

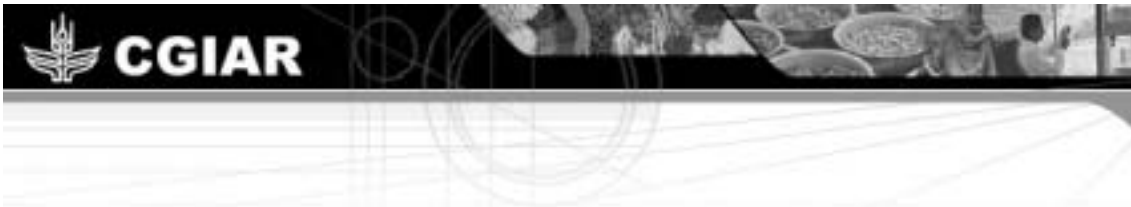
## **Annex 1 – Activity Concept Notes**

### **Thrust 1: ICT for Tomorrow's Science**

There are five activities proposed within the **ICT for Tomorrow's Science** thrust:

- 1.1 Applying ICT/KM for Excellence in Science: Strengthening Research Communities of Practice
- 1.2 Participation in Global Advanced Research Networks
- 1.3 Second Level Connectivity for the CGIAR
- 1.4 Disaster Resilience for CGIAR Data Preservation
- 1.5 Video Conferencing Systems for Project Collaborators

The first activity, Applying ICT/KM for Excellence in Science: Strengthening Research Communities of Practice, will result in 3-5 specific projects.



## **1.1 Applying ICT/KM for Excellence in Science: Strengthening Research Communities of Practice**

### **Context**

Research informatics and knowledge management are becoming increasingly important to CGIAR research efforts as emphasis shifts towards the new information intensive methodologies and collaborative research strategies required to solve difficult problems in agricultural development and natural resources management. Ensuring access to appropriate ICTs and supporting the development of research communities of practice across the CGIAR is essential to enhance the standing and influence of CGIAR research in developing global public goods and promoting research and development in developing countries.

### **Objectives**

To provide resources and support to system-wide scientific Communities of Practices for using ICT-KM to do cutting-edge science in support of the CGIAR mandate.

### **Outcomes**

A demand-driven competitive grants process leading to a stream of ICT-KM intensive research initiatives. These initiatives will upgrade CGIAR scientific research efforts and develop and extend best KM practices throughout center science communities and their partners.

For 2004, this activity will be initiated through a broad call for proposals across the CGIAR scientific community, and a selection of projects will be made by the ICT-KM Sub-Committee of the CDC.

Criteria for the selection of proposals include:

- Multi-center initiatives which will result in significant scientific progress or global public resources as well as enhancing and promoting appropriate ICT and KM practices across the CGIAR system and its partners
- Projects that are ICT and KM intensive, using and extending resources and practices available to all centers and research partners
- Projects that advance CGIAR science
- Activities that integrate with international research communities, global networks and information resources, both in the developed and the developing world
- Projects that use and promote global standards of data harmonization and interoperability.

### **Activity Leader**

Activity Leaders from within the scientific community of practices will be determined through the project selection process.



### **Timeline**

The Call for proposals will be distributed to the scientific communities by the end of May. One to two-page concept notes should be submitted to the CIO by 6 June. Individual projects may be from 1 to 3 years in length.

### **Resource Requirements**

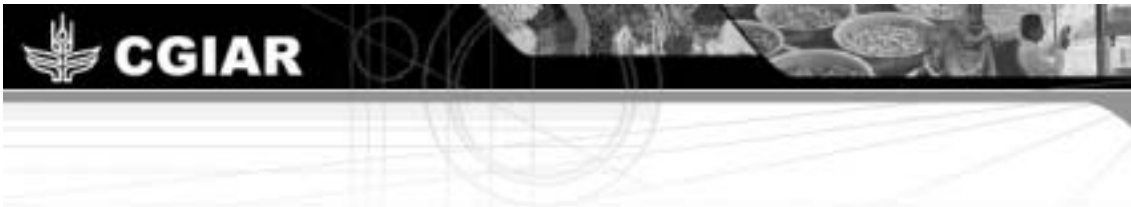
Notionally, 1.5 million USD will be allocated among 3 to 5 projects, representing approximately 30% of the anticipated overall 2004 ICT-KM Program budget.

### **Monitoring**

Each project will develop a monitoring and evaluation component and provide annual/terminal reports to the CIO. Evaluation and monitoring will incorporate project specific milestones and metrics.

In order to evaluate and monitor the implementation of the overall competitive grant process, a review of the set of activities will be conducted to evaluate their effectiveness in meeting overall ICT/KM objectives, as delineated within the ICT/KM strategy. Criteria will include questions such as the following:

- Are multi-center research communities being strengthened?
- Is appropriate ICT/KM being used to deliver relevant, high quality research outputs from CGIAR science?
- Is CGIAR science linked with the international research communities and contributing to global research resources?
- Are the projects promoting sustainable linkages between advanced research institutes, global initiatives, and capacity building research efforts in developing countries?



## 1.2 Participation in Global Advanced Research Networks

### Context

New global research networks (such as Internet2) are organized regionally and support advanced research users including Universities and NARS, with internal connections subsidized by the US, EU, or Japan. Each research institution is responsible for its own connection costs. The networks use standard Internet protocols, but are restricted to research and education applications.

High value applications supporting CGIAR goals include:

- Participate in video or other online meetings in academic areas that are otherwise inaccessible (eg. in biometrics)
- Move very large datasets (eg, GIS) among research partners to accelerate collaborative work
- Move backup datasets from CGIAR centers to offsite storage
- Conduct intra-CGIAR videoconferences or sharing of video production files.

### Objectives

The objective of this activity is to provide CGIAR centers with high-capacity links to global research networks. While not all CGIAR centers are within reach of these networks today, those who can connect should. The CIO can organize collective membership in each network, along the lines of CGIAR's membership in the Asia-Pacific APAN, opening the door for centers and even sub-centers to use the research networks. The resulting high-capacity links can be used in several applications, at least two of which should be demonstrated in this project.

### Outcomes

Key results of this project include:

- Formal CGIAR membership in all major regional research networks for advanced connectivity with Universities and NARS
- Connection of 6-8 centers in first 2 years, then 2 more centers annually
- At least 2 visible demonstrations of the network's ongoing usefulness in research or education, involving both CGIAR and non-CGIAR research partners

### Activity Leader

One or more IT Managers

### Timeline

Total duration of 12 months, including at least 2 demonstrations.

## **Resource Requirements**

Resources are required for the following activities:

- Travel to coordinate with regional centers on CGIAR membership
- Purchase of routers and firewalls
- Configuration of routers and firewalls, including support for new protocols as necessary
- Online training of center IT staff on operation of network links
- Demonstration projects, each with its own champion (eg. in bio-informatics, GIS, education)

Notional Budget: \$120,000



### **1.3 Second Level Connectivity for CGIAR**

#### **Context**

A considerable amount of the scientific research carried out by the CGIAR is accomplished at mid-sized locations that are currently not well endowed with respect to communications capabilities. This reduces their ability to access partners and information resources necessary to do their job effectively. It also makes it more difficult for staff in larger Centers to involve them actively in the collaborative work approaches required to address today's challenges. This project is aimed at leveraging new communication technologies with relatively low recurring costs to dramatically improve connectivity for these locations and thus empower the scientists to be able to work on a more equal basis with colleagues around the world.

