lack of telephone lines/network coverage
- ☐ Other

**9. Optional: Please share with us a story on a project/activity/practice that you think illustrates a potential e-Agriculture activity already taking place. If applicable, please share a URL or other contact details.** [Optional]

# Seeing the Wood for the e-Trees: Ensuring Comparability in Forest-Related Data on the Web

Roger Mills

ABSTRACT: Recent decades have seen a mushrooming of available data on the extent and depletion of forest cover, much of it generated by remote sensing, supplemented by statistics compiled by national governments and industry. This is extremely important in modeling climate change, for example, when coupled with historic data often originally published only in 'grey' literature or not at all. Much progress has been made in retrieving these data to allow the creation of more complete time series, through digitization programmes, etc. However, apparently comparable data from different countries have often been compiled to different standards and definitions; combining datasets to establish a global picture can therefore be misleading. Comprehensive metadata is required to enable identification of compatible data and appropriate conversion factors where relevant. Librarians are working alongside statisticians and forest scientists to chart a way through this minefield and flag up 'danger areas' for those using sources now publicly available on the web. This article examines the issues, their significance and possible solutions.

RESUME: Les décennies récentes ont vu la croissance rapide des données disponibles sur l'étendue et la diminution de la couverture forestière, la plupart générée par la télédétection, et complétée par les statistiques compilées par les gouvernements et industries nationaux. Ceci est extrêmement important pour modeler les changements climatiques, comme par exemple, lorsque ces données sont couplées avec des données historiques publiées souvent à l'origine uniquement dans la littérature grise, si elles sont publiées. Beaucoup de progrès ont été faits pour extraire ces données et permettre la création de séries temporelles plus complètes, par exemple à travers des programmes de numérisation. Mais, des données apparemment comparables de différents pays, ont souvent été compilées selon différentes normes et définitions; combiner ces ensembles de données pour établir une image globale peut donc induire à l'erreur. Des données détaillées sont nécessaires pour permettre l'identification des données compatibles et des facteurs de conversion adéquate lorsqu'ils sont pertinents. Des bibliothécaires travaillent avec les statisticiens et scientifiques forestiers pour tracer un chemin à travers ce champ de mine, et signaler les «zones dangereuses» pour ceux qui utilisent les sources maintenant disponibles publiquement sur le web. Cet article examine les problèmes, leur importance et les solutions possibles.

RESUMEN: Los decenios recientes han visto un crecimiento rápido en los datos disponibles sobre el alcance y la depleción de la cubierta forestal, gran parte de estos datos siendo generados por la teledetección, complementada por estadísticas compiladas por gobiernos nacionales y la industria. Esto es extremadamente importante al modelar el cambio climático, por ejemplo, cuando estos datos se unen a datos históricos a menudo publicados originalmente solamente en la literatura 'gris', si acaso. Se han logrado avances importantes en la recuperación de estos datos para permitir la creación de series de tiempo más completas, por ejemplo, mediante programas de digitalización. Sin embargo, los datos aparentemente comparables de diferentes países a menudo han sido compilados según diferentes normas y definiciones. Por lo tanto, combinar bases de datos para lograr una imagen global puede ser engañoso. Se requiere de metadatos integrales que permiten identificar datos compatibles y factores de conversión apropiados donde sea pertinente. Los bibliotecarios están trabajando junto con estadísticos y científicos forestales para trazar un sendero por este campo minado e indicar las 'áreas de peligro' para aquellos que utilizan las fuentes ahora públicamente disponibles en la web. Este artículo examina los temas, su importancia y posibles soluciones.

**'Knee-high to a grasshopper'** is a colorful English idiom used to refer to someone who is very young. As a means of communicating that idea it is vividly effective (so long as you know what a grasshopper is); as an accurate description of height it is positively misleading (even a new-born baby is many thousands of times larger than a grasshopper!). Even were that not so, it would still be imprecise; what species and age of grasshopper are we referring to, and which joint do we mean by 'knee'? We could improve precision somewhat by using the Latin name, but 'knee-high to *Chorthippus brunneus*' would not convey any meaning to most people. Although the words could be readily translated into almost any language (grasshoppers are globally distributed), the meaning does not translate; like most idioms, it only works in a particular culture or a particular context.

When it comes to official statistics, the situation is surprisingly similar. 'Diameter at breast height' (DBH) is a universally accepted measure to express the girth of a tree, necessary for estimating the volume of timber in a stand, for example, or as an aid to identifying species or age. But how high is your breast? In different parts of the world, and in different contexts, breast height is defined differently, variously at 1.3 m (4′3″) (USA, etc.), 1.4 m (4′6″) (UK, etc.) or 1.5 m (for ornamental trees). Decimal conversions also introduce variations: 4′6″ is more accurately 1.37 m. And is this a useful measure anyway?

In reality, as trees grow to very different heights, a more useful statistic would be the diameter at a standard percentage of the tree's height, say 5%; but in a tall tree this might be 4m off the ground and not easy to reach. Common sense has to guide application. If a tree happens to have a swelling in the bole at the measuring point, it would be more sensible to measure below it. If the tree is growing on a slope, do you measure the height above the ground on the higher or lower side, or half-way between? Again, conventions vary. So why not get international agreement on a single way of doing things? Because these data have been collected over many decades and large databases already exist; changing the definition of the measurement would effectively close the time series and make the historic data more difficult to use. How much does it really matter? Are the variations very misleading? In this particular case, probably not; the variations are well understood and foresters would know to make allowances for them when analyzing data from different areas. But climatologists, for example, might not share that knowledge, although they might have occasion to use the data in calculating forest volumes and the amount of carbon dioxide incorporation that implies. Small inaccuracies multiplied globally can introduce significant distortions, which may adversely impact economic and political decisions based upon them.

What has all this got to do with librarians? Our mission is to make data readily available to all who can use it. Traditionally, we avoid censorship and do not restrict access according to purpose. Use of the Internet has helped immeasurably in achieving these aims; however by making specialist data readily available to non-specialists, we have also greatly aided its unintentional (or intentional) misuse. To minimize this requires improvements in metadata and in user education, and these are being addressed in a number of initiatives. One of the first was the Global Forest Information Service, GFIS (http://www.gfis.net), which adopted data harmonization as an objective during its early planning phase. However, it has thus far not been possible to achieve this aim, largely because of manpower requirements. For instance, creating the additional layer of metadata required to aid conversion, or even just to draw attention to incompatibilities, would require either a central editorial team working in conjunction with the data providers, or additional effort by the providers to do it themselves. Most data are created for local or national, rather than international use, and projects are generally not funded to provide a fool-proof, internationally compatible interface for the inexperienced user.

Changing this situation requires political motivation, which generally comes only in times of political change. The development of the European Union (EU) gave early opportunity to address the issue. In 1989, Regulation (EC) No. 615/89 required the European Commission (EC) to set up a European Forest Information and Communication System to address the need for well-structured and reliable forest information at the European level (EC, 1989). This has given rise to a number of projects, including NEFIS — *Network for a European Forest Information Service* (http://www.efi.int/portal/project/nefis/). This explored possible system architectures based on existing structures at national, EU and international levels, giving explicit attention to the development of harmonized standards and procedures for providing metadata, with inputs from a consortium of data providers and users, and experts from the information technology (IT), terminology and library arenas. Completed in 2005, this project fed into an ongoing project by the EC Joint Research Centre (JRC) to develop an operational system under the title *European Forest Information and Communication Platform* (EFICP) (http://eficp-info.jrc.it/).

*Our mission is to make data readily available to all who can use it.… However, by making specialist data readily available to non-specialists, we have also greatly aided its unintentional (or intentional) misuse.*

Prior to NEFIS, the JRC had built a first prototype for a European Forest Information System under its EFIS project from 2000–2002 (EC-JRC, 2002). This cycle — political requirement, development of prototype, study of the problems it identifies, development of production system — is typical of international projects and timescales are often lengthy; 19 years have now passed since the 1989 Regulation came into being, and we still have no system in routine operation. Once we do, it will require ongoing funding, and continuing review and development to ensure fitness for purpose and adaptation to changing technologies. Funding for that is likely only if the system proves indispensable in meeting other political objectives. Communication is the key: every effort has to be made to raise awareness of the system and its relevance to a wide range of users who might initially be unaware of its existence. Once they know about it, they will only use it on a continuing basis if it is easy to use and saves time. Many large-scale governmental and commercial information systems have failed because users have abandoned them and their value to the enterprise does not justify maintaining them (Glass, 2003). The report on the NEFIS project (Schuck et al, 2007) provides a fascinating insight into the problems of designing a system people will actually use. Many of them relate to the traditional areas of expertise of librarians, involving terminology, classification, quality assessment, searchability, interoperability, and the construction and maintenance of high-quality, structured metadata.

