



## **CASE STUDY: Institution Based Systems, Ghana GAINS**

### **EXECUTIVE SUMMARY**

*The Ghana Agricultural Information Network System (GAINS) is a Ghanaian information network which has primarily been used for the sharing of agricultural research information. Since 1991, it has linked the libraries of 18 of Ghana's agricultural research and academic facilities to each other and to external contacts. It facilitates a question and answer service to address stakeholders' agricultural information needs, attempts to improve the accessibility of locally produced research, and builds the capacity of stakeholder institutions' libraries and information management professionals. It is managed by a coordinating centre based in the secretariat of the Ghana Council for Scientific and Industrial Research (CSIR).*

*GAINS' purpose is to bring together the creators and disseminators of agricultural research information in Ghana to increase information sharing and collectively address their common needs. GAINS' coordinating centre has been increasing stakeholders' collective access to scientific information, especially international journals, and in seeking external partnerships. However, the network faces major challenges in assisting its member institutes to improve their own information management and sharing capabilities. Despite the efforts of the coordinating centre, locally generated research output is still quite difficult to access, as very few of GAINS' member institutes have functioning repositories of their research output, and even fewer effectively share their output with the rest of the network. GAINS was formed as part of a national government program, rather than from the initiative of member institutes, and members have often been unwilling to devote sufficient resources to their library systems or to the network. GAINS is currently trying to re-position itself to increase member participation, and recently held stakeholder workshops for this purpose.*

*GAINS has also recently been attempting to expand its focus to address the needs not only of research and academia, but also of end users such as farmers and intermediaries such as extension agents and community radio stations. This is partly in response to donor funding priorities.*

### **1. BACKGROUND**

#### **Reason for establishment**

Ghana has a large number of scientific and technical research institutions, largely focused on agriculture, which for many years has been operating independently without a formal information network. With World Bank assistance, Ghana established a more coordinated National Agricultural Research System in 1991. One element of the project was the development of GAINS as an information network within the system. Member institutes have always had their own libraries, but they suffered from weak information management capacity, lacked a co-ordinated approach to making the research outputs of their institutions available, and generally lacked the budgets to afford their scientists access to current international scientific publications. Many still have these problems. GAINS was supposed to address these issues by facilitating information sharing between member institutes, building the capacity of their libraries, and using a coordinating centre to seek partnerships with donors and become a single collective repository of international journals and other materials that all member institutes could use. GAINS

was also supposed to identify, index and make accessible Ghana's own agricultural information, and be the Ghanaian focal point for the AGRIS network, which collects unpublished agricultural literature from developing countries.

### **Organizers**

GAINS is intended to be a collaborative network of its stakeholder institutions, managed by them as nodes, rather than centrally organized. These nodes are linked by the coordinating centre, to which stakeholder institutions can refer requests for information, and which seeks to ensure that all locally produced information is centrally available. This centre is based in Accra, at the secretariat responsible for Ghana's research institutes, the Council for Scientific and Industrial Research (CSIR). It is specifically hosted by CSIR's Institute for Scientific and Technological Information (INSTI).

### **Funding sources**

GAINS is funded by the Government of Ghana, primarily through World Bank projects such as the National Agricultural Research Project (NARP) (1991-1999) and the Agricultural Services Sub-Sector Investment Project (AgSSIP) (2001-2005). GAINS has also received funding for various projects and capacity building initiatives from the Technical Centre for Agricultural and Rural Cooperation (CTA), the Royal Tropical Institute of the Netherlands (KIT), the International Institute for Communication and Development (IICD), and the Food and Agriculture Organization of the United Nations (UN FAO).

### **Marketing and promotional strategy**

GAINS' coordinating centre attempts to promote the network both externally, to gain support and funding and make local resources known outside Ghana, and to stakeholder institutions in order to increase participation. GAINS publishes a newsletter 2-3 times per year, sent to stakeholder institutions, offering information about different agricultural developments, as well as lists of available information resources and trainings offered, and an information request form. It also publishes Ghana Science Abstracts Bulletin (GhaSAB), a quarterly publication of abstracts of papers produced by stakeholders. GAINS' website, [www.gains.org.gh](http://www.gains.org.gh), contains links to databases of Ghanaian research outputs and an archive of the newsletter. The GAINS coordinators also travel around the country visiting stakeholder institutions, meeting with librarians and scientists. Contact people at stakeholder institutions, such as librarians and scientists who have been chosen to attend trainings, are also relied upon to make others aware of GAINS. However, many scientists are still unaware of GAINS, interacting with it only through their librarians. GAINS has also only recently begun experimenting with promotion to non-research stakeholders such as district agricultural extension offices and other information disseminators such as community radio stations.

