Operational Framework for VERCON

1 Introduction

This document presents an operational framework for VERCON. The operational framework from our point of view is not only for the current TCP project but for the continuous operation of VERCON. The operational framework consists of the organization structure for VERCON management, and procedeures for different activities to be conducted to keep VERCON alive. These activites are mainly: Computer (H/W and S/W) acquisition, establishing connectivity, content identification, software development, user training, building the network community, conducting frequent meetings, and evaluating the usage and impact of the network.

A brief description of VERCON is first introduced. The FAO/ TCP project that initiated VERCON in Egypt is then briefly described. The layout of the report is given in the third subsection.

1.1 VERCON Concept

Internet is a potentially powerful tool for improving communication between research, extension and farmers. The **Virtual Extension, Research and Communication Network (VERCON)** employs this potential to establish and strengthen linkages among the human and institutional elements of agricultural research and extension. The VERCON enhances two-way communication, establish links between geographically dispersed people and, collects processes and rapidly disperses large volumes of information in a variety of forms.

The VERCON concept was developed as a joint effort between FAO's Research, Extension and Training Division (SDR) and the FAO World Agricultural Information Centre (WAICENT).

1.2 The Project

The VERCON FAO/TCP project is the first field application of this innovative approach for improving linkages between agricultural research and extension institutions. It will provide valuable lessons for Egypt as well as for other countries in the region. The following subsections describe its objectives, expected outputs and outcomes.

1.2.1 Objective

The objective of the project is to establish a Virtual Extension and Research Communication Network in Egypt in order to strengthen and enable linkages among the research and extension components of the national agricultural knowledge and information system. The overall goal of the project is to improve, through strengthened research-extension linkages, the agricultural advisory services provided to Egyptian farmers and in particular to resource poor farmers, in order to increase production in food and agriculture with the goal of raising farm incomes.

1.2.2 Project outputs

- An operational framework for VERCON.
- A prototype version of the VERCON information system established under the technical leadership of CLAES.
- Four pilot centres, to be chosen from research facilities, extension offices, and the central administration offices in Cairo, equipped and trained for accessing VERCON.
- 30 national staff trained in the application of Internet technologies for exchanging information between the research and extension institutions.
- Further development and subsequent versions of the VERCON system based on monitoring and evaluation activities.
- CD-ROMs, printed materials and linkages to media outlets in order to disseminate the VERCON

to users not connected to the Internet.

- Recommendations and guidelines for the expansion of the VERCON beyond the pilot initial phase.
- A project proposal for submission to potential donors for extending the VERCON at the national level and possibly regionally.

1.3 Document Layout

This document is structured to be as a guideline for the VERCON management.

The second section defines The VERCON main functions to guide the continuous development of VERCON.

The third section describes the organization structure for VERCON management and the role of participating organizations.

The fourth section presents how VERCON could be extended and the procedures for joining VERCON by other organizations. Each organization must have appropriate computer hardware and software, connectivity to the Internet, and trained staff.

The fifth section describes the contents identified so far to satisfy the functions defined. It also proposes a procedure for content identification and publication.

The sixth section discusses issues related to software development such as methods, tools, and standards.

The seventh section elucidates different aspects for the evaluation of the network usage and impact. Measures are to be defined for assessing different VERCON subsystems and their impacts on their users.

The eighth section proposes ideas for the VERCON publicity and building of the network community. This may include advertising in the media and holding frequent meetings.

The ninth section addresses the sustainability issues of VERCON such as self-financing, frequent updating, and others.

2 Functions Specifications

The following paragraphs summarize the results of discussions of the VERCON team after the workshop on the function requirements of VERCON. VERCON should be easy to use. Most participating individuals and organisations have little or no experience with computers and the Internet. VERCON will therefore start simple, but will be flexible enough to include more sophisticated capabilities later. This requirement suggests that the entry point to VERCON will be via a standard WWW homepage. The opening page should include sections corresponding to different functions provided by VERCON. A section in the opening page is to be dedicated for advertising.