User needs studies are an essential first step in determining the architecture of a new system and indeed whether a new system is needed at all. Technological trends are moving away from monolithic integrated systems in favor of a modular, distributed approach allowing end users much more flexibility in data retrieval, storage and use in a wide variety of contexts. New uses and new users of existing data are thus encouraged. However, it is difficult to study the needs of users who have not yet emerged! An iterative system of development is therefore necessary, building on new technologies at each stage. The NEFIS project identified three factors that affect the architectural infrastructure needed for a forest information system:

- advanced spatio-temporal data collection and information management;
- dissemination and fusion of heterogeneous distributed information; and
- sophisticated analysis, modeling and visualization of information which will outlive the diverse hardware and software platforms on which they reside (Schuck et al, 2007).

This closely resembles the model that has evolved within the bioinformatics community, for example, where sequencing data, tools for its analysis and annotation, and publications resulting from that analysis are closely interlinked within a single information system, such as NCBI (National Center for Biotechnology Information, http://www.ncbi.nlm.nih.gov/), a division of the U.S. National Library of Medicine. Creating such an integrated system in the forestry community is in many ways significantly more challenging, as it needs to encompass a huge variety of data types globally spread across hundreds of institutions with widely varying technical infrastructures, and to serve a highly disparate community of users with differing needs. Nevertheless it seems very probable that the NCBI model, which bridges the worlds of data acquisition, analysis and curation in novel ways, will spread across the whole of science in due course; as publishing models increasingly provide access to not only peer-reviewed research papers but also the raw data on which they are based, the latter will become a 'publication object' applicable to peer review and reward.

In this model, an author might for example compile a dataset containing forest cover statistics for a geographical region, spanning multiple jurisdictions and a long time series of a century or more, acquiring the data from multiple sources and harmonizing it, recording how this was done in accompanying metadata, and publishing the resulting package, which would then remain permanently available for direct use or further analysis by others, retrievable though the same search mechanisms as the journal articles it generates. Such a model is likely to work best within an open-access, non-subscription environment, so that the data remain visible and accessible to all — otherwise why publish them? But this requires new approaches to both research funding and the long-term costs of data curation. The latter will likely fall on the library community, whose expertise in both the business and technical aspects of archiving, along with developing and supporting integration and interoperability tools and online repositories, will ensure it a long-term and demanding role.

In the meantime, considerable work needs to be done on devising and implementing appropriate standards, which are an essential component in constructing metadata that will facilitate interoperability. The datasets studied in the NEFIS project proved so heterogeneous that no interoperability could be achieved within the confines of the project. However, that clearly demonstrated what would need to be done to make it possible. The *European Interoperability Framework* published by the EU in 2004 (EC, 2004) identified three aspects of interoperability necessary to ensure the implementation of e-government initiatives: technical, semantic and organizational. Technical interoperability is well developed, being facilitated by open standards and existing fora such as the World Wide Web consortium (W3C, http://www.w3.org/). Semantic interoperability, ensuring that the precise meaning of exchanged information is understandable by any other application not initially developed for the purpose; and organizational interoperability, modeling business processes, aligning information architectures with organizational goals and helping business processes co-operate, are seen as much more challenging (CompTIA, 2004).

*It seems very probable that the NCBI model, which bridges the worlds of data acquisition, analysis and curation in novel ways, will spread across the whole of science in due course.*

The library community has taken a lead in developing semantic interoperability, with work on descriptive metadata, controlled vocabularies and ontologies. The NEFIS metadata schema is based on Dublin Core, which provides a common denominator through multiple subject domains. The schema adds extensions to the DC elements **Subject** (to include controlled and user-nominated terms, and thematic [context] information), **Audience** (encoding scheme) and **Description** (quality report). The use of user-nominated terms requires control to avoid mis-spellings and synonyms, which can impair interoperability; however they can also improve precision, particularly in newly-developed subjects where controlled terms may not yet exist. Some editorial process to review user-nominated terms is indicated. The growing use of end-user tagging can also facilitate

the development of dynamic vocabularies. The issue of the appropriate level of granularity is difficult. NEFIS attempted to define this by requesting user groups to submit their own preferred terms, which had varying success, with some groups providing very few terms and others very many. The expertise of the end user will also affect the level of detail required for successful retrieval.

To no one's surprise, the most debated topic in the metadata schema was that of quality, including accuracy, logical consistency, completeness, positional accuracy, and lineage (identifying the original source of the information and any transformations it has undergone). Some indication of these factors, both in relation to the purpose for which the data were originally compiled and to that for which the user intends to use them, was considered essential but had to be conveyed in a non-censorious way. The method chosen was a 'quality report' containing several narrative fields including availability, sources, definitions and use guidelines, plus explanatory notes (Schuck et al, 2007). Provided with this information, the user could choose whether or not to proceed with analysis. As quality judgments are inevitably subjective, this approach was preferred to any kind of 'star rating' system; however, it does not lend itself to automated processes.

Whatever the merits of the schema, it will prove of little use if metadata creation is seen as laborious or costly. While NEFIS contributors found the DC elements 'subject' and 'description' (including quality) the most challenging and time-consuming to complete, they were supportive of their use. Most data providers preferred a model where data remained on the provider's server, rather than being copied to a central store, but this implies a concomitant responsibility for managing the associated metadata. Making this acceptable as an ongoing cost was seen largely as a matter of education, but also of demonstrated necessity in increasing use and reuse of the original data. Where data were originally generated with public funding, some level of compulsory requirement for reliable metadata could be expected, stemming from government at the national, European or international level.

The top-level dataset metadata studied in NEFIS is insufficient for interoperable working, which requires more information about the data itself, including defined protocols for query translation, mapping of field labels to those understood by the protocol, information on field contents, background information, associated files, related intellectual property rights, required executables, language and character set information, and access control mechanisms. Standards need to be agreed upon so that such metadata is always provided with datasets intended for interoperability, which should include all new compilations and reloaded legacy data.

The Advanced Information System Demonstrator developed for NEFIS did not attempt to address these issues of data harmonization, but showed the feasibility of retrieving and analyzing data from a single request to multiple servers in multiple countries. It comprised three components:

- a resource discovery module, locating relevant data through metadata searching;
- a visualization toolkit (VTK), allowing both inexperienced and expert modeling of the retrieved data; and
- a remote search demonstrator, managing data retrieval from multiple sources.

The VTK provides for aggregation, querying, data transformation and visual display. It was designed to allow a user to become familiar with the retrieved data and judge its usability for the required purpose. It can also facilitate Exploratory Data Analysis or EDA (Tukey, 1977), the unbiased examination of data to detect patterns, trends and relationships rather than answering some pre-conceived question. This again mirrors the usual bioinformatics approach. The datasets used for the demonstrator had to be specifically prepared, but the adoption of common metadata standards for dataset structure descriptions could allow the development of a toolkit with little or no requirement for human intervention in preparing the data for visualization. The demonstrator can be viewed on the NEFIS project website (http://www.efi.int/portal/project/nefis/).

It is clear that great potential exists for more effective use of existing data and the development of new services and systems using existing and new technologies. Indeed, this is likely to become essential in developing our understanding of the mechanisms of environmental change across our planet, an understanding that may prove pivotal to our very survival. Librarians have a key role to play in curating the data, developing and supporting the implementation of relevant standards, ensuring ready access to the data and promoting its appropriate use. When I was knee-high to a grasshopper, the buzz word of the moment was Universal Bibliographic Control. Maybe now we should be talking of Universal Data Control — UDC. Hang on — that just happens to be the name of a leading library classification scheme — of which the International Union of Forest Research Organization (IUFRO)'s recently-published *Global Forest Decimal Classification* (Holder, Saarikko, and Voshmgir, 2006) is a subset — maybe we should just extend it! Everything we have discussed in this article is really a form of classification; it's the way our brains work. And that's what librarians study. So however seemingly abstruse research becomes, we should never be deterred from getting involved: we really do have skills to offer and we really can help people see the wood for the e-trees!

## References

**CompTIA. 2004. European Interoperability Framework: ITC industry recommendations. 18 Feb 2004. Brussels: CompTIA.**

**European Commission (EC). 1989. "Regulation (EC) No 1615/89 of 29 May 1989. Establishing a European Forestry Information**

and Communications System (EFICS)". *Official Journal of the European Commission* L 165 (June 6): 12–13.

EC. 2004. *European Interoperability Framework for Pan-European eGovernment Services. Interoperable Delivery of Public Administrations, Businesses and Citizens (IDABC)*. [Online] available: http://ec.europa.eu/idabc/en/document/3473#finalEIF

EC-JRC. 2002. *European Forest Information System (EFIS) — Final report. Project number: 17186-2000-12 F1ED ISP FI*. European Commission–Joint Research Centre.

