

Projects Reports Summaries for Year 2006

1. Connectivity -Thrust 1

1.1 Second Level Connectivity (SLC)

Project objective: to improve connectivity at approximately 50 CGIAR remote locations (with particular emphasis on Africa), enabling researchers and “staff at large” to better communicate and access online information resources.

All but four of the site surveys pending at the beginning of the year have been carried out. The outstanding surveys will be carried out by staff from IRRI and WorldFish.

Internet connections are complete in South Africa and New Delhi. Staff in both these locations are satisfied with the results and have greatly benefited from improved connectivity. The SLC Project approved plans for upgrading Internet connections (currently at various stages of completion) in 10 other locations.

The task of developing and populating the ICT Briefcase, which is well into its final stages, was designated to CIAT. The Briefcase will be produced on CD for distribution, and an online version is also being developed to be uploaded onto CGXchange. The IRRI ICT training staff have been commissioned to develop training material on “Responsible Internet Use”.

Due to various unforeseen circumstances, the design and implementation of the Project has undergone several changes. For example, it was decided to obtain individual solutions at each location in Sub-Saharan Africa instead of a single tender for a satellite connection for the region. Some of these solutions are already being implemented, increasing the pace of overall Project implementation. Other changes include the revision of priorities at some sites, and the closure and relocation of some offices. As a result, there is a need to establish a standard, transportable network configuration. Project installations in all the locations that have received approval are at various stages of completion.

Due to the delays mentioned above, the Advisory Group asked for a one-year, no-cost, Project extension in order to complete the work originally planned. This was granted, and the Project has been extended to 31 March 2007.

Reasons for Project Delays

The Project is behind schedule mainly because most of the work is being carried out by CGIAR staff who already have full-time jobs in their own Centers. For most staff, the Project is an addition to their normal workload and they have had to fit Project activities into an already congested work plan. This is particularly true in carrying out the site surveys and implementing the resulting recommendations. Although this has caused

delays, in the long run it will be better for sustainability as it encourages people to take ownership for the work being carried out by the Project.

The status of the country and regional offices seems to be in a continual state of flux. Offices that were high-priority last year are no longer considered so this year. Several offices are being closed down or relocated. The Project is not in control of and sometimes not even included in the communication loop of these decisions, which makes planning more difficult.

It hasn't been easy to prepare a Request for Proposal (RFP) document for satellite services. The constantly changing environment not only makes it difficult to prepare an accurate list of requirements but it also makes it difficult to obtain any kind of commitment to a common contractual arrangement for all CGIAR offices.

Lessons Learned

- Centers located in the same geographical location need to collaborate more in order to receive better quality services for ICT support and Internet connectivity.
- To achieve better collaboration, the lead needs to come from those in decision-making positions in a Center.
- In general, the state of ICT infrastructure and IT support has been poor. The ICT managers need to provide more direction for these smaller offices, and the Project will produce standards and recommendations for them to follow.
- Centers have to make decisions on where they want to spend limited funds. If communication and access to the Internet or intranet resources is important then the operating funds need to be found to operate an Internet connection to meet Centers' needs. In Sub-Saharan Africa, costs are likely to be between \$50 and \$75 per month per computer for the level of Internet connectivity required to carry out the activities being requested.
- Portable network infrastructures can provide an ideal solution for the fluid nature of the CGIAR country offices. Critical network equipment can be contained in a rack that closes to create a transportable case. When an office moves to larger premises it will be easy to move the network. If the office closes, the network can be reused in a new office elsewhere. Such solutions were originally developed for relief agencies and the military.
- Some CGIAR offices hosted by NARS are not satisfied with the quality of the Internet connections they are receiving and need to negotiate with their hosts to find the best way to improve the situation. This can be done in a number of ways: from improving the equipment and service providers being used to providing training in the management of office networks and IT support so that the connections are not congested by non-work related Internet use (listening to internet music, downloading videos and other large files, etc.) or viruses.
- The many lessons learned from the installations already carried out are invaluable to future implementations.

1.2 The Consortium for Spatial Information (CSI)

Project objective: to bring CGIAR's geo-spatial data into conformity with global standards and develop a web portal where researchers can easily access such data. The Project now provides the Centers and the research community at large with user-friendly geo-spatial knowledge generation and management tools. It has also considerably strengthened the community of CGIAR staff who are active in geo-spatial work.

All Project activities are on schedule, with significant additional results.

A successful GeoSpatial Science workshop was held in Nairobi, Kenya, with representation from all Centers and several other organizations. This workshop, which also served as the CSI Annual Meeting, set a strategic vision and outlined a series of initiatives that were proposed as focal areas for the medium- and long-term development and application of geospatial science within the CGIAR.

A CGIAR metadata inventory is nearing completion at all Centers, enabling the CGIAR to build a seamless, System-wide GeoSpatial search capacity. The agreement reached with FAO-SDRN (FAO's Environment and Natural Resources Service) to join together the CGIAR's metadata search with those of FAO, WHO, and UNEP has progressed. A pilot project successfully demonstrated some of the functionalities of the GeoNetwork Open Source Metadata Search Catalog and also confirmed the potential to develop a unified metadata search capability for all Centers and initiatives. Five Centers participated in the pilot project, which was evaluated by the membership at the Annual Meeting. GeoNetwork was adopted by consensus, with the understanding that all Centers implement and maintain a GeoNetwork node.