### **Summary time path**

GAINS was originally a node of a general scientific and technical information network known as GhaSTINet (Ghana Scientific and Technical Information Network). The node was based in the Ministry of Food and Agriculture library, but did not receive a great deal of support from the Ministry's directorates. In 1991, Ghana began a World Bank-funded program to strengthen the capacity of its agricultural research system (the National Agricultural Research Program, or NARP) and it was decided that GAINS should be developed into a network of its own to coordinate and build capacity among all the research institutions' libraries.

Because the Ministry of Food and Agriculture had not been an effective host in GAINS' previous incarnation, and because most of Ghana's research institutes were stakeholders of CSIR, GAINS was moved to INSTI. The project rehabilitated the libraries of member institutions and provided them with computers and office and telecommunications

equipment and trained librarians in the development of databases. In 1992, GAINS created GHAGRI, a national database containing abstracts of research output from member institutions.

At the end of the NARP, in 1999, GAINS began partnering with CTA in the implementation of a Question and Answer Service intended to allow stakeholders in agricultural development to access information services on demand in the form of responses from researchers, bibliographic references, and full text documents. CTA had previously been managing such a system from the Netherlands for partner organizations, but decided to devolve the system to local partners for improved efficiency, and made GAINS the Ghana contact point. CTA equipped the coordinating centre with databases of research journals, which it updates yearly, and bought more computers for the libraries of GAINS institutions.

In 2000, GAINS developed a website, with the initial support of CTA, from which GHAGRI and other databases were searchable. Around 2001/2002, KIT connected GAINS to IICD, which helped the co-ordinating centre install a local area network, arranged improved web-hosting, and trained member institute librarians in information retrieval. In 2002, GAINS began receiving funding under another World Bank agriculture program, the AGSSIP.

In more recent years international initiatives have improved GAINS' capacity to help researchers access information. These have included the Programme for the Enhancement of Research Information (PERI), the Système d'Information Scientifique et Technique (SIST), and the provision by CTA of The Essential Electronic Library (TEEAL) to the network. These are further described under 'Products and services.' A major recent development is AGORA, an online database containing over 900 full text agricultural journals that is free to users in developing countries. AGORA is a partnership between FAO, major publishers, Cornell University, the Mann Library, and the World Health Organization. Individual stakeholder institutes also participate in initiatives on their own. One example is the Forestry Institute of Ghana (FORIG)'s participation in the Global Forest Information Service (GFIS).

In an attempt to extend the Question and Answer service to more stakeholders, CTA and IICD have also recently encouraged GAINS to support access to agricultural information for non-research stakeholders such as extension agents and farmers. In 2003 KIT supported GAINS in doing a survey of the information needs of these actors, and has attempted several pilot projects in this vein, in partnership with MoFA and with community based organizations, with varying success.

GAINS undertook a further information needs analysis in 2005 to determine the best ways to support linkages between research institutions and extension agents, and held a stakeholders workshop in November 2006 to discuss how to reposition itself in order to increase its usefulness to non-research stakeholders and to increase participation and ownership by member institutes, the latter having been its major challenge thus far.

The workshop allowed stakeholders to contribute their views as to their vision of a new GAINS, and currently the co-ordinating centre is developing an action plan based on these inputs. Among possible directions are a decentralization of GAINS activities, possibly through the creation of a coordinating centre for each zone, improved ties with MoFA, and the development of a Memorandum of Understanding formally clarifying member institutions roles, responsibilities, and necessary contributions. These changes will be crucial to GAINS' success in reaching non-research stakeholders, as this is beyond the role and capabilities of the existing coordinating centre. It is hoped that the member institutions will become stronger, and the coordinating centre become more of an enabler.

