

**Michigan State University
Food Security III Cooperative Agreement**

Year 1 Project Report to USAID/WARP

**Increasing the Impact of the Research of INSAH and its West African
Partners by Making it More Accessible via the Internet**

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**Project implemented in partnership with the Institut du Sahel (INSAH)/CILSS and the
Data Analysis Support Center (DASC)**

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Preface

This report describes a project that redesigned the INSAH website in an effort to make INSAH's databases and publications more widely available to development partners and the general public. The report describes, using hyperlinks to the INSAH website, the vast range of improvements the project made to the website. We have endeavored to make these changes clear to someone reading this report in "hard copy"; nonetheless, the report is best read in electronic form while connected to the Internet, as one can then simply click on the hyperlinks in this report to see directly the improved features of the website.

1.0 Introduction

This report describes achievements over the period April 2005-April 2006 of an MSU-INSAH-DASC team in greatly improving the availability and usability of INSAH/CILSS electronic resources via the INSAH website. The program was part of a two-year set of activities originally proposed to USAID/WARP to improve the utility and availability of the electronic resources and publications of INSAH and its NARS partners. This report focuses on achievements in the first year, and a companion document proposes activities and budget for year 2 activities.

1.1 Context

Over many years INSAH/CILSS, USAID, and other INSAH partners (including the National Agricultural Research Systems (NARS) of CILSS member countries) have made substantial investments in developing databases and publishing research related to agricultural development, environmental and natural resource management, and demographic and health issues. Such information is only valuable if it is available to those who need it for critical decisions, either for policy or for business. Yet much of this information was not widely diffused, limiting its usefulness for decision-making. A clear example was the CILSS/INSAH database on pesticides that are approved for different uses in the Sahel. Although this database existed since 2002, it was only available in electronic form at INSAH in Bamako. Thus, when the locust crisis of 2004/05 hit West Africa, decision-makers across the Sahel lacked easy access to this information, which could have made planning the response to the crisis much easier.

In early 2005, INSAH and MSU submitted a two-year project proposal to USAID/WARP requesting funding to enable INSAH to: (1) make its databases and research reports easily accessible through its website (2) improve the capacity of INSAH's staff to maintain the website, and (3) provide training for researchers, policy analysts, and other potential stakeholders (e.g., private-sector actors) in the use of the improved INSAH website and other on-line and electronic resources of relevance to the INSAH/CILSS mission. WARP agreed to fund the activity for one year, with second-year funding contingent on the success of the first year's efforts.

The project supports INSAH's strategic objective of adding value to its previous and current research efforts ("valorisation des résultats de recherche") by: (a) making the work of INSAH and its national partners much more visible to and easier to access by key West African decision makers and the outside world and (b) strengthening the capacity of researchers and policy

makers in NARS and INSAH/CILSS to use them. In so doing, the project directly contributes to the following three WARP strategic objectives:

- Build West African human and institutional capacity to shape agricultural policy and research;
- Strengthen West African capacity for trade policy formulation and implementation;
- Improve channels of communication between researchers, policy analysts, and public and private sector actors.

1.2. Original Proposal

The original proposal submitted to USAID/WARP was for a two-year program designed to be carried out jointly by INSAH (through direct WARP funding to the Institute) and Michigan State University, through an Associate Award under the Food Security III Cooperative Agreement (FS III). The proposal identified five objectives:

- Making key INSAH databases (on demographics, the directory of Sahelian experts and innovations, and the directory of approved pesticides) available in searchable form over the Internet;
- Increasing the availability of INSAH publications on line, through posting them in PDF format on the INSAH website and making hot links to them on the Food Security and Food Policy Information Portal (FSIP) for Africa.
- Evaluating the feasibility and cost-effectiveness of making key RESADOC publications, currently available only in microfiche, accessible electronically.
- Working on a pilot basis with national researchers in Mali and Burkina Faso who are members of INSAH networks to develop procedures that INSAH and its partners can use to increase the accessibility of the national partners' publications and reports on the web via links to the INSAH website and the FSIP.
- Working with INSAH to help make available to INSAH-affiliated researchers in national research systems key full-text as well as bibliographic resources (such as FAO's AGORA system that gives national researchers in Africa free on-line access to over 700 scientific journals in the area of agriculture and natural resource management) and learning materials in a broad range of professional skill areas available via the FSIP.