The project will target those mid-size sites that are currently badly served in terms of internet connection and have a sufficient number of CG staff to justify the investment. As a priority the project will allocate at least 30% of the entire amount to African sites.

#### **Objectives**

The objective of this activity is to provide mid-size locations of the CGIAR with the minimum connectivity required to support the new level of collaboration and information sharing required by the new CGIAR. The connectivity provided will be sufficient for asynchronous collaboration activities and in some instances for synchronous collaboration such as through videoconferencing.

#### **Outcomes**

The key results of this project include:

- Backbone connectivity provided to support the new CG with a strong focus on weakly connected CG sites, with particular emphasis on Africa
- Increased connectivity to sites with consistent presence of Scientists
- Economies of scale when dealing with Internet Service Providers

The project can cover start-up and initial operating costs for these new links, with longer term operating costs to be borne by each center.

#### **Activity Leader**

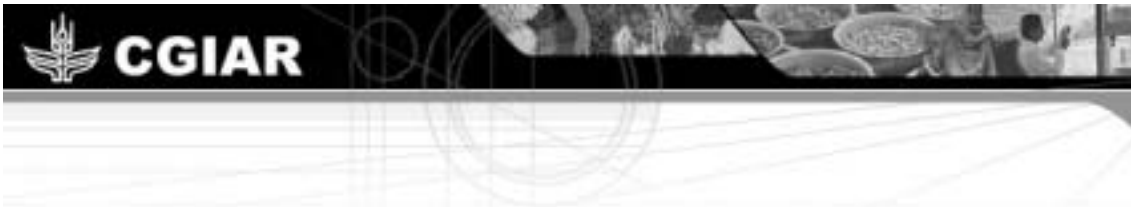
One or more IT Managers

#### **Timeline**

Total duration of 24 months.

#### **Resource requirements**

Notional Budget: \$1,560,000 over the two-year period



## 1.4 Disaster Resilience for CGIAR Data Preservation

### Context

The CGIAR is an increasingly information-intensive organization, both in its internal operations and in its output to its stakeholders. The CGIAR also remains located in places where political disturbances or natural disasters can cause great damage (e.g., the recent evacuation of WARDA staff from Cote d'Ivoire). Each center is responsible for the preservation of its data and the recovery of its operations in the event of a disturbance or disaster. Up to now, each center has been on its own in addressing this issue.

Central facilities could be built to assist centers in information preservation and recovery after disasters. Also, by coordinated sharing of resources between centers, they could also help each other. This can leverage investments already underway, in particular the adoption of a system-wide Active Directory. The result would be to provide resilience in the face of disasters, by having copies of data and shared server and other facilities to allow centers to recover more rapidly.

As with the other initiatives identified here, this one would require new hardware and software resources, as well as a project budget to simulate and rehearse recovery procedures.

In effect, this activity is comparable to an insurance policy on the considerable investments the CGIAR has been making and will continue to make on the creation and management of global public goods.

### Objectives

The objective of this activity is to ensure the preservation of and access to key CGIAR information and global public goods in the event of natural disaster or civil disorder.

### Outcomes

The outcomes from this project include:

- An inventory of assets to be preserved through disasters
- Sound disaster recovery practices throughout the CGIAR
- A set of best practices to apply to achieve proper resilience
- Periodic replication of storage to remote locations, with particular attention to sites that are under particular risk
- Preparation for new technological developments, for rapid adoption as they emerge, both to preserve critical data and to smooth recovery of center activities after disasters

The key result of this project is a dramatic decrease in the risk of losing assets throughout the CGIAR.

### Activity Leader

IT Manager



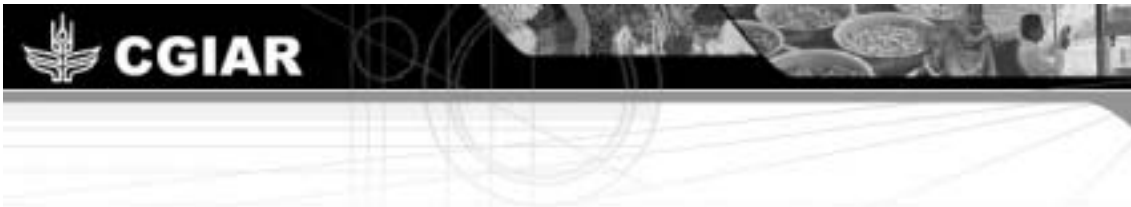
### **Timeline**

Total duration of 24 months.

### **Resource Requirements**

A notional budget of \$500,000 is required for the following:

- Internal inventory of key information assets, with consultancy input to set priorities and criteria for preservation
- Authoring and practicing disaster recovery procedures at selected centers, and use as a training opportunity for the other centers
- Purchase of hardware to stage copying process for each center (each center will need bulk disk storage dedicated to holding a preservation buffer for duplication to optical media or over a network)
- Purchase of central hardware for bulk storage of network-based information copies and for restoration from optical media when necessary
- Purchase of software to trial network-based duplication
- Ongoing hosting and system administration for central resources
- Ongoing CIO review of adequacy of system-wide performance



## **1.5 Video Conferencing Systems for Project Collaborators**

### **Context**

Video conferencing equipment should be readily available for project collaborators and managers in support of the collaboration and information sharing required by the new CGIAR goals. This project aims at providing a conferencing room and personal systems for all principal CGIAR collaborators and managers.

### **Objectives**

The objective of this activity is to provide the central and principal regional office locations of the CGIAR with basic videoconferencing facilities.

### **Outcomes**

The key results of this project include:

- A video conferencing room provided at all centers and principal regional offices
- Access to personal video conferencing for all project collaborators and managers
- Personal video conferencing tools integrated with desktop collaboration systems tools
- Training and support to underwrite uptake of this technology by project collaborators and managers
- Improved collaboration and information sharing in support of CGIAR goals

### **Activity Leader**

IT Manager

### **Timeline**

Total duration of 24 months, including training workshops at all sites:

First 12 months – install and train pilot in well-connected centers; Second 12 months – install and train in all other centers

### **Resource Requirements**

Notional Budget: \$310,000



## **ANNEX 2 – Activity Concept Notes**

### **Thrust 2: Content for Development**

There are four activities proposed within the **Content for Development** thrust:

- 2.1 Building a Strategic Alliance across Research Groups for Common Data Standards and Exchange;
- 2.2 Content Management;
- 2.3 Virtual Library; and
- 2.4 On-line Training Resources.



## 2.1 Building a Strategic Alliance across Research Groups for Common Data Standards and Exchange

### Context

This activity will define a common set of standards across the CGIAR through a broad consultation with research groups across the system, for referencing all data and information objects and with external partners and stakeholders. This will maximize the impact of CGIAR work and knowledge amassed over the years by making it available to our target audiences.

A key aspect of this activity is syndication of CGIAR data to various partner websites, so that the CGIAR data (with attribution) reaches internet users wherever they are, rather than users having to make a special trip to the CGIAR websites. Another key aspect is the interlinking of CGIAR information for end-users. For example, if species identification is harmonized among centers, it will become possible to make an inventory of all data and activities at all CGIAR centers for any given species or genus, and to keep that inventory continuously updated. Similarly, harmonization of geographic references would lead to being able to say what the CGIAR as a system has done for any given country or region. The simple ability to interlink web information adds obvious value for end users; to be "a click away" from related information automatically.