The CSI launched its GeoPortal website on 14 February 2004. The components of this rich, international geospatial resource include a Metadata Resource Center, an Intellectual Property Rights Resource Center, a GeoSpatial Links Database, a portal to GeoSpatial activities at the CGIAR Centers, and the SRTM Database. The SRTM database forms the first major addition to the GeoSpatial Data Sharing Platform. A second version of the Digital Elevation Data for the entire globe is now available on the CSI website for easy download in a variety of easy-to-use formats. Since it has been put online, it has become the single largest source of downloads within the CGIAR. In addition, the CSI GeoPortal was called into service in the immediate aftermath of the Asia Tsunami on 26 December 2004 and provided a data dissemination platform for the emergency response maps. During this period, the CSI also developed a Tsunami Remote Sensing Data Sharing Platform for distributing a large amount of previously unavailable data.

The CSI Geo-Spatial Web Portal was developed and is now hosted at CGNET. This ongoing and continuing Project activity has become very popular, with the site receiving thousands of hits per month (including an overwhelming response to the SRTM database), making it the single largest user of bandwidth in the CGIAR System. Discussions are currently underway to address the problem of bottlenecks created by

the huge demand for the site's products. The site has now become an active information and data source, not only for the CGIAR geospatial community but also for many other users who are either working in developing countries or working on developing country issues. Since its launch on 13 November 2004, the site has received more than 16,000 unique visitors from 113 countries – it currently experiences downloads in excess of 900GB per month and continues to receive many messages of thanks.

The CSI was elected to the Steering Committee of the FAO-GeoNetwork Project and will work with the other members to convert this Project into a GeoNetwork Consortium. Committee agreements stipulate data sharing with the CGIAR and relevant UN agencies.

Changes

During the past year, there were significant, substantive and visible changes in the membership; changes that went beyond improved general recognition of the role of the CSI to actively representing GeoSpatial scientists at all Centers. Consensus at the Annual Meeting showed a change in behavior and attitude by scientists from the various Centers towards active participation in and support of the CSI. Generally, there is enthusiasm to participate and join together as a CoP. There is also a general recognition of the advantages of having a Consortium. During the past year, this was translated into action. In recognition of the advantages of membership, Centers actively proposed and implemented CSI activities and joint collaboration. In addition, there is a much greater awareness of the important role that GeoSpatial activities play within the CGIAR, particularly within the mandate of the ICT-KM Program.

1.3 Desktop Video Conferencing (DVC)

Project objective: to evaluate the use of desktop videoconferencing at central and principal regional locations for supporting collaboration within CGIAR communities of practice, and to carry out a survey of available technologies, vendors and service providers.

The Project made an attempt to assess the effectiveness and value of desktop video conferencing as a tool to support and enhance collaboration among various partner groups. It has also offered suggestions on how the rapidly emerging CGXChange (the former VRC) collaboration space could include desktop video conferencing as an integral tool.

The Project successfully identified viable technical options for desktop video conferencing for CGIAR staff. It also carried out a significant number of trials with the NARES partners in India and ARI partners elsewhere. As a result, it emerged that desktop video conferencing can be a viable option with at least some of the NARES.

Presently, the Microsoft firewall used in the CGIAR imposes limitations on the use of video conferencing from a desktop in a LAN, and this has limited the effective participation of CoPs during the Project period. However, this will be overcome with the

integration of the Microsoft Live Communications Server (LCS) client into the System-wide VPN (Virtual Private Network) that is under negotiation. This can be an important service that the CGXchange can offer. Alternatives to using a VPN involving IT administration have been identified. A tool called "FlashMeeting", a web-based, hosted video conferencing system, has been tested extensively and found to be useful.

The use of video conferencing as a tool in promoting inter-institutional collaboration has received positive ratings from the NARES partners. The NARES University faculty has been particularly appreciative of the use of the FlashMeeting tool as an effective way to interact with ARIs. Similarly, rural organization partners have rated desktop video conferencing as an outstanding tool to facilitate dialogue and interaction between small groups. In the last eight weeks of testing, a rural organization representative suggested that desktop video conferencing was possibly the best grant that the government agency had made to his organization because of the increased opportunity for dialogue with distant experts. The rapidly increasing availability of tools with video capability, such as MSN Messenger and GoogleTalk, has altered the NARES perception fundamentally. This is all the more reason why the CGIAR should adopt an enterprise-oriented approach to the deployment of desktop video conferencing to enhance collaboration both within the System and with NARES and ARI partners.

The Project was extended by four months to cover continued testing and the development of technical specifications, and to accommodate NARES partners' request to use desktop video conferencing to enhance expert collaboration with the CGIAR. During this period, CGXchange was rolled out and the MS-LCS client was identified by the CGIAR IT community as the choice for a common IM client. The integration of desktop video conferencing into CGXChange has emerged with even greater clarity in this period, justifying the extension sought.

1.4 Advanced Research Network (ARN)

Project objective: to connect at least four CGIAR Centers by high-capacity links to global research networks with high-speed connections to universities and advanced research institutes, and to test the application of grid computing over these networks.

IRRI was already connected. In the past year, CIP and CIMMYT successfully organized connectivity and CIAT and ICARDA have applied for funds from the Project and are in the process of establishing ARN connectivity. Within a short time it is expected that five CGIAR Centers will have and will be using such connectivity regularly.

The Project has met its major objectives. However, the difficulty of establishing ARN connectivity in developing countries has affected the timetable.

Reflection and Learning

The number of Centers with advanced research network connectivity will probably increase to five in 2006.

Some interesting synergies are emerging from the ICT-KM projects and from the shared agendas of the Centers:

- The ARN Project will support the ESBC Project. The ARN Project's investment in the grid cluster was largely made to add to the grid's resilience in the interest of data protection.
- CIMMYT's decision to get ARN connectivity and the Center's expected adoption of Access Grid technology is seen as critical to the success of the joint IRRI-CIMMYT Crop Research Informatics Laboratory.

