

**Report of the
2nd Expert Consultation
International Information Systems
for Agricultural Science and Technology**

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**2nd Expert Consultation on
Information Systems for Agricultural Science and Technology (IISAST)**

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ACRONYMS

AARINENA	Association of Agricultural Research Institutions in the Near East and North Africa
AGORA	Access to Global Online Research in Agriculture
AGRIS	International Information System for the Agricultural Sciences and Technology
AGMES	Agricultural Metadata Element Set
AGNIC	Agriculture Network Information Centre
AGROVOC	Multilingual Agricultural Thesaurus
AIMS	Agricultural Information Management Standards
AOS	Agricultural Ontology Service
ARD	Agricultural Research for Development
ASARECA	Association for Agricultural Research in Eastern and Central Africa
CABI	CAB International
CARDI	Caribbean Agricultural Research and Development Institute
CGIAR	Consultative Group on International Agricultural Research
CIRAD	Centre de coopération internationale en recherche agronomique pour le développement
CLAES	Central Laboratory for Agricultural Expert Systems
CTA	Technical Centre for Agricultural and Rural Cooperation
DFID	Department for International Development, UK
FARA	Forum for Agricultural Research in Africa
FORAGRO	Foro de las Américas para la Investigación y Desarrollo Tecnológico Agropecuario
GFAR	Global Forum on Agricultural Research
GlobAL.RAIS	GLOBal Alliance of the Regional Agricultural Information Systems
GPP	Global Partnership Programme
IAALD	International Association of Agricultural Information Specialists
IAC	International Agricultural Centre
ICM	Information and Communication Management
ICT	Information and Communication Technology
IICA	Inter-American Institute for Cooperation on Agriculture
IM	Information Managements
IMARK	Information Management Resource Kit
IT	Information Technology
ITO	ITrain Online
ITOCA	Information Training and Outreach Center for Africa
NAL	National Agricultural Library
NARIMS	National Agricultural Research Information Management System
NARS	National Agricultural Research System
OAI	Open Access Initiative
PERI	Programme for Enhancement of Research Information
RAIN	Regional Agricultural Information Network
RDF	Resource Description Framework
RSS	RDF Site Summary
WAICENT	World Agricultural Information Centre

EXECUTIVE SUMMARY

The 2nd Expert Consultation on International Information Systems for Agricultural Science and Technology (IISAST) was convened in Rome to bring together the partners in the initiative that had been established in 2005. The objectives of the Consultation were: to review progress since the 1st Consultation in 2005, to reassess the objectives of the IISAST initiative on and confirm commitment of the partners, to reassess the modalities of implementing the initiative, and to 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 recognising 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 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 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.

1. INTRODUCTION

1.1 Background

The 2nd Expert Consultation on International Information Systems for Agricultural Science and Technology (IISAST) was convened in Rome to bring together the partners in the initiative that had been established in 2005. The 1st Expert Consultation was held in October 2005 and brought together key stakeholders in at least two separate initiatives to address the goal of developing coherence in international information systems for agricultural science and technology. This goal was set in the context of increasing inequity in access to agricultural information, and the emergence and adoption of new information and communication technologies (ICTs) which are reducing costs and catalyzing a migration of content to digital formats. Firstly, the Consultation formed part of a series of meetings from 2000 onwards in the context of *"Coherence in agricultural information"*, which comprised representatives from key organizations providing information services in the field of agriculture, natural resources and rural development. Secondly, the Consultation built on the findings of a series of regional and inter-regional meetings in 2003/04 within the framework of the GFAR "Global.RAIS" project. These meetings were attended by representatives of national agricultural research systems and their regional forums and associations.

Participants in the 1st Consultation agreed that their collective goal was that stakeholders in agricultural science and technology should be better informed so that they make better decisions (*researchers, extensionists*) and develop policies based on evidence (*policymakers*), leading to the economic and social enhancement of rural livelihoods of the poor. A set of outcomes was agreed that should emerge from follow-up to the Consultation. The Consultation participants attributed high priority for intervention to three major areas, namely *"Advocacy"*, *"Capacity building"*, *"Content Management"*, recognizing that in fact they are closely inter-related. For each of those action areas, participants identified opportunities and constraints, and then moved on to highlight proposed actions. The Consultation generally recognized that new institutional partnerships and operational mechanisms are required to maximise the potential of recent technical advances. Extensive discussion on participants' experience in organizational networks produced a detailed analysis of strengths and weaknesses of such networks and mechanisms of collaboration.

Participants agreed that a more structured global partnership was required to bring together the existing range of initiatives into a more cohesive alliance that would increase the chances of enhancing information management in agricultural science and technology. Responsibility for activities would then be attributed to specific interest groups, or Task Forces, of organizations within the partnership, which were foreseen for *"Advocacy"*, *"Capacity building"*, *"Content Management"*, with the potential for a group on *"Evaluation"*.

Two of these Task Forces were established in 2005, in Advocacy and Content Management, and had a productive programme of work over the last two years. The remaining strategic area of capacity building was handled in an *ad hoc* way, mainly through the IMARK partnership.

The 2nd Expert Consultation was held 23-24 September 2007 at FAO headquarters in Rome, and was attended by about 60 experts from different regions and organizations. The objectives of the 2nd Expert Consultation were:

- Review progress since the 1st Expert Consultation on International Information Systems for Agricultural Science and Technology (IISAST) of October 2005

- Reassess the objectives of the IISAST initiative on and confirm commitment of the partners
- Reassess the modalities of implementing the initiative
- Establish future priorities for and contributions to the initiative

1.2 Process

During the first day several “country cases” were presented by actors on the national level who shared their experiences in planning and implementing collaborative agricultural information services in their countries. The presentations were discussed in working groups to extract lessons for them of relevance for the international community. On the second day the progress was reported in the priority areas identified during the 1st Expert Consultation (November 2005).

After a general discussion of the scope of the initiative the working groups reviewed the results that had been presented and the lessons of the first day to propose actions and modalities for the further implementation of the IISAST initiative.

1.3 Opening statements

Statement from FAO: Anton Mangstl, Director Knowledge Exchange and Capacity Building Division, FAO.

Anton Mangstl welcomed participants to FAO. He explained that FAO is facing a period of major change with the Independent External Evaluation and the Reform, which had emphasized the strategic importance of knowledge exchange. He drew attention to some major relevant trends in international development such as the recent emphasis the World Bank and other major agencies had placed on innovation systems in agriculture.

Within FAO’s own programme on agricultural information, he described the great success of the literature access programme AGORA. As a counterpoint to the success of AGORA, FAO also perceives the urgent need to mobilize in digital format global knowledge that is not available in the formal literature. Capacity building is an important aspect of this latter process, and FAO has continued to make a major investment in IMARK.

FAO is pleased with the continuing collaboration amongst the major stakeholders since the 1st IISAST Expert Consultation in 2005, which was to be reported at the second, together with some of the lessons learned. He thanked the major stakeholders and donors for their continued support. He reminded participants that in March 2007 DFID had confirmed its support for the IISAST initiative until 2010, and he thanked DFID for this renewed pledge. He closed by stating that the 2nd Consultation provided an important opportunity to take stock of progress and to set new goals for the initiative.