USAID/WARP funded the first year's activities through a \$135,000 Associate Award to FS III and \$65,000 directly to INSAH through its Project Implementation Letter (PIL). INSAH and MSU designed an integrated program that co-funded most of the activities outlined below. One of the key elements of the program was hiring the services of DASC (Data Analysis Support Center) of Rome to: (a) initiate training of local personnel, (b) conduct an initial analysis and restructuring of the databases and the programming needed to adapt the website to the restructured databases, (c) design an Intranet system that will be used to maintain and update the databases, (d) provide additional training in Rome for the head of INSAH's communications unit (advanced programming skills needed for maintaining the website) and (e) develop tools to synchronize the Intranet and the Internet. MSU provided additional direct support in the testing and improvements in the system design, providing technical support to get INSAH's publications on line, linking the INSAH website with the Food Security and Food Policy Information Portal

for Africa, and in jointly programming with INSAH a workshop in Bamako to inform INSAH partners of the website changes. This workshop also demonstrated how the website now operates and discussed measures being proposed to ensure regular updating and data quality. In addition, MSU worked closely with the FAO, the WHO, Cornell University, the Information Training and Outreach Center for Africa (ITOCA) and the Institut Polytechnique Rural de Formation et de Recherche Appliquée (IPR/IFRA) to organize a 4-day workshop in Katibougou Mali for participants from Mali, Burkina Faso and Senegal on the AGORA and HINARI online tools for agricultural and health research. INSAH also participated in the workshop and used it as an outreach opportunity to demonstrate the improvements in its web resources to a broader sub-regional audience.

Because the project was implemented collaboratively by MSU/INSAH as an integrated set of activities, the following discussion of activities makes no attempt to differentiate between the two funding sources.

2. Activities and Impacts of the Project in Year 1

The first year of activities fell into five broad activities:

- Putting the databases on line and making them interactive.
- Developing an Intranet to maintain and update the databases.
- Training INSAH staff to maintain and further develop the website and databases.
- Conducting an outreach workshop to inform stakeholders in Bamako of the changes.
- Helping organize a training program for librarians and researchers from Mali, Senegal, and Burkina Faso on AGORA and HINARI (systems allowing free on-line access to nearly 2000 journals in agriculture and the health sciences).

2.1 Putting the Databases on Line and Making Them Interactive

As planned, MSU/INSAH hired the Italian firm DASC to do the initial assessment of the website and databases. DASC was contacted because of its prior experience in developing a website for the Malian Ministry of Health (Malinut.org) that has characteristics similar to what INSAH wanted. FS III supported an initial feasibility study by DASC in April 2005 that laid out the firm's general recommendations. The feasibility study and its recommended work plan were accepted by MSU/INSAH, and implementation began in September 2005.

The key components of the database work involved modifying the Internet site to incorporate interactive sections permitting users to query and extract subsets of information from four databases:

- INSAH/CILSS publications
- A directory of Sahelian expertise, including:
 - Researchers associated with INSAH's partner institutions
 - Institutions doing research in the Sahel
 - Technologies developed by INSAH and partner institutions
- A database of CILSS member country profiles containing demographic and health data, much of it relevant for monitoring poverty indicators.

- A database of pesticides approved for use within the CILSS member states.

At the time this work began, none of these databases was available through the INSAH website, and there was very little in the way of “interactive” communications possible, even for information already on the website. This can be observed by clicking on the following link to INSAH’s home page (see figure 1):

<http://www.insah.org/index.html>

The contents of the pre-existing website are accessed through the list of items in yellow font on the upper left side of the page (e.g., *Decouvrir INSAH*, *Activités de l’INSAH*, *Publications*, etc.). There are two new sections of the home page. The first is accessed half way down the left-hand side of the page in the section *Services en ligne*. Either the *Documentation* button or the *Bases de données* button takes the user to a new page from which one can examine each of the four databases listed above. The second new item is labeled *Portail SA* at the bottom center of the page, which links to the Food Security and Food Policy Information Portal for Africa.

The new interactive part of the website (accessed through the link to the *Services en ligne*) permits users to maximize the utility of the INSAH databases. The interface was developed using Javascript and Cold Fusion programming languages. It is currently functional in both English and French, with the capacity to be expanded to other languages such as Portuguese and Arabic. Information is stored in ACCESS files, which are supported by UNICODE. Queries are made using SQL. If desired, the ACCESS database can be transferred to a Client-Server (SQL-Server, MySQL, or even ORACLE) with little difficulty.

The analysis of the databases was the first and most critical part of this activity. Limitations in the design of databases only become apparent when one tries to use them extensively, and this certainly proved to be the case with the INSAH databases. In the process of putting them on line and testing the system, INSAH, MSU, and DASC staff identified significant limitations in the way the databases had been designed and in some of the content. Thus, the project staff devoted substantial effort to identifying the strengths and weaknesses of the existing databases, and then enhancing the value of the strong points and eliminating the weaknesses. The overriding concern was to end up with databases that are easy to manage and update. The standard procedure followed in most cases was to identify and implement a preliminary restructuring, develop the templates for interactive questioning of the database, test the templates and carry out a preliminary restructuring, and then finalize the restructuring and templates based on what was discovered during the testing process. Because of INSAH’s strong interest in rapidly making these databases available on the Internet, the first round of restructuring focused on the easier-to-fix problems. This was followed by a more in-depth analysis that took into account the need for the databases to be flexible enough to adapt to the longer-term needs of INSAH and potential website users.