Glass, R.L. 2003. *Facts and fallacies of software engineering*. Reading, MA: Addison-Wesley Professional.

Holder, B., J. Saarikko, and D. Voshmgir. 2006. *Global Forest Decimal Classification (GFDC)*. IUFRO World Series; 19. Vienna: International Union of Forest Research Organizations (IUFRO).

Schuck, Andreas, Tim Green, Gennady Andrienko, Natalia Andrienko, Alex Fedorec, Aljoscha Requardt, Tim Richards, Roger Mills, Eero Mikkola, Risto Päivinen, Michael Köhl, and Jesus San-Miguel-Ayanz. 2007. "Towards a European Forest Information System". *European Forest Institute Research Report*; 20. Leiden: Brill.

Tukey, J.W. 1977. *Exploratory Data Analysis*. Addison-Wesley Series in Behavioural Science; 29. Reading, MA: Addison-Wesley.

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# Agricultural Information Management Standards Website: An Initiative to Facilitate Interoperability and Improve Coherence

Gauri Salokhe, Margherita Sini, Boris Lauser, Fynvola Le Hunte Ward, Johannes Keizer, and Stephen Katz

> *Interoperability is connecting people, data and diverse systems.*
>
> —WIKIPEDIA, June 2007

## Background

Over the past few years, the Food and Agriculture Organization of the United Nations (FAO) has been working on the development of semantic standards in metadata and controlled vocabularies in the agricultural domain. At present, there are a number of parallel and dispersed developments in standards, tools and systems for managing agricultural information. The First Consultation on Agricultural Information Management (COAIM), held in 2000, recommended that FAO assume a leading role as a clearinghouse for internationally used information management standards in the agricultural sector. The Consultation further recommended that FAO coordinate and facilitate the promotion and adoption of these standards in collaboration with Member Nations and other stakeholders in the agricultural sector. A recent workshop report published by the Department for International Development (DFID) recommended that a website be established for Information Exchange Standards in the Field of Agriculture and Natural Resources (Besemer, Addison, and Ferguson, 2004). This effort, aimed at providing improved access, lies within the strategic framework of FAO to eradicate hunger through information.

FAO, in its role as an international body, is in an ideal position to bring together and disseminate authoritative guidelines on the management of agricultural information. The tasks involved to facilitate this were:

- establishing a network of partners who adhere and agree to the primary goal of the initiative (see The Network, below);
- facilitating discussions between different partners to agree on common standards; and
- creating a web-based service to disseminate standards and tools under a single access point (see The AIMS website, below).

The initiative is also motivated by the desire to minimize the duplication of effort in the creation of information management standards and tools, and to foster cooperative sharing of outputs within the agricultural information management community. The clearinghouse, as a mechanism, will assist the coordination, dissemination and/or exchange of various types of resources. The role of the clearinghouse is to:

- provide a one-stop reference to different implementation methods and methodologies,
- facilitate discussions among the community of participants,
- provide access to training materials and other important information management resources, and
- provide a registry to search and browse promoted standards and tools.

## The AIMS Website

The Agricultural Information Management Standards (AIMS) website (www.fao.org/aims/) is the medium through which the different players can interact and share information. The aim of the website is to disseminate different standards and other information to support these standards. It provides, among others, resources related to standards and vocabularies in different formats, guidelines and documentation to facilitate understanding and reuse of the standards, training materials, tools and more.

**KEY URL: http://www.fao.org/aims**

An example of this is the list of tools made available to facilitate interoperability between agricultural datasets, and methods for creating new systems that use consistent and commonly accepted standards in the description of agriculture-related information and that of similar fields. The site also offers a page that brings together a summary of known tools used for creating metadata for various types of resources. It includes tools for entering and editing, and utilities for processing, extracting, validating and viewing metadata. Ontology tools are also available on the AIMS website for helping with acquiring, editing, visualizing and maintaining domain knowledge as well as aiding in the building of ontologies.

Extensive information about metadata schemas, instructions on how to create an application profile along with the possibility to browse classification schemes and the AGROVOC Thesaurus are other key characteristics of the AIMS website. Furthermore, the possibility to suggest classification schemes and new terms to enrich the AGROVOC Thesaurus makes this site very interactive. The website also provides access to the AGROVOC Thesaurus via web services, which can

Snapshot of multilingual AIMS pages


be called from any client application. With web services, updates to the Thesaurus are immediately available, reducing the time and effort necessary to regularly download and incorporate the latest version of the Thesaurus into applications.

For those interested in an indepth explanation of the site, the most recent publications on topics covering agricultural information management using metadata standards, ontologies and classification schemes are available for download, and links to discussion lists on agricultural metadata standards, application profiles and thesauri are also provided.

The set of services is completed by a list of freely available Knowledge Organization Systems (KOS) in the domain of agriculture and updated news and information about upcoming agriculture-related events.

In summary, the site should serve as a one-stop first access point for anyone who is interested in agricultural information management and wants to manage their information in a standardized manner, and to be interoperable with others in the domain.

## The Network

Constructing and maintaining standards and vocabularies for the management of agricultural information is a huge effort that can be facilitated by collaboration between the main stakeholders in a specific domain. Agricultural

(in its broadest sense) information services can participate as stakeholders in this initiative if they are willing to commit themselves to contribute staff time to support the activities of the project. The first step to become an active member consists of sending a letter of intent with a statement of endorsement of the Coherence initiative.

All partner organizations in this network are expected to:

- make joint efforts to cooperate in the development of multilingual knowledge organization systems and semantic standards for information exchange;
- come to an agreement about common standards and try to apply the agreed upon standards in their own organizations, to the extent possible;
- seek effective approaches for capacity building and for strengthening and improving information and knowledge management capacities at various levels; and
- promote information and resource sharing via the AIMS website.

For more information on becoming part of this community, e-mail FAO-Agris-Caris@fao.org, or go to: http://www.fao.org/aims/partners_join.jsp

## Intellectual Property Rights

The intellectual property rights (IPR), in particular copyright, of material such as terminological data, glossaries, information, software and designs, made available to the network, remain with the originating party, who are indicated as the source partner if the information is reproduced or disseminated through the AIMS website or elsewhere. Copyright of the information, as well as rights to any other intellectual property, developed jointly within the network, is jointly vested in all parties involved. Each party has full rights to exploit such jointly owned works after informing the other parties, without the need of approval of the others. All partners of the network have free access to all information developed pursuant to activities mutually undertaken for their internal use.

## Future Steps

The Agriculture Information Management Standards website will progressively act as a dynamic meeting place for researchers and practitioners who are working on agricultural knowledge production, organization, and exchange with the aim of establishing common standards and guidelines. The management and maintenance of its content has been an ongoing activity.

## Notes

**1. For more information on the Consultations on Agricultural Information Management, visit the COAIM website: http://www.fao.org/gi/gil/consultations/coaim_en.asp**

**2. For more information on the Coherence initiative, read *Improving Coherence in Agricultural Information Systems: A proposal to improve coherence through information sharing and community building* (FAO, 2004), ftp://ftp.fao.org/gi/gil/gilws/aims/references/coherence_in_ag_proposal.doc**

## Reference

**Besemer, Hugo, Chris Addison, and Julie Ferguson. 2004. *Fertile Ground: Opportunities for greater coherence in agricultural information systems*. International Institute for Communication and Development (IICD) Research Report No. 19. [Online] available: http://www.ftpiicd.org/files/research/reports/report19.doc**

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# e-Agriculture and e-Government in Hungary: Electronic Claim Submission Service to Facilitate EU Farm Subsidy Payments

László G. Papócsi

**The European Union** (EU) provides subsidies for farmers in the form of direct payments. The largest amount of budgetary expenditure for direct payments is spent on area based subsidies.

The majority of the claims are for the agricultural "parcel", that is a piece of land used by one farmer for one type of production or other activity. The size of one parcel must exceed 0.30 hectare, while the overall amount of claimed land cannot be less than 1.00 hectare. Any farmer who meets these criteria and keeps the land in good agricultural and environmental condition is eligible for payment. Because of these very broad and basic rules, virtually all farmers submit a claim every year. In Hungary, 198,000 farmers are eligible for subsidy payments.

Farmers must submit their annual claims to the national paying agency. The Agency is responsible for the administration and control of the overall process and workflow, including receiving the claims, checking the validity of the requests, paying out the subsidies and reporting to the EU.

Despite simplified claim procedures, the control process is complex, cumbersome, and strictly regulated by European Union law. Difficulties in the administrative and control steps arise from having to deal with large amounts of data, such as claims, claimants, parcels, and physical blocks, and track (update) the dynamic changes in all of these entities. In addition, separating accidental mistakes from deliberate fraud is a challenging task in the validation of the clients' input data.

