



### **Case Study: Institution-Based Information Systems, Egypt The VERCON Experience in Egypt**

#### **EXECUTIVE SUMMARY**

The Virtual Extension Research Communication Network (VERCON) is a FAO-developed model for an internet-based network designed to improve information sharing between agricultural researchers and extension workers. This case discusses the model's first field implementation, which took place in Egypt.

#### **1. BACKGROUND**

##### **Reasons for Establishment**

During the last decade, the Egyptian economy has seen a transition toward a market economy. An agricultural policy reform programme has been removing controls on input and output prices. Domestic and export markets for key commodities have been privatized. Relaxation of land tenure and land reform processes has taken place. The impact of these and other reforms has been rapidly changing the traditional system of agricultural production in Egypt. These changing conditions mean that the agricultural research and extension systems are facing unprecedented challenges as well as new opportunities. Access to information is increasingly critical to meet these challenges and opportunities.

The Virtual Extension Research Communication Network (VERCON) has employed the potential of the Internet to establish and strengthen linkages among the human and institutional elements of agricultural research and extension.

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). Establishment of the VERCON in Egypt has been the first field application of this innovative approach for improving linkages between agricultural research and extension institutions. It has provided valuable lessons for replication.

##### **Key Organizer**

The Central Lab for Agricultural Expert Systems (CLAES), within the Egyptian Ministry of Agriculture, has been involved with Internet initiatives since 1994. The United Nations Development Programme and FAO have supported CLAES in the past to implement the Expert Systems for Improved Crop Management Project (EGY/88/024). CLAES developed various crop expert systems that provide a solid basis for "populating" the VERCON with relevant technical content. CLAES has its own local area computer network, equipment and facilities suitable for staff computer training, meetings and conferences.

##### **Summary of Funding sources**

The VERCON project was initiated by a TCP project sponsored by FAO with the total amount of \$ 236,000 for 18 months (extended to 24 months, from August 2000 to July 2002), and a government in-cash contribution of L.E. 397,670 (~ \$69,000). The project continued 20 months (August 2002 to March 2004) with governmental funding only, which is L.E 683,000 (~ \$118,000).



### **Marketing and Promotional Strategy**

The Egyptian Ministry of Agriculture (MOA) supports the VERCON web site as it was considered as part of the Ministry's mission in disseminating agricultural information free of charge. The marketing and promotion of the site is being done through workshops, training researchers and extension workers from different sites, and advertising the VERCON URL in the well known newspaper Al-Ahram and other specialized magazines.

### **Summary Time Path**

The VERCON project started in August 2000 and was supported until August 2002 with funding from both FAO and the Egyptian government. The project then expanded with sites in new locations, and enhanced its contents with government funding until March 2004. In April 2004, VERCON was merged with a new project, Rural Development Communication Network (RADCON) funded under the Debt-for-Development Programme between the Governments of Italy and Egypt. The RADCON project engages a wider stakeholder community beyond government extension and research institutions to include other public and private information service producers and the media. In addition, the project actively seeks the direct participation of male and female farmers and farm groups in the communication network.

### **Geographic Coverage and Size**

The total number of nodes by **August 2002** (the ending date of the original project) was **9 (5 central, and 4 in one governorate)**. The total number of nodes, by **March 2004**, just before the start of the new project, was **57 (5 central, and 52 in six governorates)**. The target of the plan in the new project is to **add 106 sites in 9 governorates**. So the total number of sites is expected to reach **163 in 15 governorates** by March 2007.

### **Relation to National Policy on Information and Communication**

The initiation of the Egypt VERCON project was in the framework of enhancing the relationship between research and extension, which is one of the strategic goals of the MOA. At the time of VERCON's initiation, there was no formal declared Information Policy for the MOA. However, recently a national information policy is being prepared in which VERCON will be included.

## **2. OBJECTIVES**

The objective of the project was 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.

## **3. STAKEHOLDERS**

The stakeholders of VERCON can be classified into four main categories: farmers, extension workers, researchers, and statistical information providers.

### **Farmers**

Farmers benefit indirectly through improved capacity in the extension agents with whom they work.

### **Extension Services**

The extension services are represented in VERCON through two entities: the Central Administration for Agriculture Extension Services (CAAES) and the agricultural directorate (AD) at the governorate level.

Responsibilities:

*CAAES:*

1. Publishing all extension documents through its Media Centres
2. Receiving Growers Problems and getting responses from specialized institutes
3. Documenting these problems in the Growers Problems Database

*AD:*

1. Reviewing problems collected by the Extension Centres (ECs) and approving them.
2. Providing and documenting solutions for growers' administrative problems.
3. Using VERCON in farmer extension seminars and providing recommendations and advice to farmers.

### **Research Institutions**

The research institutions are represented in VERCON through all the research institutes, central laboratories, research stations, and Central Administration for Research Stations (CARS) in the Agricultural Research Centre (ARC). The institutions that have direct connectivity to VERCON are: the Agricultural Extension and Rural Development Research Institute (AERDRI) branch in the Regional Research Stations in Sakha, the Central Administration for Research Stations (CARS), and the Central Laboratory for Agricultural Expert Systems (CLAES).