VERCON must provide the following functional requirements:

- Searching facility either by keywords or free text search of its contents
- A problem solving facility for its users
- Facilities for participating organizations to manage their contents hosted by VERCON
- A "portal" or a "gateway" that leads to organisations, to content, and to activities. It is likely to be similar in appearance and function to well-known WWW entry points like www.yahoo.com. The obvious difference is that it will be in Arabic. The most prominent links on this VERCON front page will be to the homepages of participating Egyptian agricultural organisations.
- News of recent developments in Egyptian agriculture. Perhaps updated weekly. Research, extension, business, markets, politics. Where might such news come from and who might assemble it for posting on the homepage? The best source would almost certainly be national newspapers and magazines, and the most logical compiler would appear to be AERDRI. An excellent example

of a web site built around such content is www.oneworld.net.

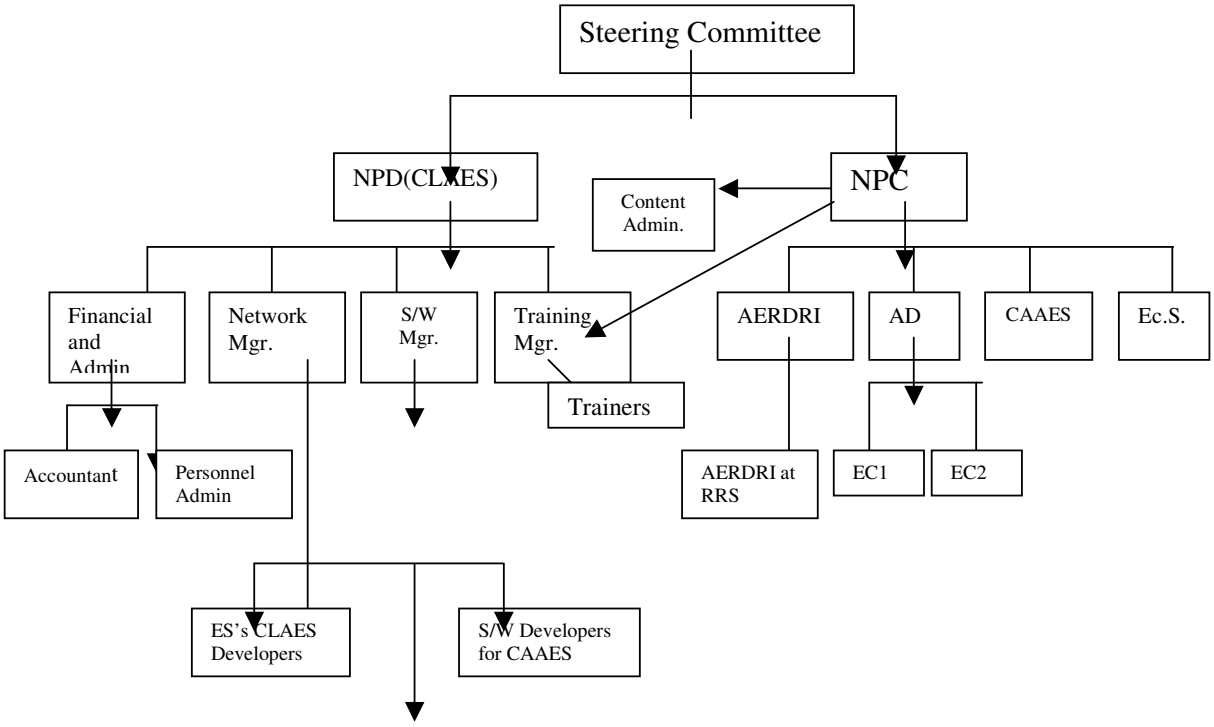
- A calendar of upcoming research/extension events, as well as announcements.
- Links to ongoing interactive activities for individuals in participating organisations. Possibilities include a range of electronic conferences and discussion groups.