CIP has become a recognized ARN leader in Peru and has had a deputation from the other institutes with ARN connectivity to learn about Access Grid technology. When CIP was having problems with Access Grid software, it adopted and quickly exploited another less complicated open source video conferencing solution called ISABEL, which it used regularly. In future, it is recommended that Centers start out with this solution rather than resort to it after they have failed to make Access Grid work first time.

1.5 Utilization of Intelligent Systems for Plant Protection (UISPP)

Project objective: to develop a plant protection expert system to assist training staff in the diagnosis and treatment of crop diseases, enabling farmers to use the resulting knowledge to increase the productivity and profitability of their crops.

The Utilization of Intelligent Systems for Plant Protection Project is a partnership between CLAES, ICARDA, ICRISAT and IRRI. It was approved in December 2004 and officially started on 1 January 2005, although actual activities didn't commence until two months later. The main activities during the past year related to knowledge acquisition and the development of the expert systems and e-learning modules. During the Project's first phase, considerable effort was made in the acquisition, collation and formatting of the knowledge bases through interactive meetings with experts (pathologists, entomologists, virologists and breeders) from ICARDA and ICRISAT, NARS scientists, and literature surveys.

Knowledge acquisition web tools were developed to acquire knowledge on barley, wheat, and chickpeas – most of the pest management knowledge bases have been acquired for these three crops. Expert system generic task tools (for the easy generation of expert systems) and barley e-learning modules were developed. Utilizing the barley knowledge base and the task tools, a Barley Plant Protection Expert System beta version was developed.

A website was developed to accommodate the acquired knowledge bases and to highlight the status of the Project's activities. Printouts of knowledge bases for the three crops (barley, wheat and chickpeas) can be obtained from the site. During the past year, a workshop and several meetings were organized with Project and NARS scientists to acquire and validate knowledge bases and the barley e-learning module. A project paper

entitled "Rapid Generation of Plant Protection Expert Systems" has been accepted for delivery at the World Congress on Computers in Agriculture (<http://www.wcca2006.org/>) in Orlando, USA, in July 2006.

Because the integration of various components of the UISPP Project is of immense value in making decisions related to barley, wheat, and chickpea plant protection, intensive training for end-users is of prime importance. It is hoped that such training will be addressed in the next phase of the Project.

It is felt that the Project is on the right track to facilitate effective management of pests and diseases for a safer environment, better health and increased profits.

Reflection and Learning

What worked

- A community of enthusiastic researchers was established
- Interaction between CGIAR and NARS researchers went well
- Scientists who had no prior experience were exposed to expert systems technology
- Project meetings were very useful
- A multi-disciplinary approach was undertaken for the Project
- A Generic Expert System Tool was developed
- Knowledge on barley, wheat and chickpeas was acquired
- Publicity was generated for expert system utilization
- There was increased awareness of the potentialities of expert systems

What didn't work

- The knowledge acquisition process was delayed
- The involvement of NARS scientists could have been better sought
- Expectations were not clear to some of the partners
- The resources needed were underestimated
- Stakeholders' participation in the Project was absent
- Time planning was poor

What could have been done better

- The timing of the start of activities
- The estimation of the resources required
- The orientation of the Project's key resources
- Alternative funding was lacking

Lessons Learned

- Teamwork between Project players is essential
- There is only scattered knowledge available at the Centers
- Biological scientists and IT specialists can devise tools to identify constraints and opportunities to improve crop production
- Knowledge gaps exist in the plant protection area

1.6 Enterprise Security and Business Continuity (ESBC)

Project Objectives: to protect valuable information assets developed, maintained and owned by all the Centers; manage information security risks across CGIAR member Centers by implementing a secure information architecture (i.e. organization, process and technology); and minimize disruption in operations in case of a disaster by implementing a comprehensive data resilience/disaster recovery program (including business continuity). The Project is implemented through clustering by geographical locations with resource sharing and training (field and workshop) taking place within three regions.

Background

Development of business continuity plans are founded on an internationally accepted notion that a continuity plan is a critical function of the organization's everyday business operations requiring substantial advance planning.

The CGIAR Centers have been constantly aware of the many challenges to its continuity of operations, but past efforts to address these concerns had been quite sporadic. Over the past two years, however, concrete steps have been taken to establish a strong foundation for the long-term protection of the Centers' public goods and IT infrastructure through the implementation of the Project.

The Project is running within budget and can now see substantial achievement of objectives. It should now be possible to complete the Project in all regions as a result of the no-cost extension to enable the Centers in the Americas to participate. Each event and rollout has benefited from the experiences gained in the preceding ones. Once the Project Managers at IRRI and SGV, the Project Officer and Regional Resources, have performed their functions and the monies have been spent, it will be necessary for someone with vision to see all of the activities to completion by the end of 2006. There should also be continued vigilance within the CGIAR to ensure that security breaches are prevented or counter-acted, and that Centers are continuously active in the area of Business Continuity Planning.

IRRI offered to lead the CGIAR-wide project, recruit the Consultants, host the regional ESBC workshops and became the pilot Centre for the Asia region. To support the implementation of the project across Asia Centers, the ESBC Project adopted the following strategies:

- Hiring of SGV Consultants to assist in implementing the project
- Conduct of workshop in IRRI, which is the pilot site of Asia
- Selection of regional resource for both ES and BCP
- Development of continuity plans for IRRI to serve as a point of reference in developing similar documents in other Asia Centers
- Sharing the lessons learned from the pilot site

The Executive Briefing on BCP Highlights of the workshop included IT Security demonstrations, videos about information security risks, and decisions that the Risk Management Information System (RMIS) would be desired by most Centers, and that the scope should initially at least focus on Information Assets, not all Center assets. The main feedback from the participants was that less PowerPoint and more participatory activities were of interest, as participants felt they had been in a long, rather detailed lecture instead of an Executive Briefing and Workshop.