Responsibilities:

*ARC Research Institutes and Central Laboratories:*

1. Preparing Extension documents in cooperation with the CAAES
2. Providing advice for solving growers problems
3. Incorporating the problems raised by farmers into ARC research programmes

*AERDRI:*

1. Collecting and publishing questions posed by farmers to extension workers at the extension centres and answers to these questions from regional research institute representatives
2. Producing reports of growers problems and questions to be submitted to top management
3. Publishing agricultural news
4. Assessing VERCON outcomes

*CARS:*

1. Monitoring the process of solving the growers' problems
2. Providing and documenting solutions in the growers' problems database, if necessary.

*CLAES:*

1. Publishing Expert Systems on the web
2. Conducting training courses
3. Conducting assessment studies of VERCON usage

### **Statistical Information Provider**

The Egyptian Agricultural Economic Sector (AES) is responsible for making its information available to VERCON users. To make this possible, CLAES developed a Web interface for VERCON stakeholders to access its information through the Web.

## **4. PRODUCT AND SERVICES**

The contents of the VERCON site, developed through an assessment of stakeholder needs, include:

- Information related to agricultural production,
- Agricultural news,

- Consultation facilities, and
- Experience exchange facility

**Information Services**

The VERCON information system provides information related to agricultural production. This information can be classified into

- technical information on different commodities
- statistical information on agricultural production and marketing
- government agricultural regulations

Table 1 summarizes the content of each information service category, its content development and management, and its information source.

**Table-1 Information Services**

<b>Content, development and management, and source</b>	<b>Content</b>	<b>Content Development and management</b>	<b>Information source</b>
<b>Information Service</b>			
Technical Information	Extensions brochures	ARC and CAES	ARC
Statistical and Marketing Information	Production statistics, cultivation areas, production cost, and return on investment, and farms and markets prices	AES	AES
Government Agricultural Regulations	Legislation related to: keeping plant wealth, keeping animal wealth, keeping fishery wealth, Landlord leaseholder relationship, Agricultural cooperatives, Agricultural Reform	AES	Parliament or by Ministerial decrees

**ARC:** Agriculture Research Centre

**CAES:** Central Administration for Agricultural Extension Services

**AES:** Agricultural Economic Sector

**Agricultural news**

*News content:* general news, timetables of televised extension programmes, and information related to conferences, seminars, and training cycles.

*News Sources:* media and administrations in the MOA.

*News Management:* AERDRI

In the future, different stakeholders will be able to add their news directly and AERDRI's will merely approve submitted news for publication.

**Consultation facilities**

There are two sources for consultation services:

- The knowledge bases of the expert systems developed by CLAES, which contain information related to management of specific crops from NARS experts, and provide users with information customized to their farm conditions.

- The growers' problem solving database, which provides extension workers and researchers with answers to questions already solved by researchers.

**Experience exchange facility**

An electronic forum was included to collect information from stakeholders based on their interests. While the VERCON steering committee encourages leading scientists to moderate the created forums, the VERCON site is not responsible for the forum content. The information contents of the created forums mainly relate to agricultural production, training, and extension.

**5. TECHNOLOGY AND SYSTEMS**

**IT System Architecture**

CLAES is the central node of the network because of its level of infrastructure and human resources. The CLAES bandwidth connectivity to the Internet is now 2Mbs. The central sites are either connected through the ARC network, leased lines, or dial up. The sites in the governorates have dial-up connectivity with 56 Kbs modems, through the Internet dial-up services provided by large ISP companies in agreement with the Ministry of Communication and Information Technology (MCIT). The price of the connection through dedicated numbers is the same as a local telephone call. This service covers the whole country.

CLAES has two servers; each one is a dual processor Pentium III, 1 GHz running Windows 2000. The workstations at all sites are at least Pentium III, 768 MHz running Windows 2000.

**Software**

CLAES' server is running Windows 2000 operating system. The database engine is MS SQL 7. The workstations are running Windows 2000 or XP operating system. CLAES engineers have developed all of VERCON's applications.

**Table 2 Functionalities of VERCON Modules and Software and Tools used to develop them**

<b>Functionalities</b>	<b>Software and tools</b>
Web interface	DreamWeaver, Adobe Photoshop
Brochure search facility	MS SQL, Java
Economic statistical DB	ASP, Java script, VB script, XML
News and Events	NEMS
Expert Systems	KSR, and RD tools (developed at CLAES), ASP, XML, XSL, VB script, and COM technology
Growers Problems Solving	MS SQL, Java script, VB script, XML
Discussion Forum	Snitz, which is a shareware software

**Human Capacity Development**

The VERCON human capacity development element involves three categories of participants: system developers, information providers, and information users.

*System developers-* The developers built their capacity in the process of creating the system under the leadership of CLAES researchers knowledgeable in information and expert systems development.

*Information providers-* CLAES media centre personnel (6 employees), extension workers (92), researchers (12), and AERDRI (2 employees, and 2 researchers) received training on inputting information into modules.

*Information users-* Because the information providers of one subsystem are users of the other subsystem, training cycles were conducted on the usage of the modules at every level: extension centres, agriculture directorate, regional research stations, central administrations, and AERDRI.