### **Geographic coverage**

GAINS has a relatively small coordinating secretariat, but is composed of stakeholders across Ghana, including the nine agriculture-based institutes within the CSIR network, the Biotechnology and National Agricultural Research Institute (BNARI), the agriculture faculties of most of Ghana's universities, and the library of the Ministry of Food and Agriculture. Though until recently it has only focused on research institutions, it is intended to serve all stakeholders in agricultural information in Ghana.

### **Relation to national policy on information and communication**

GAINS has from its outset been funded by the Government of Ghana as the information sharing component of its World Bank Agriculture Projects. The government's recent National ICT for Accelerated Development Policy discusses the need for increased access to and exchange of research information, and the Ministry of Food and Agriculture's ICT strategy mentions strengthening GAINS as a key strategy of its plan to revitalize agricultural research and development.

GAINS' efforts to become a resource for non-research stakeholders tie into Government efforts to improve linkages between agricultural research and extension, in response to concerns that Ghanaian agricultural research was not contributing effectively to Ghana's agricultural development.

## **2. OBJECTIVES**

The objective of GAINS is to improve the capacities of stakeholders in agriculture and rural development to access information in support of their activities.

In this capacity, it is intended:

- To coordinate and encourage networking between the libraries of all stakeholder institutions
- To act as a centre to which librarians and scientists can refer requests for information on agriculture
- To collect and disseminate locally generated agricultural research information
- To build the capacity of its stakeholder institutions to fulfil all of the above functions.

GAINS has for most of its life been focused primarily on providing information for agricultural research scientists and academics and collecting and disseminating the products of their research, but it is currently trying to increase its capacity to be a resource for end users such as extension agents and farmers, by helping to repackage research information for greater accessibility, and has engaged in pilot projects with this purpose in mind.

## **3. STAKEHOLDERS**

### **Rural service providers**

#### Information producers

GAINS' major stakeholders have traditionally been the librarians and scientists of its stakeholder institutions. There are approximately 500 scientists spread across the country actively involved in agricultural research and development, as well as lecturers and students focused on agriculture-related topics at Ghana's universities.

#### Information disseminators

Traditionally, GAINS only related indirectly to the disseminators of research information but recently has begun experimenting with more direct interaction with extension agents and other information intermediaries, helping them to repackage research information into formats better fitting farmers' needs. The target groups GAINS is hoping to serve better include MoFA extension agents, community-based FM stations producing

agriculture programs, local NGOs focused on agriculture, and other information professionals.

### **Rural communities and households**

Rural Communities and Households are intended to be the end beneficiaries of the research supported by GAINS. However, GAINS does not interact directly with these stakeholders, and mainly provides information to support researchers, and more recently information intermediaries. GAINS does have some interaction with Farm Based Organizations.

### **Policy makers and their advisors**

Policy makers of Ghana's National Agricultural Research System benefit from the improved access to agricultural information that GAINS provides. The increased capacity of local researchers to access information also improves the quality of their research, which is often used in policy decisions.

### **Relationship between the groups**

Rural Service Providers such as extension agents, NGOs, and farm-based organizations are generally rural communities' and households' main links for scientific agricultural information. Information is passed through field visits, radio broadcasts, and face to face meetings. However, until 1994, there was very little relationship between Ghana's researchers and its extension system. While a few partnerships were developed, no formal mechanism existed for researchers to consult extension agents or farmers in their choice of topics. Likewise, extension agents received their information from the Ministry of Food and Agriculture, rather than directly from the research institutes. In 1994, Research Extension Linkage Committees (RELCs) were created to facilitate co-ordination between researchers and extension agents so that research would be more directed towards the expressed needs of farmers. This information is then disseminated through extension agents and through the Ministry of Food and Agriculture's Information Support Unit. Since 2003 there has been a RELC in each of Ghana's 10 regions. In its new re-positioning, GAINS is now trying to become more of an on-demand resource for district extension offices, so that district directors can use the network directly to search for information. This is in part because GAINS is the Ghana focal point for CTA's question and answer service, which is supposed to be a resource for end-users as well as researchers.

### **Relationship with community and local government**

GAINS has informal relationships with several farmer organizations, which generally arose from the heads of organizations contacting GAINS for information requested by their members. GAINS has recently begun piloting more formal relationships with district agricultural information centres and community-based radio stations in an attempt to extend its Question and Answer service to end user stakeholders. Previous to this, GAINS had almost no formal relationships with communities or local government.