These functions must be achieved in a reasonable time compared with other similar sites. The output presentation of each function must satisfy its expected users

3 Structure Organization

3.1 Organization Chart

The VERCON is to be governed by a steering committee consisting of representatives of the stakeholders, a Manager of VERCON, and a Coordinator of all stakeholders. The following Structure represents the current organization of the VERCON project that eventually will be expanded to include more stakeholders.



3.2 Roles and responsibilities of participating organizations

Generally, CLAES will be responsible for technology management while other institutes will be responsible for collecting the contents and manage their information. All organizations that participate in VERCON will have final responsibility for collecting their own content and for publishing it on the WWW. CLAES activities will be under the supervision of the NPD while other organization activities will be supervised by the NPC. The steering committee will approve any strategic decision and follow up the VERCON activities. The following subsections describe the roles and responsibilities of the existing participating organization. In the future, when more organizations participate in the VERCON, their main roles will be to provide contents.

3.2.1 Central Lab. For Agricultural Expert Systems (CLAES)

CLAES will be responsible for:

1. Network Management
2. preparing and publishing the CAAES content in the first phase. Later, CAAES will do that
3. developing the S/W for collecting farmers problems form the EC's
4. publishing the Field Crops ES's on the web
5. conducting training courses
6. conducting assessment study of the VERCON usage

3.2.2 Agricultural Extension and Rural Development Research Institute (AERDRI)

AAERDRI will be responsible for:

1. preparing the survey for farmers problem identification
2. supervising the collection of these problems
3. acquiring the recommendations of these problems, if any, from different institutes and publishing them
4. collecting problems received at the RRS (different research institutes) This will be done like that in this phase. Eventually each research institute will do that
5. conducting assessment study of VERCON outcomes

3.2.3 Central Administration for Agricultural Extension Services (CAAES)

CAAES will collect all extension documents of the field crops cultivated in Kafr El-Sheikh area. Eventually it will be responsible for publishing them

3.2.4 Agricultural Directorate (AD)

AD will be responsible for reviewing problems collected by the Extension Centers (EC's) and approve them. EC's are part of the AD and will responsible for collecting the data. In the first phase of VERCON, we have only one AD that is located at Kafr El-Sheikh Governorate. The same role will be played by other AD's from different governorates when joining VERCON.

3.2.5 Economic Affairs Sector (EAS)

EAS will be responsible for availing its information on the Web. This is very special situation because EAS already has its own database. Other Agriculture Sectors (a sector in the Egyptian Ministry of Agriculture is an administrative entity that consists of several central administrations) may not have their own databases and hence their roles will be like any other institution that will join VERCON.

4 Connectivity to VERCON

What incentives will organisations have to participate in VERCON? Most of the motivations currently on the table have to do with the Internet. For example, VERCON will usually offer to host the homepages of participating organisations on CLAES servers in Cairo. It will offer a limited number of free email accounts to staff in those organisations. It will provide staff training. But the VERCON team also recognizes that such technology-oriented incentives may not be sufficient to encourage potential participants to develop their homepages quickly and to establish procedures for continuous posting of content. How to encourage participating organisations? VERCON will take an active approach to broadening its base, and may even consider offering periodic prizes and tangible

incentives for the best new and updated sites.

If a new institution is willing to participate in VERCON, it must provide a request to the steering committee showing its interest and what kind of information it will provide, what kind of Hardware/Software it has, how it is intended to be connected to VERCON. The committee is to examine the request and make a decision. If the institution is accepted to be actively participating in VERCON, the steering committee will ask the CLAES to assist the institution in acquiring the appropriate H/W and S/W, to advise on the best way to connect to VERCON, and to conduct training. The following three subsections describe the procedures for equipment acquisition, Internet Connectivity and training.

4.1 Computer Hardware and Software Acquisition

When any organization is to join VERCON, it has to acquire appropriate H/W and S/W if it does not have. These steps are to be followed:

1. CLAES will help in identifying the needed equipment and prepare the specifications for the organization.
2. The organization is responsible for bidding and purchasing procedures.
3. CLAES will help in the evaluation of the bids.
4. Vendors will do installation and testing of equipment.
5. The computer suppliers during the warranty duration will provide the technical support for hardware problems after that it will be provided by special contract. The technical support for any site in Cairo will be achieved through CLAES staff.