Statement from Organizers: Enrica Porcari, Chief Information Officer, CGIAR

An increasingly inequitable access to agricultural information, the emergence and adoption of new ICTs that catalyze the migration of content to digital formats, and the changing needs of users, are all trends that are shaping the way we work. Trends we can no longer ignore.

In October 2005, major stakeholders in information and agricultural science and technology gathered to establish an international initiative with the objective of

enhancing collaboration and improving the effectiveness of information/knowledge sharing.

As a result of that expert consultation, three priority areas were identified for action: Advocacy, Capacity Building, and Content Management. Subsequently, task forces were created to address two of these areas: Advocacy and Content Management.

Much has been accomplished since then, both through face-to-face meetings and virtual interactions.

The role of this meeting is to review the progress we have made to date and reassess our objectives. For if we are to continue, and succeed, we must take a critical look at our goals and strategy, and make adjustments accordingly. We are here to learn from the taskforces and members, develop new taskforces, establish our future priorities and ways forward, and ensure the value added from our work together. The meeting will also enable us to confirm our commitment to this initiative, both as partners and as members.

I think we all agree that the landscape in which we work is constantly changing - new technologies, new users and clientele, and changing needs, lead to continued development and challenges. We need to have the flexibility and vision to confront these changes and ensure we are addressing new challenges in the field and taking advantage of new opportunities. Recommendations that focus on an innovative system approach rather than the more linear research system approach need to be taken into consideration, as they will have significant impact on our strategy and direction.

During consultations over the next two days, members will share with us their accomplishments, key challenges and lessons learned. Our sessions will kick off with reports from the national initiatives engaged in mobilizing information resources, and will be followed by an update from the Advocacy and Content Management Taskforces. In another session, we will hear about the considerable progress that has been made in the area of capacity building.

On behalf of all the partners, CTA, GFAR, the French Ministry of Foreign affairs, DFID, IAALD, the CGIAR and our host FAO, I want to take this opportunity to thank you for your commitment to the objectives of this initiative and for the time and effort each of you have contributed and will continue to dedicate to this important undertaking.

2. POLICY FRAMEWORK OF IISAST INITIATIVE

2.1 Background

Key stakeholders had been working for several years to bring greater coherence in agricultural information and knowledge management between international initiatives in this area, which had created a network of global-regional-national stakeholders. It was noted that different perceptions had emerged around scope of the initiative since the 1st IISAST Expert Consultation in 2005. Participants agreed that it was timely to reflect on what the initiative was trying to achieve from decision-makers in national agricultural research systems (NARS) to farmers, to develop a clearer picture of what could be done and how the initiative fitted into the wider development picture of rural poverty, agricultural production, and food security. It was acknowledged that science and technology information should enhance the work of NARS, but it had been questioned whether this initiative could sensibly address the whole chain from laboratory to farm. Discussion at the 2nd Expert Consultation focused on the policy framework developed for the initiative, namely the goal, purpose and outputs.

2.2 Goal ((developed by Advocacy Task Force - 2006)

To improve the impact of science and technology on enhancing food security, rural livelihoods, and responsible use of natural resources

2.2.1 Development impact

Participants recognized that it was not possible at the goal level to limit the scope of the initiative solely to “science and technology”, or to “information systems”. Most IISAST partners are aiming to enhance rural livelihoods, and they perceive the need to understand and enhance the links between scientists and farmers. It was stated repeatedly that it would not be useful to set artificial “boundaries” to the initiative, that the researcher is just one innovator in a system, and that no stakeholders should be ruled out.

While retaining the bigger picture at goal level, it was recognized that the main interventions in the initiative would be around science and technology. The key concepts of innovation and competitiveness were identified. It was noted that innovation systems in agriculture involve many stakeholders linked together by integrated systems using and exchanging a diverse range of information content. These systems do not involve only NARS in the narrow sense of public sector “research” and “extension”, but bring in other stakeholders such as private sector and NGOs. The principal aim of the wider NARS is to improve technologies that enhance livelihoods of stakeholders at community level, of which the majority are smallholder farmers. It was recognized that the IISAST initiative cannot aim to benefit farmers without including them in some way. Looking to value-added information services in science and technology, the initiative needs to foster conceptualisation and learning and then “sell” specific approaches/models in the wider development context.

2.2.2 Scale and Structure of the Initiative

All participants were agreed on the need for subsidiarity in information systems - local, national, regional, international – and in retaining the overall focus of the initiative on developing science and technology information at the local/institutional level. However, the IISAST initiative cannot aim to be involved in each country directly. Instead, national and local actors need to take action, with appropriate support from the regional level to include facilitation of and coherence between national initiatives. In fact, it was

acknowledged that the initiative relies to a great extent on regional and sub-regional forums which are linked to the national stakeholders including civil society, and which comprise key parts of the global vision. These forums have a critical role in identifying demand as they are involved and accountable to many stakeholders in innovation in information/communication. The IISAST initiative also draws credibility from the involvement of the major international players such as FAO as a normative intergovernmental body, GFAR as a multi-stakeholder forum, and CGIAR as global apex body in Science and Technology. However, it was recognized that there is still a need for better coherence between these international players, and other partners such as DFID and MAE can contribute by improving coherence between their programmes that impact the different initiatives. Each participant should be an ambassador who should ensure that the issues are fed back to their own institution and result in the appropriate follow-up. It was felt to be important that the initiative establish an international identity within a global policy framework that national nodes can provide as justification to their own policymakers, and that would add weight to national advocacy efforts.

2.3 Purpose *(Expert Consultation – 2007)*

To facilitate an international community of practice in agricultural science and technology information that collaboratively develops common standards, shares knowledge, and contributes to effective institutional approaches in this area.

2.3.1 Community of practice

The participants approved a revised Purpose statement, recognizing the need to harness resources of expertise to share experience and knowledge through a community of practice (CoP). The initiative should build a CoP and aim to be a learning platform accountable to stakeholders, developing networks open to a diversity of stakeholders not just those active in Open Access to repositories of information content. It was felt that the IISAST initiative and proposed CoP should widen its scope to cover processes and standards associated with use of Web2.0 technologies, and exploit the associated opportunities for engaging new stakeholder groups.

2.3.2 Evidence

It was agreed that the IISAST initiative would depend on sharing evidence in the form of documented case study(ies) on the development of institutional information repositories using the common standards related to national and regional priorities. Practical business cases were also needed, supported by arguments, examples and solid evidence in the form of stories and data for the key audiences. Participants felt that these case studies should be integrated into capacity building and formulated into advocacy materials such as policy briefs.

2.3.3 Advocacy

The need to listen to the leaders of NARS was recognized. At the same time, it would be important to show impact to impress policymakers on the connection between science and technology information and farmers trying to make decisions. Simply advocating for more accessible information for researchers was felt to be an inadequate argument to convince policymakers to invest, as would advocating the benefits of information management and standards. In fact, enhanced information management would need to include and benefit a range of stakeholders with sustained capacity building at various levels.

It was noted that the Advocacy Task Force had identified a primary message on the need for increased investment in information systems. However, the message cannot simply

be advocated as a new approach will lead to easy fixes. A step-wise process is required to avail access to content, with a need to focus advocacy on key national/local bottlenecks and constraints. Participants agreed that continuous awareness raising was required at policy level, and also amongst scientists on the need to generate, share and use information.