In order to deliver an efficient information management solution, the European Union requests each member state to use a computerized database, called the "Integrated Administration and Control System" (IACS). The IACS has several "pillars" that are composed of the Clients database (farmers' registry), the Land Parcel Information System (LPIS) and a Claim scheme database/workflow. The payment of the subsidy can only be initiated after a cross check of all the pillars.

Although mostly unknown to the general public and many agricultural professionals, the IACS is one of the largest and most complex of the governmental information systems in each EU member state. It is generally set up as a governmental Intranet network interconnecting the paying agency headquarters with county offices, land information centres, remote sensing institutes, and Ministry of Agriculture departments. After a difficult implementation, member states are now starting to introduce new, farmer-oriented e-Government services based on the IACS backbone. These services enable their clients to create and modify relevant data in a controlled way through an online interface.

In Hungary, this process was initiated in 2006, when the electronic claim submission pilot system was developed and tested among 110 farms. This was achieved with the help of the EU eContent project titled "eFarmer". The system offered the following main services:

- Input data validation of the form field allowed values such as type, pattern, enumeration, etc.
- Cross field business rule checks
- Pre-population of certain records based on the previous year's default and/or current input
- Auto-calculation of numeric data
- Accurate input (drawing) of parcel graphical images on digital block maps, GIS software constantly displaying size of current area and other useful information

The pilot project proved that such a service can offer great advantages and benefits for both the farmer and the paying agency:

- The farmer can prepare the claim without errors and in less time. Adding and removing parcels can be done more quickly. There is no need for paperwork, except for the final print-out. The electronic dataset can be used for several other purposes as well.

**key URL: http://www.gak.hu**

- The agency can save time and money because the claim does not need to be digitized. Digitization includes both alphanumeric input (filling in claim form fields) and parcel vectors (drawing graphical images). Data quality (error free claim form input data) speeds up the whole control process. The physical block maps do not need to be printed out by the Agency, because farmers receive and use them in electronic format throughout the process, except for the final print-out at the end.

Based on these positive results and benefits, the Hungarian agricultural paying agency decided to introduce a claim submission service titled "eSAPS" to a wider clientele — agricultural farms using more than 200 hectares of land — in 2007. These farms comprise about 2% (3,950) of the total, but they receive 50% of the subsidies (called SAPS base area). Farms below 200 hectares were allowed to use the service only for data input and validation.

The electronic claim submission service opened in April 13, 2007 and was operational through June 11, 2007, on the website of the paying agency (http://e-kerelem.mvh.gov.hu/). Farmers over 200 ha were requested to obtain their electronic claim package containing username and password directly from their regional extension agent employed by the Ministry of Agriculture; farmers below 200ha received paper-based claim packages. First access to the claim data, the finalization, printing out and signing of the claim could only be done in the extension agent's office, equipped with personal computing equipment designed for flawless eSAPS operation. Farmers could decide whether they wished to fill in their claim form electronically in the agent's office or at "home". In the latter case, they received a DVD free of charge, containing a software package with all the necessary files.

Deployed web request/response and data input validation technology was based on the Apache Struts Framework, extended by the DOJO toolkit. Farmers could also use a CSV/XLS file format to backup their parcel data on a local computer and/or upload it back to the server. Only error free claim datasets could be saved into finalized status and printed out.

The GIS solution was delivered by DigiTerra MePAR (LPIS) software. Besides displaying the actual parcel size against the claimed area (and the difference between the two as a percentage), the software also offered several other useful features to help farmers comply with relevant regulations. Users had to fill in the web-based claim form in an Internet browser while in parallel running the GIS software (as a Windows program). The communication between the two software modules was achieved by Apache Axis web services.

An online help desk, FAQs and additional advisory content services were operated by St. Stephen University–Godollo Agribusiness Center. Context sensitive help, e-learning packages and a digital document library were made available for users requiring additional information. Offline claim completion and validation software was also offered for downloading.

Despite several small and annoying mistakes, overall the e-government service solution has achieved a good success rate: 99.3% of eSAPS users finalized, printed out, signed and submitted their claims in the "first round", before the first deadline (15 May 2007).

The evaluation of this exciting and valuable project is currently in process. It is expected that the project will continue on a more open and larger scale in 2008.

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# AgEcon Search: Expanding the Distribution of Current Literature in One Subdiscipline of Agriculture

Louise Letnes and Julie Kelly

**As the landscape** of publishing and scholarly communication continues to evolve, librarians have new opportunities to make connections between users and information. AgEcon Search (http://ageconsearch.umn.edu/) is an example of the type of new collaboration librarians can forge with academic departments, professional organizations, government agencies and NGOs.

AgEcon Search is a 13-year-old subject repository that covers working papers, conference papers and small press journals in agricultural, energy, environmental, resource and other areas of applied economics. All materials are full text, in PDF format, and may be searched and downloaded free of charge. AgEcon Search began as a local solution for departmental working papers, and currently includes material from over 150 organizations in 27 countries.

The project is coordinated and largely run by two librarians at the University of Minnesota, one from the Department of Applied Economics and the other from the University Libraries, with assistance from technical and support staff from each group. It is also co-sponsored by the American Agricultural Economics Association (AAEA). In addition to travel funds, publicity, and support for special projects, AAEA also requires presenters at its annual meeting to post their papers on AgEcon Search two months before the meeting.

**key URL: http://ageconsearch.umn.edu**

Agricultural economics, like many other subdisciplines in agriculture, has a rich tradition of publishing pre-prints, technical reports, conference papers, government documents and other types of grey literature that cover the most current research available. Authors are anxious to have their material widely disseminated, and researchers, students, policy makers and practitioners are anxious to have access to those same items.

The papers are free to the users because costs are kept very low. AgEcon Search runs on a distributed model, which means that each group uploads their own papers, or pays AgEcon Search staff a small amount to do it for them. The software running the system was originally developed in-house, and currently, free, open source software, DSpace, is being used. AgEcon Search is now considered part of the University of Minnesota's institutional repository, the "Digital Conservancy," and has benefitted from the promotion and expertise associated with that effort.

Other major professional organizations worldwide also participate and provide support, often funding a booth at their meetings so that new materials can be solicited. Small grants for special projects such as digitizing older materials have also been obtained from various sources.

With the large number of groups who contribute materials, flexibility has been a key to success. Some groups have each author submit their own papers, while others have a designated person do them all. Librarians at participating institutions serve as informal liaisons, and the Agricultural Economics Reference Organization, a small library professional association, has lent invaluable support from the outset.

While AgEcon Search was initially a small project focused on North American sources, the emphasis has shifted to a more global perspective, in terms of both use of the materials and new contributions. Trends in commercial publishing have not necessarily made documents produced in less developed countries any more widely available than they used to be. Projects like AgEcon Search are an affordable way to promote the use of research done by authors in countries with fewer publishing opportunities.

**Louise Letnes and Julie Kelly are librarians at the University of Minnesota, St. Paul, Minnesota, USA. The former manages the Department of Applied Economic's Waite Library; the latter is at the University of Minnesota Libraries' Magrath Library.**

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# ICT Tools in Action

Ednah Karamagi

***The new generation of Web 2.0 tools can play a major role in helping small-scale producers share knowledge and improve marketing prospects. Ednah Karamagi, one of a team in Uganda committed to pushing out the ICT frontiers, describes some of the creative ways online applications can help farmers to boost production and sell their produce for a better price.***

**Web 2.0 offers** various networking and collaboration tools to address personal, organizational and community needs. At BROSDI (www.brosdi.or.ug), we have embraced the trend, using many Web 2.0 tools to reach out to our target groups.

Our agriculture, education and health programmes each have a blog. The health blog is a platform where people share information on reproductive health and HIV/AIDS issues. The education blog enables orphaned children to talk about the challenges they face, their views, successes and future dreams. Meanwhile, on the agricultural blog, farmers share their knowledge and post content on agricultural topics. For each of the blogs, two-way communication is possible.

## Sharing Information

These blogs are one of the sources of information disseminated through weekly SMSs sent out by our CELAC project (Collecting and Exchange of Local Agricultural Content). This initiative uses ICTs to collect useful agricultural information from farmers and distribute it to others who might find it helpful. CELAC has recently installed a Web-to-Phone tool, which farmers can use to share information freely, with up to 10 people at a time. This service can be accessed from the project website, www.celac.or.ug . Another knowledge-sharing method we use is podcasts. Farmers who are knowledgeable about a given subject make recordings, currently in local languages, though we plan to add English at a later stage. These are then turned into audio CDs and distributed to other farmers, who have received CD players from BROSDI. Copies of these recordings are also uploaded on the CELAC website.