### **Model of ownership and/or governance**

A GAINS coordinator manages the network's day to day operations. The overall direction of the network is overseen by an 11 member board containing representatives from the Ministry of Food and Agriculture and GAINS' stakeholder institutes and universities. The Deputy Director General of CSIR and the GAINS coordinator are also members. In addition a committee of libraries is supposed to meet quarterly to guide the network's operations, chaired by the GAINS coordinator. Changes to the governing body are currently being undertaken as a result of the November stakeholder workshop, which called for a more representative structure.

### **Motivation of stakeholders' participation**

Participation in GAINS can take many forms. Stakeholders can access information through the network, use it as a platform to disseminate their research outputs, gain

skills through capacity building trainings, or participate in governing the network or in building its information content. Many stakeholders are motivated mainly by a desire to access information. Most of Ghana's research institutions do not have the budgets to keep journal subscriptions up-to-date, and scientists see GAINS as a means of accessing current materials. While scientists can also benefit from increased visibility and accessibility when GAINS publishes their output in international databases, many scientists do not yet seem to recognize this benefit enough to want to submit their material. Librarians and some scientists are also motivated to participate in GAINS' capacity building trainings, which give them skills to improve their work. Thus far motivating stakeholders to contribute to the network rather than just using it as a service has been a major challenge.

#### **4. PRODUCTS AND SERVICES**

##### **Information content**

GAINS offers access to agricultural research information, both from local research institutions and from international journals.

Its resources of specifically Ghanaian information include:

- The Ghana Agricultural Research Information (GHAGRI) database- a database of records of locally produced agricultural research
- Union List of Agricultural Serials (ULAS)- a list of journals held by stakeholder institutions,
- An Experts database of Ghanaian specialists on various agricultural subjects
- Records from the Ghana Science Abstracts Bulletin (GHASAB)
- A directory of the agricultural databases held by the various GAINS stakeholder institutions
- A directory of Ghanaian agricultural student theses and dissertations

GAINS' international resources, available on CD Rom and online, and which also comprise some Ghanaian material, include:

- Access to Global Online Research in Agriculture (AGORA), an online full text database of over 900 journals, which is accessible free to research institutions in developing countries
- The Essential Electronic Agricultural Library (TEEAL), which contains full text contents of over 140 journal titles on 426 discs and is updated yearly
- AGRIS, a database of bibliographic references to grey literature from around the world, including Ghana
- CARIS, a database of current agricultural research projects worldwide
- A database of FAO documentation and a catalogue of FAO publications
- AGRICOLA- a bibliographic database of citations, with many records linked to online full text documents
- Programme for the Enhancement of Research Information (PERI)
- African Journals Online (AJOL) – which includes Ghanaian journal content
- Database of African Theses and Dissertations (DATAD)
- Global Forest Information Service (GFIS) is available through FORIG
- Science Direct, an international database made available through KIT containing 1700 online journals
- Virtual libraries of data and abstracts from the International Livestock Research Institute, EIARD-InfoSys, CABI, and KIT's TROPAG and RURAL.
- Reports from the Consultative Group on International Agricultural Research (CGIAR)

- GAINS also receives a yearly budget from CTA for publications it can order for requesting stakeholders, though this is not frequently used, and does not seem to be widely known by researchers.

Agriex, Ghasab, Ghagri, and the thesis database, as well as the GAINS newsletter archive, are accessible from the GAINS website, and many of the international databases are accessible from their own sites. GAINS sends out lists of available materials to institutions and includes them in its newsletter, and researchers or librarians are expected to request it.

### **Approaches to content development and management**

Internationally generated information is made available from various journals through the databases of abstracts and full text articles listed above. Generally the choice of databases and CDs is based on what is made available by donors. Locally generated information is developed by researchers at stakeholder institutions and is verified by the submitting institutions.

### **Language, complexity, source, format, medium**

The information provided by GAINS generally consists of scientific documents, which are sent to stakeholder institutions on request in hard copy or made available online. All are in English, and most language is relatively complex. GAINS has recently begun supporting the repackaging of information requested by farmers and extension workers into less complex, more accessible formats such as video and radio programs, some of which are in local languages.

### **Other types of products and services**

GAINS also produces a newsletter and the Ghana Science Abstracts Bulletin (GHASAB) and gives training in various aspects of information management.