2.3.4 Information Content

The Content Management Task Force (CMTF) was seen being as a key mechanism within a CoP, which would have potentially global impact. The CMTF in particular and the IISAST initiative in general is facilitating development of an Open Archive network, based on a philosophy of decentralization and local empowerment, with methodologies and tools that avail accessible content that "intelligent" retrieval system(s) can harvest in a practical way for users from laboratories to farms. The CMTF would also be supporting development of the national initiatives that would provide the evidence for the advocacy.

2.4 Outputs *(developed by Advocacy Task Force - 2006)*

- stronger national information policies and strategies around information and communication management in agricultural research and development;
- clear facts-based plans and investments at national and institutional levels for information and communication management (ICM);
- better information products and services delivered to local and national stakeholders by international/regional systems and services;
- one "international approach" with all key stakeholders.

2.4.1 Deliverables and Time Horizons

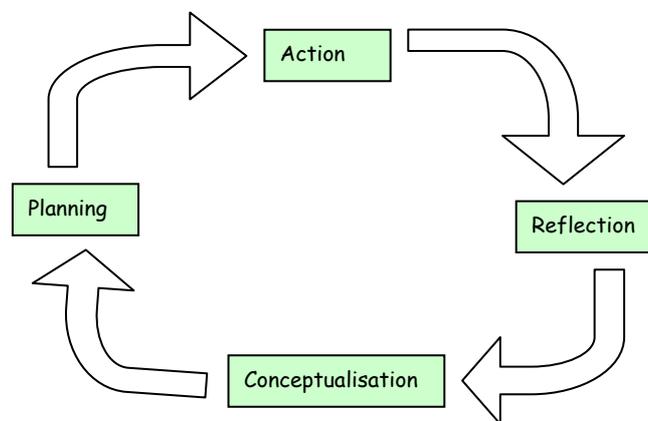
Participants expressed the need to concentrate on deliverables that contribute to development goals, as part of a vision of desired outcomes at global, regional and national level. While such a broader vision is essential, shorter term achievable objectives and targets that can be measured must still be set in a manageable timeframe of 2-3 years. It was felt that the focus should be on short-term tangible deliverables with the core stakeholder groups, recognizing the goal as above and the link to livelihoods. These deliverables could include (a) a roadmap for development of national systems, with steps and guidelines based on experiences and case studies, and creation of regional approaches for coherence between national information systems and networks of institutions; (b) guidelines for establishing systems/networks (checklists and decision trees), and (c) guidelines for monitoring and evaluation of such systems and networks (assessing outcomes & impacts).

Many participants recognized it would be important to acknowledge that what may seem modest initial achievements are still valuable – e.g. a functioning network with active information sharing between three institutions. Finally, it was seen to be important not to insist on a unified approach, and to let "a thousand flowers bloom".

3. National Case Studies

Before the IISAST 2nd Expert Consultation, the organizers had invited six actors from the national level to document their experiences in developing information systems and institutional networks in the form of case studies. This approach had been recommended by the Advocacy Task Force, whereby lessons drawn from such case studies would provide the basis of advocacy with the key stakeholders. The concept of experiential learning was introduced to participants, in the context that the aim of IISAST initiative was to develop a systematic learning process within a community of practice to derive sound policies and practices. Experiential learning, as the name implies, is learner-rather than teacher-centred. It has been described as “the process whereby knowledge is created through the transformation of experience”¹. Experiential learning theory involves an understanding of the experiential learning cycle (ELC) (Figure 1).

Figure 1: The experiential learning cycle



In this cycle, *action* or experience is reflected upon. During this process further information or guidance may be sought to provide solutions to, or an interpretation of, the experience. From this *reflective* process a new understanding, *conceptualisation*, generalisation or theory emerges. This is then used to test or *plan* another action. In the next section (3.1) the reflections of the actors at a national level on their experiences will be reported in the form of summaries of their case studies. In the next paragraphs (3.2/3.5) follow the results of the conceptualization that took place in the working groups where the participants discussed the case studies. The last chapter (4) of this report treats the result of the planning for further action.

3.1 Summaries of Case Studies

The progress of work on the development of collaborative institutional networks for scientific information systems was reported from Egypt, Ghana, Kenya, Madagascar, Peru, and Thailand (with reference to work in Lao). Longer versions of these case studies (c. 3,000 words) will be made available through the community platform (see section 4.3.1).

- ***Egypt: National Agricultural Research Information Management System (NARIMS).***

The National Agricultural Research Information Management System (NARIMS) is an integrated, bilingual (Arabic/English) web-based system that aims to capture and

¹ Kolb, D.A. (1984) *Experiential learning: Experience as the source of learning and development*. Englewood Cliffs, New Jersey: Prentice Hall, page 38.

disseminate information about research institutes, researchers working in those institutes, publications issued by those researchers, completed or currently active projects, and the national plan on agricultural and veterinary research in Egypt. The system was developed for the Agricultural Research Center (ARC) by the Central Laboratory for Agricultural Expert Systems (CLAES), building on existing FAO tools and methodologies, and working in cooperation with FAO staff. Financial support for initial NARIMS systems development and training activities was provided under an FAO project which was implemented from July 2004 to July 2006. The sustainability of the system is assured through the continuing commitment of the government to fund equipment maintenance and Internet connectivity.

Clarifications requested by participants: It was stressed that there had been a need to address national ICT policies as well as agriculture policies in developing the network. The focus at the national policy level had been important, but in fact action had been taken by institutions/organizations. Links to farmers had been established through the Rural Agricultural Development Communication Network (RADCON), which is linked and complementary to NARIMS.

- ***Ghana: Ghana Agricultural Information Network System (GAINS).***

The Ghana Agricultural Information Network System (GAINS) aims at bringing together the creators and disseminators of agricultural research information in Ghana. Since 1991, it has linked the libraries of 18 of Ghana's agricultural research and academic facilities to each other and to external contacts. GAINS facilitates a question-and-answer service to address stakeholders' agricultural information needs, attempts to improve the accessibility of locally produced research, and builds the capacity of stakeholder institutions' libraries and information management professionals. Formed as part of a national government programme, the system is managed by a coordinating centre based in the secretariat of the Ghana Council for Scientific and Industrial Research (CSIR). GAINS is currently trying to re-position itself to increase member participation.

Clarifications requested by participants: Five different stakeholder groups had been identified and addressed through differentiated approaches. An incentive system for researchers to submit content was being devised. It was stressed that with the frequent changes in institutional top management, there was a need to have information policies embedded, and to widen involvement so that support is not personalized in the Director.

- ***Kenya: Agricultural Information Network (KAINet).***

The Kenya Agricultural Information Network (KAINet) was initiated in April 2006 to promote information exchange and access among stakeholders in the agricultural sector. KAINet is being implemented under the a pilot project with five national institutions: the Kenya Agricultural Research Institute (KARI), the Kenya National Agricultural Research Laboratories (KARI-NARL), the Kenya Forestry Research Institute (KEFRI), the Ministry of Agriculture (MoA) and Jomo Kenya University of Agriculture and Forestry (JKUAT). The project's objectives are to establish institutional repositories of agricultural information, facilitate the development of institutional and national information and communication management (ICM) strategies and policies, and support the development of human capacity in ICM. Technical support to KAINet is provided by FAO, CABI Africa and ASARECA/RAIN, while financial supported is granted by the UK Department for International Development (DFID).

