Support Services

Geographic Information Systems Unit

The Geographic Information Systems Unit (GISU) was established in 2005, replacing the former MTP Project "Agroecological characterization for agricultural research, crop management and development planning". The specific mandate of GISU is to address ICARDA's growing needs for spatial database development and analysis through GIS, and to deliver mapping products, resource databases, methodologies for spatial analysis and agroecological characterization, training, and web portals for knowledge dissemination.

GISU supports ICARDA's research agenda with new and innovative GIS applications. A study in Syria provided the know-how for outscaling research on identifying the biophysical potential of water harvesting sites. A GIS-based decision-support system was developed – the "ICARDA Agroclimatic Tool", which helps quantify climatic stresses in different agro-ecological regions of CWANA. Building on the concept of resource poverty, a new approach to poverty mapping was developed that combines macro-level socioeconomic with micro-level environmental determinants of rural poverty.

GIS-embedded weather generators for characterizing climatic stresses

Agroclimatic characterization of the CWANA region is of paramount importance to map the occurrence of abiotic stresses, particularly extremes of temperature, heat and drought. ICARDA has a good climatic database which allows an adequate representation of the average climate.

However, a risk assessment of climatic stresses is basically an estimation of probabilities, which requires consideration of climatic variability. The low density of meteorological stations in the CWANA region, the high cost of meteorological data and many gaps in data records have made it hard to quantify these stresses in most parts of the region.

To address this problem a joint study was undertaken with the Plant Stress and Water Conservation Laboratory of the USDA's Agricultural Research Service. The objective was to develop a decision-support system, the "ICARDA Agroclimatic Tool". This application allows a user to select any agricultural location inside the ICARDA mandate region through a simple Windows user interface and obtain a set of relevant views on the climatic stresses at that location for the selected crop, growing season and soil type. The outputs are estimates of means and probabilities of exceeding user-defined thresholds for tempera-

ture and precipitation on a daily basis, or for user-defined time periods. The results can be viewed as graphs or exported as data files for use in other software applications.

The core of this application is a 'weather generator', which is actually a software module that generates artificial series of climatic data through a process of stochastic simulation. The weather generator was first parameterized for different parts of CWANA by using real climatic data series. The application was then developed using several public domain databases. Precipitation, minimum and maximum temperature data for 649 stations were obtained for the period 1977-1991 from two climatic data archives in the public domain, the Global Daily Summary Data (GLDS) and the Global Daily Climatology Network (GDCN). Additional databases were added: a crop database containing information for irrigation, the GTOPO30 Digital Elevation Model, and simplified maps of country boundaries, population centers, agricultural areas and station locations. All these databases are 'embedded' within the application.

The weather generator used is GEM6, developed by the USDA-ARS (www.eightnine.org/USClimateGEM.htm). The feasibility of using synthetic climatic data produced by the weather generator software, instead of real climatic data, depends on its ability to reproduce realistic estimates of the real climatic parameters. A validation was undertaken by comparing generated versus real data, and shows satisfactory agreement. The ICARDA Agroclimatic Tool currently has some limitations, notably the short time series used to parameterize the weather generator, but a newer version will use a longer and more up-to-date time series. The main benefit of the Tool is that the use of synthetic climatic data allows us to largely overcome the lack of climatic data available for ICARDA's mandate region. Its potential applications are manifold. First, the Tool will allow ICARDA's crop breeders to better target new varieties, with specific tolerances or sensitivities to various climatic stresses, to environments where these varieties have not been tested. We also expect the Tool will be used by the Genetic Resources Unit for more in-depth characterization in terms of stress tolerance of germplasm collected at specific sites. The Tool is also vital for the characterization of climatic variability and climatic stresses. For example, it will allow water management specialists to assess potential impact of rainfall and temperature variability on crop water and irrigation requirements. It also has applicability in climate change research.

Computer and Biometrics Support Unit

The most important achievement of the Computer and Biometrics Support Unit (CBSU) during 2005 was implementation of the web-based version of Oracle Applications (11i) covering financial, administrative and human resources areas, to meet new reporting requirements and overcome deficiencies in the previous system. Many functional processes were re-engineered, new reports developed, users trained, and access improved.