Figure 1. INSAH Website, Opening Page



A simple example of what has been done can be illustrated using the pesticide database. Today, the system has a specific number of domains and pests for pesticide characterization; if tomorrow this number needs to increase (or be modified), the system now allows for this. Before the restructuring of the database, this change could not have been done without a complete re-organization of the database and re-writing of the routine. The work that has been done now permits these changes to be accomplished by simply adding a new record to the relevant tables.

This more in-depth analysis went beyond the initial terms of reference (to get the existing databases online), but was considered a necessary step if the databases were to increase rather than decrease in value over time. In most cases, significant effort was devoted to “normalizing” the data so that it could be used efficiently in the interactive routines being developed. While DASC focused on the design and programming details of this activity, MSU provided support for testing the system and improving its user-friendliness. MSU also worked with INSAH on developing the text for both the English and French versions of the website.

The following paragraphs describe the work on each of the individual databases and their current status. The URLs given below for the specific databases take the reader directly to those sections of the INSAH website. The databases can also be accessed through a series of links that begins by clicking on the *Base de données* button under the *Services en ligne* line of the INSAH homepage (figure 1).

2.1.1 The Publications Database

An April 2005 mission to INSAH by MSU computer specialist Steve Longabaugh provided assistance to INSAH in prioritizing documents to be put on line and procedures for getting them in electronic format. Although many documents had at one time been available in electronic format, there had been no systematic procedures established to retain the electronic copies over time and make sure that they were readable by current software. The most complete source of documents was in hard copy, so it was decided that the best approach to getting these documents in electronic form was to scan the hard copies into PDF files. MSU provided INSAH with a high-speed sheet-feeding scanner and updated software and trained INSAH staff in their use. Scanning hard copies is not ideal because scanned PDF files tend to be large and slow to download. Scanning hard copies was, however, considered a more cost-effective approach than trying to recover widely dispersed electronic copies or scanning microfiche copies of documents (which requires special equipment). As a result of this experience, INSAH has now instituted a policy of requiring that all future publications be submitted in electronic format, which will facilitate their being put on line. A decision was made to begin scanning the most recent publications (2001-2004) because a recent directory of publications for this period had already been created. Older publications (back to 1979) were subsequently added, so the online document database now includes all documents (approximately 685) that were previously stored on micro-fiche in the RESADOC database.

The next step in the process was to make it possible to search for documents on INSAH’s website using a variety of search queries (author, title, country, key word, institution, etc.). To

accomplish this, it was necessary to move from INSAH's existing "flat" database to a "relational" one. The "flat" database was information that had been entered into a DOS program for bibliographies (ISIS). Over time, personnel entering the data had changed frequently, and the software did not provide rigid controls at the data entry stage to ensure consistency in the data entered (e.g., use of the same character to end a line of data, use of the same terms, spellings, or codes to represent key concepts or search words such as countries). Another complication was that there were two separate document databases (one for CERPOD and one for INSAH in general) that did not have the same structure. Consequently, a third structure had to be created that was able to incorporate both of the bibliographies. This data structure was created in ACCESS by DASC, working in collaboration with INSAH personnel. The data were transferred to ACCESS and then cleaned. The cleaning involved controls on the key words, extraction from the original databases of all documents published by INSAH, CILSS, AGRHYMET, and CERPOD, and a check to remove duplicate entries. The document section of INSAH's on-line services can be accessed by pressing the "control" key and clicking on the following hyperlink:

<http://217.221.158.182/dbinsah/index.cfm?sect1=avant3&id=30>.

Upon arriving at the page, the first step is to indicate language preference (English or French) using the toggle switch in the upper left of the page. Key search possibilities include: title, collection, conference, author, year(s), key words/themes (approximately 3970 options), and geographic zones (a total of 66, which extend from the general category of Africa to disaggregated levels such as a particular arrondissement in a particular country). An example of how the site links the user to a description of a document and different opportunities for downloading all or part of the document can be seen by typing "Kelly" in the author box of the query screen and clicking "execute" at the bottom of the page. If you scroll to the bottom of the document description page, you will be presented with four options for downloading different parts of the document. These four options (table of contents, summary, conclusions, and full document) were introduced to accommodate users who might not have fast enough Internet connections to download the full document as well as to help users determine if they really need the full document.

2.1.1 The Pesticides Database

The member countries of CILSS voted in 1992 in favor of collaborative management of pesticides, including development of common standards ("homologation") for pesticides approved for different uses in the Sahel. Regional pesticide standards and registration helps prevent forbidden products from freely circulating from one country to the next because of porous borders.