Clarifications requested by participants: It was recognized that the challenge would be to move from a pilot project with six institutions to a full national network. In fact, registration of KAINet as an NGO would provide a basis for other institutions to join, as well as for marketing the network to other institutions. The KAINet NGO's main

role would be to provide capacity building services to new members, who will bring their own resources. The biggest constraint was the lack of motivation for researchers to submit full text, but the management committee and stakeholder consultations had highlighted the need to stimulate researchers to publish their “public goods” in the public domain open access publishing. This was identified as a major advocacy target, with the primary motivation being for institutional repositories to provide internal access first before content is made accessible externally.

- ***Madagascar: Scientific and Technical Information System.***

The establishment of a Scientific and Technical Information System in Madagascar is being carried out with support from the SIST (“système d’information scientifique et technique”) project of the French Ministry of Foreign Affairs. The process started with a survey carried out in 2003 – 2004 covering the country’s priorities in research, its main research institutions, its sources of scientific and technical information, as well as its physical infrastructure and connectivity. Subsequently, the SIST platform has been installed, which is being operated by the Antananarivo University Library. Awareness has been raised among potential stakeholders, and a beginning has been made with the provision of relevant content from different sources, as well as the training of staff.

Clarifications requested by participants: Currently the national SIST node relies on external funding specifically targeted to development of information systems initiatives. It was recognized that continuing financial sustainability would be dependent on a strong partnership bringing together key stakeholders. Several ministries handling science and technology information had become involved through a key e-governance agreement, whereby content from the various sources could be handled through the SIST platform.

- ***Peru: Red Peruana de Intercambio de Información Agraria (AGRORED).***

AGRORED Peru is a decentralized and multi-stakeholder open network for public and private institutions aiming to provide support to agricultural science, technology and innovation in Peru. It was officially established by Ministerial decree in June 2006, but built on the work of its predecessor: the Network of Agricultural and Ecological Libraries (REBIAPE). Initial activities, such as development of a portal and search engine and staff training, were financed by public funding thanks to advocacy by the key stakeholders. AGRORED is based on common technologies and international standards, as well as the use of a meta-search engine. The Declaration of Principles, the Code of Ethics, and Institutional Agreements guide institutions and individuals working in AGRORED to build capacity and promote technical exchange in areas such as copyright, standards and norms for information management.

Clarifications requested by participants: It was noted that the instability of public institutions had been resolved by creating a balance between public and private members, but there had been an ongoing issue problem with key decision-makers changing every few months. A major constraint was seen to be the imbalance between the generators of the information and librarians and information systems professionals, and yet researchers often complained about the lack of published information while they did not publish themselves. The new Diploma at the University of La Molina Faculty of Agriculture will be launched in November for implementation in 2008, under the original AGRORED policy to institutionalize a continuous learning system in information management and knowledge management.

- ***Thailand: Thai AGRIS Centre.***

The Thai AGRIS Centre (TAC) was formally established as part of the Kasetsart University Central Library in 1980. The main stakeholders of the TAC are internal faculties and departments of the Kasetsart University, other state-owned and private universities, departments of the Ministry of Agriculture and Cooperatives, and

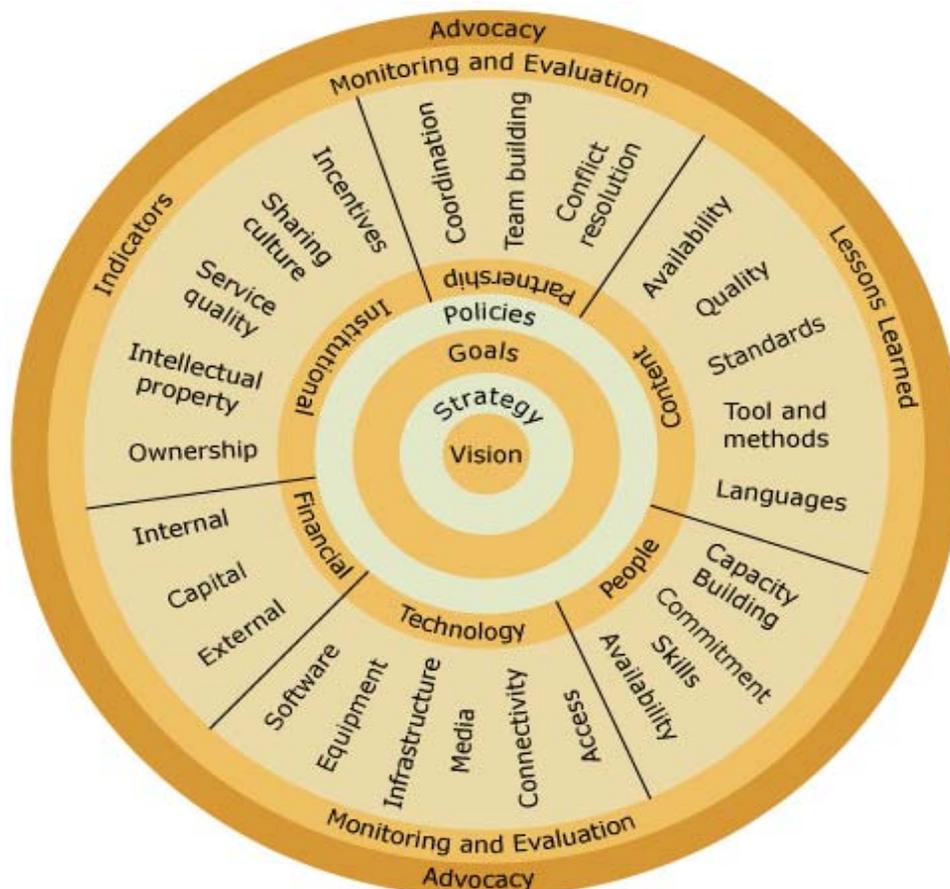
government research agencies. The TAC and the Central Library work together to provide a variety of information services to support end-user's requirements, including bibliographic databases, experts databases, reprographic services, consulting services and training. Some of these services were obtained through the AGRIS cooperative network. The TAC has an open and flexible policy: all materials in the system are available to anyone within and outside the country. The Thai government provides funding support to the TAC; other sources of funds are the external revenues of the Central Library.

Clarifications requested by participants: It was noted that the Thai AGRIS Centre gathers data from 20 research institutes with decentralized input into a centralized data repository. It was recognized that farmers use a variety of services, but the intelligent search engine will be promoted as an information discovery tool. Access by mobile phone services was not yet possible, but it could be feasible in due course.

3.2 National Case Studies: issues, challenges, lessons learned

An important aspect of learning is the categorization of what we encounter in the reality that we want to understand. The working groups used a conceptual model, which had emerged from the 1st IISAST Consultation and been dubbed the "onion model" (owing to the slight similarity of its graphical representation with an onion), to categorize the "reality" presented in the case studies. The model was intended to map the major elements that are required for successful development of agricultural information systems in institutions, and group them into categories where possible. It had been recognized that the model did not show relationships between factors in different groups, and that the model was not specifically for agricultural institutions.