During the Executive Briefing it was decided that the Business Continuity part of the project should concentrate on ICT issues. IRRI would be the Pilot Center. The two regional resource people would roll out the Enterprise Security and Business Continuity implementation in the five Centers, with the collaboration of staff in each Center

For the IT Enterprise Security Implementation and Business Continuity Implementation, it was decided to concentrate on carrying out all BCP activities on a few organizational units with IT-intensive processes due to the time restrictions. This would ensure that the regional resource people would go through the full process of developing a business continuity plan.

Plans for roll out in the region have been made and are being implemented.

The EMEA region of the ESBC Project comprises six Centers: IPGRI, ICARDA, WARDA, IITA, ICRAF and ILRI. There are five additional CGIAR Offices in the region with Active Directory installed that also need to implement the recommendations of the project: ICRISAT – Niger, IITA – Benin, IITA – Cameroon, ILRI – Ethiopia and IWMI – South Africa.

ILRI offered to host the regional ESBC workshops and by default became the pilot Center for the region. Two Regional Resource people, Colin Webster – ICARDA and Sylvester Kisonzo – ILRI, were chosen from the Centers in the region. They will be trained in the IT security and business continuity and assist with the rollout and implementation of the Project in the CGIAR offices in the region.

Enterprise Security and Business Continuity Executive Briefing and Business Continuity workshop highlights included IT Security demonstrations and video, WARDA experience in implementing Business Continuity plans and a video conference with IRRI on their RMIS. The main feedback from the participants was that pre-workshop information on the content needed to be improved as most only received the invitation letter and the agenda of the workshop with no other details on the content.

IT Enterprise Security Workshop and Training participants learned a lot from the training activities but just as important this was the first time many of the network administrators had met each other and this has led to much improved collaboration and sharing of ideas and assistance in resolving problems since the workshop finished.

Following the pilot implementation in the Asia region, it was decided that the Business Continuity part of the project should concentrate on ICT issues. It was therefore decided that for the EMEA region the two regional resource people would be trained to do both the Enterprise Security and Business Continuity implementation. However, in hindsight, even when concentrating on IT activities, business continuity does not require high-level IT skills. Organizational, planning and interviewing skills seem to be much more relevant.

Plans for IT Enterprise Security Implementation were developed and are being implemented. The plans for the roll-out to the other Center in the EMEA Region are being finalized.

A draft Risk Assessment summary report and a draft Business Continuity Plan was developed using the information available but there are gaps that still need to be completed.

CIP is in the process of organizing project activities for the Americas region.

2 Content for Development (C4D) - Thrust 2

2.1 Virtual Resources Center Infrastructure (VRCI)

Project objective: to provide the platform, maintenance and support for the CGIAR's System-wide intranet, including extranet tools, a single sign-on and a common search engine.

The VRCI Project is now on schedule and meeting its objectives. A no-cost extension of three months was approved by the CIO office to improve the work done on some of the more complex activities and to provide a bridge until new funds are allocated for the next phase of the Project.

During 2005, the Project was considerably realigned to accommodate the needs of content publishing, and the branding and marketing of the site. The Project Team accommodated changes and supported those CGIAR groups and C4D projects willing to make content available through CGXchange, as the VRC is now known.

CGXchange was launched at the CGIAR's 2005 Annual General meeting in Morocco and has been improved ever since. It serves as a one stop corporate portal providing access to content and easy-to-use collaborative tools relevant to the whole CGIAR community. The project has been spending considerable time and resources on these tools, which are now available to all CGIAR staff along with a set of valuable papers on technologies and their utilization. Of great significance during the past year of this Project was the almost unanimous decision to adopt a best-of-breed commercial portal platform: Plumtree.

Leading and managing a project of this magnitude in any enterprise is highly demanding. However, the CGIAR faced further complexities in the form of high transaction costs that would have been considerably less for a similar project in a more formally organized enterprise.

Lessons Learned

- Getting consensus and commitment in the CGIAR is difficult.
- Communication (transaction costs) is expensive.
- Using a fully committed CGIAR manager (in this case, IPGRI's IT Manager) to coordinate the VRCI Project resulted in a heavy load and sub-optimal performances for both jobs. Due to funding limitations and the amount of work to be performed, two Junior Consultants were hired, requiring considerable coordination time on the part of this Manager. Indeed, the IT Manager spent 40% of his time coordinating VRCI activities.
- Professionally managing tasks needs heavy analysis; one solution doesn't fit all.

2.2 Web Content & Usage Analysis (WC&UA)

Project objective: to identify the critical content elements for inclusion in the initial launch of CGXchange and develop the initial CGXchange marketing material, along with tools and techniques for monitoring and evaluating the use, usage and utility of web-based services.

Since the Project was originally conceived, it has gone through several iterations and several Project Coordinators, resulting in loss of time, vision conflicts and ownership issues. It finally found a home in IPGRI and was divided into three sub-projects – Content, Marketing and Evaluation. Towards the end of 2005, work was accelerated when it was decided to launch CGXchange at the CGIAR's AGM in Morocco.