### **Training provision**

GAINS has trained librarians at stakeholder institutions in the development of in-house electronic databases of their institutions' documents, as well as how to upload these documents to online databases such as Agris, and has trained liaison scientists at stakeholder institutions to develop institutional websites. Sensitization workshops have also been held for scientists, lecturers, policy makers, extension officers, and librarians and other information professionals. Partners such as CTA, FAO, and IICD have funded most of these trainings, and also supported GAINS coordinating staff in attending international trainings. Very few institutes have thus far put the training into practice. This has been attributed to high turnover among librarians, poor equipment, and lack of support and resources. Some member institutions with other sources of support (particularly FORIG) have sought training and support on some of the same topics independently of the network.

## **5. TECHNOLOGY AND SYSTEMS**

### **IT system architecture**

GAINS' back office IT system includes a database driven website that can be updated both from the GAINS coordinating centre and from stakeholder institutions. Several of GAINS' resources are available online, allowing researchers to use them directly if they have connectivity. Others are housed on CD at the coordinating centre, and abstracts of their contents are put on the computers of stakeholder institutions' computers.

GAINS relies in large part on the IT systems of stakeholder institutions, which vary a great deal. All institutions have been given some sort of infrastructure under different donor projects, but at many institutions, investment in IT infrastructure is still not a

priority. Nearly all scientists use computers, though many have to use their own personal equipment. Many institutions have broken-down hardware that goes unused, and at times institution computers containing the GAINS abstracts have broken, rendering the information inaccessible. All institutions now have connectivity, but often the connections are so slow that scientists go to cybercafés or wait until late at night to browse. CSIR has been for years trying to set up a wide area network with all stakeholder institutions, but has not yet succeeded. Several institutions now have local area networks, and one university will begin running a LAN version of TEEAL on theirs in November 2006, but none are connected to other institutions. Scientists at some institutions have now taken it upon themselves to pay for connectivity out of their own salaries.

### **Software**

GAINS' databases and website are all run on software available free online. The GHAGRI database, hosted at INSTI, runs on WebAgris, a multilingual web-based system downloadable at ([www.fao.org/agris/tools/WebAGRIS/Webagdw.htm](http://www.fao.org/agris/tools/WebAGRIS/Webagdw.htm)). GHAGRI is linked to GAINS' website using the interface software GenISIS, downloadable at ([http://portal.unesco.org/ci/en/ev.php-URL\\_ID=5331&URL\\_DO=DO\\_TOPIC&URL\\_SECTION=201.html](http://portal.unesco.org/ci/en/ev.php-URL_ID=5331&URL_DO=DO_TOPIC&URL_SECTION=201.html)). Librarians at GAINS stakeholder institutions have been trained to develop their own institutional databases using CDS-ISIS, a library software system downloadable at ([www.unesco.org/webworld/isis/](http://www.unesco.org/webworld/isis/)). A Webagris training was also given to stakeholder institutions, but no institutions decided to use it.

One stakeholder institution, FORIG, runs its own database using another system, Adlib, which it received from an external funder. The coordinating centre finds this problematic because it has difficulty translating the records into its ISIS format. FORIG's information is therefore not available on GHAGRI, though it is accessible worldwide through the international Global Forest Information System (GFIS) database. Adlib is thought by some stakeholders to be more user friendly, but it is too expensive for the network to be able to pay for all member institutes to use it.

### **People/Organizations (I/C systems-related)**

#### *Researchers at stakeholder institutions*

For most of GAINS history, researchers have been the network's primary target client. Researchers are supposed to submit their research output and make document requests, primarily through their institutional librarians. Therefore many researchers' awareness and use of GAINS depends on the capacity and motivation of their institution's librarian in promoting the network, and the institution's prioritization of its library, which in many institutions has been a challenge.

#### *Librarians of GAINS stakeholder institutions*

Institution librarians have thus far provided the main link between scientists and the GAINS coordinating centre, making scientists aware of the resources GAINS offers and collecting and submitting scientists' work to the coordinating centre or directly to the AGRIS and GHAGRI online databases. Librarians have also been trained to use CDS-ISIS to build their own library databases and collect the abstracts of the articles produced by scientists for the AGRIS database. However, few stakeholder institutions have electronic libraries at this point. Some librarians and institute directors have called the software problematic because it requires some training and practice to learn and turnover is high. High turnover has also been a challenge in librarians' effectiveness as emissaries for GAINS.