Data held within the CGIAR are of immense value to internal and external communities and access will be significantly improved through this project. The CGIAR strategic alliance for common inter-exchange languages and protocols will tap into the knowledge generated and captured within research groups across the system. Its primary output will be the creation of a data-sharing culture combined with system-wide standards for data content and exchange mechanisms.

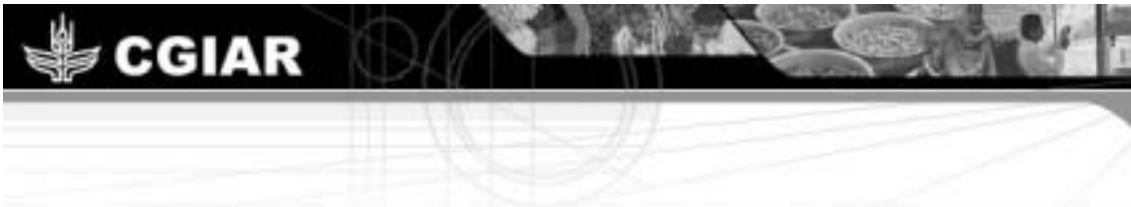
Common standards/descriptors are required for the following critical areas:

- Taxonomy
- Geography (Regional, Country, Location, GIS)
- Biological Descriptors (Genetic Resources, Breeding, Molecular, INRM etc...)
- Partners/Institutions

Access to this information will require a decentralized access mechanism that taps into the various information sources held in individual Centres. This project will address this need for scientific databases in genetic resources, breeding, bio-informatics, INRM and related.

A system-wide IPR mechanism is needed as an overall umbrella to ensure that information and knowledge are properly used. This information pathway (a mechanism for duplication of data among partner websites with attribution and usage feedback) is targeted in particular to CGIAR partners as a window to the Global Public Goods. The funding and effort to upgrade websites to exploit this linkage must be part of the project. This effort cuts across GPG's, accomodates pre-existing and future GPGs as well as those in current development, and develops new technology and practices that can be incorporated into current and future GPGs with minimal additional effort by the GPGs

This activity builds on previous work in data standardization and harmonization, and in some ways catches up with and does not duplicate other scientific efforts.



## Objectives

The objectives of this activity are to:

- Strengthen data management and hosting capacities within CGIAR Centres
- Improve data standardization at a system-wide level in key thematic areas (Taxonomy, Geography, Biology etc...)
- Stimulate data integration and management within and between CGIAR Centres
- Develop a decentralized access mechanism to data sources within the CGIAR
- Promote the establishment of Communities of Practice between and within Centres
- Support Challenge Programmes and other CGIAR system-wide initiatives by improving their access to data.

## Outcomes

The principal outcomes of this activity are

For Year 1:

- Inventory of CGIAR scientific data sources is extended and completed
- Safety duplication and backup routines are set in place at Centres level
- A set of information standard dictionaries are developed and agreement reached within the CGIAR
- Methodologies for data exchange and access are developed and agreement reached
- An IPR umbrella is operational
- 4 leading CGIAR Centres are engaged in feasibility studies
- A prototype information pathway is developed and evaluated

For Year 2:

- Guidelines for Centres implementation are finalized and agreement reached system-wide
- A CGIAR information pathway is established system-wide and accessible worldwide
- An additional 4-6 Centres involved

For Year 3:

- All Centres have established an information pathway to their information sources
- The CGIAR information pathway is fully operational

## Activity Leader

Information Manager

## **Timeline**

Specific activities will be carried out according to the following timeline:

For Year 1:

- 1<sup>st</sup> CG-wide scientific consultation meeting with external partners
- 4 Centres implementation started
- Existing standards adopted where appropriate
- CGIAR representative joins related standards bodies
- Coordination with partners
- Initiate system-wide project for decentralized access/Information pathway
- Demonstration of linkages on at least two centers' websites.
- IPR mechanism initiated
- CGIAR standards and methodologies published
- Evaluation of Centres Pathway and CGIAR Information pathway
- IPR mechanism operational
- First external monitoring/evaluation

For Year 2:

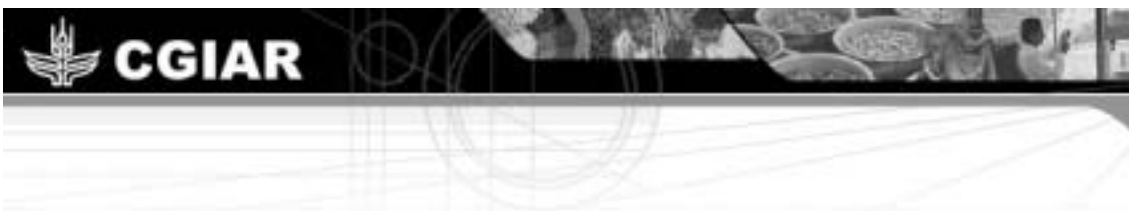
- 2<sup>nd</sup> CG-wide consultation meeting
- 12 Centres implementation starting
- 4 Leading Centres implementation finalized
- Support to CP and other GPGs initiated/operational

For Year 3:

- 12 Centres implementation finalized
- Final external monitoring/evaluation
- Final CG-wide consultation meeting

## **Resource Requirements**

The notional budget is \$445,000 over the three-year period.



## 2.2 Content management

### Context

All centers and challenge programs generate, acquire, organize and deliver large amounts of information. 'Information' covers a wide variety of types, including text, images (graphical, photographic and moving) and sounds. A large proportion of this information is now captured in electronic form. However, the majority of 'information objects' are created with a single delivery vehicle in mind, and in isolation from other related information objects. Assembling related information objects is challenging even within institutes; assembling them across the CGIAR centres is virtually impossible. Converting the information from one delivery form to another (e.g. from a print-oriented publication to a Web-based resource) requires human intervention, using up scarce resources.

The emerging field of content management offers opportunities to separate the creation, capturing and management of content from the vehicle or context in which that content is to be used. This facilitates the delivery of information objects in the most appropriate form for a given audience with the minimum of manual intervention.

Generally, the information operations of the individual CGIAR centres are too small to justify the investment of time and money needed to acquire and put in place a content management system. Working together, such a system would benefit each centre but more importantly would provide the foundation for the creation of a CG-wide knowledge base.

This activity links the fields of information management and publishing (in all its forms) and will be dependent on the skills of both groups.

### Objectives

The objective of this activity is to implement a content management system for the CGIAR that supports a number of important functions, including:

- Support for "integrated publishing" – i.e., material that can be produced and stored once, and reproduced or restructured on to different media many times. Potential output media include paper, web pages, web instruction, CD-ROM, video or DVD.
- Workflow support. Certain processes apply to all publications: assembling, drafting, editing, translation, layout, graphic art, layers of approvals, pre-publication external review, object classification taxonomy (ontology), embargo before release and marketing. It's always a team effort, and nearly always involves a number of specialist contractors as well as several staff members. The software must support this workflow.
- Materials archive: Materials must be saved at various points in the production process, to allow for re-use and restructuring in different outputs. The archive should also be sharable within the CGIAR to allow for reuse in collaborative cross-center publications.
- Multiple languages: Production and systematic translation of materials must be supported in a variety of languages.
- Distributed local function: The key 'players' in this work (authors, publishers, translators, editors, information managers) are distributed throughout the CGIAR and among its partner organizations. The data objects they manipulate are large. It must be possible to work on local servers to get good performance for the publishers while they work.