Responsibilities for the development and implementation of the standards are distributed across the regional (CILSS) and national (country) levels. A regional convention setting out the procedures has been signed by all CILSS member states. This convention focuses on the authorization, marketing, use and control of active pesticide ingredients and manufactured products in the member countries. At the regional level, pesticide registration is granted by the CSP (Sahelian committee for pesticides), a division of DREAM (Department of Studies and Research on Agriculture, Environment and Markets) at INSAH. Pre- and post-registration

activities are implemented by national organizations. These activities include the testing needed for registration, control at the national level and toxicant monitoring.

The goal of the pesticide database is to provide national governments and all the users with reliable and up-to-date information on pesticides authorized by the CSP. There is now information on 406 pesticides in the database. This information includes authorized products, active ingredients, fields of intervention, maximum limits for residues, safety measures, targeted pests and firms selling the products. A technical data sheet for each product is available in PDF format. Links are established with various other documents including:

- la Réglementation Commune aux Etats membres du CILSS sur l'homologation des pesticides ;
- la Composition du Dossier d'homologation des pesticides au Sahel ;
- la Composition du Dossier d'homologation des bio-pesticides au Sahel .

To increase the capacity of website visitors to query the database using a large variety of variables and relationships, the structure was changed from one principal table to a structure that includes not only a principal table but also six secondary tables and eleven dictionaries. This pesticide information is now easily accessible by researchers as well as government agencies and private sector operators who might be involved in agricultural pest control activities such as the locust campaigns of the recent past.

The link below will take the reader to the Pesticide “Background” page, which is the entry point to the pesticide database.

<http://217.221.158.182/dbinsah/index.cfm?lng=en§1=avant1&id=28>

The page permits one to query the database using the following types of questions:

- Status of Authorization
- Homologation
- Formulation (e.g., powder, aerosol)
- Type of pesticide (e.g., fungicide, herbicide)
- Toxicity (using WHO standards, with four categories, ranging from slightly toxic to extremely toxic)
- Pests (ten options available, such as weeds, insects, fungus, virus, etc.). For each category of pest, there is a submenu with specific pests in that category (e.g., for insects one might find ant, mosquito, aphid, etc.)
- Domain of use (six options, including public hygiene, crops, food stocks, seed, other and not specified)

One can place specific conditions in each query box or use a subset of the boxes. For example, asking for a list of all insecticides (type = insecticide) gives 302 products; narrowing this down by specifying that the domain is crops reduces the choices to 144, and so forth.

2.1.2 Directories of Sahelian Expertise and Technologies

Although these could be considered three separate databases (one providing information on research institutions located in CILSS countries, a second on researchers working in the Sahel, and a third on agricultural technologies that are relevant to the Sahel), they are treated as a single database on “expertise” for the purposes of database restructuring and placement on the website.

The data sets were initially developed in 2002 by the Mitchell Group in an effort to stimulate collaboration among researchers in the various INSAH partner institutions. Survey instruments were sent to individual INSAH collaborators, who were asked to fill in their personal information for the researcher database, their institutional information for the list of research institutions, and to provide information on research results for the technologies database. Because the contacts were made through individuals rather than institutions, there is not yet complete coverage of all countries and all technologies available from INSAH’s partner institutions. Now that the initial database has been restructured and made available on line, INSAH/MSU are implementing a systematic program of contacting all partner institutions to ask them to verify the data provided by their researchers in 2002 and update or expand the information as appropriate. This will be done via email during May and June 2006.

In addition, INSAH was granted time on the agenda of the April 2006 CORAF/WECARD (Conseil Ouest et Centre Africain pour la Recherche et le Développement Agricoles/ West and Central African Council for Agricultural Research and Development) meeting in Banjul for a presentation of the website and to inform CILSS member countries on the modalities for updating their information. The presentation was very warmly received, with many participants commenting on how useful having the databases on line will be. As the CORAF network covers most of West Africa, in addition to the CILSS countries, this was an excellent means of “advertising” INSAH’s new website and encouraging other institutions to develop similar sites and/or link to INSAH’s site. To the extent that a large number of partner institutions in the West African region can develop similar websites and connectivity among them, research quality and outreach should improve. Developing this type of network would facilitate efforts by SAKSS and CAADAP/NEPAD to encourage regional networking for agricultural development analyses and monitoring.

The researcher database provides basic information about Sahelian researchers (name, institution, nationality, gender, education, areas of specialization, and languages). In its initial format, the database provided few opportunities for searching researchers by different characteristics. In addition, the format in which the data had been entered made it time-consuming to transfer it to an improved structure due to a lack of consistency in how the information had been entered (the use of different spellings to represent the same language rather than numeric codes, lack of uniformity in listing degrees and diplomas, etc.). The restructured database now permits numerous types of searches.