Follow up meetings were conducted to get feedback and usage questions from the users. Seminars were also conducted at all levels to increase awareness and enable stakeholders to easily use the system on the Internet.

## **6. FINANCIAL**

In the first phase, all services were supported by the FAO/TCP project until August 2002 and then by governmental support until March 2004. Currently the project is expanding through funding from the Italian/Egyptian debt swap programme.

Once the second phase is terminated, the services will continue to be provided as a CLAES activity. To continue the services, it is estimated that CLAES will need about \$50,000 per year. The government has already approved this amount in the 5-year plan 2002/2007 for maintaining and expanding VERCON coverage.

The sustainability of adding and providing contents is guaranteed through the commitment of the participating organizations and government to provide the requested funds for maintaining the equipment and connectivity to the Internet.

In the first phase, it was suggested that a section on the VERCON homepage be designated for advertisements, to generate revenues to support expansion. However, this option has not yet been implemented.

Another source of revenues may be to charge consultations and training fees from the organizations requesting to be part of VERCON. A third source of revenue is to cooperate with one of the big ISPs to dedicate a special telephone number to access VERCON and share the revenues generated from the calls with the ISP. This business model exists in the Egyptian market.

## **7. KEY ISSUES AND CONCLUSIONS**

### **BRDD Livelihoods Approaches**

#### **Adapting content to local context**

VERCON's extension brochures were prepared by research institutes in collaboration with CAAES, in a form suitable for extension workers to convey them to small farmers. The expert systems were prepared by CLAES in cooperation with the research institutes and AERDRI. The growers' problems are collected from the grassroots level to address farmers' actual problems. Solutions are all reviewed by researchers to ensure quality and by extension workers to ensure suitability for different users. Statistical contents were identified to address the needs of the research and extension institutions and presented in an easily-interpreted way.

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

The VERCON system maintains existing channels of communication between researchers and extension workers, but makes them much more efficient. Extension workers can get an answer to any farmer question within a maximum of three working days. All problems are documented for further research use. The expert system is now available to all Internet-enabled extension centres. All expert system modifications are done centrally, so all centres have the latest versions. Agricultural production statistics are available as soon as they are published by the AES. The news and forum systems also strengthen communication between different stakeholders.

#### **Addressing diversity**

Many men, women, and youth are working in agriculture-related activities. Therefore, in the first phase of the project, the main motivation was to build on the existing information in research and extension that had already been identified to be needed by the extension workers to assist these groups. More work is currently being done to identify other sorts of information needed at the village levels by marginalized groups. Key stakeholders who can provide information on the needs of marginalized groups are also being identified.

### **Capacity building**

The VERCON project has strengthened CLAES' capacity in building web information systems. In central administrations, research stations, agriculture directorates, and extension centres, staff were trained to use the VERCON modules to enter and manage growers' problems, to publish and manage the news system, to search for information, to publish the extension brochures, and to use VERCON to assist them in doing their jobs.

### **Access and empowerment**

The growers' problems module allows farmers to be part of the decision-making process related to planning and implementing the research and extension programmes

### **Strengthening partnerships and participation:**

The solutions to the growers' problems published on the VERCON information system and the electronic forum module have created horizontal links between growers nationwide. The other modules, namely the extension brochures, the statistical database, the expert systems, and the news system, vertically linked farmers and extension workers to research institutions and central administrations. The growers problems solving module also has a vertical link, which is unique in that it allows interactions between the different extension and research management levels. All stakeholders using the VERCON system share its ownership as they use it to express their problems, to publish their expertise, to help them generate management/ research/ extension reports, to communicate with their peers, experts, and superiors, and to search for information, news and events.

### **Realistic approach to technologies**

Information technology is spreading across Egypt and has very strong governmental support. Internet can be accessed across the country for normal local telephone tariffs. Computers can be purchased in low-interest-rate instalments, which can be paid through buyers' telephone subscriptions, thanks to a government scheme. Therefore, using information technology to enhance and strengthen the research-extension linkage within the MOA was a logical step. VERCON is sustainable in its organization and management aspects as it addresses the needs of its participants and was based on an existing MOA organizational structure of research and extension institutes.

### **Costs and financial sustainability**

The technical sustainability of the network is assured by the government commitment to support communication infrastructure throughout the country using a sustainable business model based on collaboration with the private sector. VERCON information provision sustainability is based on the mission of the MOA's research system, which is committed to conducting experiments and publishing research to benefit growers all over the country. VERCON maintenance sustainability is based on CLAES, which is part of the ARC, and its mission is to use information technology to transfer research results to growers. Both transfer this knowledge through the extension services. Financial sustainability is based on the Government providing the necessary funds to maintain the system and expand it horizontally all over the country. The funding needed is not tremendous, considering that by the end of the current project more than half the extension centres will be covered and most of the needed information systems will be developed. Other business models can also be implemented such as those mentioned above.

**URL of the Service:** [http://www.vercon.sci.eg/Vercon\\_en/vercon.asp](http://www.vercon.sci.eg/Vercon_en/vercon.asp)

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