### **Outcomes**

The outcome of the establishment and use of such a content management system will be a coherent, readily accessible, CG-wide knowledge base that can be delivered in a variety of forms, as needed by various users. It will add value to the current information held by the CG centres and offer opportunities to develop novel, innovative knowledge products.

### **Activity Leader**

Information Manager or Publications Manager

### **Timeline**

The total duration for this activity is about 24 months, including a pilot involving at least 1-2 centers or challenge programs followed by a rollout to all interested centers.

### **Resource Requirements**

A notional budget of \$480,000 is required for the following specific actions:

- Review of requirements and selection of software
- Purchase of servers
- Software loading and hosting
- Consultancy for configuration and customization
- Training for information providers and system administrators
- Evaluation consultancy after initial use to correct and fine-tune the system
- Ongoing software upgrades, especially for XML and web services functions, including associated system administration or hosting effort



## 2.3 CGIAR Information Portal

### Context

A wide variety of electronic and paper based information resources are available throughout the CGIAR system, but there is no way for a user, either internal or external, to easily access or search all of them. Most CGIAR centres address their needs individually by building Library databases and providing access through their websites. The CGIAR researchers require information to support their research and have produced important contributions considered as a Global Public Goods, but each center has its own way of dealing with this. It will therefore be useful to develop a platform that can be developed jointly as a team to allow all centers to centrally manage their resources and provide access to information internally (to licensed products) and publicly to CGIAR Global Public Goods. This could integrate with the overall "Enterprise" information portals that are being developed in the CG.

### Objectives

A CGIAR Information Portal will be created to provide a platform to develop a network for resource management and sharing as well as for delivering high quality services to their users. The portal will allow CG information staff to manage their library holdings and other resources centrally in union catalogs, meantime, provide one-stop access to the current CGIAR libraries collections and other resources through a Virtual Library gateway. This gateway should lead to all information products in the CGIAR. It will also provide access to other leading scientific resources such as bibliographic and non-bibliographic databases, journals and reference materials, which currently vary from center to center but will be pooled. The CGIAR Information Portal should be designed to help CGIAR Centers resolve their development problems through the sharing of knowledge and information resources from various sources.

The portal/gateway would allow CGIAR Centers to develop and manage:

- Library catalogues (OPAC)
- Centers' publications
- Institutional information
- Expert/expertise information
- Research project information
- Image and Photo library

It will also include:

- Statistical data
- Meteorological data
- Expert systems that are developed or being developed by different centers
- Discussion forums to improve communication and dialogue between researchers, extensionists and farmers.



## Outcomes

The outcomes for this activity include:

- Improved tools to allow all centers to jointly manage their information sources, including library OPACs, Centers' publications, CG expert/expertise information, research projects information, and photo library.
- Improved effectiveness of the CG research by giving one-point-access to resources the CG scientists need, such as statistical data (e.g., FAOSTAT), maps on natural resources, NARS institutions, and country profiles, etc.
- Improved quality and relevance of the CGIAR science by giving easy and broad access to CGIAR partners and collaborators.
- An opportunity for integration and sharing of CGIAR information resources and services around the clock worldwide.
- An integrated measurement of use of services that will lead to increased relevance of the collection.

## Activity Leader

Information Managers

## Timeline

The total duration of this activity is about 24 months, including a pilot involving at least 1-4 centers or challenge programs followed by a rollout to all interested centers. During this Phase I, the platform will be developed and delivered across the system, and negotiations and implementation of electronic subscriptions will be done.

## Resource Requirements

A notional budget of \$850,000 will be needed to cover the following specific activities:

- IT platform development \$200,000
- Bring up to date supporting resources as databases and journals to fulfill the needs of the scientists (Web of science back issues, Elsevier, FAOSTAT) \$450,000

Other implementation activities for \$200,000

- Leverage of the systems collections (according to international standards)
- Development and implementation of a common search interface for library collections
- Software loading and hosting
- Consultancy for configuration and customization
- Training for information managers and web developers
- Evaluation consultancy after initial use to correct and fine-tune the system
- Monitoring usage and evaluation
- Ongoing software upgrades, especially for XML and web services functions, including associated system administration or hosting effort.

## 2.4 On-line Learning Materials and Resources

### Context

National research, development, training and education partners and clients continue to express a need for capacity building and strengthening in agriculture and natural resources management. Most CGIAR Centres address this need partly through the organization and implementation of short group training courses and the development of supporting learning materials. However, the demand by far exceeds the offer of such training opportunities and training materials are often the only alternative to extend these activities beyond the primary target of the training. All CGIAR Centres have produced important amounts of teaching and learning materials in different styles and formats. More recently, a number of Centres have made these materials available in electronic format for distribution on CD-ROM or using the internet. Each Centre has its own way of dealing with this and those interested (NGOs, extension services, universities, colleges, policy-makers,...) need to browse and navigate many different sites to obtain the materials they are interested in. It will therefore be useful to develop a single-stop platform for CGIAR learning materials and resources that will make these international public goods more easily available and accessible to all.

### Objectives

The objectives of an ICT/KM project on 'On-line Learning Materials and Resources' will be:

- To produce an up-to-date inventory of all relevant (best practices) teaching and learning materials and resources available from the CGIAR Centres
- To develop a standard navigation structure and format(s) so that these materials and resources become available in electronic and on-line formats to national partners with different levels of technology access and usage skills
- To facilitate the use and adaptation of these materials and references to suit local needs and conditions
- To provide links to other relevant sources of information and reference materials
- To develop intra-center capacity to use standard navigation structures and formats in production of future materials.

### Activities

Implementing this project will require the following activities:

- The organization of a one-week international workshop that brings together training representatives of all CGIAR Centres to present their materials and decide on common standards and formats
- The development of all available learning materials and resources in electronic format(s)
- The development of the single-stop CGIAR 'Learning Resources Centre' portal site
- Concept promotion and development through basic training of center staff, collection of materials and exchange visits
- Managing and updating this site



## **Outcomes**

The following are some of the expected outcomes that will be generated through this project:

- A workshop report and strategy that outlines the modus operandi for the CGIAR to avail its learning materials and resources produced by the Centres
- An updated inventory of CGIAR produced learning and teaching resources
- A single, one-stop 'CGIAR Learning Resources' portal site that provides easy access to these resources
- Centers have the capacity to develop their own materials

## **Activity Leader(s)**

IRRI , ICRAF.

## **Timeline**

The initial phase of this project can be implemented in a single year (2004) with the portal site becoming available towards the end of the year.

Maintenance and updating may require about one month in each subsequent year (2005-2006).