4.2 Connectivity to the Internet

There are many available alternatives to establish communication links between VERCON information system and the pilot sites. Depending on the four pilot sites survey there are three data transmission techniques can be used: Leased line, Frame Relay and dialup connections. Because of the large geographical area between the four sites the most suitable solution is to establish a dial up connection through an ISP in the same governorate for each site. Through this dialup connection the four sites which represent the extension can communicate with the research using the Internet backbone to send or get information from the VERCON information system. VERCON network is considered to be an open system any additional sites could be connected to it easily with minimum hardware and software requirements.

The continuing issue here , when an organization is to join VERCON, will be the selection of the best way to connect sites outside Cairo to the Internet. As noted above, the team was unanimous in concluding that the best choice for the first pilot sites in Kafr el-Sheikh is dialup. Connection via leased lines is expensive, but can always be considered later if the volume of traffic warrants and/or if dialup proves to be unreliable. A major advantage of dialup is that it is simple, and additional sites can therefore be connected easily with a minimum of new hardware and software. CLAES will help the organization to decide on this issue according to the following steps:

1. If the organization is in Cairo then it has the option to be connected through CLAES or any ISP if the connection is dial up
2. If the connection is a leased line then the best route and price must be investiagted.
3. If the organization is outside Cairo then a local ISP is the best solution for dial up or leased line.
4. The ISP that located in the same governorate near sites will provide the technical support for Internet programs and dialup connection.

4.3 Training

In the first phase of VERCON, the FAO/TCP project will develop a training package on Internet Usage, Web development, and VERCON Information System Usage including the content

management of each institution. As soon as the hardware for the pilot sites in Kafr el-Sheikh has been procured and installed, the VERCON team will implement an intensive training program for new users. The tentative plan is that approximately 30 people will be trained, probably in two groups of one week each. These initial training events will focus on use of the new hardware, software, and Internet. Further training on Web development and the management of content will occur later. The first training cycle will be common for all VERCON users. The second training cycle will be customized for each institution.

In the future The VERCON will provide training to the participating institution through CLAES.

5 Content Identification and Publishing

This section describes the procedure followed to identify content in the first phase of VERCON. It is proposed to adopt this procedure when a new organization requests to join VERCON. Publishing the content is briefly described and will be amended based on the experience the VERCON team will gain in the first phase.

5.1 Content Identification

The VERCON team has carried out an information needs assessment survey. The objective of this exercise was to discover what types of content were priorities for research and extension personnel at selected sites in the Kafr el-Sheikh Governorate. Responses were collected and tabulated from sixty-two (62) officials in five different organisations. The results in matrix format are included in Annex I. At a VERCON workshop in Cairo in February 2001, officials from organisations that will participate in the network reorganized and prioritized these data. The output was six lists (by organisation) containing thirty-nine (39) different types of potential information (Annex II)

In meetings and visits following the workshop, the VERCON team narrowed these lists still further. The result of such intensive priority setting exercise is a list of four (4) major information categories on which VERCON will focus in the first stages of the project.

1. *Farmer Problems.* Many of the data required for analysis of farmer problems are available in hardcopy registers at the Agricultural Directorate in Kafr el-Sheikh, at local branches of Agricultural Research Center (ARC) institutes at the North Delta Regional Research Station, and in the two extension centres at Ariamon and Al-Khadmia. When a farmer has a question, he usually goes to the local extension agent. The agent tries to recommend a solution, but if he cannot, he often refers the farmer to scientists at one of the local ARC institute branches. He also makes an administrative report to the Agricultural Directorate. In each of these organisations, therefore, there are excellent records of farmer visits, of problems reported, and of solutions recommended. The VERCON team believes that aggregate data from these registers can be useful to researchers, to extension agents, and to farmers. Researchers will be able to use them to get an overview of problems in a particular geographic area, while extension agents and farmers will be able to use them to find out what solutions have been tried. And computerization will not be difficult. The team believes that a simple database that can be easily manipulated by new computer users will be sufficient. The target is to have at least basic data sets available from Ariamon and Al-Khadmia before the end of the initial project period. One of the first tasks after PCs have been installed at the pilot sites will be to train staff in use of the database software that has been selected. In addition, the VERCON team plans to supplement the material in these registers with socio-economic and production data, to be collected via farmer surveys.
2. *Extension Brochures.* The Central Administration for Agricultural Extension Services (CAAES) publishes numerous brochures on crops, cultural practices, diseases, and pests. All such publications are now in hardcopy, and are therefore sometimes not available when researchers, extension agents, and farmers need them.
3. *Expert Systems.* CLAES has developed several excellent and sophisticated expert systems, which can be of clear benefit to extension agents and farmers if they can be made more readily available.