The Content and Marketing sub-projects were carried out in time for the AGM, but significant ongoing work is necessary as the operational phase of CGXchange unfolds. The Content sub-project contributed to defining initial content (other than that provided by the VLS and OLR activities) that would eventually be made available through CGXchange for the launch. The Marketing sub-project produced the initial marketing material for the launch, while the Evaluation sub-project is just getting started. To date, considerable learning has been gained through these activities:

- The overall participatory approach should be recognized, commended and continued.
- A better understanding of technical possibilities and restraints would be highly useful.
- Better links between Project teams, while very time consuming, are necessary.
- There are ongoing conflicts that occur when trying to manage a System-wide project while holding down a full-time Center job.

- The CGXchange concept needs further clarification for all Centers, whether or not they are planning to adopt Plumtree.
- Content/marketing activities need to be implemented jointly with technical activities – one should not be driven by the other. Either overall project coordination or very close joint management is required.
- CGXchange gave some people the opportunity to grow and develop their career without having to find a new job.
- People involved in CGXchange have become ambassadors of System-wide approaches to doing business.

2.3 Virtual Library Service (VLS)

Project Objective: to provide easy access, through CGXchange, to the collections and information resources held by the CGIAR libraries and to other leading scientific databases, journals and reference materials.

Considerable progress has been made in implementing the Virtual Library Service. Despite delays early on resulting from the examination of a different project approach, the Project has moved forward quickly, mostly because it has a mature community of practice behind it, and a significant number of resources and functionality had to be ready in time for the CGIAR's Annual General Meeting in December 2005.

As of March 2006, more than one hundred electronic resources have been selected and described, and are searchable through the **CGVLibrary** – the name that was selected. In terms of CGIAR catalogs, a change in strategy has meant that 11 of the 15 CGIAR Centers have already been included in the overall service, though not all have been as integrated into the service as was originally hoped. The Project is on track to meet the CGVLibrary's anticipated formal launch date in June 2006. Activities between now and then will include completing implementation of full text linking services, emphasizing training, documentation and marketing, and encouraging other organizations to adopt standards that will allow incorporation into the CGVLibrary.

Analysis of the possible technical approaches that could be adopted served to highlight the risks involved in adopting an untried approach, such as implementing a VLS with Plumtree, and the benefits that could be gained by sharing technical development and support with other users of a standard VLS software. In the end, ExLibris's MetaLib product, the Knowledge Base (for resource directory and cross-database search), and SFX product (for the OpenURL link resolver) were the unanimous choices of the evaluation group. ExLibris, which has a worldwide presence, the largest installed customer base for VL software, and an excellent reputation offered a robust and flexible software solution at a very attractive cost. This solution allows the CGIAR to benefit from database connectors already developed and tested by other organizations.

Reflection and Learning

Although the participants were widely distributed over different time zones, evaluation and selection of software was carried out successfully. Electronic communications and a

mature community of practice played an important role in ensuring all members of the group had the same information and were able to communicate easily.

The principal difficulty during this phase of the Project was the time pressure under which the group was working; there was a need to present a substantive prototype at the CGIAR's 2005 AGM. Although having a longer time for vendors to respond to the proposal might have resulted in a larger number of responses, those received included the main market leaders in this product area and were sufficient to represent different approaches in the current marketplace.

Lack of both continuity in Program and project personnel and detailed documentation can lead to difficulties in inter-project communication. Without full documentation of inter-project agreements, the way in which commitments are perceived can shift over time between different project teams. In particular, when projects are working under tight deadlines (as all projects were from May to December 2005), these issues can be difficult to resolve and can increase the pressure on all concerned.

The benefits of sharing information and expertise with other organizations using the same software have already become evident. It was easy to identify a consultant experienced in the software to assist in the implementation of the software and the integration of authentication services. A number of the connections that have been implemented have come from the library of software developed by or for other users of the VL software.

Competing projects, launched while the VLS was being developed, diverted the attention of the Information Managers, and resulted in the need for a significant chunk of the work to be done by staff based at IFPRI. Great efforts were made to involve, accommodate and work with staff at other Centers, but a variety of issues served as important barriers, including the Project's extremely tight deadline, competing demands on staff at all Centers, different perceptions of the activity on the part of management in the Centers, and the difficulty of travel and geographic dispersion.

Web-based training tools have proved to be very effective, available at very low cost, and well-adapted to the training required for the VLS. However, these will supplement, not replace, the face-to-face training that is planned to coincide with the CGIAR Information Managers' meeting in Nairobi in May 2006.

A meaningful and mnemonic domain name was registered: vlibrary.cgiar.org.

ExLibris has recently asked permission to write up the CGVLibrary as a case study, to show others this exciting and innovative application of their software. The VL will gain valuable additional exposure via this case study, as well as some additional training offered by the company.

There is increasing pressure on CGIAR Centers to standardize their library systems to use software used in other Centers, and to make their catalogs available over the

Internet. For some Centers, particularly those under financial pressure or with weak local infrastructure support, it may be some time before they will be able to offer their documentation resources through the VL.

2.4 E-publishing

Project objectives: to give Centers the technical infrastructure to vastly improve how the CGIAR publishes its research, with a common publishing workflow approach to the production of information across the System, resulting in document creation (layout or web pages) that is largely automatic. Upon completion of the Project, Centers will be able to centralize document creation and share resources for editing and graphics work.

Following a successful initial assessment phase, the Project proceeded to the development/implementation phase. Initial tests of a prototype system showed great promise for the eCMS system as a platform to support e-publishing in the CGIAR System. However, subsequent progress has been slow and hampered by delays in the development of the contracts with the main supplier and by problems in pilot testing. A one-year extension of the Project is needed to complete delivery of the planned system.

Learning highlights.