Figure 2: Revised version of the "onion" conceptual model



The working groups identified limitations in the initial model, and several additional categories were identified. These are listed in Annex 3. Apart from that, the interdependencies between the major elements of the module were stressed. Some participants felt that the model was too “static” and two dimensional, and while it did not allow for a feedback loop, it was recognized that the experiential learning cycle did address that aspect. The model was then redrawn to accommodate the points raised (Figure 2).

Before the 2nd Expert Consultation, the principal challenges, issues, and lessons learned that had emerged from the six cases studies outlined in section 3.1 were analyzed with the national focal points and then placed in seven major categories identified in the conceptual “onion” model. These categories were: Strategy/Policy; Institutional Issues; Stakeholders; People; Content; Infrastructure; and Financial Issues.

The working groups in the 2nd Consultation studied the accumulated lessons learned that had emerged from the cases, and identified additional lessons from their own experience to complement those from the case studies. The entire collection of material is available in Annex 4.

3.3 Application of lessons learned

The working groups discussed the question of how the output from the case studies could be organized in a format that would be useful when planning a project for development of an institutional information network at national level. Preferably from a larger set of case studies than the six collected to date, the approaches should be packaged to demonstrate successful or unsuccessful outcomes, identifying the issues and challenges to be confronted and also the lessons learned. Systematic analytical tools such as problem tree, SWOT and logical framework would be helpful as part of this repackaging. The material should be made available in multiple formats to suit the needs of different audiences. Decision trees should be developed which allow priority setting at national or local level. It was recognized that a greater understanding of the specific needs of policy-makers and important stakeholders is needed if these lessons are to be put into a suitable form to be useful for advocacy.

3.4 IISAST Products and Tools

The working groups also considered what products and tools might be needed to plan and implement information networks/systems at national level. The principal tool identified was documented case studies with policy connotations, supported by context-sensitive checklists, guidelines, detailed reference materials and even video material. Another popular proposal was a social networking platform for collaborative learning of good practices, drawing together and building on formal networks and individual experts. The need to make all kinds of capacity building materials widely available was recognized, including self-paced e-learning materials such as IMARK, although their impact would be increased if the materials are flexible and customizable for local circumstances and specific audiences. In the area of tools for information management, participants recognized the need for more sharing of knowledge about local institutional requirements in order to show the potential value of making available generic applications or system tools, or even the development of starter kits of open source software for aspects of information content and knowledge management. Generic tools for monitoring and evaluation were also identified as possible outputs, as well as sample cost calculations for short, medium and long term investments.

4. IISAST Modalities and Tasks

4.1 Review of activities in 2006-07

The progress since 2005 of the Task Forces for advocacy and content management (See Annex 3), and the work on capacity building, were presented by members of the Task Forces. The full reports will be made available through the community platform (see section 4.3.1).

Content Management Task Force (CMTF) Progress Report: The CMTF was established to address priority actions identified by the 2005 Expert Consultation. Terms of reference² were developed for the Task Force, and the mode of operation and the timeline were defined for each of these activities. Two virtual workspaces were established for the Task Force discussions and sharing and collaborative development of documents, one on the *Dgroups* platform³, and the other on *pbwiki*. The virtual activities of the CMTF were facilitated by Hugo Besemer.

Schedule of Events: The first face-to-face meeting of the Task Force was held in May 2006 in Nairobi, and the second meeting was held in March 2007 in Wageningen.

Outputs/Conclusions: Considerable progress was made over the two years between Expert Consultations in the three main areas of work identified during the 1st Expert Consultation.

- **Open Access document repositories:** The AGRIS Application Profile (AP) is used by all active resources centres in the AGRIS Network. The standard has also been adopted, for exchange of metadata on "Document-like Information Objects" by the Global Forest Information Service (GFIS), the NARIMS project in Egypt, Kenya Agricultural Information Network (KAINET) in Kenya, and AGRORED project in Peru. It has been implemented in various software products. The work also included customization of the Lucene technology to AGRIS AP to create a search engine and customisation to the OAI protocol to harvest data using AGRIS AP format. A proposal ("White Paper") for an "*Architecture for open archive networks in Agricultural Sciences and Technology*" was developed by FAO and is under discussion in the Content Management Task Force.
- **Vocabularies:** Metadata schemas have been finalized in description of organizations, events, news and learning resources. These have also been applied in various information exchange projects. Work is currently being carried out for creating exchange standards for projects, job announcements, experts and fellowships. Various thesaurus and ontology projects have also been carried out in the last two years covering the further content development of AGROVOC, increasing its multilingual coverage and creation of the Concept Server. Domain ontology projects have helped to create specialized vocabularies for use in information systems in areas such as (a) the Ontology for Country based Information Systems, (b) Crop Wild Relatives Ontology, (c) Food & Nutrition Ontology, (d) Language Code Ontology, and (e) various Fishery Ontologies under the NeOn projects.
- **Exchange of newsfeeds and other Web 2.0 approaches:** An Agricultural Event AP has been implemented in the Agrifeeds⁴ Application. The AGRIS team at FAO has produced the Agrifeeds Application to help aggregate news and event feeds. The Application then allows the users to disaggregate feeds based on filter criteria such as subject, country of location and language.
- **Integrated systems:** The objective was to add value by developing relationships between different datasets. Descriptions of different types of data have been developed for publication on the AIMS website (see below).

² Terms of Reference of the Content Management Task Force were published in July 2006 after a first meeting in Nairobi in May 2006. The TOR are accessible at <http://agriscontent.pbwiki.com>

³ <http://www.dgroups.org/groups/fao/agriscontent/index.cfm>

⁴ <http://www.agrifeeds.org/>

All work done by the CMTF is currently documented at: <http://www.fao.org/aims/>, pending transfer to the community platform (see section 4.3.1).

Advocacy Task Force Progress Report: The Task Force was established to address priority actions identified by the 2005 Expert Consultation. Its members comprise representatives of key organizations that participated in the Expert Consultation in October 2005, and others co-opted from major constituencies in the initiative that were not present. Two virtual workspaces were established for the Task Force discussions and sharing and collaborative development of documents, one on the *Dgroups* platform⁵, and the other on *pbwiki*. The virtual activities of the Advocacy Task Force were facilitated by Chris Addison.

Schedule of Events: A workshop on “*Inter-regional Cooperation for Information & Communication Management in Agricultural Research for Development*”, organized at the Asian Institute of Technology (AIT) in Bangkok, Thailand in July 2006, provided the venue for face-to-face discussions on “Setting up an Advocacy Agenda”. In November 2006, a draft white paper on “Developing an Open Archive Network” was promoted to the Advocacy Task Forces as the operational/technical basis for the overall initiative, and the four principal sponsors of the 1st Expert Consultation held a Press Conference at the GFAR Triennial Conference in New Delhi to promote the IISAST initiative. In March 2007, Chris Addison participated in the CMTF meeting to update CMTF members on the findings of the Advocacy Task Force, to obtain clarification on technical objectives and outputs of relevance to the Advocacy Task Force, and to assist in the presentation and summarising of the CMTF’s findings to the Advocacy Task Force.

Outputs/Conclusions: A Policy Framework for the IISAST initiative was developed. The basis for an Advocacy Campaign to enable achievement of the Policy Framework was defined to include the following four components: Constraints and Justifications for Intervention; Advocacy targets; Prerequisites for Advocacy Activities; and Principal Messages. A programme of advocacy work was defined with four categories of activity: Preliminary activities; Build advocacy tools; Collect evidence; Advocacy activities.