## **Resource Requirements**

A notional budget of \$ 230,000 is required for the following items:

Staff/Consulting time to collect and develop an inventory of all CGIAR learning materials and resources

International workshop that brings together Centre training and education representatives to discuss and agree on navigation and format standards

Staff/Consulting time for the development of the 'CGIAR Learning Resources Centre' portal site

Computer hard/software

## **Annex 3 – Activity Concept Notes**

### **Thrust 3: A CGIAR WITHOUT BORDERS**

There are three general activities proposed for the **CGIAR Without Borders** thrust encompassing 8 specific activities. These are:

#### **3.1 Knowledge Management**

- 3.1.1 Creating and Strengthening a Knowledge Sharing Culture
- 3.1.2 Institutionalizing KM through Participatory KM Strategy Development for Individual Centers, Programs and Challenge Programs
- 3.1.3 Providing Access to Knowledge Sharing Tools and Techniques
- 3.1.4 Supporting Communities of Practice

#### **3.2 Core CG-Wide Intranet for Inter-Group Communications**

#### **3.3 Content and Usage Evaluation**

- 3.3.1 Usage Analysis
- 3.3.2 User Surveys
- 3.3.3 Content Quality Assurance

### 3.1 Knowledge Management

*"If we only knew what we know, we would be 30 percent more productive"  
.....Lewis Platt, CEO of Hewlett-Packard (1992-1999)*

#### Context

Knowledge resides in people's minds and in an organization's culture. Only a small portion of what we know is codifiable or "explicit". The vast majority of knowledge is "tacit" or uncodifiable. Technology's role is to *facilitate* the sharing of knowledge.

What is Knowledge Management?

"A conscious strategy of getting the right knowledge to the right people at the right time and helping people share and put information into action in ways that improve organizational performance." (O'Dell 1998)

"The systematic process of acquiring, creating, capturing, synthesizing, learning, and using information, insights, and experiences to enable performance." (Andersen Consulting)

"Knowledge management is about hiring smart people and getting them to talk to each other. It is not about technology." (L. Prusak 2000)

The CGIAR system, like many organizations, is adept at generating information. However, the challenge is in knowing how to extract and manage the knowledge buried within the volume of information being produced, and then being able to apply that knowledge to emerging needs. Knowledge sharing (management) is a way of putting information, communities, processes, and tools together to allow the CG to collaborate more effectively and make better decisions.

Tools and technologies by themselves cannot ensure successful partnerships, collaboration or teamwork, nor make the CGIAR work as a system; they are necessary but not sufficient. And, while the tools and technologies can contribute to improvements in personal and organizational performance, significant gains require changes in organizational culture and individual behavior. People, and the tacit knowledge they have, are central. It is through greater understanding and the application of "Knowledge Management" principles and approaches that organizational culture can shift towards one of ongoing learning and collaborative sharing of knowledge and expertise.

Knowledge management should be seen as a key part of the core business of the CG System as well as a precondition for accomplishing its goals of contributing to food security and poverty eradication in developing countries.

The CG system generates knowledge as part of its technical leadership and assistance; it possesses a great wealth of technical and non-technical knowledge. This knowledge is embedded in the minds and relationships of key staff throughout the Centers and with their Partners; it often escapes or diminishes as staff leave, is left out of important decision-making discussions, or staff fail to see the value in sharing what they have gained. The CG system needs to know what their technical and non-technical staff and partners know and be able to capture that knowledge in ways that can be used for improved efficiency and impact. It is too costly for the CG system to:

- duplicate what has been done by another center or partner
- lose valuable knowledge when an experienced staff member retires or relocates without leaving behind an adequately trained and knowledgeable replacement
- laboriously collect reports, project results, system-wide efforts, and management decisions that may be scattered throughout the CG system.

#### Why early KM attempts failed

Early attempts at KM were unsuccessful because they failed to recognize the importance of tacit knowledge. These early attempts focused more on capturing knowledge stock (through document management systems, best practice databases, and more reporting) rather than enabling knowledge flow between and among people.

It is now realized that the best knowledge transfer technique is face-to-face interaction and that the best knowledge repository is a community or group of people, supported by a technology solution. But technology on its own does not address the problem.

The CGIAR has been exploring KM approaches over the last several years through the Organizational Change Program (OCP). Changes in behavior and organizational cultures do not occur overnight. Continuing efforts are required.

There are four activities within the proposed KM activity. These are:

- 3.1.1 Creating and Strengthening a Knowledge Sharing Culture;
- 3.1.2 Institutionalizing KM through Participatory KM Strategy Development for Individual Centers, Programs and Challenge Programs;
- 3.1.3 Providing Access to Knowledge Sharing Tools and Techniques to Support a Knowledge Sharing Culture within the CG System; and
- 3.1.4 Supporting Communities of Practice.

#### **3.1.1 Creating and Strengthening a Knowledge Sharing Culture**

Organizational culture is a complex subject. To develop a knowledge management culture where knowledge sharing is appreciated as being in everyone's best interest is a significant challenge. Creating and strengthening a Knowledge Sharing (KS) culture involves people's beliefs and building trust within an organization, so expecting very rapid changes is unrealistic. The participatory development of KM strategies for individual centers, programs and challenge programs is an important first step in embedding a KS culture. Good KM strategies are based on simultaneous, semi-coordinated introduction of different activities and tools, both big and small. One key component for the CGIAR to establish a knowledge culture is that there must be a critical mass of people who take personal responsibility. Awareness-building through events such as workshops and Knowledge Fairs are essential to getting the necessary buy-in and creating this sense of responsibility. The nurturing of KM champions – from every level - will also be crucial to effecting change in the organization's culture. Two sets of activities are envisaged to create and strengthen a knowledge sharing culture within the CGIAR:

- KM Workshops
- Knowledge Fairs



## **KM Workshops**

These workshops will provide an orientation to KM concepts, processes and tools so that CGIAR management and staff have a common framework and foundation for planning and decision-making related to the application of KM approaches and techniques. Different workshops can be envisaged for various sets of CGIAR personnel.

## **Outcomes**

The outcomes of this sub-activity are:

For Senior Management – to expose senior managers to KM thought leaders and to other successful global organizations and systems in order to get the necessary leadership buy-in to KM and learning.

The result - concrete support by Senior Management for the implementation of the ICT-KM strategy and the ongoing integration of KM approaches towards significant CGIAR culture change.

For Human Resource Managers – to develop policies and approaches for promoting appropriate organizational culture: incentive systems; performance appraisals; staff development policies; mentoring.

The result - revised policies, performance appraisals and incentive systems enabling staff knowledge sharing and influencing their work behaviour.

For Scientists and all staff - to sensitize staff to the role of KM in their work and to the benefits of knowledge sharing.

The result - staff participate in and help shape the development and application of KM strategies with a concrete grasp of the issues.

## **Activity Leader**

The Chair of the CDC ICT-KM Sub-Committee (who oversees the entire process and coordinates the work of different partners).

## **Timeline**

During the first year, a total of five workshops will take place:

One for Senior Management

One for Human Resource Managers

Three workshops for Scientists and CG staff (one in Asia, one in Africa, one in LAC)

## **Resource Requirements**

Estimated cost per workshop: \$20,000 plus participants' costs

Total cost: 5 workshops X \$ 20,000 = \$100,000 plus participants' costs

### **Knowledge Fairs**

Knowledge Fairs would be conducted at Centers and during AGM / CDC and CDDC sessions to update Center Directors and others on the results of KM initiatives and to continue to expose CG leaders to KM thought leaders in order to reinforce necessary leadership buy-in to KM activities and culture change within the CG.

### **Outcomes**

Concrete support by Senior Management for the implementation of the ICT-KM strategy and the ongoing integration of KM approaches towards significant CGIAR culture change.

### **Activity Leader**

The Chair of the CDC ICT-KM Sub-Committee (who oversees the entire process and coordinates the work of different partners).