Four key lessons were learned during this phase. First, losing more than half the core project team seriously impeded progress and resulted in a lot of time being spent bringing new members up to speed. Second, having the Project Coordinator in one Center and the Project budget in another caused confusion and uncertainty about roles, responsibilities and the process for expenditure of funds. Third, when dealing with technical projects like this one, there is a danger of getting wrapped up in the technicalities (especially when there are many problems to solve), with the result that the need for communication, both among the team and with its constituencies, is overlooked. Fourth, there is no substitute for face-to-face interaction with team members in getting things done; virtual teams working across time zones are fine in theory but not when the team needs to interact in depth.

Shortcomings and challenges

Major problems faced by the Project during the past year include the loss of the Project Coordinator and another key member of the original core team; the loss of one of the original core participating Centers during the initial testing phase; and the competing demands on the time of Project team members from their 'day jobs'. Together these resulted in less time than necessary being available to dedicate to the Project, especially at crucial junctures (e.g. review and negotiation of the software contract, and testing). This also put pressure on the remaining core team members.

These pressures contributed to the infrequency of communication from the Project core team to its constituencies. As a result, the team will need to improve communication about the Project and its achievements if it is to gain the buy-in necessary for successful adoption of the eCMS.

During testing of the prototype, responses were received from three of the 'hands-on' test Centers (CIP, IPGRI and IWMI) and from six 'demo' Centers (CIFOR, CIMMYT, ICARDA, ICRISAT, IRRI and WorldFish). These responses were highly positive and in favor of pursuing further development and adoption of the system.

2.5 Data Standards and Exchange: Capacity Development

Project objectives: to train CGIAR staff in the latest technologies and standards in use by the international scientific community for managing scientific information; and develop a strategy for implementing appropriate information architecture within the CGIAR for maximizing access to these distributed information sources. These objectives were successfully met within the Project timeframe.

Training Workshop

More than 40 CGIAR scientists were trained during a five-day workshop in Rome. A survey carried out at the end of the event clearly indicated that the training was relevant to the participants and had raised sufficient awareness about the technology within the CGIAR. Scientists were also taught how to immediately deploy the technology on a large scale. The workshop provided CGIAR partners an opportunity to see how things are moving in the international community, and for the non-CGIAR partners it provided a window of opportunity to involve CGIAR partners in their work.

More importantly, the web-based information service package (BioCASE) selected at the meeting as the most appropriate for the CGIAR has already been deployed at five Centers: IRRI, CIP, CIAT, IPGRI, and ILRI. BioCASE provides unified access to the biological collections in Europe while leaving full control of the information with the collection holders. During the workshop, it was discovered that both BioCase and BioMoby protocols can work together and, in fact, complement each other. [BioMOBY](#) is a web service integration project that aims to create architecture for the discovery and distribution of biological data across the Internet.

Strategy

All 14 Centers participating at the workshop finalized their individual strategy for adoption and deployment of web services.

Linking all the databases together using the BioCASE and BioMOBY protocols will provide huge benefits to the scientists, farmers, policymakers and educational institutes. Scientists will be able to retrieve information from different sources, thereby enhancing their research agenda, and farmers will be able to access accession level information through one web portal. The availability of such an enormous amount of information will also help policymakers make appropriate decisions at both the crop and the country level.

BioCase and BioMoby came to an agreement to build a middleware that will allow access to the information coming from either protocol, thereby facilitating the exchange of information between partners. BioMoby and BioCase protocols are ready-to-use, open

source initiatives that are available free of charge. The implementation of these protocols will save the CGIAR both money and effort.

Recommendations

Although work on deploying BioCase at each Center has started, some Centers still need assistance in putting the right infrastructure in place so they can install BioCase and BioMoby to map their information sources and make their data available to others. Consequently, there is a need to continuously provide support to the efforts that are already underway. Significant work is also needed to define the exact role of the middleware that will enable BioMoby and BioCase protocols to talk to each other.

2.6 Virtual Academy for the Semi-Arid Tropics (VASAT)

Project objective: to empower vulnerable rural communities in the semi-arid tropics so they can cope with recurrent droughts. The Project was established to build a pilot model that would blend the advantages of contemporary ICT and KM with the power of non-formal, open learning, to develop a new approach for the delivery of agricultural and development information to such communities.

The Project made significant progress during its second year. Rural hub activities in the Addakal region in South Central India were significantly strengthened with the building of new capacity among the participants from the Adarsha Women's Association (AMS). This community-based, micro-credit organization trained the village network assistants in IT literacy, added value to farmer questions on production/storage/marketing issues, and obtained expert answers from ICRISAT and its partners using an advanced content management system. The active members of the Association were honored nationally for their contributions to improving learning and livelihood opportunities among rural families.

On another strand, agricultural university partners collaborated with VASAT to promote an ODL (Open and Distance Learning)-based, technology-mediated paradigm for extension education. The formation of a grid of online extension/education materials covering seven universities is being facilitated by the Project. The capacity developed in VASAT in the use of learning objects and the Academy's ability to localize generic material is widely recognized now. A number of long-duration partnerships have been established with technological institutions. Based on CGIAR System priorities, VASAT has been classified as a long-term Institutional Project. The activities have been on schedule, the outputs have been generated as projected, and a number of learning experiences have been documented.

New Partnerships

A new partnership was developed with the well-known Indian Institutes of Technology System to apply GIS (Geographic Information Systems) at a micro-level, both in the use of semantic web technologies and in the use of weather sensors. Another partnership was formed with Microsoft Community Affairs to extend the hub operations. VASAT materials along with a significant volume of online materials contributed to the OLR

(Online Learning Resources) repository. VASAT leaders are also active in the processes associated with the CGIAR Global Open Agricultural and Food University (GOAFU), and have pointed out the availability of the OLR as a significant resource for GOAFU and partners. NARES partnerships were strengthened by ensuring their participation in the work of rural hubs and farmers' interactions involving new tools, such as the Internet and videoconferencing.