VERCON will provide a means of making this material accessible via the WWW. The VERCON team has tentatively decided to focus at the beginning of the project on two of the CLAES expert systems most relevant to Kafr el-Sheikh: wheat and rice.

4. *Statistics.* The Economic Affairs Sector of the Ministry of Agriculture and Land Reclamation (MALR) currently collects, aggregates, and publishes numerous agricultural statistics. Its formal publications are all now in hardcopy, and are therefore (like the CAAES Extension Brochures) sometimes not available when researchers and extension agents need them. The VERCON team plans to work with the Economic Affairs Sector to make some of these data available on the WWW. The team has recognized that it must set priorities because the EAS has so many different types of data available, and it has therefore tentatively decided to focus on market and price data in the first stages of the project.

In identifying each of these four categories of information, the VERCON team has set criteria as to what material should ideally be included at the beginning and what not. It has formulated the following preliminary list, which should be expanded later. Each type of data or information should:

1. be directly relevant to the objectives of VERCON;
2. be targeted toward a significant number of clearly defined users; and
3. have potential benefits for extension agents and/or farmers.

After a particular type of material has been identified that meets the agreed criteria, the VERCON team will oversee the following action sequence:

1. design and testing of formats suitable for electronic publication, including agreement on data and indexing standards;
2. training of staff from participating organisations to use these formats; and
3. monitoring of implementation, including use by intended audiences.

The procedures illustrated here above for the first phase of VERCON will be repeated each time a new organization is to be part of VERCON. To summarize the procedure is as follows:

1- Assess Information needs of the organization requesting participating in VERCON using the above criteria

2- Decide what information it can provide and what information it needs

3- Get samples of the information to be provided by the organization and design appropriate format and software for publishing this information on VERCON.

4- If the information needed by the organization is not already there on VERCON, identify the provider of this information and contact him for joining VERCON

5.2 Content Publishing

Once the software is developed for each of the four above categories, each content owner institution will be responsible of publishing its content.

The Extension Centers at Armion and El-Khademia will be responsible of publishing the farmers problems they receive under the supervision of the AD extension staff and AERDRI researchers.

The VERCON team plans to work with CAAES to re-publish some of the extension brochures electronically. Its goal is to provide ready access to this material, both so that the content can be used and so that it can be more readily updated. Because farmers in the Kafr el-Sheikh Governorate grow mostly field crops, it is likely that the first brochures selected will deal with this subject area.

CLAES will be responsible of building the Knowledge Base of the Expert Systems on the web just after implementing the ES inference engine on the Internet.

The statistical data are already there. So these data will be available once the web based system is developed.

Each organisation will determine its own procedures for the addition and modification of its content. Who has the authority to add content and who has the authority to modify it? CLAES will be available to advise on the management and software options necessary if certain materials are to be available to selected users only.

Each participating organisation will be free to include on its homepage whatever content it wishes. Examples might include a history of the organisation, its mandate, its structure, its programs, its staff, a calendar of upcoming events, announcements, and links to the homepages of organisations with which it cooperates. VERCON will leave the development of most such content to the organisations themselves.