For example, in clicking on the following link:

<http://217.221.158.182/dbinsah/index.cfm?sect1=avant2§2=chercheur&id=29#>

one finds the query page for researchers. If one wanted to find all Senegalese women who were working on forestry issues one would select:

- Female (click on the button)
- Country of nationality = Senegal (using the drop-down menu)
- Field = forestry (using the pop-up menu)

Although the work of restructuring the database is complete and the initial data have been transferred to the new database, INSAH personnel are continuing to work on the data cleaning (removal of duplicates, standardization of degrees, etc.). DASC was able to develop a number of programming routines to facilitate the transfer and cleaning, but due to the lack of consistency and the format of the initial database, parts of the transfer and cleaning need to be done manually.

Improvements that could ultimately be made in this database would include fine-tuning of the list of fields/expertise, which is extremely large and includes many categories that might be better grouped together, and addition of a search for geographic areas of expertise. The former would require some work by MSU and INSAH to refine the categories and some programming by DASC; the latter would require data collection, as information on countries of expertise or experience is not currently in the database.

The database on institutions doing research includes information on 135 institutions located in the Sahelian countries. One can search by country, for six types of institution (e.g., research structure, private firm, government, NGO), and nineteen research domain (e.g., agriculture, livestock, fisheries, forestry, hunting, agro-industry). The information page for each institution includes the name, address, phone number, FAX, and email address (which links to the user's email software). The institution queries page is found at:

<http://217.221.158.182/dbinsah/index.cfm?sect1=avant2§2=institut&id=29>

The database on technologies provides descriptive information about production and processing technologies developed by INSAH partner institutions in the nine CILSS countries. The structure of the technologies database had many of the same problems as the researcher database. DASC used the same approach to restructuring this database: consultation with users to identify the key variables of interest and their relationships to one another and then restructuring of the database to permit the desired types of queries and updating. The restructuring work is complete. INSAH continues to work on verifying the data quality and transferring it to the website.

An illustration of how the technology query page works can be seen by clicking on the following link:

<http://217.221.158.182/dbinsah/index.cfm?lng=en§1=avant2&id=29§2=technol>

One finds eleven technologies listed at the end of the following query:
Country: Mali

Domain: Natural Resource Management
Product: Cereals
Type of technology: Production

The first results page of the query reports the name of the technology, the general description and the expected impact. At the bottom of this summary is a button that will send the user to a more detailed description that includes information such as:

- Source of information (usually the institution)
- Performance (technical and socio-economic)
- Utilization
- Agro-ecological zones of relevance
- Inventor
- Sources of financing used in the research

2.1.3 Country Profile Databases

The country profile data is the only database INSAH is putting on-line that involves management of statistical data. The profile database illustrates well the point made earlier: when one makes a database more accessible and use increases, one also learns rapidly about the shortcomings in its design. The initial conceptualization of the database raised multiple problems for INSAH/DASC/MSU as they worked to put it on-line because the design did not adequately take into account the need to select judiciously the key indicator variables and differentiate them from the variables that are used to break the indicator variables into subgroups. For example, instead of designing the data so that the variable “population” is used as a key indicator variable and variables such as “age,” “sex” and “region” are used as distributional or classification variables, the original database defined various combinations of indicator and classification variables all as key indicators in the following manner:

- Female population under 5 in Segou
- Male population under 5 in Segou
- Female population under 5 in Mopti
- Male population under 5 in Mopti, etc.

This leads to very inefficient storage of data and also restricts users of the database to the predetermined combinations of indicator variables and distributional variables.

In addition, there are numerous inconsistencies in how the data are reported across countries that should be addressed before restructuring the database. An example of this is the reporting of GDP: many countries report it for the primary, secondary, and tertiary sectors, while others report it for more disaggregated sectors such as agriculture and livestock, but do not give the aggregate primary, secondary, tertiary numbers. An additional concern is that the restructured database should use official codes provided by each country for breaking the data down into local administrative or geographic regions; at present there is a mix of official and *ad hoc* coding.

Given the complexities involved, DASC invested a substantial amount of time to working with users of the profile database to develop an appropriate restructuring plan. A plan was proposed in November 2005. Because of the nature of the problems and the magnitude of the task, it was not possible to make small fixes rapidly (as was the case with the other databases) and get the data on-line. At present, the initial data restructuring has been completed and the test versions of the interactive templates have been developed. The data have not been transferred, as there is a need for some preliminary work by INSAH demographers, in consultation with DASC, to develop a final list of the indicator and distributional variables that will be used in the database, to determine the level of administrative disaggregation of the data by country, and to obtain the official codes for administrative units. Once this work is completed, it will be possible to transfer the data to the new structure and complete the template for interactively querying the database. Although the work with the profile database has been time-consuming, a major payoff to this effort will be INSAH's ability to design better datasets for the future.

Although not yet finalized, it is still informative to examine the anticipated format for the country profile queries and output tables. Clicking on the following link brings one to the "profile" introductory page, which warns users that the data available for the moment are NOT verified!