The hub activities reveal that international organizations, in partnership with NARES, are able to bring about rural information empowerment in innovative ways.

Unanticipated Changes

In the past year, three of the individual members of the AMS who joined the VASAT capacity-strengthening processes have gone on to become Fellows of the National Virtual Academy for Rural Prosperity. The three Fellows were inducted by the President of India ceremonially. This level of national honor for VASAT partners was not anticipated in the earlier stage of the Project and has led to a very large number of young members seeking to join VASAT activities at the village level.

Lessons Learned/Program Adjustments Needed

The capacity-strengthening process is successful when it is localized – this is almost a necessary condition if partners are to take advantage of new capacities. This has implications for learning material development, which is a generic process. Following VASAT's experience with AMS volunteers, the coalition has developed a greater appreciation for the design of educational materials that can be easily localized. This is a lesson that has been shared with content creation partners, such as the agricultural universities, in various forums.

Rural Hub Results

VASAT has been able to demonstrate that vulnerable rural communities can be empowered by increasing their capacities to access information. The Project has encouraged rural women and youth to gain leadership in information matters. VASAT's experiments on email-based agro advisories have shown that distressed communities can access timely expert advice and reduce time lag if the right measures are adopted. The Project has also encouraged these communities to establish linkages between knowledge gain and the adoption of practices. The demonstration of the positive effects of micronutrients on the important crops of this area is one such example. The capacity built and strengthened has attracted national level attention in India. Experiments using new communication tools, such as video conferencing, enhanced the capacity of the community to interact with experts and rural families in other regions on a real-time basis. This has positively influenced the confidence of poor rural farm families, particularly that of women in managing their farm and home affairs. The Project has been able to influence how communities seek and use information by exposing them to various communication tools and by building their capacities to handle them with ease. Current activities include the participatory development of a GIS-based micro-level planning tool for drought vulnerability analysis. One of the significant outcomes has been the strong institutionalization of the Project's activities in the AMS. In spite of

drastic leadership changes, the Community Based Organization has continued its partnership with VASAT. New opportunities for long-term financial sustainability have also been identified.

It is evident that a rural information/extension program can be built around ICT-based information hubs. The exact processes and steps need to be location-specific, but community support for enhanced information access can be mobilized and sustained using broad, generic approaches. Building partner power and contributing to local capacities are the key factors.

2.7 Online Learning Resources (OLR)

Project objective: to develop a CGIAR On-Line Learning Resources center, allowing an international teaching and learning community of practice to enhance the quality and relevance of their teaching and learning in agriculture and natural resources management in close collaboration and coordination with their CGIAR training and education partners.

As a project that seeks to take on the complicated and ambitious task of sharing training-related materials within the CGIAR and beyond, there have been successes and challenges on many fronts. Last year saw the Project change directions from a 'stand-alone' knowledge pool to a Learning Object Repository using internationally recognized standards that allow exchanges with other learning objects repositories and referatories¹. Although resources for this Project were minimal, it was able to successfully continue due to the support provided by interns from the Commonwealth of Learning.

Despite funding constraints, the OLR Project staff believed it was important for the Training Community to meet and garner a better understanding and support for the tools that had been created and to develop strategies and best practices for their use. Funds for this face-to-face meeting were partially secured through another training project implemented by the World Agroforestry Center.

Technical challenges were addressed through the partnership with the European ARIADNE Foundation, a knowledge pool comprising a distributed network of learning repositories. The CGIAR LOM (Learning Objects Metadata) Core Application Profile was successfully implemented into the CGIAR Learning Objects Repository, thus creating something of value and relevance to a community of trainers and educators in agriculture and natural resources management. Technical support will be needed to continue beyond the present phase of the Project in order to maintain a level of service that will fix bugs that occur. Similar support is needed to continue providing added-value to the repository with new features that allow the system to evolve with changes in training and the community.

¹ Gateways to instructional repositories.

There has been increased research into the Project's new direction, which has been documented for the community. The implementation of the tools involved close collaboration between the technical partner (ARIADNE) and the Project team to ensure that the tools would reflect the 'look and feel' of the CGIAR and be of value to trainers.

The Project coordinating team tried to work with the community as much as possible to provide a greater feeling of 'ownership' of the repository. These efforts were only successful in some aspects.

The community's commitment to the Project was highly evident in two main events. Firstly, most of the members of the community provided support for a representative from their own Center to attend the Leuven Implementation Workshop in October 2005. Indeed, 60% of the workshop participants covered their own participation costs, while the remaining 40% covered partial costs. Secondly, the community committed to upload their training resources for the CGIAR 2005 AGM, which they did at their own expense.

Although the Project has faced some problems and will need to seek further support in order to complete some essential tasks to make it sustainable, overall it has experienced a year of progress and success.

Results/Highlights:

1. An Application Profile based on international metadata standards was adopted.
2. A community portlet on CGXchange was established.
3. CGLearning Resources, a learning object repository where training officers can upload resources for the benefit of each other, was created. This site is set to be the central source of training resources for the entire CGIAR training community (<http://learning.cgiar.org/resources>).
4. A collective resource uploading effort involving more than 560 Training Resources from 11 CGIAR Centers was carried out.
5. CGMoodle, a Learning Management System (LMS) that allows the training community to host online courses, has been adopted.
6. A collaborative working space for community members has been created. The site has shifted from the former DGroups site to CGXchange, where the community can exchange ideas, host discussions and share resources.
7. As a result of a pledge made at the workshop, many individuals are now in the process of developing online courses for their Centers. In the process, they are turning to ARIADNE with technical implementation questions. After holding a series of meetings with the institute, one of the Centers is now writing a formal proposal for online courses using the LMS.
8. A CGIAR Community of Practice, trained in the tools developed and understanding how they can be integrated into their work, has been established.
9. A working relationship with ARIADNE has been formed. The level of service provided to the CGIAR by this organization includes the maintenance of tools and sites, keeping the CGIAR abreast of innovative developments in the field of educational technology, and implementing ideas from the training community to make the tools more relevant for trainers and educators.