Each such organisation will be responsible for the design, operation, and maintenance of its own page and its own content. CLAES will give overall direction to the VERCON website, and will be prepared to provide technical support as required and requested. CLAES will also determine the standards that participating organisations should use if they wish the content on their pages to be accessible and searchable by VERCON users. These standards are likely to have four components: software, templates for data entry, guidelines for indexing, and procedures for regulating access to any sensitive materials. The only qualification to this policy will be that organisations should consult CLAES before deciding on software and data formats for any particular type of material ,just to be sure that VERCON does not intend to set system-wide standards for that data type.

6 Software Development

The strategy of VERCON is to use software tools already exist as much as it could. However, it may be needed to develop some customized tools or system to meet the requirements of the VERCON users. CLAES will be responsible of this task. So far the following software development activities are needed :

1. Transforming the Inference Engine of the Expert Systems to be a component in the Web server,
2. develop a tool that takes the textual data in the extension documents at the lowest index-able level to help researchers categorize this text, and publishing them easily on VERCON
3. re-build the reports and queries of the Statistical Database to be available on the Web,
4. develop an information system for the Farmers problems.
5. Build the VERCON interface on the Web

Once methods and tools are developed other stakeholders will use them when they join VERCON. If other methods and/or tools are identified, CLAES must work to develop them.

The required software for the pilot sites to develop their own web sites and using the VERCON information system, and the required software for CLAES to develop the VERCON information system are:

- MSDN that include: Web authoring package: Front Page 2000, Arabic Enabled Browser: Internet Explorer 5.5, Microsoft Office 2000, SQL server 2000, Visual InterDev 6.0
- Acrobat Reader Ver.4
- MCAFEE Standalone latest version)
- MCAFEE TVD latest version
- Any other software according to the implementation phase in the software development

7 Usage Evaluation and Impact

CLAES will be responsible of evaluating the VERCON usage. This will be done through counting the number of accesses to different VERCON components and the updating of contents by the participating institutions. More specific measures depend on each component.

For the Farmers Problems database, the rate of problems adding and the problems solved will be used to measure the usage effectiveness of this database.

The Expert systems include a database storing farm data of the users. This database will be used to produce reports analyzing the type of users, usage frequency, and types of problems posted to the expert systems.

The types of users and their frequent usage of statistics related to specific crops and/or category (import/export, ...) will be recorded to enhance the data presentation and to provide more detailed information for those statistics that are more frequently accessed.

The access to the extension documents database will be analyzed aiming to find the most frequent parts accessed in the documents. This will lead to identifying the agriculture practice information needed in a certain crop. The words or sentences used in searching will also be stored to be analyzed to find out the common form that the users utilize for a technical term. This may lead to enhance the search performance later.

The other components such as

AERDRI will be responsible of conducting surveys to measure the impact of utilizing VERCON in the areas that have access to it. {Dr. Shafie we need more elaboration on this part}

8 Publicity

The steering committee is to arrange frequent meeting to publicize VERCON to the agriculture stakeholders in Egypt. Advertisement in the media is to be done. Register VERCON URL in different search engines. {Dr. Shafie we need more elaboration on this part}

9 Sustainability

An important policy issue for the VERCON homepage concerns revenue generation and sustainability. There will be a section on the VERCON homepage for advertisements of private companies and NGO's, with links to their homepages. In the first phase, the main focus will be on getting the pilot VERCON up-and-running. Another source of revenues may be to charge consultations and training fees from the organization requesting to be part of VERCON. The Expert System Research and Development Unit within CLAES could act as the VERCON management Unit in the future. According to the Egyptian Law this unit can receive money and funds from different organization; private or public. It can hire professionals to do a certain job with suitable remuneration according to experience and to the market. . {Dr. Shafie we need more elaboration on this part}