<http://217.221.158.182/dbinsah/index.cfm?sect1=avant4&id=31>

If one clicks on the "inter-country query" button at the left, one arrives at a page offering two choices of output format:

Paramètres Profil 1

Années				
	Pays			
Indicateur				

Paramètres Profil 3

Indicateur				
	Années			
Pays				

One is then asked to select the "domain" of interest: demography, health, or economics. If one selects demography, then one is asked to select a specific demographic theme from another drop-down menu that contains eleven demographic themes. For the purposes of this example, we selected "state of the population". The next step is to select a specific population indicator from a drop-down list of 16 items. We select "population density" and then proceed to a drop-down menu that permits the user to select the countries of interest (all nine CILSS member countries are options). We select all nine CILSS countries and then submit the request by clicking "ok". The following table is produced:

Densité de la population

Unité de mesure: hbts/km2

☒



	1960	1963	1970	1971	1973	1975	1976	1977	1979	1980	1983	1985	1986	1987	1988	1990	1991	1993	1994	1996	2000
Burkina Faso	16					21						29					34			38	0
Cap Vert	50		67							74						85					109
Gambie		30			46						64							97			
Guinée Bissau									21								27				
Mali	0						5							6	8						
Mauritanie								1													2
Niger								4								6					
Sénégal	0		20	20			25								35		37	41	40	41	

Note that the data are at present incomplete and not verified. The table is presented to illustrate the format and potential uses of the database. Once the initial table is produced, the user has the option of adding or subtracting years, transferring the data to an Excel file, sending the output to someone via email, or printing the output (all accomplished by clicking on the small icons at the left of the output page just above the table).

By returning to the initial “profile” page using the link above, one can also elect to do country-specific analyses with intra-country breakdowns by selecting the “national query” button on the left side of the page. The levels of disaggregation within each country will ultimately be determined by the data availability, but it is anticipated that the minimum coverage will be to the regional level (e.g., Segou, Mopti, Sikasso, etc. for the case of Mali).

Although there is still substantial work to be done on this database, we anticipate that it will be one of the most useful once the issues of standardization across countries are worked out. It should serve as an excellent source of data for monitoring progress in meeting the Millennium Development Goals and for use by SAKSS in both monitoring and analysis of alternative investments to stimulate agricultural productivity growth and poverty reduction.

2.2 Programming of the Intranet and linking it to the Internet

For the databases to maintain their usefulness over time, they need to be updated regularly. Yet updating such databases, if left to a single person or office (e.g., the computer coordinator at INSAH), can quickly become an overwhelming task. Thus, INSAH/DASC/MSU decided to develop a system that would allow selected individuals (eventually including correspondents in the individual CILSS countries), linked through an intranet, to update the information regularly, while still allowing INSAH final control regarding data quality and format. The task of developing an Intranet system to keep INSAH’s databases up to date was undertaken by DASC as a subcomponent of the MSU work. The objective was to make INSAH independent in the management of its databases while ensuring that the system was simple to operate yet attentive to quality control of the data. While the existing system is set up for INSAH staff to be in charge

of updating and managing the website, it is designed in a manner that can be easily adapted to permit updating by partner institutions in CILSS member countries. In the long-run, this is the direction in which INSAH wants to move to ensure more rapid updating of information and to lessen the burden on INSAH staff.

While each database has a slightly different approach to how the Intranet handles the updating, there are a few common elements such as:

- Password protection that permits all INSAH staff to access the Intranet but gives only selected personnel the right to actually change data;
- Ability to suspend data entry if information is not complete and validate it at a later time when completed; in the suspended state, the data are not available for interactive queries;
- Controls on the quality of the data through cross-checks across variables and logic tests.

For example, the pesticides database requires that a minimum of the following key pieces of information be entered before the data can be validated: the main table must be completely filled out and three other tables (distributor, type of pesticide, and composition) must have at least one entry each. Numerous logic tests are used, such as not allowing the authorization extension variable to be filled in with a date that precedes the authorization date.

For the pesticides in particular, the site has been programmed to permit INSAH to post electronic versions of documents received from the CPS, as they often contain additional information that goes beyond what is in the INSAH database. With the exception of posting these documents, the pesticide database has been completely updated as of April 2006, and all the information available is now available on the website.

The publication database has been updated but INSAH is still in the process of uploading all the documents that have been prepared for the system and removing double entries.

The “expertise” database is completely updated for the part covering institutions. For the researchers and the technologies, the existing data are still in the process of being cleaned. INSAH has also decided to undertake a formal updating of the information by contacting its partner institutions and asking them to verify and augment the information now available on the website concerning their researchers and technologies. (This effort will also inform others of the website improvements and encourage them to become familiar with these changes.) In updating this information, INSAH will be using the new data entry templates developed for the website so that information should be received in a format that is relatively easy to move to the web. An effort is being made to ensure more systematic reporting of the data on technologies, as the existing database exhibits problems of quality and completeness.

In short, INSAH is continuing to work on cleaning and updating the “expertise” databases, but the programming for the Intranet and Internet has been completed for these databases.