10. A How-To Guide for uploading resources into the CGLearning Resources site was created.
11. The Project, its tools and approaches were presented to an international audience at the EDMEDIA Conference in July 2005, and will be presented at the “E-Learning in Africa” Conference in May 2006.
12. A strengthened network of trainers within the CGIAR has been formed. The workshops and discussion forums have further explored the needs and concerns related to the sharing of resources within the CGIAR, resulting in further communication between the training staff in the Centers and a drive to increase work efforts on a CGIAR level.

3. Work Culture -Thrust 3

3.1 CGIAR Knowledge Sharing (KS) Project

Project Objective: to encourage open and inclusive sharing of expertise and experiences among CGIAR members of staff and partners in order to support learning and change and to improve the effectiveness and impact of the CGIAR's work. The Project has generated commitment to KS primarily by supporting pilot activities on the ground in CGIAR Centers and programs, with a view to disseminating lessons more broadly.

In 2003, the developers of the ICT-KM Program decided that its technical activities related to infrastructure and content management should be complemented with a knowledge sharing project that would foster behavioral and cultural changes leading to improved production and use of knowledge in the CGIAR system. CIAT assembled a Project development team, and submitted the resulting project at the end of 2003. Reflecting earlier change programs in the CGIAR led by external consultants, the Project design centered on the development of comprehensive Knowledge Management (KM) strategies in CGIAR Centers and programs. However, when the Project got underway in 2004, the design was shifted in the direction of introducing KS approaches into major Center events in order to involve large numbers of managers and staff and foster capacity building. The Project was originally approved for a 12-month period, but implementation was stretched over 20 months, in order to allow the completion of a set of pilot activities in four Centers and to document the results. In addition to the pilots, highly successful facilitation courses were organized and a study was conducted on the role of human resources policies and practices in fostering KS and organizational learning. The KS Project has also cultivated a strong relationship with the community of international development practitioners KM4Dev.

The Project has essentially “put KS on the map” in the CGIAR by introducing hundreds of people to KS approaches that directly improve interpersonal communication, relationships, collaboration and participatory decision making.

The core KS team is encouraging the Program to support a second phase of the KS Project, designed to mainstream KS in the CGIAR, particularly in its research

partnerships. The following suggestions are made for designing and implementing the Project:

- **Ensure a more participatory process of Project design, involving Centers and partners.**
How: Through a longer and facilitated process of Project preparation, including face-to-face meetings and online discussions among collaborators.
- **Clarify the role of the KS Project within the ICT-KM Program.**
How: Seek greater alignment of the objectives and activities of the ICT-KM project leaders through facilitated face-to-face meetings and regular online discussions.
- **Clarify the “impact pathways” leading from specific activities to the desired long-term goals.**
How: Hold a planning meeting and provide time for developing hypothetical impact pathways.
- **Integrate KS thoroughly into Centers’ key research areas and development activities.**
How: Clarify the connection between KS and cutting-edge science involving a broader cross-section of people (including scientists) in Project design and implementation.
- **Plan activities over a longer time period to support institutional change processes.**
How: Move beyond the focus on events and meetings to strengthen KS in research.
- **Build stronger links between the KS Project and communities of KS practitioners.**
How: Foster the development of a CGIAR-wide KS community, linked to such global KS communities as KM4Dev.
- **Pay greater attention to cross-Center activities.**
How: Put KS more thoroughly on the map of existing cross-Center activities, and facilitate active knowledge sharing among the CGIAR KS community of practitioners.
- **Make decision-making more transparent.**
How: Form a steering committee that includes all actors involved and define its Terms of Reference.
- **Improve communication between the coordination team and leaders of pilot activities.**
How: Clarify roles within the Project Coordination Team and outline communications processes and tools.
- **Integrate pilot activities more thoroughly into the Project.**
How: Through the steering committee, ensure the pilot activity leaders have central roles in the Project, and facilitate strong relationships and exchanges among them.

In very broad terms, it was expected that the KS Project would encourage people in the CGIAR to do their work differently. The expected changes include more openness and sharing, people seeking out the knowledge, experience and advice of their peers, people more willing to admit and discuss failures and learn from them, more teamwork within programs and Centers and, ultimately, more teamwork across the Centers. These behavioral changes together would constitute a profound cultural change.

In retrospect, many of the expectations for behavioral and cultural change were unrealistic, given the short duration and limited resources of the KS Project. Nevertheless, some important changes have been registered, particularly in CIAT and CIFOR.

- The CIAT Pilot was the first to be planned and implemented, and it has had the most continuous and concerted support from the KS coordination team. The environment at CIAT was also highly conducive to KS and organizational learning. Therefore, it is not surprising that the most profound and widespread changes have been observed at this Center.
- Although its pilot activity was only recently completed, CIFOR is another Center that has experienced notable behavioral changes as a result of the KS pilot.
- KM has been a priority at IWMI since before the initiation of the KS Project, and many activities have been carried out to promote KS in the Center. In this case, the additional value of the KS Project has not been measurable.
- In the case of CIMMYT, the Center is undergoing profound structural and personnel changes, and in this environment, few observable benefits have accrued from the KS pilot.