**key URL: http://www.celac.or.ug**

Our most recent information-sharing tool is www.filesanywhere.com. This has been a real eye-opener. We are using it to upload various categories of information from different sources, including digital world space radio. The information will be available online to the public as soon as we have completed the process. We use Picasa and Flickr online photo albums to share images of our field activities.

## Direct Market Linkage

We are currently using Google Maps to relay agricultural information in the districts where the CELAC project is implemented. This offers information about the district where we work. Now we are taking it to the next stage where we will place valuable information about farmers' harvests online, including contact phone numbers. This link will be advertised directly to potential buyers.

At our BROSDI centre in Mayuge, we give computer lessons. The Internet has a lot of information and one needs to know where to look for it. Joseph Mulopi, a farmer in Mayuge district, grew cabbages, but after each harvest, which was once a year, he sold the cabbages for UG SHS 100 (less than €0.50) irrespective of the size. Mulopi took advantage of our training, searched the Internet and got the telephone number of a buyer in one of the Kampala markets. Today, he produces cabbages all year round, which he sells at UG SHS 300/kg (€1.25) to his contact. He has also managed to convince three of his friends to grow cabbages, which he buys from them for resale. By using Google Maps, we hope to do even more to cut out the middlemen. With this tool, the buyers will know what the farmers have produced and using the contact phone numbers placed there, they will be able to get in touch with the farmers directly.

In-house, we use a wiki as an internal planning tool for training. We also use Yahoo! and Skype for monthly and ad hoc meetings. In a community programme like ours, it is important that the team is well organized. These tools are important to us because team members are often in the field and yet we need to communicate and discuss frequently. I should also mention that no single tool can work independently. Projects need to be in touch with the emerging technologies and creatively adopt those within their means. A cocktail of tools is the way forward.

**Ednah Karamagi is Executive Director of the Busoga Rural Open Source and Development Initiative (BROSDI) in Kampala, Uganda.**

***Editor's Note:*** **Ednah Karamagi's presentation at the Web2forDev Conference during e-Agriculture Week (September 2007) was very well-received. The PowerPoint of her presentation is available at: http://www.web2fordev.net/465.html. We are pleased to be able to reproduce here a short viewpoint she wrote after the conference that was recently published in CTA's *Spore*, no. 133 (February 2008).**

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# Focus on e-Agriculture: e-Agriculture Week and Beyond

## 2nd IISAST Expert Consultation

The 2nd Expert Consultation on International Information Systems for Agricultural Science and Technology (IISAST) was convened September 23–24, 2007, during e-Agriculture Week in Rome. Seven organizations — CGIAR, CTA, DFID (UK), FAO, GFAR, IAALD, and MAE (France) — organized and participated in this important event. Participants comprised approximately 60 experts working in networks and information systems in agricultural science and technology at international, regional and national levels. The objectives were to:

- review progress since the 1st Consultation in 2005 (http://www.fao.org/kce/consultations/iisast.htm),
- reassess the objectives of the IISAST initiative and confirm commitment of the partners,
- reassess the modalities of implementing the initiative, and
- establish future priorities for and contributions to the initiative.

Participants reflected on what the initiative was trying to achieve, for stakeholders at all levels from decision-makers to farmers, and how the initiative fitted into the wider development picture of rural poverty, agricultural production, and food security.

Discussion focused on the policy framework developed for the initiative, and the goal was agreed as being "to improve the impact of science and technology on enhancing food security, rural livelihoods, and responsible use of natural resources". In the context of that goal, the desired development impacts were defined in the wider vision. The importance of subsidiarity was stressed with regard to scale and structure of the initiative, setting the primary focus on local and national levels and recognizing the distinct roles of regional and international actors. The purpose of the initiative was defined as being to develop a community of practice around coherence in agricultural information, with content management approaches, accumulation of evidence of good practice, and advocacy all being the key elements of achieving this purpose. Finally, the deliverables were defined as including a roadmap and guidelines for development of national systems, and guidelines for monitoring and evaluation.

Actors from the national level in six countries presented case studies that documented their experiences in developing information systems and institutional networks, in the context of developing a systematic experiential learning process to derive sound policies and practices. Working groups then used a conceptual model to categorize the experiences reported in the case studies. The groups identified several additional categories in the model, which was then modified, and they studied the principal challenges, issues, and lessons learned from the cases in relation to the conceptual model. They identified additional lessons from their own experience. The groups then outlined how case study output could be packaged to assist development of national information networks, demonstrating outcomes and identifying issues and lessons learned, so that it could be used to support advocacy. Finally, the groups decided what products and tools might be needed to plan and implement information networks/systems at the national level.

The progress since 2005 of the Task Forces for advocacy and content management, and the work on capacity building, were presented. The second working group session considered the interventions necessary to support national information systems and the recommendations from Task Force reports. The short term (i.e. one year) priorities for action were to recommit to the policy framework and to sustain the Task Forces. The medium term priorities were to develop a roadmap to assess the impact of the initiative's activities, and to develop further the community platform to support learning around the initiative's purpose.

The Consultation proposed additional operational elements in the IISAST initiative in the creation of a web-based collaboration platform, a third Task Force on capacity building apart from the existing ones on content management and advocacy, and a facilitation body with a monitoring function. The nature and scope of the activities of these elements were defined.

The final full report on this event may be viewed at: http://www.fao.org/docs/eims/upload/239266/2nd%20ExCon%20Report%20Final.pdf

***adapted from the Executive Summary of the Consultation Report***

## Web2forDev: Participatory Web for Development Conference

The centerpiece of e-Agriculture week was the Web2forDevelopment conference. Originally conceived by CTA, Web2forDev 2007 was the first conference devoted to ways in which Web 2.0 can be used to support networking, collaboration and knowledge exchange in agriculture and rural development. The programme had a mouth-watering array of speakers and experiences — Agricultural Market Information Systems 2.0; Web 2.0 for Rural Communities; Drylands Resources Knowledge and Practice Network; Village to Village Knowledge Sharing; Climate Change Mashups; GFAR 2.0; E-agriculture 2.0 in the Pacific; Rural community 2.0 in Uganda;

GFIS Forest Information Gateway; IFPRI 2.0; and much more.

The three-day conference, which was held at FAO September 25–27, 2007, provided an opportunity for participants to share experiences in the use of social networking technologies (i.e. blogs, wikis, feeds, mash-ups, and so forth) to build collaborative knowledge organizations. With a focus on support for rural community information needs, the conference attendees also explored issues of the digital divide, local ownership, linguistic challenges, illiteracy, privacy, capacity building, information overload, and potential delivery mechanisms such as mobile phones and e-mail alerts.

Selected presentations included a demonstration of RSS feed technology used by the Global Forest Information Service (GFIS) gateway; the use of semantic wikis at ICRISAT to build a repository of re-usable information objects; IFPRI's experiments with improving both internal and external communication using blogs, wikis, RSS feeds, and social bookmarking; and Oxfam's MySpace community engagement.

The experiences of BROSDI, a Ugandan NGO, were striking. It works to improve rural livelihoods through the use of ICTs and knowledge sharing. The BROSDI website provides farmers with weather information, concise FAQs, and access to open source tools for text-messaging. Village knowledge brokers are trained to facilitate two-way communication and to build ICT capacity among all village members, including school children (see p. 30 of this issue for more on this topic).

The Web2forDev conference presentations are available for download, with video also available for selected presentations, via the conference website: http://www.web2fordev.net/programme.html

***adapted in part from a contribution by Barbara Hutchinson***

## 4th ICM4ARD Inter-Regional Consultation

On September 26, 2007, the 4th inter-regional consultation on Information and Communications Management for Agricultural Research for Development (ICM4ARD) was held during e-Agriculture Week in Rome. ICM4ARD (http://www.egfar.org/egfar/website/action/partnership?contentId=241) is a GFAR Global Partnership Programme (GPP) started in 2004 with the purpose of enabling "more equitable access to agricultural information globally for ARD stakeholders through improved ICM and more efficient use of ICT in National, Regional and Global agricultural information systems". The ICM4ARD meeting took place a few days after the 2nd Expert Consultation on IISAST, and drew on related discussions and outcomes of the Consultation.

The ICM4ARD consultation was the occasion for a review of the project, which highlighted some major achievements, particularly as regards the strengthening or establishing of Steering Committees/Task Forces of all Regional Agricultural Information Systems (RAIS), the development of their websites, the studies on the ICM status in the regions, the development of toolkits for the National Agricultural Information Systems (NAIS) and the re-engineering of EGFAR (http://www.egfar.org) to contribute to development of an ARD Web ring. The review also stressed that there are areas where the targets have been slow to be realized, such as capacity development of NAIS managers, the development of distributed databases on Institutions, Experts, Projects and Project outputs, monitoring and evaluation, and attracting funds.