Recommendations for Action: At its meeting in March 2007, the CMTF identified the various areas that should be considered for the IISAST advocacy activities if the partners in the initiative could agree on the principal focus as being development of an Open Archive Network.

Capacity Building Report: Considerable progress has been made on capacity building initiatives over the last two years in the action areas identified in the 2005 Expert Consultation. This has involved most of the organizations in the initiative, and has been channelled to a large extent through the IMARK steering committee since no formal Task Force was established.

Institutional support. Regional and/or sub/regional forums have become the clearing houses for capacity building initiatives, and have defined and developed a wide range of information-related capacity building initiatives. International stakeholders have been continuously working with the forums to support their initiatives in a variety of ways.

Training targets and formats. Progress was made in 2006-07 by all the regional and sub-regional forums to implement training activities in the form of face-to-face and distance learning formats with the three main stakeholder groups identified, namely: (i) information specialists, and (ii) managers and decision-makers, and (iii) researchers and academics. The Information Management Resource Kit (IMARK) has been used in support of the various capacity building activities. In addition, synchronous online training has been offered in several regions, drawing on IMARK modules, and a group of universities in one region has developed a plan for a formal postgraduate course in Agricultural Information and Communication Management.

⁵ <http://www.dgroups.org/groups/fao/agrisadvocacy/index.cfm>

Training resource materials. The IMARK partnership has been active in the evaluation of the first IMARK module; preparing language adaptations of the IMARK modules in French and Spanish, Chinese, Russian and Arabic; and preparing a proposal for revising and updating the first two modules,

4.2 Priority tasks

The second working group session considered the interventions necessary to support national information systems and the recommendations from Task Force reports, from which some higher level actions were proposed. These actions were prioritised for the short (i.e. one year) and medium term.

4.2.1 Short-term Priorities

These were agreed as:

- to describe and recommit to the revised policy framework of the initiative;
- to establish a facilitating body for the initiative as a whole;
- to continue the work of the Content Management Task Force;
- to continue the work of the Advocacy Task Force;
- to establish a Capacity Building Task Force;
- to develop a web-based IISAST community platform.

4.2.2 Medium-term Priorities

These were agreed as:

- to develop a roadmap to assess the impact of the initiative's activities, by setting targets in time and by level, i.e. institutional, national, regional and international. Tools such as logical frameworks and output mapping would be used for this activity.
- to develop further the community platform to support social learning and identifying experts in different areas.

4.3 New Approach

The Expert Consultation proposed several changes to the existing approach in the IISAST initiative. The new Purpose (see section 2) in the form of a community of practice led to the proposal for a web-based collaboration platform. The arrangement of three main Task Forces on content management, advocacy and capacity building was agreed. The addition of a facilitation body with a monitoring function was also proposed. These five areas are discussed below.

4.3.1 Collaboration Platform

Given the purpose of the IISAST initiative to develop a community of practice, it would be essential to engage experts in information management in any web-based facility. The proposed web-based platform would be both for internal communication within Task Forces on specific activities, as well as for dissemination of information about the initiative's activities and outputs. It was agreed that more stakeholders should be encouraged to participate, such as managers of Regional Agricultural Information Systems (RAIS), the European Commission, and national agencies from major countries such as those in the Russian Federation.

The community would benefit from being linked to an established web platform, with two suggestions being offered namely the "e-Agriculture" community of practice or the EGFAR domain (Electronic Global Forum on Agricultural Research). Existing Task Force

web-based materials and forums have to be migrated, and additional features created such as:

- **Case studies repository.** An agreed standardized framework is needed for documenting case studies. It was agreed that a greater number of diverse case studies were needed, documenting innovations generated by the IISAST initiative and elsewhere, and that they should be available in such a way that they can be utilized for different purposes/focuses. The case studies should be presented as success stories (e.g. IICA used online forms with jury to determine which to publish online). Some examples of potential case studies were identified, such as the Global Forestry Information System (GFIS) in which standards are facilitating the aggregation of content from a network of institutions to facilitate searching and sharing.
- **Observatory.** An “observatory/monitoring platform” for ongoing monitoring of the status of selected national ICM projects, which would serve as a description of the landscape in existing agricultural information services and activities in progress, and a forum for collection and discussion of evidence for policy papers.

4.3.2 IISAST facilitating body

It was agreed that this body would keep an overview of the initiative and ensure linkages between the Task Forces, without introducing an overly bureaucratic approach. Its members would initially comprise the organizers of the IISAST Expert Consultations, namely CGIAR, CTA, FAO, GFAR, IAALD and MAE. The members would meet to agree terms of reference and suggest a modus operandi. Amongst other tasks, it was agreed they would (a) review and monitor the policy framework and procedures of the initiative, (b) consider recommendations of Task Forces and facilitate communication between the Task Forces, (c) organize future Expert Consultations, and (d) provide feedback to stakeholders. The body would not direct individual activities. It was suggested that AGNIC be studied as an example of an organizational model of an institutional alliance governed by a board.

4.3.3 Content Management Task Force

The immediate tasks for the Task Force were identified as being developing (a) terms of reference, including commitments required from Task Force members and their organizations, and (b) a clearer schedule with priorities for the coming years. Some basic principles for the CMTF were identified, which the Task Force could consider when it develops its terms of reference. In no particular order, these were:

- to identify/develop common standards and tools to facilitate information exchange and open access;
- to prepare and agree on guidelines on application of those standards;
- to consider integrated information systems development, that supports a variety of functionalities;
- to develop a “starter kit” for information and knowledge management to include a guide to suitable (open source) software tools capable of applying the common standards, and guidelines for application sharing (e.g. source code documentation). It was suggested that this starter kit should be made available through an international forum such as the AIMS website.
- to facilitate internationalisation and localisation of content – i.e. planning decisions, adaptation, translation
- to consider approaches to facilitate use of different languages and to integrate content at a semantic level;
- to develop indicators to monitor and evaluate outcomes of the CMTF activities.
- to promote its work and outputs through appropriate channels to advocate for open access and common standards at both policy and institutional levels, based on

arguments that information strategies, standards, etc. will help them to achieve their goals.

It was agreed that the CMTF should focus on the following modalities:

- Face-to-face meetings. The CMTF will continue to conduct technical meetings to adjust and finalize the tools and standards that have been developed;
- Community platform. As mentioned above the community platform and collaboration mechanisms will be improved through more integration with the Advocacy and Capacity Building Task Forces;

4.3.4 Advocacy Task Force

The principal objectives for the Task Force were identified as being development of: (a) terms of reference, including commitments required from Task Force members and their organizations (b) a clearer schedule with priorities for the coming years, and (c) a larger set of case study evidence, (d) enhanced exchange of experience. The following areas of activity were identified which the Task Force could consider when it develops its terms of reference:

- to formulate an advocacy plan focusing on Open Access approaches within the framework approach developed by the Task Force in 2005/06 (i.e. to build advocacy tools, collect evidence, implement advocacy activities), and incorporating the key messages identified in the Inter-Regional workshop in Bangkok;
- to collect more case study evidence on successful use of open access to support advocacy, through the CMTF and directly with national institutions;
- to collect experiences in existing advocacy activities around Open Access approaches from IISAST partners, given that they are assisting organisations in open access projects and will have experiences to share;
- to develop a joint proposal/work plan on Advocacy for Open Access, based on the evidence collected;
- to develop policy briefs on the need for and benefits of Open Access.