#### *GAINS coordinating centre staff*

GAINS coordinating Centre staff respond to requests from researchers and librarians and help them find information. They also at times upload research outputs into the Agris

and GHAGRI databases, though this is supposed to be the responsibility of institute librarians.

#### *Directors of institutes and deans of agricultural faculties*

The leaders of GAINS stakeholder institutions are key to making information management a priority at their institutions. GAINS has been specifically targeting them to put more focus on investing in information systems.

#### *Scientific secretaries of stakeholder institutes*

Each CSIR institute has a scientific secretary who collects all publications for annual in-house reviews. GAINS is now putting more focus on using the scientific secretaries as resources for collecting information.

#### *Other information intermediaries*

Other information-seekers, such as Farm-based organizations, extension agents, NGOs, and community radio stations also use GAINS, but mainly on an ad-hoc basis. GAINS is hoping to increase and systematize its use by these stakeholders.

### **Process/methods**

#### Making information available to scientists

GAINS has several different processes for making information available to scientists. As mentioned, many of GAINS resources are available online to institutions which have connectivity. These online resources are expanding to include almost everything GAINS has on CD. However, for information not available online, once or twice a year the GAINS coordinator drives around the country and updates electronic databases at each stakeholder institution, containing lists of journals and abstracts of articles which are available on request from the coordinating centre. When a scientist finds an article or journal they want, they (or their librarian) call or email the request to GAINS and then GAINS mails it to them. This is a slow process, but is unavoidable because it would cost too much to buy full electronic copies of the journals for every research institution, and due to copyright issues, most of GAINS' CD-ROM based articles cannot be emailed or made available online. GAINS also sends out local journals and its own newsletter and the abstracts bulletin.

From March 2000 to March 2005, GAINS received 2894 requests for information from 1318 users, and many researchers also access online GAINS resources on their own.

#### Collecting information from scientists

Librarians at stakeholder institutions are supposed to collect research information from their in-house reviews, annual and quarterly reports, and monthly seminars, and scientists are expected to actively contribute their work to their libraries. Librarians are then supposed to assemble this information into their own local electronic databases, and submit it to GAINS on disc, by email, or in hard copy. This information is inputted into AGRIS and GHAGRI by the GAINS coordinating centre.

Some articles published by scientists are also published in journals produced in Ghana, like the Ghana Science Association Journal and the Ghana Journal of Agricultural Science. Scientists' articles also sometimes appear online on the websites of their research's funders.

#### Repackaging information

GAINS' pilot project with extension agents and farmers (funded by IICD) consisted of partnering with a MoFA agricultural information centre to show videos describing different agricultural technologies to selected communities. Communities were then trained in a chosen technology, the training was videotaped and the tape made available at the

information centre, and the training was combined with a program on a local community radio station. GAINS is planning to expand this effort to other communities. Many of GAINS stakeholder institutions also disseminate and repackage information autonomously, through the RELCs or other means. Many also put their scientists on their area radio stations to discuss different agricultural issues.

## **6. FINANCIAL ASPECTS**

### **Business models**

GAINS is heavily dependent on government and donor funding. Stakeholders thus far do not contribute to its maintenance, and it even has some trouble getting scientists and institutions to pay for the price of photocopying articles from TEEAL. In the period between the end of the NARP in 1999 and the beginning of the AgSSIP in 2001, GAINS received some funding from INSTI, but had some difficulty funding its activities to their full extent, in terms of visiting institutes regularly to support them and collect information. It was hoped that institute libraries would take some of this role, but as yet, this has not been the case for most. This has meant that the network is in some ways dependent on the interests of donors in terms of what projects it is able to undertake and what resources it is able to make available.

### **Incomes/Revenues**

GAINS has been trying to develop a revenue generation model for the information it provides, or a revenue-based model to get scientists to contribute articles. Thus far, however, this has not occurred, and it was not mentioned at the November 2006 stakeholder meeting. However, GAINS is exploring potentially requiring its member institutes to contribute financially to the network, or to ask their scientists to write the costs of information support into their research grants.