The discussion on future priorities focused mainly on: sensitization of senior NARS leaders and policy makers; attraction of donor investment; improvements in monitoring and evaluation; and improvements in content generation and its management. It was recognized that in addition to ICM policy development at global, regional and national levels, the major focus needed to be on individual institutions having clear policy frameworks on how the outcomes of research and development activities are communicated to stakeholders and beneficiaries. It was recognized that all the partners active in the Task Forces of the IISAST initiative would be taking the lead in developing this framework as a tool for further advocacy and support to NARS, in the form of guidelines for development and implementation of ICM policies. The outputs would be advocated under the ICM4ARD GPP. These policies should look at issues in generating, processing and using more effectively information through ICT-enabled systems for ARD at the Institution and ARD Systems level.

The draft report for this event may be viewed at: http://www.egfar.org/egfar/digitalAssets/908_4th_ICM4ARD_InteregionalConsultation_Proceedings_2nd_DRAFT.pdf

***taken from GFAR Newsletter no. 20, September 2007***

## Technical Consultation on Agricultural Information and Knowledge Management

The Technical Consultation on Agricultural Information and Knowledge Management was held on September 28, 2007, at FAO in Rome, Italy. FAO convened the Technical Consultation to consider technical and policy issues related to accessing, exchanging and contributing agricultural information and knowledge to ensure food security and sustainable development. The Technical Consultation considered FAO's work in the area of e-Agriculture, including the findings of an international survey on e-Agriculture conducted in 2006, with participation from 135 Countries, and other activities related to the development of the international community of practice.

The Conclusions of the Consultation are enumerated below. It was recognized that FAO should address problems of hunger and malnutrition through best practices in agriculture incorporating new and evolving means of exchanging knowledge and information.

1. Members congratulated FAO on its prioritization of knowledge management, including the knowledge services facilitated by the Knowledge Exchange and Capacity Building Division, and recommended strong linkages be established with national knowledge services.

2. Members expressed their appreciation of the stimulating series of meetings organized during "e-Agriculture Week" exemplifying FAO's role as a participatory knowledge-sharing organization, and reiterated the observation expressed throughout the week that knowledge exchange is about "the people and not the tools".

3. Members placed priority on knowledge exchange services being accessible to smallholder farmers and the rural poor, taking into account technological constraints, lack of infrastructure, and language issues.

4. Members noted the roles of mobile and fixed line telephony, rural radio and television as key elements of knowledge exchange in rural areas, given their widespread accessibility.

5. Members recommended rural knowledge services be based on multi-stakeholder innovation systems, engaging private enterprise, technical advisers, market intermediaries, and so forth, while keeping a focus on farmers.

6. Members proposed that FAO examine mechanisms and intermediaries to help simplify the knowledge provided through FAO, including the use of local languages and multimedia.

7. Though adopted at the World Summit on the Information Society (WSIS), Members expressed the need for a participatory mechanism for defining the evolving scope of the term "e-Agriculture".

8. Members proposed a series of specific topics to be considered by the e-Agriculture Community of Expertise, including farmer-oriented weather and market information services and trans-boundary trade and commerce.

9. Members acknowledged that not all stakeholders can easily access the web-based e-Agriculture platform, and proposed that the e-Agriculture Community further develop other means to engage the full range of stakeholders and build local capacity.

10. Members recognized that ICTs have changed rural livelihoods not just in the context of agricultural production, and that the e-Agriculture initiative should take account of this.

For more information on the Technical Consultation, go to: http://www.fao.org/kce/consultations/tech-cons/

***submitted by Stephen Rudgard***

## GK3: e-Agriculture — Continuing Dialogue to Action

Key stakeholders in e-Agriculture came together on December 13, 2007, during the Third Global Knowledge Conference (GK3) in Kuala Lumpur, to consider the unique factors related to enhancing sustainable agricultural development and food security by improving the use of information, communication, and associated technologies in the e-Agriculture sector. The panel session, entitled "e-Agriculture — Continuing Dialogue to Action," addressed the following key questions:

- What is the policy dimension of e-Agriculture today, and how might this change in the future?
- Where are the limitations in the use of ICT in rural development?
- What are the biggest constraints to the expansion of e-Agriculture?
- How can organizations join forces in an economically smart way to increase working capacities and efficiency?

The panelists addressed these questions and also fielded questions from the attendees. Among the session highlights were:

- *M.S. Swaminathan* (Founder and Chairman, MS Swaminathan Research Foundation) – ICT is particularly relevant in developing small agriculture ventures. Communication centers (information kiosks) are imperative to reach everyone in the agriculture community. The communication should be two-way and in real time. Timeliness of content is crucial. It is not enough for governments to put money on hardware and infrastructure — more needs to be done for software development. Also, to bridge the digital divide, India is working towards training one million knowledge workers who will be distributed among the agricultural communities.
- *Aida Opoku-Mensah* (Director, ICT and Science & Technology Division, United Nations Economic Commission of Africa) – In the African experience, community radios have been the most effective tools in bringing knowledge to the agriculture community. We need to create an environment where innovation can flourish in the agricultural sector. Many opportunities can be created in ICT development among the agricultural communities.
- *Anton Mangstl* (Director, Knowledge Exchange and Capacity Building Division, FAO) – ICT is an enabling tool in the agriculture sector, as it is in other domains. Even governments can be bypassed in agricultural ICT developments, though governments have a crucial role to play. Mangstl agreed with Swaminathan that in the process of ICT developments in agriculture, knowledge workers are necessary to keep the rural community informed.
- *Manish Pandey* (Deputy General Manager, KATALYST) – Political will is required in the implementation

of ICT policies and infrastructure. Though technology can cause disruptions in the lives of the agricultural community, these are mostly positive. The benefits of technology in agriculture are too great to be ignored. For example a telecenter in a rural farming community could provide assistance in terms of presenting a wide range of choices for farmers.

- *Matt Keller* (Director for Europe, Middle East and Africa, One Laptop per Child): Local content is most important in information exchange. When everyone is connected with everyone, and information is disseminated quickly, we can help avert crises.

*Lessons Learned* – For centuries, farmers have learned from each other. This is not expected to change even with the implementation of ICT policies. So knowledge transfer should occur not only vertically (between policy makers and farmers) but also horizontally (among the farming community). In fact, it is horizontal communication at the grassroots level that sustains agricultural developments in rural communities across the world. Local or indigenous knowledge should be a key feature in ICT considerations for the agricultural community. Also, what works best in a particular locale may not necessarily work in another. For example, the German experience in agricultural development is very different from that in Africa. Individual farmers in Germany are often in competition with each other while farmers in Africa usually work in a collective group sharing information and expertise.

*Visions, Innovations and Trends* – The implementation of ICT policies in the future should be about creating not only a knowledge chain but also an empowerment chain. Context (the geographical aspect) will be an important consideration in the implementation of ICT development programs.

*Priorities/Potential for Action* – Emphasis should be placed on user generated information. Also, we need to train knowledge workers who can bridge the gap between policy makers and the agriculture community.

*Burning Questions/Questions to be deepened further* –

- Will farmers' voices actually be heard? Traditionally, the mainstream media does not pay much attention to rural agricultural communities.
- What happens to the middlemen who are bypassed in the ICT revolution, when farmers can communicate directly with the market?
- Accessibility, which is a key concern now, is only one facet of the ICT revolution. Where will e-Agriculture be in 20 years?
- Can policy makers be held accountable for drawbacks experienced by the agriculture sector with regard to ICT development?

Thus, the session ended where it began, with questions, but a new set of questions. And so, the conversation continues…

***adapted from the Session Summary, http://www.e-agriculture.org/fileadmin/uploads/documents/GK3eagriculture.pdf***

## Information for ARD Manifesto to Launch at Japan World Congress

In January 2008, the IISAST (International Information Systems for Agricultural Science and Technology) partners held a planning meeting to examine ways forward for the initiative. There, the partners agreed that a "manifesto" would be highly beneficial for the initiative, in terms of laying out the substantive agenda that was being addressed. This could act as a common declaration at a global level on collaboration and consistency between various organizations building, supporting, and maintaining information systems in agricultural research for development. Furthermore, it was agreed that the 'IISAST' title was inappropriate for the overall initiative. After considerable discussion, it was agreed that the initiative should henceforward be known as: "Coherence in Information for Agricultural Research for Development"— CIARD. The manifesto is being drafted and will be launched by the partners at the IAALD World Congress in Japan (August 2008). The partners include CABI, CGIAR, CIRAD, CTA, FAO, GFAR, IAALD, and the British and French development agencies.