As noted above, work on the country profile databases was more complicated than initially anticipated. Rather than opting for a “quick fix” that would not serve INSAH and its partners well in the future, it was decided to restructure the databases, with a particular emphasis on making the presentation of information across countries more consistent and coherent and

improving the efficiency with which users can query the database. At present, the templates for updating the database have been prepared, but before they can be used, INSAH and DASC need to work out the details of which variables will be indicator variables and which ones will be distributional variables. This task requires a combination of DASC's analytical skills and input from INSAH demographers who are familiar with the database and its varied uses. There is also a need to establish guidelines on the administrative codes and levels of disaggregation that will be used for each country in the database. It is anticipated that this work will be covered by funding during the second phase of the project.

The current plan is for the Intranet system of updating information to be linked to the Internet via the FTP (File Transfer Protocol). This protocol allows uploading and downloading of files through the Internet more efficiently than the HTTP protocol. Eventually, when INSAH is able to have partner institutions participate in updating the databases, a Web-Service system will be more appropriate. The web-service will allow the transfer of subsets of records instead of entire data files, thus allowing for better performance and a reduced use of the Internet band. Furthermore, once the management of the profile database is decentralized, the web-service will ensure consistency among the different databases (the one in INSAH and the one in each country) and quality control, which cannot be done by using a simple FTP mechanism for uploading. At present, the FTP responds well to the centralized nature of the updating that is being done by INSAH.

2.3 Training

Two INSAH staff members were trained during this project: Aguibou Coulibaly (head of the UCID, the Unité Communication, Informatique et Documentation) and Fadima Diarra (librarian). Training included developing skills in HTML and Cold Fusion. This training involved 3 half-day sessions per week during one month and was provided on site by DASC. In addition, training in the use of a project-purchased scanner and the creation of PDF files from hard copies of documents was provided by MSU during a mission by Steve Longabaugh. An additional phase of training in Cold Fusion, Javascript and Cascade Style Sheets was provided to Aguibou Coulibaly during a two-week period in Rome. The training was designed specifically for INSAH and involved practical exercises working on the INSAH website and databases. In April 2006, both Coulibaly and Diarra received additional training in Bamako from DASC in the use of the Intranet; this training was designed as a "training of trainers" so they will now be responsible for training others at INSAH in the use of the Intranet.

Training of INSAH staff and partner institutions in the use of AGORA (part of the 5th project objective listed on page 3) was not one of the objectives covered by funding for this first year of activity. Nonetheless, thanks to its ongoing collaboration with the organizations promoting AGORA throughout Africa (as part of the broader efforts of the Food Security III Cooperative Agreement), MSU was able to facilitate a subregional training-of-trainers workshop in Mali on both AGORA and HINARI.¹ The workshop, held in collaboration with the FAO, WHO, Cornell

¹ AGORA is a portal developed by the FAO and Cornell University that gives librarians, researchers, faculty members and university students free on-line access to over 700 scientific journals in agriculture and natural resources. HINARI is a similar system, developed by the WHO, providing access to over 1000 journals in the health sciences.

University, the Information Training and Outreach Centre for Africa (ITOCA—based in Harare) and the Institut Polytechnique Rurale de Formation et de Recherche Appliquée (IPR/IFRA—Mali’s school of higher education in agriculture and natural resource management), included participants from Burkina Faso, Mali, and Senegal. It was held at IPR/IFRA in Katibougou on March 21-24, 2006. USAID/Mali’s investment, in 2005, in a high-speed VSAT Internet connection for IPR/IFRA and the school’s extensive computer labs made it an ideal venue for the workshop. Fadima Diarra represented INSAH at the workshop and also made a special presentation on the INSAH website, giving the site broader sub-regional visibility. MSU also facilitated the translation of the extensive AGORA and HINARI training materials into French, making training elsewhere in francophone Africa now possible.

2.4. Outreach Workshop

INSAH organized a half-day workshop in Bamako on April 13, 2006 to inform INSAH researchers and local collaborators in Mali of the website improvements and to solicit feedback on them. The workshop was held at the Grand Hotel, where it was possible to have a high-speed internet connection and project the website on a screen so all could appreciate the interactive nature of the databases that are now on line. Participants included donor representatives (Swiss, German, French, World Food Program), Malian government services (health, meteorology, geographic service, national statistics, environment and sanitation), research institutions and universities (IER and IPR/IFRA), and project representatives (PROMISAM). Given its relatively small size (31 participants), the workshop received surprisingly good press coverage, with videos appearing on the evening news the same day and also being run again during the weekend.