ICARDA's Local Area Network achieved very high availability of network and services (Exchange, Proxy/ISA, File Servers, Intranet) throughout 2005, approaching an uptime of 99.9%. ISA 2004 server was installed to replace an old VPN system for Active Directory and SMTP messaging. The wireless network was extended into the conference room, for both Satellite and LAN services. A new anti-virus software, Trend Office Scan was installed on servers and client PCs. Secure access for the Oracle outreach project was set up and tested successfully. SSL-Explorer was installed to give remote access to the Intranet. GoRemote software was installed for traveling users to replace expensive TAS access. We successfully set up a second standby MS Exchange server and a secure certificate web server for traveling users.

The Internet bandwidth was further upgraded to 2 Mbit/sec. The ICARDA Intranet was developed further with new pages and services.

Support to ICARDA outreach offices continued. The ICARDA School was supported for hardware maintenance, local area network, internet access, and Oracle Applications on-line reporting. Site surveys on internet service were carried out for the Tashkent,

Kabul and Cairo offices.
As part of ICARDA's involvement in the CGIAR ICT-KM projects, CBSU participated in the CGXchange project, and initiated the first phase of the "Utilization of intelligent information systems for crop protection" project. Considerable work was done on capturing the knowledge base for barley and chickpea in cooperation with scientists. The Center hosted the annual meeting of the CGIAR information technology managers in June.

Participants of the annual meeting of the CGIAR Information Technology Managers, held at ICARDA headquarters.

The Unit completed the design and development of a web-based soil database and initiated data loading. Further development was carried out to enhance and maintain the meteorological database, and it was migrated to an Oracle 9i database. A new version of the Meta database was introduced. A system requirements study document was developed for a database on Participatory Plant Breeding.

Data loading for the Project Manager system was largely completed. The new Payroll System covering all contract staff at headquarters and outreach offices was developed and implemented successfully. For the new payroll system, 12 programs, 31 reports and 29 forms were developed or modified.

The Unit provided 110 biometric consultancies to ICARDA researchers. Support on statistical software and data management was provided on over 60 occasions. Online bio-computing facilities were provided to users on 73 occasions.

Statistical designs were developed for various experiments including those for evaluating the effect of irrigation on wheat; chickpea seed treatments and foliar treatments; safflower variety, row-spacing, and seed rate; seed storage factors; response of barley genotypes to vernalization and photoperiod; application of phosphorus and organic matter and water on soil nutrients extracted in the resin polymer.

Statistical analyses were carried out for numerous datasets – identifying winter and facultative wheat genotypes and classifying them into categories for drought tolerance and input responsiveness; diversity and selection coefficients using data on pathogen distribution on a number of barley hosts; evaluating wheat genotypes under protection treatments in a crop-loss experiment on yellow rust; performance of mixtures of genotypes; evaluating effectiveness of core sampling methods on the coverage of population parameters using core sample based confidence intervals; fitting genetic ratios on *Ascochyta* blight score in faba bean and estimation of effective number of factors controlling the disease; evaluating data from meat tasting experiments; behavior preferences of sheep on grazing of shrubs; screening of models for validating evapotranspiration using experimental data; and data on phosphorus dynamics.

Training

CBSU participated in the Generation Challenge Program on Bioinformatics capacity building and in conferences to provide training on statistical analysis of gene expression data and on Monte Carlo methods. Five biometrics courses for 83 participants were offered.

Communication, Documentation and Information Services

Publications and media relations

The Center produced a wide range of publications in 2005, targeted at various audiences. These included a weekly newsletter; *Caravan*, a periodical describing ICARDA's research to non-technical readers; corporate and program annual reports; newsletters for regional seed network and the dryland agrobiodiversity project, and a number of scientific reports and workshop proceedings. Six titles were produced in the "Ties that Bind" series which describes collaboration between ICARDA and individual countries or donor agencies. The publications were distributed widely to NARS and other partners worldwide. A large number of posters were produced for scientific conferences and book fairs.

The New Scientist carried a feature article "Returning Farmland to Productivity," inspired by 'Healing Wounds,' produced at ICARDA for the CGIAR. The article brought increased visibility to ICARDA and other CGIAR centers, and was subsequently cited in several media stories. The Canadian Broadcasting Corporation radio network did a feature on rebuilding agriculture, and the Crawford Fund published a brochure (drawing material from Healing Wounds) on Australia's support to rebuilding agriculture in various countries.