***submitted by Peter Ballantyne***

## Just Released: *Emerging Issues in e-Agriculture Policy Brief*

e-Agriculture community members have identified the emerging issues and priority areas for strengthening information and knowledge systems for e-Agriculture. The recently published *Emerging Issues in e-Agriculture Policy Brief* (March 2008) offers a definition of e-Agriculture, discusses how use of appropriate technology can help resolve the digital dilemma, presents priorities in e-Agriculture, and addresses the steps that will have to be taken by policy-makers in order for e-Agriculture to fulfill its promise. The Brief also provides several 'real world' examples of how e-Agriculture is helping farmers in their daily lives. The two-page Brief is reprinted opposite. A full-color version is available via the e-agriculture.org website, or at: http://dotproject.fao.org/fileadmin/uploads/documents/e-agr_PolicyBriefmarch2008.pdf

# Emerging Issues in e-Agriculture

*Policy Brief - March 2008*

**e-Agriculture: a definition**

e-Agriculture is an emerging field for enhancing sustainable agriculture and food security through improved processes for knowledge access and exchange using information and communication technologies (ICT).

## Technology for changing times

For millennia, people have used knowledge from family and friends to grow crops or raise livestock. Globally, new digital systems now exist for sharing information on agricultural innovations and markets, but most of these systems are inaccessible to poor farmers in developing countries. Today, technology can and should be a key agent for changing people's lives by improving access to information and sharing of knowledge. Rural livelihoods would be greatly enhanced by improvements in areas such as:

- access to agricultural markets
- improved agricultural practices
- information on weather, including extreme events

## Digital dilemma

The divide between those who can and cannot access ICT will widen unless efforts are made to ensure that digital technology and information is accessible as well as affordable at a local level.

- As computer technology becomes more sophisticated and often more expensive, developers should ensure compatibility with older hardware still in use.
- Information on the Internet is often not available in local languages, which seriously constrains rural people's access to otherwise relevant information. Approaches need to be developed to overcome these constraints, and the value of local knowledge emphasised in systems focused on farmers and rural communities.

## Appropriate technology

The needs and the services required will determine how ICT are used, adapted and thus evolve. To enable and empower rural communities to improve their livelihoods is likely to involve a mix of traditional communication channels (neighbours/family, local news, announcement boards etc), as well as newer ones (internet, mobile phones etc).

**Reaching rural areas with digital radio**

Due to the region's dialect preference radio is the most important information source for farmers in the Cajamarca region in Peru. The NGO 'Soluciones Prácticas' is using old and new technologies to reach these farmers, by disseminating important agricultural information through 'podcast' radio programmes, which are saved in digital format, recorded in discs and distributed to the local radio stations.

- The INTERNET has many advantages as a medium of information and knowledge exchange. But limited access and poor connectivity constrain many individuals, particularly in rural areas in developing countries.
- MOBILE TELEPHONY has been a major breakthrough in communications, as a means of providing market prices, weather and other advice. It is currently the most accessible ICT available, allowing access to a broad spectrum of people, including marginalized people in remote rural areas. The technology is adaptable, handling voice and data, and the cost of advanced features continues to drop. The mobile telephone and the hand-held computer are becoming almost indistinguishable.

### Mobile phones connect African fisherman

Tanzanian fishermen are using mobile phones to communicate amongst themselves regarding weather forecasts, where to get the best catch, local market information, and coordinate pickup.

## Priorities in e-Agriculture

The e-Agriculture community spans a diverse range of actors: researchers, extensionists, farmers, international development practitioners, as well as information/knowledge intermediaries. As a global initiative, the **e-agriculture.org** platform enables members to exchange opinions, experiences, good practices and resources related to e-Agriculture, and to ensure that the knowledge created is effectively shared and used. It is through the input and guidance of these Community members, through various online forums and face-to-face events held in 2007, that the priority requirements for strengthening information and knowledge systems for e-Agriculture emerged. These include:

### Market Chains

- The growth of communication networks needs to be supported amongst actors in the market chain (farmers, transporters, buyers, traders, etc), in order to ensure more equitable, timely, and collaborative access to markets for smallholders.

### Farming/Production

- Investment is needed to repackage technical information for farmers and make it available in local language.
- Existing channels for technical information (e.g. extension services, radio stations) should be integrated with new communication technologies which are accessible to farmers.
- Financial sustainability must be built into all systems.

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### Research & Innovation

- Technical information systems in agriculture need to incorporate local knowledge, be integrated into regional and international systems, and maintain links to policy-makers.
- More investment in infrastructure and skilled human resources is needed for such systems.
- Researchers and extensionists require continued training in how to interact and share knowledge more effectively using the new digital technologies.

## What next for policy-makers?

- **Investment** in communication infrastructure has to focus on financially viable and socially acceptable approaches that are accessible to the rural poor.
- One-way information flows from "producer" to "user" need to be transformed so that a wide range of actors, in communities and institutions, can develop **networks** for sharing information and knowledge.
- Appropriate **incentives** for information sharing have to be developed at all levels.

### Agricultural Community connects in India

An innovative agri-information portal provided by the Department of Agriculture of Kerala, India offers numerous services for the benefit of the farming community, including toll-free call centres and multimedia resources. The 'Karshaka Information Systems, Services and Networking' (KISSAN) project also gives farmers the opportunity to ask specific questions to agricultural scientists and technical experts.

For more information, contact: **info@e-agriculture.org**

# News from IAALD

## Japan World Congress Program Update

The theme chosen for the World Conference on Agricultural Information and IT, to be held in Tokyo, Japan, August 24–27, 2008, is "Advancing Information and Communication Management, Knowledge Creation and Sharing, and the Application of Information Technologies in Agriculture." Co-organized by IAALD, AFITA (Asian Federation for Information Technology in Agriculture), and WCCA (World Congress on Computers in Agriculture and Natural Resources), this event promises to have something for everyone!

The Conference will provide an effective forum for agriculture related researchers and information specialists to share and discuss the latest developments on applications and developments in the use of Information Technologies. These include new applications of well established and understood technologies to innovative and entrepreneurial applications of emerging technologies, in addition to issues related to policy and knowledge dissemination. The Conference will also provide an appropriate forum for agricultural information specialists for information dissemination, exchange and knowledge sharing. It will cover a wide array of topics, including information technologies and information knowledge and communication activities related to the applied life sciences, including: agriculture, food from production to marketing, natural resources, fish and wildlife, environment, extension, communication, and education.

The conference will begin on Sunday, August 24 with a series of pre-congress workshops organized by IAALD members and partners, on topics such as adoption of ICT-enabled information systems; semantic problems and solutions; rural telecentres; image management; and RSS feeds – with more being planned.

The conference proper, which will run August 25–27, will follow a traditional pattern of plenary sessions and parallel discussions in smaller groups. Already confirmed is a plenary panel on e-Agriculture, the launch of the CIARD manifesto, and sessions on forest information (with our IUFRO colleagues), AgInfo in Africa and the Pacific, research access and dissemination services, digital libraries, rural telecentres (with CTA), AgInfo 2.0, ICT adoption in rural areas (with GFAR), and developments on the semantic web.

On the morning of August 27, there will be a breakfast meeting of the IAALD General Assembly. The agenda will include updates by the President, Secretary/Treasurer, and Editor, IAALD business matters, and a discussion on the plans and strategy of the Association.

For more information on this exciting international event, go to: http://iaald-afita-wcca2008.org

***submitted by Takashi Nagatsuka***

### Notice of General Membership Meeting

There will be a breakfast meeting of the IAALD General Assembly on August 27, 2008 during the IAALD World Congress in Japan.

***Tentative agenda:***

- President's Update
- Secretary/Treasurer's Update
- Editor's Update
- IAALD Business Matters
- Discussion on the plans and strategy of the Association

## Highlights of the IAALD Executive Committee Meeting – Rome, Italy, September 27, 2007

The IAALD Executive Committee (EC) met on September 27, 2007, in Rome, Italy. In addition to routine items and regular reports, some highlights were:

- ***President's Report:*** Peter Ballantyne reported that he had spent much of his time on international positioning of the organization through the blog, the web and investing in the organization. He is looking for blog reporters, as he currently posts the majority of the news items himself.
- ***Secretary/Treasurer's Report:*** Toni Greider reported that IAALD is now officially an incorporated association with an educational mission. It took approximately 18 months from start to finish to obtain legal status. The secretariat is located in Lexington, Kentucky, USA.