Participants were enthusiastic about the website. The WFP representative saw the effort to restructure the country profile database as a major step forward in efforts to measure progress toward the Millennium Development Goals, and encouraged INSAH to keep the indicators for those goals in mind as it finalized the choice of indicators for the database. He also encouraged INSAH to move toward a decentralized data management system to ensure rapid updating, with quality controls and validation provided by INSAH. Several participants (WFP, geographic service) made suggestions about eventually linking the INSAH website to their sites and coordinating the databases. Representatives from the national statistics institute raised some questions about what INSAH was doing to ensure data quality and document the underlying sources (particularly for the national databases with demographic information); based on responses from INSAH, they appeared to be satisfied that procedures being put in place were adequate. A participant from IER who had looked at the website prior to attending the workshop asked for some training by INSAH to help users improve their query skills; the participant also strongly suggested a program of decentralized updating, with INSAH providing each partner institution with the training necessary for doing this. By the end of the workshop there appeared to be a general consensus on two issues:

- The website improvements represented a real accomplishment for INSAH
- The challenge of keeping the data up to date and accurate is great and has often been the downfall of similar efforts by others in the past—INSAH must not drop the ball!

3. Looking Forward

Although the funded activities under the MSU FS III Associate Agreement ended in April 2006, INSAH, MSU, and DASC are undertaking a short-term program of work between April and June to consolidate the gains made in year one of the project. These actions include a number of small tasks to wrap up the work done over the past year. MSU and INSAH, in conjunction with DASC, are also developing a longer-term proposal for activities to be carried out in a second year. These would build upon the strong first-year achievements, assure the full functionality of all the databases, and undertake outreach with INSAH's partners in the NARS, SAKSS, and NEPAD/CAADAP to help them learn how to take full advantage of these rich sources of information (and other on-line services) in their work. That proposal is a separate, companion document to this report.

The short-term tasks being carried out by INSAH, MSU, and DASC are outlined in Annex 1. These tasks were discussed in a general meeting in Bamako following the April 13 workshop. The work involves fine-tuning of the changes made in the website (e.g., final verification of the text in French and English, uploading of all the documents that have been prepared, updating of the researcher and technologies databases as much as possible through email contacts, etc.).

This INSAH/MSU/DASC discussion also raised the issue of the heavy demands on the time of the head of the UCID and the negative impact that this might have on his ability to manage the additional workload associated with website maintenance and make full use of his training. INSAH was encouraged to find a way of shifting some UCID tasks (e.g., resolving day to day hardware and software problems of INSAH staff) to a more junior person or contracting some of it out. Budgetary limitations seem to preclude such options for the present.

Annex 1. INSAH/MSU/DASC tasks for finalizing phase one activities

ID	Action	Responsable action	Date limite	Output
1	Identification des responsables de chaque base de données	DG INSAH		Courrier avec le nom de chaque responsable à MSU et DASC
2	Finalisation du système de maj de la base profils	DASC	12/5/2006	Masque de saisie fonctionnelle sur INTRANET INSAH
3	Préparation des formulaires pour complètement des info sur les chercheurs	Chef UCID	30/4/2006	Formulaire de saisie
4	Préparation des formulaires pour complètement des info sur les technologies	Chef UCID	30/4/2006	Formulaire de saisie
5	Envoi via mail à DASC des formulaires pour vérification et suggestion	Chef UCID	30/4/2006	Courrier
6	Finalisation des formulaire et remplissage automatique	DASC	7/5/2006	Formulaires finalisés et envoyés à INSAH
7	Préparation lettre d'accompagnement des formulaires pour les chercheurs et les institutions	Chef UCID / MSU	10/5/2005	Lettre finalisée et signée par DG INSAH et par responsable MSU
8	Envoi des formulaires à tous les chercheurs pour qui nous avons l'adresse email	Chef UCID	15/5/2006	Courrier à MSU/DASC avec le nombre de emails envoyés
9	Envoi des formulaires à toutes les institutions pour qui nous avons des technologies	Chef UCID	15/5/2006	Courrier à MSU/DASC avec le nombre de emails envoyés
10	Finalisation des textes en français pour le site web	Chef UCID	30/4/2006	Proposition de textes validés par DG INSAH
12	Insertion des textes en français dans le site web	Chef UCID	3/5/2006	Site web à jour
13	Préparation des noms scientifiques des domaines d'utilisation et des nuisibles pour la BD pesticides	Monsieur Amadou Diarra	30/5/2006	

ID	Action	Responsable action	Date limite	Output
14	Mise-à-jour des traduction en anglais de tous les textes du site web après verification par l'INSAH	MSU	30/5/2006	Courrier à Chef UCID avec les textes traduits
15	Insertion des textes en anglais dans le site web	Chef UCID	5/6/2006	Site web à jour
16	Nettoyage de la base fond documentaire (élimination duplication, ajout info manquantes)	Chef UCID	30/6/2006	Base propre
17	Insertion des documents numérisés dans la base fond documentaire	Chef UCID	30/6/2006	Base avec les liens actifs
18	Etude et définition des coûts des différentes solutions pour l'hébergement du site (Housing auprès de Afribone ; location sur un ISP international)	Chef UCID / DASC	30/5/2006	Rapport