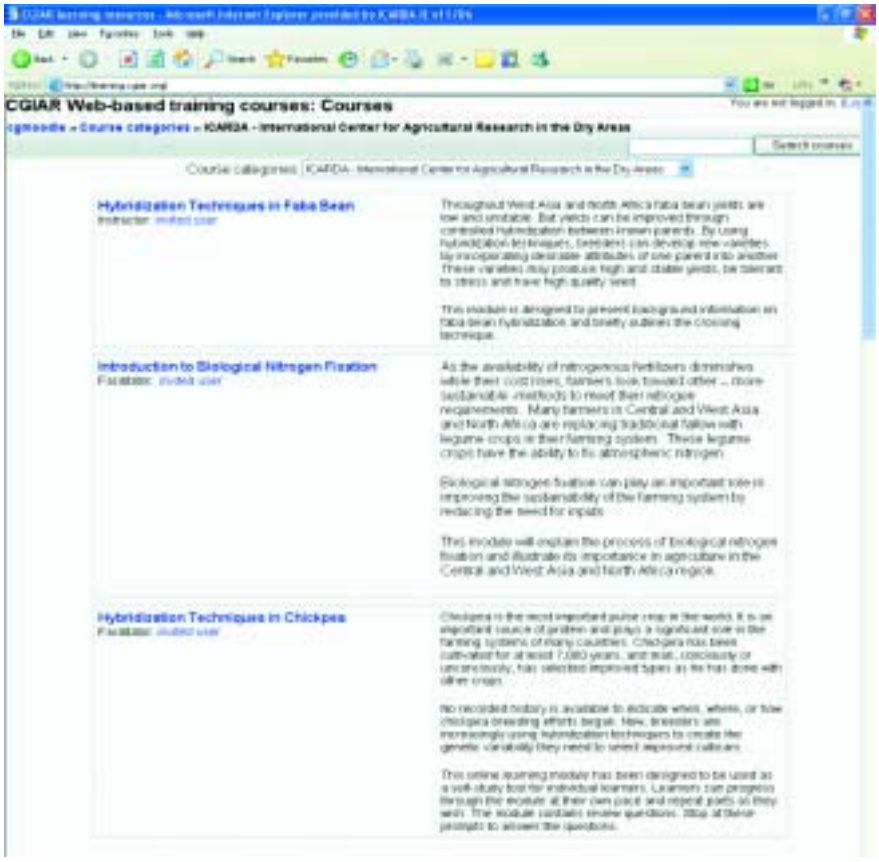
'Healing Wounds' was formally launched in Kabul in February 2005, by the Afghanistan Minister of Agriculture. The launch was covered by a large number of mdia representatives including those from BBC, Voice of America, the Afghanistan print media, and local and regional radio and TV stations.

The regional and international media continued to provide positive coverage of ICARDA's work. The clippings are posted on ICARDA's website (www.icarda.org/Media.htm). Key stories appeared in a number of regional newspapers and magazines and also in Australia, Japan and elsewhere.

A BBC journalist visited ICARDA in May to film the Center's work on Sunn pest management. The documentary featured in BBC's 'Hands On' program, viewed by more than 270 million households worldwide. A Swedish TV journalist visited ICARDA to familiarize himself with the research programs, and featured the Center's work in a documentary on Syria, for Swedish TV.

Website and multimedia products

The Center's website continued to attract increased number of visitors, with over 1 million during 2005. On average, the English version of the website received over 6000 hits, and the Arabic version about 1000 hits per day.



Five ICARDA training modules for online learning were redesigned, and uploaded to the CGIAR learning objects repository and learning management system.

A number of multimedia products were developed in 2005. These included video films in English and Arabic – including a short film in memory of the late Dr Robert Havener, which was shown at the CGIAR AGM 2005. Video footage was recorded on ICARDA's work on Sunn pest control in Syria and Turkey, as well as on small-scale milk processing initiatives in Syria. Video footage on various research projects was shared with BBC and Al-Jazeera TV.

Library and documentation services

The library added to its collection over 275 books, 800 issues of journals and annual reports, and updates of AGRIS databases on CD-ROMs. It fulfilled over 1900 requests for literature searches and other services from NARS scientists. The Virtual Library (CD-ROM library) on the Center's Intranet was enriched with additional links to useful reference sources, and was extensively used by ICARDA scientists, trainees and visitors.