### **Timeline**

During the second and third year, a total of ten Knowledge Fairs (five per year) would be organized.

### **Resource Requirements**

Cost per activity: \$10,000

Total Cost (10 Fairs X \$10,000): \$100,000

### **3.1.2 Institutionalizing KM through Participatory KM Strategy Development for Individual Centers, Programs and Challenge Programs**

Valuable experience has been gained by ICARDA and IWMI in the process of a participatory development of a KM strategy for their Centers. This approach, described below, can be improved through the learning from the earlier experiences and applied to other Centers, Programs or Challenge Programs. The approach included:

- Consultation and knowledge / relationship mapping: this scoping exercise, done through individual and group interviews, will allow the CGIAR to see how knowledge is generated and shared. This will also seek to identify existing KS processes and tools and gather suggestions from staff on potentially useful practices, obtain their ideas on opportunities and constraints for KM in their center or program and identify potential KM champions.
- Knowledge gap analysis: the team will analyze the collected data and identify the opportunities, strengths and challenges that arise.
- Preliminary recommendations: the results and findings will be documented in a draft strategy paper, which will be distributed to all staff and managers.
- Online consultation and/or face-to face workshop: a face-to-face and/or online event will provide staff and managers with an opportunity to provide feedback.
- Final recommendations / action plan: the team will elaborate a final report containing data, analysis and feedback from previous phases, as well as an action plan and TORs for implementation.



## **Outcomes**

A simple blueprint for action, developed by the staff to address their KM needs

## **Activity Leader**

The Chair of the CDC ICT-KM Sub-Committee (who oversees the entire process and coordinates the work of different partners)

KM Champions from within Centers

## **Timeline**

Over a three-year period, a total of six KM strategy development processes (two Centers per year) would be undertaken.

## **Resources Required**

Cost per strategy development \$50,000

Total cost: 6 GC Centers KM strategy development X \$50,000 = \$300,000

### **3.1.3 Providing Access to Knowledge Sharing Tools and Techniques to Support a Knowledge Sharing Culture within the CG System**

The need to know, why knowledge sharing is important to the CG system, know who are potential partners both within and outside of the system as well as who is working on specific research agendas and programs, know how to work effectively across centers and with partners, know what specific tools and techniques are available to share knowledge, know where to access information, and know when knowledge sharing techniques would be most appropriate are part of this objective.

Specific activities that would enhance the access to knowledge resources within the CG System include:

- Pilot Training course on Knowledge Sharing Tools
- Access to Practical Guides and Best Practices

#### **Pilot Training Course on Knowledge Sharing Tools**

##### **Objectives**

A 5-day pilot course is proposed that would be designed to build knowledge and skills around several basic Knowledge Sharing tools and techniques. Sessions would include modules on Basic Facilitation Skills; Formation of Communities of Practice; and Use of Before, During, and After Learning Techniques such as Peer Assists and After Action Reviews. The course would be offered both within centers and across the system for individuals who are charged with helping teams be more effective at collaborating on their work. Total number of participants per course: 20-25



## **Outcomes**

By the end of the course, a core group of CG staff will have the basic skills to initiate knowledge sharing methodologies within their centers.

## **Activity Leader**

The Chair of the CDC ICT-KM Sub-Committee (who oversees the entire process and coordinates the work of different partners)

## **Timeline**

The course would be designed and piloted during the first year, with at least one delivery per year for the following 2 years.

## **Resources Required**

Total Cost \$100,000 (not including participants' costs)

## **Access to Practical Guides and Best Practices**

### **Objectives**

The objective of this activity is to provide access via the CG-wide intranet for inter-group communications to the Tips and Tools documents on Knowledge Management and Collaborative Alliances created as part of the Organizational Change Program. The material is available as PDF files on the TRG website: [HYPERLINK "http://www.trg-inc.com/orgchange/" http://www.trg-inc.com/orgchange/](http://www.trg-inc.com/orgchange/)

Members of the systems office are also producing materials that may be of interest to CG staff and these could also be linked to the CG-wide intranet. For example, the CGIAR Gender and Diversity Program has just released its new publication, entitled: *Working with Diversity in Collaborations: Tips and Tools*, which could also be linked.

There would be no additional costs to the CG system for accessing any of the information available on these website. All of the Knowledge Management and Collaborative Alliances Tips and Tools documents created as part of the Organizational Change Program are available as PDF files on the site.

## **Outcomes**

As a result of this activity, all CGIAR staff would have easy access to a comprehensive set of KM tools and techniques that they could then use to strengthen the KM culture of their community, program and Center. Note that the Intranet activity (3.2 below) also will produce KM resources of value to the whole CGIAR.



### **Activity Leader**

The Chair of the CDC ICT-KM Sub-Committee (who oversees the entire process and coordinates the work of different partners).

### **Timeline**

This activity would be carried out during the first year in concert with the roll out of the intranet.

### **Resource Requirements**

Intranet system described in the Core CG-wide intranet for inter-group communications. No additional financial resources are necessary.

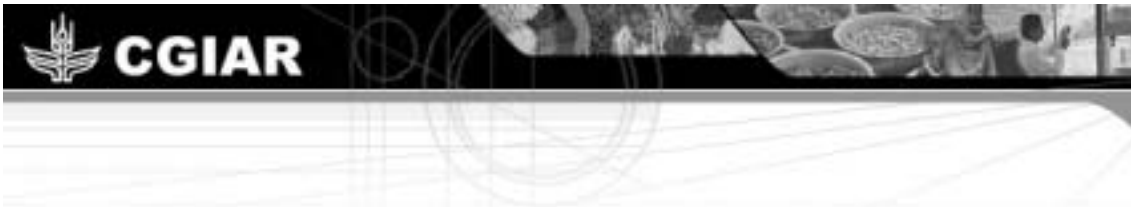
## **3.1.4 Supporting Communities of Practice**

### **Objectives**

The CGIAR has expertise in many areas, from the sciences to practical agriculture to economic development to research management. The Internet is increasingly used as the channel for communication within communities of practice ("CoP"), especially when the practitioners are dispersed around the globe and in numerous different organizations. CGIAR staff should be active participants in online CoPs, contributing from their experience. The CGIAR would thereby become known as an authoritative source of information in its areas of expertise within these communities. In addition, the CGIAR will be more able to attract collaborators in future work based on its reputation in these communities. This also applies to internal CoPs within the CGIAR system.

When online communities work, they are quite productive and have a big impact. But many attempts at online communities do not succeed and sustain themselves. How to achieve success? The CGIAR should try a few alternatives and set up a learning process to institutionalize the successful parts. Several distinct efforts should be done:

- CoPs relevant to the work of the CGIAR should be identified and brought to the attention of the CGIAR's various specialists, and projects should be formulated to make CGIAR specialists available to these CoPs. After some initial efforts, this can become an ongoing effort.
- CGIAR centers should sponsor CoPs where they are needed and where CGIAR staff could constitute a critical mass of members. This should be in collaboration with related institutions appropriate to the CoP, so as to encourage the broadest participation. (This would build on experience to date with the many CGIAR listservers.)
- Engage in a series of topically focused and time-limited projects to generate content for CoPs. Whether partnering with an existing CoP site or building up a CGIAR-sponsored CoP, an organized CGIAR contribution would be a prominent and rewarding effort. For example, CGIAR biotech staff could contribute information about options for rice to the CABI's Agbiotech site, producing materials and fielding questions across a 4-week period. (This could be even be coordinated with the release of a new CGIAR publication or education event, both to re-use material and to spread awareness about it.)
- Support a group of CGIAR staff to maintain personal web logs. The group should work in closely related areas, so that their materials can reinforce each other, such as public policies for forestry, agro-forestry, and conservation. (Knowledge-oriented weblogs, or "k-



logs," are a new and fast-growing way of building a distributed CoP. They have the advantage of serving as personal productivity tools for the user producer of the weblog.)