ANNEX I MATRIX

Information Sources and Flow

9.1 To / From	Agricultural Extension Center (AEC)	10 Agricultural Directorate 11 (AD) in kafr-El-Sheikh	Regional Research Station (RRS) North Delta.	Central Administration of Agricultural Extension Services (CAAES)	Agriculture Extension and Rur Development Research Institu (AERDRI)	Central Lab of Agriculture Expert Systems (CLAES)
Agricultural Extension Center (AEC) in Ariamon and A Khadmia.		- Recommended practices follow up reports. Cropping pattern reports. - Farmers problems of agricultur production and marketing. - Monitoring reports of crops condition. - Training activities reports. - Reports of demonstration plots and field days.	- Data regarding demonstration fields , field days their results. - Data regarding extension meetings. - Data regarding cropping areas and seed istribution. - Insects and diseases infection indicators. - Agricultural production and marketing problems.		- The constraints of extension activities performance. - The non-adapted recommended practices.	Remarks on the utilization of Expert Systems.
Agricultural Directorate (AD) in Kafr-El-Sheikh	- Agricultural legislation - Prices of agricultural crops - Training programs for the area. - Extension programs.		- The activities of extension programs, projects and national campaigns tabe shared by RRS researches - Data regarding cropping areas and production averages. - Data concerning demonstration fields and field days. - Farmers problems. - Insects and diseases infection indicators.	- Minting reports of programs, projects and national campaigns. - Agricultural councils reports. - Cropping pattern reports. - Follows reports of crops condition. - Problems facing farmers.		Remarks on the utilization of Expert Systems.
Regional Research Station	- Solution of the agricultural	- Recommended practices follow up reports. - Solutions of agricultural	-	- Crops varieties suitable for the area. - Recommended practices of	To Agriculture Research Center (ARC) via AERDRI: - Reports of research activites	Field test results of Expert Systen

9.1 To / From	Agricultural Extension Center (AEC)	10 Agricultural Directorate 11 (AD) in kafr-El-Sheikh	Regional Research Station (RRS) North Delta.	Central Administration of Agricultural Extension Services (CAAES)	Agriculture Extension and Rur Development Research Institu (AERDRI)	Central Lab of Agriculture Expert Systems (CLAES)
(RRS) North Delta.	production problems.	production problems. - Lists of researchers involved in extension and training activities.		various crops in the area. - List of researches - Participating in extension and training activities.	regarding the programs, projects and national campaigns. - Reports of training activites regarding the programs, projects and national campaigns. - Reports of extension activites regarding the programs, projects and national campaigns. - On-farm trials results.	
Central Administration of Agricultural Extension Services (CAAES)	-	- Work plans of extension programs, projects and national campaigns. - Extension training work plans. - Extension photo database. - Extension publications. - The procedures of implementin various extension activities.	- Extension publications. - Extension photo database. - The recommended practices of extension programs , projects and national campaigns. - Training topics for extension staff in kafr-El-Shaikh governorate.		To Agriculture Research Center (ARC) via AERDRI: - Achievement reports of extension programs, projects and campaigns. - Monitoring reports for various crops. - Agriculture production problems of various crops.	- Required extension TV series to be prepared on CDs. - Extension publications to be processed.
Agriculture Extension and Rur Development Research Institut (AERDRI)		- Extension training contents. - The recommendations of optior extension performance. - Information explaining the recommended practices.	- ARC research plan. - - Work plans of national campaigns in kafr-El-Shaik - - Photo database. - - ARC regulations. - - The low of civil workers No. (47).	- The results of extension studies - Extension training topics - The media processing of extension contents. - The recommended practices issued by A.R.C.		The results of extension studies regarding the utilization of expert systems.
Central Lab of Agriculture Exper Systems	ES developed by CLAES	ES developed by CLAES.	- Expert systems developed by CLAES.	- TV extension series prepared on CDs.	Expert systems developed by CLAES.	

9.1 To / From	Agricultural Extension Center (AEC)	10 Agricultural Directorate 11 (AD) in kafr-El-Sheikh	Regional Research Station (RRS) North Delta.	Central Administration of Agricultural Extension Services (CAAES)	Agriculture Extension and Rur Development Research Institu (AERDRI)	Central Lab of Agriculture Expert Systems (CLAES)
Systems (CLAES)				- Expert systems developed by CLAES.		

ANNEX II 6 LISTS

This will include the list of possible information of each oraganization