In 2005, the Center's Library installed NewGenLib, an Integrated Library Management System, which will allow ICARDA to computerize all library activities, and network all ICARDA program libraries at headquarters and in regional offices. Considerable progress was made on ICARDA's digitization project, which aims to consolidate information from a vast number of reports, technical papers and other publications into a comprehensive searchable database.

The Unit staff participated in several meetings and consultations with professional associations, regional forums, FAO and other agencies to strengthen library and documentation services in the CWANA region. These included, for example, the GLOBAL-RAIS project of GFAR, which will assist regional forums to develop and implement their own regional agricultural information systems. The Center provided a resource person for the CG online learning initiative, and also expanded collaboration with FAO to strengthen support to NARS.

ICARDA continued to maintain and strengthen its twinning agreement with agricultural libraries in Sudan and Egypt.

Training

The Unit continued to help strengthen NARS capacity to document, manage and disseminate information. Training courses were offered on science writing and PowerPoint presentations. In collaboration with FAO, a two-week training course on "Management of electronic documents and web databases," was offered, which brought together participants from 10 countries.

Human Resource Development Unit

During the year 2005, ICARDA offered training opportunities to 1196 national scientists from 49 countries within and outside the CWANA region. In addition, 58 national scientists from developing and developed countries are conducting their graduate research training for MSc and PhD degrees, under the joint supervision of ICARDA and the respective parent university or institution. About 20% of training participants in 2005 were women.

ICARDA continued its strategy of gradually decentralizing training activities by offering more training courses at locations outside its headquarters in Aleppo. The Center offered 22 courses at headquarters and 35 in-country, regional and sub-regional courses. Nearly two-thirds of participants were trained in courses organized outside headquarters, in close collaboration with NARS.

In response to increasing (and evolving) demand for training from NARS, the Human Resources Development Unit (HRDU) facilitated and coordinated a number of training courses for external-funded projects, for example the Agricultural Higher Education and Development (AHEAD) Project in Iraq, funded by USAID and the University of Hawaii; the Netherlands-funded project on IPM in Egypt; as well as projects funded by the CGIAR Gender and Diversity Committee, FAO, ICBA, and JICA.

The different types of courses are summarized below:

- Twenty-two training courses and workshops conducted at ICARDA headquarters in

Aleppo, involving scientists from NARS, universities and other organizations, NGO staff, farmers, and scientists and administrators from CGIAR Centers.

- Regional training courses held in Afghanistan, Bangladesh, Egypt, Eritrea, Iran, Morocco, Oman, Sudan, Syria, UAE, Uzbekistan, Turkey, and Yemen, in collaboration with national research and extension agencies, other national and regional institutions, CGIAR Centers, JICA, and international organizations including USAID, DFID, FAO, IFAD and the European Commission.
- In-country courses for national researchers, extension and NGO staff and farmers, conducted in 11 countries. Some courses were conducted in one country for the benefit of participants from another: for example, training in greenhouse management conducted in Egypt for participants from Afghanistan.

Collaboration in human resources development was further extended not only with NARS, but also with regional and international research and training institutes such as JICA, World Bank, FAO, IFAD, AFESD, ADB, GEF, ICBA, USAID, SYNGENTA, CLAES, universities, and several CGIAR Centers. Inter-Center collaboration was also strengthened through participation in the IARCs Inter-Center Training Group and the exchange of training databases with other CGIAR programs. ICARDA was actively involved in CGIAR activities related to human resource development, including the Global Open Food and Agricultural University (GO-FAU), Virtual University, and initiatives on distance education, e-learning and knowledge management and dissemination. ICARDA's training database was also updated and placed on the Center's intra and internet websites.

A training course in biotechnology in progress at ICARDA.

ICARDA is also working with the Japanese International Cooperation Agency (JICA), the Syrian Planning Commission, and national authorities in Afghanistan and Iraq for implementation of training courses, workshops and seminars under the newly approved 5-year Third Country Training Programs for Afghanistan and Iraq. Another project proposal for graduate and undergraduate studies for Afghan students was recently prepared in collaboration with Mega-Project 6 and submitted to USAID for funding. The CCER on human resources development and capacity building at ICARDA was launched in November 2004 and will be completed in early 2006.