- Support IT or library staff in some centers to become CoP facilitators. The facilitators' role is to assist CGIAR researchers in understanding, utilizing, and contributing to CoPs in their field. Facilitators should be trained in the general process of facilitation, without being tied to a particular software platform (since CoPs are supported both inside and outside the CGIAR).

### **Outcomes**

As a result of this activity, CGIAR staff would be desirable participants in international CoPs, more and more CGIAR staff would be comfortable playing various roles within CoPs, and the CGIAR system would benefit from increased and more relevant knowledge sharing both within and beyond the system.

### **Activity Leader**

The Chair of the CDC ICT-KM Sub-Committee oversees the entire process and coordinates the work of different partners such as: a research manager, ideally one with some authority to encourage participation among scientists in more than one center; a support team, with one or more librarians (to identify and research relevant CoPs); IT staff (to support systems); and possibly an educator or a publisher to provide content and leverage for the team.

### **Timeline**

The total duration of this activity would be approximately 8 months, with many activities in parallel.

### **Resource Requirements**

A notional budget of \$340,000 would cover the following components:

- Review of requirements and selection of CoP software
- Purchase of servers
- Software loading and hosting
- Consultancy for web site configuration and customization to suit CGIAR purposes
- System administration staff to coordinate the different contributors to the CoP (setting up accounts, making top-level changes, etc.)
- Training for facilitators and system administrators
- Facilitation staff, supplemented by some CoP consultant facilitation
- Ongoing evaluation consultancy to fine-tune the system and publish lessons learned
- Management backing to encourage staff participation

### **TOTAL THREE-YEAR KM Activity 3.1 BUDGET:**

5 workshops X \$20,000 = \$100,000  
10 Knowledge Fairs X \$10,000 = \$100,000  
6 GC Centers KM strategy development X \$50,000 = \$300,000  
Providing access to tools = \$100,000  
Supporting CoPs = \$340,000  
Total Cost = \$940,000



## 3.2 Core CG-Wide Intranet for Inter-Group Communications

### Context

The CGIAR lacks a common point of reference for internal information postings, discussions, and shared applications. With the investment now being made in Active Directory, a system-wide infrastructure for information sharing is being built. Now would be a good time to leverage that investment in an intranet web site that would tie together the internal shared application needs of the system. The focus of an intranet is to improve the efficiency of inward-looking processes in an organization. In particular, the intranet could house the following shared inter-center applications, each of which can be considered a separate initiative.

### Objectives

A new website (for now, call it 'intranet.cgiar.org') would provide a common home for information and tools relevant to the entire CGIAR community. This would function like standard corporate intranet 'portals' of today. Intranet components could include:

### Outcomes

A CGIAR Bulletin Board:

This is a one-stop space for news and current events across the CGIAR. Any center or cross-center initiative or shared system entity could occupy an area of the site for publishing its announcements, documents, and calendar. Users would have facilities to customize the portal to their interest profile, for example to highlight certain announcements, and to combine relevant events into a single calendar. The site would allow searching across the CGIAR for internal documents. Basic content could include:

- Shared calendars
- Shared CGIAR Reports/ Results
- Recognition/special awards
- Announcements/celebrations

CGIAR Directories:

This is the place where users can link to all the people in the CGIAR and learn about their expertise, providing the means to connect scientists and professionals to solve common problems or find others who have already solved the problem. This will save CG staff time and money from having to reinvent the wheel and thereby enabling their work to have a quicker impact for their clients. Examples of potentially useful directories include:

- Know Who/what (staff directory and expertise; CGIAR Communities of Practice)
- Systems' Office
- CGIAR Committees (ExCo, CBC, CDC, CDDC, etc.)
- Science Council
- Information Sources (linked to CG Virtual Library)



### The CGIAR Managers' Briefcase

This is where leaders and managers of the CGIAR tap into practical guidelines, models, best practices, and other applications for achieving organizational excellence. Vetted tools for project management, finance, and administration would be located here. Intellectual property guidelines are an essential part of the Managers' Briefcase. AIARC and the System-wide Gender and Diversity Programme would be asked to fill the site with HR material. There is also a pressing need to develop shared information resources donor intelligence at the system level. This activity will involve close cooperation with the CGIAR Systems Office, Marketing Group, and others to better develop and manage a clearinghouse for fundraising information. Recommended content (a non-exhaustive list) would include material of relevance to: RM (Marketing); HR; G&D; Finance; IAU; and IP (CAS).

### The 'Platform Emporium'

In this space, users will be able to access tools and software for facilitating inter-group communications. The CGIAR should have access to a portfolio of multi-media tools for virtual teams and KM that can be combined as needed. These could include:

- Virtual team coordination: private small-team workspaces
- On-line events: open, small or large-scale, real-time presentations, often open to the public, sometimes including live video, and always with the ability to record and view the event later
- Weblogs and collaborative searching and retrieval: the use of personal web sites as both a tool for personal information organization, and as a means for collective exploration of cross-disciplinary topic areas ("knowledge logs" or "k-logs")
- Communities of practice: workspaces and websites with indexed collections of people and material, to allow for knowledge sharing and the discovery of experts and best practices
- Multimedia videoconferencing: the integration of personal and room-based videoconferencing facilities for long-distance face-to-face meetings
- Compendium development: web-based tools to allow large numbers of content experts to collaboratively build a compendium (or portal) with comprehensive coverage of a topic or discipline
- Telephone conference calling
- Shared desktop or shared whiteboard distant presentation tools (e.g., WebEx)
- Conference and presentation recording and playback tools, to make them available across time differences
- Shared workspaces (e.g., Groove, Sharepoint Team Services)
- Meeting augmentation tools (voting, brainstorming)
- Instant messaging

### Activity Leader

Knowledge Manager

### Timeline

The total duration of this activity will be about 15 months, through two rounds of revision and expansion.



### **Resource Requirements**

The notional budget for this activity is \$380,000 covering:

- Intranet servers
- Software components
- Software configuration and customization
- Training for system administration
- Training for information providers
- Initial content preparation
- Evaluation of first phase
- System administration and coordination

### **Monitoring and Evaluation**

Web report software would be used to monitor usage and content downloads. Inactive and underutilized material and components would be analyzed, and when needed, eliminated, in an effort to ensure that the intranet is demand driven.

### 3.3. Content and Usage Evaluation

#### Context

The CGIAR will need an ability to judge the effectiveness of its work in Global Public Goods (GPGs). The GPGs are currently being funded under a CGIAR system-wide effort. They include web-based public databases covering forestry research, policy and social science research, and global spatial datasets. Related work is also being funded in genebank and breeding data. To judge the value and effectiveness of these efforts, the CGIAR should be able to answer the following questions about any GPG:

- How many people in the target audience are aware of the GPGs?
- How many actually use it?
- How can the GPG be promoted?
- What additions would be considered most valuable?
- Are there technical or content issues that impede the usefulness of the GPG, and how have those problems been overcome elsewhere?
- What other organizations republish or link to this information? Is that at or below potential?