4.3.5 Capacity Building Task Force

In order to establish the Capacity Building Task Force (CBTF), it was agreed that a call for volunteers should be made to the IISAST stakeholders. Terms of reference would have to be drawn up taking into account the whole gamut of ongoing capacity building initiatives and the interactions with other organisations defined, and define the Task Force space on the community platform. It was recognized as important that the CBTF should work in close collaboration with the IMARK Steering Group, but focus on specific actions for the agricultural community. It was suggested that the Task Force should address knowledge management in addition to information management. Some basic principles for the CBTF were identified, that the Task Force could consider when it develops its terms of reference. In no particular order, these were:

- to develop modular training materials that can be customized to the local context to (a) advocate better information management practices; (b) to improve understanding of the sector; (c) draw attention to good IM/KM practices at the organizational level (perhaps establishing an information management standard of good practices, ie. ISOs); and (d) enhance understanding of how to use tools and standards;
- to develop attractive, market-oriented visual aids that can be used to “train-the-trainers”;
- to facilitate organization of workshops (face-to-face and virtual) for information managers and policy makers on (a) creation of digital content; (b) strategy formulation; (c) enhancing investment in IM/KM; (d) proposal writing; and (e) use of templates and cookbooks;
- to develop materials that can be adapted into local languages.

2nd IISAST Expert Consultation Agenda

Preliminary e-Consultation

17 – 21 September 2007

Objective: to discuss the overall Purpose of the IISAST initiative

Moderators: Hugo Besemer and Chris Addison

Main Consultation

23 – 24 September 2007

Day 1

Plenary Session

09:00-09:15 Opening and welcome by Anton Mangstl, FAO

09:15-09:30 Joint statement from organizers: Enrica Porcari

09:30-10:00 Short presentation on objectives and format of the Expert Consultation, followed by discussions on objectives of the IISAST initiative, drawing on output from the e-consultation.

Facilitators: Chris Addison and Hugo Besemer

10:00-10:20 *Coffee/Tea*

10:20-12:10 Case Study presentations (10 mins each) from national level on developing institutional archives and collaborative networks, highlighting key issues and lessons learned:

- Egypt: Ahmed Rafea
- Ghana: Joel Sam
- Peru: Hugo Wiener
- Thailand: Aree Thunkijjanukij
- Madagascar: Pierre Ravelonandro
- Kenya: Justin Chisenga

Chairperson: Thierry Doudet

12:10-12:20 Discussion on approach to Working Groups: Sophie Treinen

12:20-14:00 *Lunch*

Working Group Sessions

14:00-15:45 Discussion on case studies presented to identify best practices.

15:45-16:00 *Coffee/Tea*

Plenary Session

16:00-17:00 Reports from Working Groups and Open Discussion.
Facilitators: Chris Addison and Hugo Besemer

Day 2

Plenary Session

- 08:30-08:45 Highlights of Task Force on Content Management: Koen Beelen
- 08:45-09:00 Highlights of Task Force on Advocacy: Ajit Maru
- 09:00-09:15 Capacity Building Activities: Stephen Rudgard
- 09:15-09:30 Discussion on approach to Working Groups: Chris Addison and Hugo Besemer

Working Group Sessions

- 09:30-10:30 Discussions on the IISAST initiative
- 10:30-10:50 *Coffee/Tea*
- 10:50-12:30 Discussions on the IISAST initiative (cont.)
- 12:30-14:00 *Lunch*

Plenary Session

- 14:00-15:20 Reports from Working Groups and Open Discussion.
Facilitators: Chris Addison and Hugo Besemer
- 15:20-15:40 *Coffee/Tea*
- 15:40-16:30 IISAST Action Plan:
i. future priorities
ii. future modalities
Chairperson: Jean-François Giovannetti
Facilitators: Chris Addison and Hugo Besemer
- 16:30-17:00 Closing Statements from Organizers

Resources

- Short background paper (*distributed prior to the e-consultation*)
- Background documents (*distributed prior to the Main Consultation*)
 - Report of 1st IISAST Expert Consultation
 - Report of the Advocacy Task Force 2005-2007
 - Report of the Content Management Task Force 2005-2007
 - Review of Capacity Building 2005-2007
 - National Case Study Reports

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Analysis of Conceptual Model

The working groups identified some areas which had not been included in the original version of the “onion” model.

Monitoring and Evaluation

- Feedback
- Capturing lessons learned (to feed into planning)
- Indicators of Impact

Partnership

- Coordination between donors/development partners
- Collaboration – national and international

Audiences

- Reach out to other fields of expertise at all levels in agriculture R&D

Advocacy

- Awareness raising - communication
- Marketing
- Lobbying

Institutional

- National structures – committees, NGOs etc
- Sustainability/ownership
- Culture of Sharing/Exchange; behaviour (people/institutions)

Content

- Volume – in electronic format
- IP/copyright issues

Capacity Building

- Curriculum development – development of agro-informatics

Infrastructure

- Different technologies (non-web)
- Application software – technology tools

Issues, challenges, and lessons learned identified in National Case Studies

The six case studies were jointly analyzed by the national coordinators and FAO, and the following issues, challenges and lessons learned were formulated.

(E) = Egypt; (G) = Ghana; (K) = Kenya; (M) = Madagascar; (P) = Peru; (T) = Thailand

Strategy/Policy

- Support from senior management was crucial to success of collaborative network/system. (E)
- The national coordinator played a vital role as project champion with senior management staff and other potential stakeholders. (E)
- Establishment of a Steering Committee provided an enabling policy environment for the management of the network/system. (E)
- Institute directors do not prioritize information. (G)
- Development of an agreement between network members is required, outlining roles and responsibilities and requiring minimum contributions of resources to the network. (G)
- Lack of awareness of the network means use by scientists is limited, including by secondary audiences such as extension agents and NGOs. (G)
- Poor/non-existent policies and workflows for content collection and development have been barriers. (K)
- Development of IM strategies is a lengthy process. (K)
- Adequate preparation and stakeholder consultation before strategy workshops, including sharing of relevant information, is essential. (K)
- Inter-institutional competition could have jeopardized the network and its objectives, and the commitment of the directors of each institution had to be obtained. (P)
- Policies for management of scientific information have been developed in all institutions. (P)
- Establishment of a formal entity to lead development of the network is foreseen. (P)
- Success and failure of information network depends on support from policymakers, so it is necessary to make them understand the need for investment. (T)
- Establishment of a new ICT culture within organizations should be a priority. (T)

Institutional issues

- Development of the system relied on a solid base of existing institutions. (E)
- Organizational restructuring needed to ensure efficient functioning and sustainability of the system. (E)
- The network has attempted to build on existing library capacities in institutions. (G)
- The network was initially developed in a top-down manner, with insufficient consultation with stakeholders, who have not bought in. (G)
- Many institution libraries not strong enough or sufficiently connected to scientists to be efficient vehicles for the transmission of information. (G)
- Lack of information-sharing culture and appropriate institutional policies means many scientists are unaware that they can submit work to the network, or are not motivated to do so. (G)
- Scientists also do not frequently write institutional capacity building elements related to information management into their research proposals. (G)
- Lengthy procurement procedures in the lead institution meant that full-text archiving has been delayed due to lack of requisite IT equipment. (K)
- Institutions are motivated to participate because the network improves access to and exchange of their information resources, and strengthens their technical capacities. (P)
- Lack of institutional cultures that foster the means and incentives for information sharing and establishment of demand-led information services. (P)