### **Costs**

GAINS' major costs are the salaries of its co-ordinators, trainings, travel around the country to collect articles, and photocopying. Several of these could be minimised if ICTs were used more by institution librarians and scientists (emailing articles to the coordinating centre, or taking greater advantage of online resources).

## **7. KEY ISSUES & CONCLUSIONS**

### **Benefits and challenges**

The key benefits of GAINS are

- improved capacity among stakeholder institution information management professionals
- improved stakeholder access to agricultural information
- increased accessibility of locally generated information

However, GAINS still faces many challenges.

#### *Stakeholder misconceptions about the nature of GAINS*

Many stakeholder institutions have for too long seen the coordinating centre as the totality of GAINS, and seen GAINS as a centralized external body that is funded to supply them with information services. This has resulted in a lack of support from stakeholder institutions both financially and in terms of prompting scientists to make research outputs available to the network. There has also been no clear framework of accountability for institutional information management. While INSTI is supposed to be

responsible for information management in general, librarians are employed by their individual institutes, which makes it more difficult for INSTI and GAINS to influence their actions. It would be difficult for this to change, since INSTI doesn't have the resources to pay the librarians' salaries, which would be expected were they to be their employers.

#### *Lack of information sharing and institutional prioritization by scientists*

In many cases, scientists are either unaware that they are supposed to submit their work to the network, or are otherwise not motivated to do so. Published works are already available in international journals, and scientists do not seem to be interested in whether they are available locally. A great deal of research is also donor-funded, which has meant that scientists often feel that they and the funder, rather than the institution, own their research, and therefore they are not obligated to submit it to the library. Scientists are also reluctant to share unpublished works for fear of plagiarism. This has all resulted in severe underpopulation of the online databases of Ghanaian research. Scientists also do not frequently write institutional capacity building elements into their research proposals.

#### *Lack of capacity in libraries*

In addition, librarians at institutions, who are supposed to be the key connection between researchers and GAINS, have proved to be something of a bottleneck. Generally they have less academic qualifications than scientists, they are paid very little, and there is high turnover. Many years of under-resourcing of institution libraries has also weakened the relationship between researchers and librarians, because researchers no longer go to libraries for information, not expecting to find anything current. This has meant that librarians have not been very successful at promoting GAINS' resources, motivating researchers to submit their outputs, or taking advantage of the trainings they have been given. Many also have had hardware problems. Scientists at several institutions have discussed creating their own database of information, and the librarian at one institute has done so, which signifies that the institutions may still not see themselves as a coherent network. Some of the systems used by GAINS, such as CDS-ISIS and AGORA, also require some learning before they can be effectively used, and high turnover has meant that this has sometimes been a problem for librarians.

#### *Lack of prioritization of information by directors*

Institute directors could potentially do a lot to remedy the above problems, but so far have not given great priority to information management. However, GAINS recently held a workshop on investing in agricultural information, intended to get directors thinking about developing strategies. Directors also have a high turnover rate, as do other staff, which has meant that often GAINS will train and sensitize directors and other key personnel only to have them replaced.

#### *Lack of knowledge of GAINS by other users*

GAINS information is also not sought out by all potential users, such as extension agents and NGOs. This seems mainly due to a lack of knowledge of GAINS on the part of many potential users outside the research community. GAINS non-online resources cannot be accessed without coming to Accra, or visiting one of the research institutes, looking at lists of the resources available, and writing to GAINS. Most non-researchers do not seem aware of this possibility. Also, until recently, GAINS did not have much direct interaction with district extension bureaus.

#### *Lack of infrastructure at stakeholder institutions*

Poor or no connectivity, power outages, and computer breakdowns in many cases block scientists from easily accessing GAINS resources, and have affected the capacity of many institutions to create databases of their libraries. It also discourages scientists from feeling supported by their institutions, since many have to use their own personal computer equipment or operate under less-than-ideal lab conditions.

### *Funding Difficulties*

GAINS' reliance on donor funding has meant that its operations were somewhat interrupted between the NARP and the AgSSIP. It has also had to prioritize some of its projects based on the priorities of donors, rather than always focusing on the interests of its stakeholder institutions.

GAINS is now attempting to re-position itself to face these challenges. One course of action discussed is to develop clear memoranda of understanding with member institutions outlining their roles and responsibilities and requiring minimum contributions of resources to the network or their libraries, and to only include those willing to accept these responsibilities to join the network. The hope is that building the capacity of several key institutions which have shown motivation, and hope that the benefits these show will get others to follow.

