Egyptian -Dutch co-operation in land drainage and technology transfer

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Land drainage installation in Egypt (Photo: DRI)

The Drainage Research Programme, which started at Egypt's Drainage Research Institute (DRI) in December 1994, has been a bilateral project between the Governments of Egypt and the Netherlands. From Egyptian side the Drainage Research Institute of the National Water Research Center (NWRC) in the Ministry of Water Resources and Irrigation (MWRI) is the executing agency. The Dutch component of the project is funded through a grant by the Directorate General of International Cooperation (DGIS) of the Dutch Government and is executed by the International Institute for Land Reclamation and Improvement (ILRI) and ARCADIS Euroconsult.

This unique continuous project, which started as a typical technical aid project, was notable for its emphasis on the "soft capacity building components" of institutional strengthening and organizational development. This capacity building has taken the form of providing both management tools and training in the use of them, and has been a major work activity of the DRP projects. Tools that have been developed specifically for supporting researchers in their tasks are: the intranet, an activity database, timesheets and a (technical) Data Information System (DIS).

The Intranet continues to provide interesting information for DRI, - like management decisions, electronic newsletters, software upgrades and access to various MIS databases. The activity database keeps track of the planning and activities of DRI researchers and studies. It can handle several levels of planning, and indicates the progress of activities. An important input for the database is timesheet information, which enables the time that researchers spend on their various studies to be recorded. Periodic progress reports for management are a major output of the database.

The Data Information System was developed in order to store and access technical data, and consists of a Folder Storage System (in which line, regional, and other data are stored), and a Database Management System (which mainly holds point data). Data can be extracted from the system using simple query routines.

The concluding activity of the Drainage Research Project was a Final Technical Workshop, held in June 2001, which:

1. Assessed the achievements of the drainage research during DRP and DRP2 projects;
2. Illustrated the role of DRP and DRP2 projects in the improving the quality of research;
3. Assessed the role of new drainage technology in improving the quality of construction of subsurface drainage systems in Egypt;
4. Exchanged ideas and experiences

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between different land drainage experts;
5. Introduced drainage topics and problems expected in the near future.

Research carried out under the project, and by DRI, has achieved noticeable savings and potential increases in food production (and hence in the incomes of both the farmer community and the country as a whole) under the following headings:-

- **Drainage construction costs** can be reduced with 25% by using the V-plough method of drainage construction. This can be achieved in both problematic areas (for which the method was specifically introduced) and in other soil types/areas as well.
- **Synthetic drain envelopes** can result in construction cost savings (compared to systems that use the traditional gravel envelope material) of $125 per ha[2] , and can enable the V-plough to be used in all areas where drain envelopes are necessary. (Gravel envelopes cannot be used with the V-plough.)
- **Controlled drainage** – has enabled farmers in rice-growing areas to save time and money. Actual savings amounted to $50 per ha. The increase in drainage construction cost was calculated to be 27%, approximately equal to $50 per ha. It is clear that if the actual savings in the pumping of water are also passed on, the farmers should have no difficulty in accepting the higher drainage investment costs. Financially they will recover the extra investment in two to three rice seasons.
- **Drain maintenance** - Egyptian Public Authority for Drainage Projects (EPADP) has fixed funding allocations for maintenance based on area served rather than actual need. The performance assessment techniques introduced, the medium pressure flushing of subsurface drains, the video inspection and the monitoring of salinity with the EM38 device are all new tools that have the potential for savings in the O&M of drainage systems, and can contribute to further increase of agricultural production.
- **Production in heavy clay areas**, in the Northern Nile Delta, is only about 25 – 50% of the potential production - based on climate, plant genetics and no limiting crop production factors. The following were identified as limiting factors on production: water, soil salinity/sodicity, nutrient level, socio-economic factors, weeds, pests and diseases.

DRI has moved towards a market and client oriented research approach under guidance of the this programme, and has become much more aware of internal management and of the latest developments and techniques in planning, designing, constructing and managing drainage systems. Also, farmers - major stakeholders of drainage systems – have received intensive attention during the introduction of management for the controlled drainage system. DRI is also paying a lot of attention to water quality and environmental impact issues through its studies. It now offers a fully integrated and multidisciplinary approach in drainage expertise.