Stakeholders

- Increased dialogue with stakeholders outside the institution will be necessary to cultivate a sense of ownership and convince them to participate fully in the system. (E)
- Many stakeholder institutions perceive the coordinating centre as the totality of the network, hence have not engaged with the network or dedicated their own resources. (G)
- Attempts have been made to increase dialogue with identified new stakeholders and to assess their information needs through participatory workshops. (G)
- The network needs to diversify its services if it is to address end-user needs as well as

- scientists, and it may need to embrace other media (radio and video). (G)
- The Centre has not targeted poor farmers specifically, but it needs to collaborate with intermediaries to help farming communities learn. (T)

People

- High turnover rate of senior managers and other staff leads to continuing demand for training and sensitization. (G)
- Generally librarians and information managers have lower academic qualifications than scientists, they are paid very little, and there is high turnover. (G)
- Institutional librarians have proved to be a bottleneck, as researchers no longer consult libraries for information. (G)
- Librarians do not promote the network's resources, motivate researchers to submit outputs, or take advantage of the training. (G)
- Lack of human resources in specialized information management in network members. (K)
- Constant rotation of politicians and technical staff in charge leads to delays in planned activities. (P)
- Empowerment of information managers through participation in the network is high, and their participation is very active. (P)
- Staff turnover in specialist information management and IT areas is especially high. (T)
- Major training programme was required for information managers and technical staff. (E)
- Implementation of new skills by information managers and scientists limited by (i) insufficient institutional support, and (ii) inadequate IT infrastructure in many institutions. (G)
- Initially, insufficient time was allocated for hands-on training on Web tools – further on-site training was arranged with FAO and continuing training will be organized. (K)
- Capacity building to support creation of the network has used particular methods focused on distinct objectives. (P)
- Capacity-building activities promote participation and technical exchange among specialists in charge of different technical processes in their organizations. (P)
- The network Centre provides information management training to partners on request. (T)

Content management

- Lack of locally generated content is a function of stakeholder scientists and institutions not making this information available. (G)
- The use of norms and standards for sharing information has been promoted, and clear and formal procedures for their application established. (P)
- AGROVOC needs to be updated and restructured to improve content management. (T)
- Users in rural areas require information in local language (dual language databases) and in less technical language. (T)

Infrastructure

- Initial developments used commercial software platforms already in use prior to the project, with the intention to adapt to open source technology at a later stage. (E)
- Significant resource savings were made by adopting and/or adapting tools and methodologies already developed (by FAO etc). (E)
- Librarians are unable to develop new systems without improved infrastructure and more training. (G)
- Network institutions with inadequate IT infrastructure (i.e. poor/no connectivity, power outages, computer breakdowns) cannot access the network's resources or create their own databases. (G)
- The network's members have not yet used their connectivity to network librarians to one another for more constant capacity building. (G)
- Insufficient IT equipment (computers, scanners) is available for digitization of full-text. (K)
- Problems with troubleshooting WebAGRIIS software require specific training from FAO. (K)
- IT-related capabilities differ between institutions, meaning that some can manage only relatively unsophisticated systems and tools. (T)
- Expansion of services and new collaborative arrangements will necessitate upgrading and renewal of IT equipment. (T)
- Adoption of open source applications limited by extreme shortage of IT staff. (T)

Financial aspects

- The system/network was developed with government and donor funding. Ongoing government financial support has been committed within the regular annual budget. (E)
- External funding being sought for expansion of the system to include universities and other

- research organizations. (E)
- The network's reliance on external funding means it is vulnerable to interruptions in projects and changes in donors' priorities, and unable to focus consistently on institutions' interests. (G)
- The network coordinating centre is asking users of services to help cover costs, but stakeholder institutions have scarce resources and see that the centre has funding. (G)
- Budgetary support from the Government would assist in covering some network costs. (P)
- Institutional members have to be persuaded of the need to invest financially in the activities of the network and in organization and digitization of their own information. (P)
- Continuing and increased financial inputs will be essential as the volume of data increases and services expand. (T)

Issues, challenges, and lessons learned **identified by 2nd Expert Consultation working groups**

Strategy/Policy

- Information policies and strategies should fit into broader environment.
- Assess strategies for IT/KM and AG at national level.
- Integrate the national network into the national policy.
- Develop a strategy for sustainability as part of the overall strategy.
- Clear policy needed when establishing a system/network.
- Build on existing national systems – focus attention on future actions.
- Institutional policies needed for collections development, workflow, archiving and digital documentation (mandatory statement).
- National networking initiatives should be demand-led, not just project-driven.
- Build network/system incrementally.
- Need to recognize the complexity of building a system – there is also a human dimension, so cannot be too prescriptive – “One size doesn't fit all”.
- Theory-practice conflict level.
- M&E process is needed.
- Integrate lessons learnt from other systems development.

Institutional issues

- Need to define a lead institution.
- Need for champion, leader especially at national level.
- Need for institutional champions.
- Need for a facilitation role - not just leadership role.
- Appropriate acknowledgement of institutional contributions is required.
- Need to articulate the institutions at national level.
- Need to address institutional questions “What's In It For Me” (WIFM).
- Develop partnerships and alliances prior to or as part of the process.
- Institutional partnerships have to be based on agreed principles: Flexibility; Complementarity; Modularity; Subsidiarity.
- Sharing expertise should be encouraged.
- Need to agree on principles and ethics of working together.
- Need to create ‘community’/network of individuals beyond institutions for sustainability; but also need to keep institutions involved for sustainability.

Stakeholders

- Need to define stakeholders in a changing landscape.
- The focus should be on the audience.
- Need to address real demand of users and build that demand for the content offered.
- Communicate with users and get feedback.
- Approaches should be people-focused, as well as institutional focus, not top down.
- Information needed by not limited to research community, but also farmers, businessmen, policy makers, etc.
- Develop collaboration with private sector in the development process (training, services).
- Need to stimulate commitment and involvement of the stakeholders – to establish a national platform for discussion.

- Need for adequate links and integration between local/regional/international levels.
- Need to be able to tell stakeholders: Why they need to invest; to do what? Where do they invest? How to invest? Who should invest?
- Need to recognize crosscutting aspect of agriculture nowadays – health, energy - to develop system in relation to other sectors and include content for other audiences.

People

- Need to create awareness of the role of the information specialist.
- Need for collaboration between information management and information technology experts.
- Incentives should be provided to share information through digital formats.
- Capacity building is not just about training.
- Training should be provided to the right people.
- Training needs to be evaluated.

Content management

- Contribution of content is the key.
- At which level is standardization needed? Organisation of information? Yes, but rather focus on "Access to information".
- Interoperability is important based on common standards.
- Need for non-textual content, including global iconic language-independent system of markers (e.g. farmers log in with graphic icons; farmer's audio blog).
- Need to repackage and rewrite content such that farmers/local people can access and use.