  Arrangements have been made to accept credit cards (Visa, MasterCard, American Express, Discover), which should facilitate various organizational transactions. The 2007 budget was reviewed and approved.
- ***Editor's Report:*** Debbie Currie reported that the *Quarterly Bulletin* was back on schedule, with its final issue due out by the end of the year. Much of her time had been spent on preparations for the launch of IAALD's new journal, *Agricultural Information Worldwide*, in March 2008. The cover was designed gratis by designers at the University of Arizona. The Editorial Board has been identified and invited to

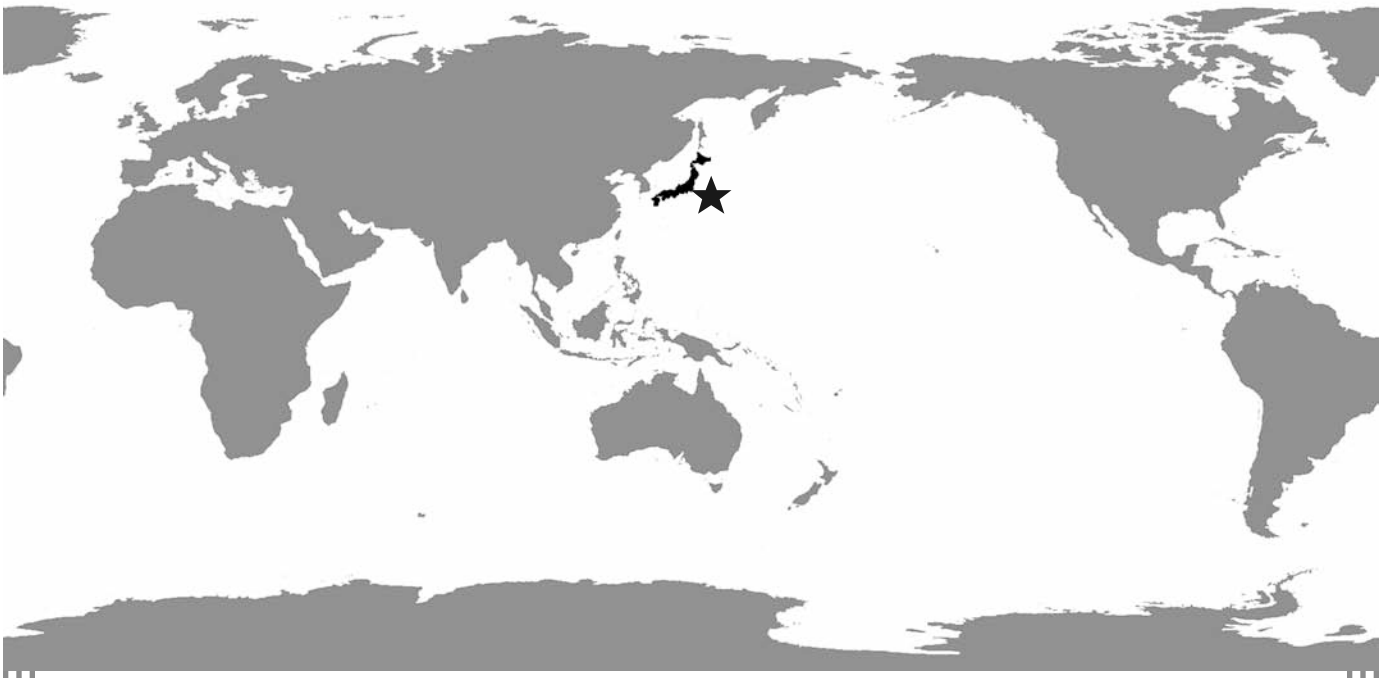
assist in seeking funds and content for thematic issues in their areas of expertise. Currie discussed the theme (e-Agriculture) and the contents of the first issue. Each theme issue will have an executive summary on the topic. The publicity for the new journal needs to get underway in order to solicit input from members. A plan for phased electronic distribution of the journal between 2008 and 2010 was outlined.

- ***Membership Recruitment and Retention:*** Toni Greider expressed the opinion that IAALD's future is in chapters and discussed ways to provide chapter funding. The idea is that a percentage of the membership fees would go back to the chapter to provide program funding. Chapters could apply for additional funding for major events. A motion to return 10% of dues collected for a recognized IAALD Chapter to the chapter for programming was approved.

  A discussion followed on how to build a chapter. Justin Chisenga said that the Africa Chapter piggybacked on other events such as the IFLA Conference. Michal Demes suggested that activities need to be planned that attract people by providing access to good keynote speakers. Dorothy Mukhebi volunteered to revitalize the membership committee
- ***Conferences:***
  - **Africa 2006** – The IAALD Africa Conference had a lot of impact and the organization is still building on that momentum. There is still untapped potential in Africa. The African Group met at IFLA and the Africa Chapter wants to have a Conference in 2009 in Southern or West Africa.
  - **Japan 2008** – Conference Chair Takashi Nagatsuka gave an update on the planning for the XIIth World Congress. The challenge has been bringing three organizations together (IAALD, AFITA, and WCCA). In a discussion on the program, it was suggested that an e-Agriculture theme be woven throughout the conference. Michal Demes suggested that there was a possibility of a Central/Eastern European Roundtable meeting at the conference.
- ***Other Business:***
  - Michal Demes reported that a project to establish an agricultural information management institute in the Ukraine has been completed and it will provide a solid base for IAALD in the future. Work is being done on the language issue for the former Soviet Union and there is potential for IAALD in Syria.
  - IAALD's relationship with IISAST (International Information Systems for Agricultural Science and Technology) was discussed. Barbara Hutchinson suggested that IAALD, as a neutral party, could help facilitate collaboration.
  - Michael Demes brought up the need to have branding for IAALD, including on the web
  - Dorothy Mukhebi described the situation with the Regional Agricultural Information Network (RAIN). Due to a FARA reorganization, RAIN is going to be part of a bigger program and there was concern that the information activities will be diminished in the program. Peter Ballantyne will draft a letter to express concern to the appropriate parties that the information activities continue.

It was agreed that the next EC meeting would be held in Toyko, Japan, in conjunction with the XIIth IAALD World Congress in August 2008.

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



# World Conference on Agricultural Information and IT

*'advancing information and communication management, knowledge creation and sharing, and the application of information technologies in agriculture'*

**Tokyo, Japan, August 24–27, 2008**

**• IAALD • AFITA • WCCA •**

(12th World Congress of the International Association of Agricultural Information Specialists)
(6th World Congress on Computers in Agriculture)
(6th Asian Conference of IT in Agriculture)

***Hosted by***

the Japanese Society of Agricultural Informatics,
the Japanese Association of Agricultural Information Specialists,
the Tokyo University of Agriculture,
– with the e-agriculture community of expertise –

***For more information, go to:***

http://iaald-afita-wcca2008.org/

## Instructions for Authors

*Agricultural Information Worldwide: An International Journal for Information Specialists in Agriculture, Natural Resources, and the Environment* (*AgInfo World*) is the official journal of the International Association of Agricultural Information Specialists (IAALD). *AgInfo World* provides an international forum for high quality articles on information, knowledge and communication activities related to the applied life sciences, including agriculture, food from production to marketing, natural resources, fish and wildlife, environment, and agricultural extension and education. Priority will be given to practical and applied topics, such as but not limited to best practices. Research articles with practical applications will also be considered for publication.

Articles submitted will go through a blind review process with an independent reviewer and will be returned to the author for corrections and modifications if necessary. Research should be statistically valid and replicable with the results of broad applicability. English, French, and Spanish language articles will be considered for publication. Generally, full articles should not exceed 5000 words, but longer articles will be considered on a case-by-case basis.

All *AgInfo World* articles are published with a specific tabular style and follow bibliographic conventions as listed in the *Chicago Manual of Style* 15th edition. References should be complete and tables should comply with the editorial style represented in *AgInfo World*. Notes and references should be presented at the end of an article, not as footnotes. An English language abstract of 150 words or less is required at the time of submission. Additional abstracts in French and Spanish are welcome. Articles submitted should be accompanied with the institutional affiliation and address of each author as well as a brief biography.

In addition to full articles, *AgInfo World* also publishes short reports and updates on projects, tools, and organizations in its *AgInfo Dispatches* section. Dispatches will be less formal in nature and will be reviewed for acceptance by the Editor. Dispatch submissions do not require abstracts and should not exceed 1500 words.

As of January 1, 2008, *AgInfo World* will only accept manuscripts submitted in standard electronic formats, either on disk (accompanied by a hard copy) or as e-mail attachments. MS Word (.doc) or Rich Text Format (.rtf) documents are preferred; please contact the Editor regarding other acceptable formats. Graphics may be embedded in the native word processor file, but for optimum layout efficiency and reproduction it is best to also submit them separately on disk or by e-mail.

To learn more about publishing in *AgInfo World*, please contact the Editor:

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

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

*To further this mission:*

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

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

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

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

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