Systematic evaluation should be designed into information systems and projects from the outset. There should be also some harmonization of this across CGIAR information efforts. The evaluation data can serve many uses:

- improve and assist the GPG implementation
- provide guidance for modifications and growth
- establish the value of the GPG to donors
- allow for comparisons and thereby understanding of best practices

Too many websites are constructed without regard to evaluation. The use of standard web usage log reporting is never sufficient to provide meaningful evaluation of critical questions. Proper evaluation will require:

- real-time recording of selected web site usage patterns with real-time query and retrieval
- enlistment of a large group of early users who can provide usability guidance while the web site is being constructed or renovated
- periodic voluntary surveys of users to confirm usage record information and provide qualitative feedback
- subscription to external web site quality and performance measurement services
- a group of people available to the CGIAR CIO to provide ongoing analysis of usage evaluation data

In summary, an ongoing effort should be built to gather feedback from the clients and stakeholders of the CGIAR regarding the value of outputs. If successful, it could be expanded to cover publications and training and e-learning as well.



To have these capabilities at hand, the CIO and the information system builders in the CGIAR need the hardware, software, and training to perform these activities. Experience with external services in a pilot effort will also be most helpful.

### **3.3.1 Usage Analysis**

#### **Objectives**

The CGIAR has many websites today, with many more to be added as part of the global public goods (GPG) development. A system to measure, analyze, and evaluate the actual usage of these sites is required.

#### **Outcomes**

The system should be able to do the following functions:

- Measure volumes and trends of usage, across a site, a region of a site, a collection of related sites, or across all CGIAR sites
- Analyze usage by country or region of origin
- Compare usage between sites, or within regions of a site
- Compare volumes of usage before and after press releases or other promotional activity
- Respond to requests in as nearly real-time a method as possible

Sites that attempt this sort of measurement discover that ordinary web logging data and reports are insufficient by themselves to provide adequate answers. It is better to incorporate measurement programs into the site, either by the design of the pages or the use of server-based filter programs. In addition, usage information should flow from all sites into a common database for analysis, and that database should be augmented with geographic and other information. The result will be a system that can be used both by the CIO and by the web developers in each center to understand how their websites are being used.

#### **Activity Leader**

CIO in concert with at least one high-volume web publisher in the CGIAR

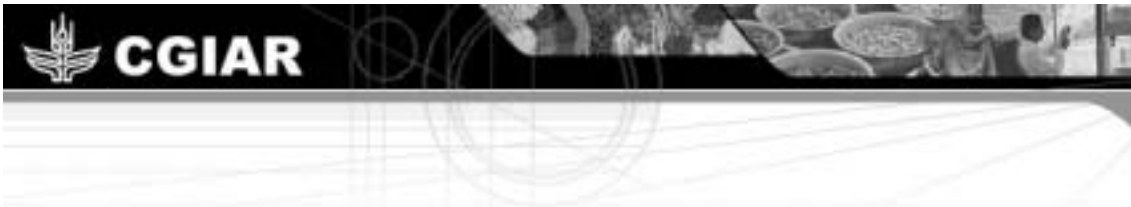
#### **Timeline**

The total duration for this activity is about 10 months, with implementation on web sites of 2-3 centers at first, then a rollout to other centers.

#### **Resource Requirements**

A notional budget of \$240,000 will cover the following components:

- Consultation among CGIAR web developers and consultants to derive requirements, standards, and guidelines
- Purchase of servers and software, including "internet geography" dataset
- Software loading and hosting
- Center-based web site modification efforts to retrofit new measurement methods into their web servers



- Training for web site developers for supporting the standards in future web sites
- Initial baseline report on the state of the CGIAR web presence
- Ongoing staff support for CIO and web developers of a person who specializes in analyzing CGIAR web sites

### **3.3.2 User surveys**

#### **Objectives**

The objective of this activity is to have an ongoing reading of the information needs and wants of CGIAR stakeholders.

#### **Outcomes**

The outcomes of this activity include:

- Identification of types of key stake holders (developing country policy makers, researchers, students; donor country officers, scientists)
- Enlistment of a number of each type to respond to surveys periodically to offer feedback and guidance on the CGIAR's online information efforts
- Use of online and other surveys to find out how they use the Internet, what they hope to find online, what sites they currently visit, what they would like to find that is not online yet
- An ongoing program of surveys so that current information is always available to content developers in the CGIAR
- Use of the surveys to validate and extend usage-based reporting from CGIAR websites.

This work should be coordinated with related survey efforts in other international agricultural institutions. Partnerships with other institutions should be formed when appropriate to share burdens and improve results.

#### **Activity Leader**

CIO in concert with a publications or outreach professional in the CGIAR.

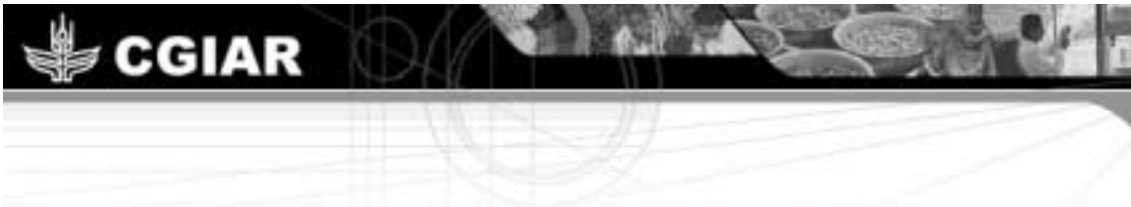
#### **Timeline**

The Initial survey should take about 6 months, with an ongoing program to guide future work.

#### **Resource Requirements**

A notional budget of \$125,000 will cover the following components:

- Review of current efforts, both inside and outside the CGIAR
- Identification of key gaps in information about stakeholder needs
- Contact information from current CGIAR outreach efforts in each stakeholder group, from training records, newsletter subscriptions, conference attendance, etc.
- Selection and deployment of online survey software or services



- Consultancy for initial efforts, and staff support for ongoing work

### **3.3.3 Content quality assurance**

#### **Objectives**

The objective of this activity is to promote higher quality web sites by detecting and correcting problems in content quality.

#### **Outcomes**

This activity will result in automated tools that can:

- Detect problems in web content in any CGIAR website. Problems could include inappropriate size of graphics, excessive click depth of materials, broken links, categories with no content, areas with old content, etc.
- Contract services that provide realistic tests for feedback on site performance and user experiences from various locations around the world
- Distribute reports of detected problems and performance results to appropriate web publishing staff for the site where the problems are found
- Track detected problem reports, to highlight both quality improvements and long-standing uncorrected problems

Measurement and feedback will lead to faster correction of problems, or design around the problems, resulting in more usable and reliable provision of global public information goods.

#### **Activity Leader**

CIO in concert with Web developers, especially those with complex sites.

#### **Timeline**

This activity will take about 5 months.

#### **Resource Requirements**

A notional budget of \$80,000 will cover the following components:

- Selected software for problem detection and tracking
- Selected services for performance measurement
- Servers, and hosting fees for software
- System integration for distribution of results to appropriate web developers
- System administration staff to coordinate the different users of the information
- Online Training for web developers