### **Key Lessons**

#### **Content adapted to local context**

GAINS' content consists of agricultural research information. In general its format has been suitable to the needs of its primary users, research scientists. However, as mentioned, one of GAINS' major constraints has been a lack of locally generated content in the GHAGRI database. This is a function of stakeholder scientists and institutions not making this information available. In addition, since GAINS has begun focusing on non-research stakeholders, it has had to explore more solutions for adapting content for greater accessibility.

#### **Building on existing systems**

GAINS has attempted to build on the existing library structures of Ghana's agricultural research institutes and university faculties of agriculture. However, GAINS was to some degree developed in a top down manner, rather than created by its stakeholders, which has made it difficult to get sufficient buy-in from stakeholder institutions. In addition, in many cases institution libraries have not been strong enough or well connected enough to scientists to be efficient vehicles for the transmission of information. Scientists are often more likely to seek information through existing personal connections or online than to go through the library. In its current attempt to reposition itself, GAINS is currently trying to look at how to better reach its stakeholders, in terms of strengthening librarians, making use of institutes' scientific secretaries who already collect a great deal of scientists' information, or dealing more directly with scientists.

In reaching out to non-research stakeholders, GAINS is trying to work through existing agricultural extension centres and community radio stations. However, it could be taking greater advantage of existing re-packaged material from MoFA and NGOs.

#### **Addressing diversity**

Women are still a minority among Ghanaian research scientists and extension agents, despite making up a majority of Ghana's farmers. GAINS has had a problem with a lack of requests from female researchers, partly because males were more likely to be chosen for GAINS trainings. GAINS has tried to remedy this, when funding was available, by offering trainings, supported by CTA, specifically for female researchers.

#### **Capacity building**

GAINS has engaged in a great deal of capacity building for librarians, scientists, and information focal points at research institutes. This has been successful in some cases, but in many cases attendance at trainings was not driven by enough institution-level demand for the information offered or linked to short term deliverables on the part of the directors of the institutions. Therefore, many trainees have never implemented what was learned. In addition, high turnover has resulted in many trained personnel leaving their institutions before implementing and without passing on their knowledge. Another

issue, especially with ICT related trainings, is that in many cases institution infrastructure is not sufficient to implement the training. GAINS members also have not yet begun using their connectivity to network librarians to one another for more constant capacity building.

### **Access and empowerment**

GAINS has, for most of its life, focused on providing information access only to research scientists, and its mandate was not interpreted to include helping end-users access research directly. Its new experiments with radio and video are steps towards offering end-users more access and empowering them to seek out information on their own.

### **Strengthening partnerships and participation**

GAINS is intended to be a partnership between all its stakeholders, with the coordinating centre simply providing support, capacity building, and linkages among stakeholder institutions and with outside partners. However, currently many stakeholders see GAINS as a centralized entity, of which they don't feel enough ownership to participate fully. GAINS also has not yet fully strengthened its partnership with the Ministry of Food and Agriculture, which has always been problematic since GAINS was moved into CSIR from the Ministry.

INSTI is now attempting to increase dialoguing with identified stakeholders, assessing the information needs of previously unidentified actors, and has conducted several workshops since 2003, as well as a study of the information needs of extension agents.

### **Realistic approach to technologies**

To help scientists access information, GAINS uses the internet (for scientists that are able to connect to it), and the post. Despite something of an over-necessity to rely on institution hardware, which still seems to break down somewhat too often, these approaches are as realistic as can be expected. The expectation that librarians will build electronic libraries has not generally turned out to be realistic, with some exceptions, and librarians feel that they would need both better infrastructure and more training to do so.

GAINS' attempts to use video and radio as means of reaching non-research stakeholders are realistic, though they to some degree overestimate the capacity of Ghana's community radio network, which is quite small.

### **Costs and financial sustainability**

At this point GAINS survives on government and donor funding. Government funding alone is not sufficient to support its activities, which is problematic. GAINS is trying to get users of its services to help cover costs, but is having difficulty, partly because resources are scarce and stakeholder institutions see that GAINS has its own funding. It is possible that a more successful model might involve stakeholder institutions being specifically responsible for funding GAINS, which would make them more invested in making sure it is filling their needs.