

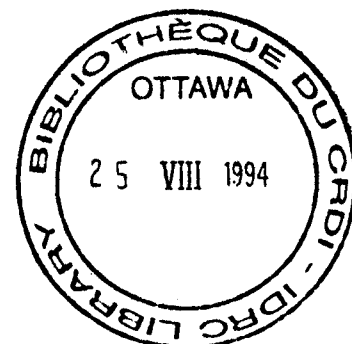
***Roundtable on Land &
Water Management***

***Table ronde sur la
gestion de l'eau et des
terres***

**Proceedings
Actes**

**Cairo/Le Caire
13-15 dec. 1993**

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(Editor/Éditeur)**



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FOREWORD

This document contains the *Proceedings of the Roundtable on Land & Water Management* organized by the Regional Office for North Africa and the Middle East (MERO) of the International Development Research Centre (IDRC). Held at the Cairo Sheraton Hotel from 13 to 15 December 1993, the roundtable counted on the participation of 11 IDRC-supported projects in North Africa and the Middle East and served to:

- i) highlight the projects' commonalities, strengths and weaknesses;
- ii) strengthen their execution by facilitating linkages;
- iii) plan and design future activities and mechanisms for:
 - a) resource sharing, technical assistance, South- South technology transfer
 - b) improved communications and dissemination of results
 - c) joint research
 - d) coordination
- iv) facilitate their contributions to the evolution of the programs of IDRC Regional Office for North Africa and the Middle East (MERO).

The invited projects all concern research activities in the areas of integrated management of natural resources, environmental studies and environmental policies, and illustrate well MERO's current program priority. They included (from West to East):

- 1- Développement d'un système d'information géographique pour la mise en valeur agricole (SIGMA); Maroc/IAV Hassan II, Canada/U. de Sherbrooke (completing in 1994).
- 2- SIG pour la gestion de l'activité pastorale dans la steppe algérienne; Algérie/CNTS (to start in 1994).
- 3- Système d'information à référence spatiale (SIRS) basé sur les données de télédétection pour la conservation des eaux et des sols; Tunisie/ENIT, Canada/U. Laval (completing in 1994).
- 4- Geographic Information System for Water Resources Management; Egypt/SRI, Canada/GIS Division-EMR (completing in 1994).
- 5- Water/Land Management; Egypt/U. of Alexandria, Canada/UBC/Guelph (completing in 1995).
- 6- Environmental Policy-Making; Egypt/AUC (completing in 1994).
- 7- Irrigation Efficiency; Egypt/Desert Development Centre, AUC (starting in 1994)
- 8- Irrigation Management; West Bank/ARIJ (completing in 1996).
- 9- Water Harvesting; Canada/U. of Concordia, Jordan/ U. of Jordan, ICARDA (completing in 1996).
- 10- Agro-Ecological Characterization; Regional/ICARDA (completing in 1994).
- 11- Terrace (Dryland Resource Management Project Phase II); Yemen/AREA, ICARDA (starting in 1994).

(Another initially scheduled project, Integrated Watershed Management -Syria-, could not be represented at the meeting)

The program for the meeting consisted of 2 days of presentations on project concepts (issues

covered, disciplines involved, objectives, methodologies, technical and organizational problems). Participating project leaders were requested to prepare a 30-minute presentation (jointly in the case of multi-component projects) allowing a 15-minute question period between each.

The next day was used (1) to present a synthesis of commonalities, strengths and weaknesses; (2) to propose and discuss innovative activities and mechanisms relating to objectives (ii), (iii) and (iv) above; and (3) to discuss potential follow-up activities by MERO staff and the projects.

These *Proceedings* include the speeches of the participating MERO staff members, followed by the texts made available by the invited project leaders on their projects. The compilation of commonalties, challenges and recommendations was made possible thanks to the assistance of *rapporteurs* selected among the participants. We are particularly thankful to Robert Valantin, Ferdinand Bonn, Mike Jones, John FitzSimons and Seeman Sarraf for their assistance in this matter.

AVANT-PROPOS

Ce document contient les *Actes de la Table ronde sur la Gestion de l'eau et des terres* organisée par le Bureau régional pour l'Afrique du Nord et le Moyen-Orient (BREMO) du Centre de recherches pour le développement international (CRDI). Tenue à l'hôtel Cairo Sheraton du 13 au 15 décembre 1993, la table ronde a compté sur la participation de 11 projets appuyés par le CRDI en Afrique du Nord et au Moyen-Orient et a servi à:

- i) illustrer les points communs des projets, leur force et leurs faiblesses;
- ii) renforcer leurs opérations en favorisant des liens entre eux;
- iii) planifier et formuler des activités et mécanismes futurs pour:
 - a) le partage des ressources, l'assistance technique, la coopération Sud-Sud en transfert de technologies
 - b) une amélioration des communications et de la diffusion des résultats de la recherche
 - c) la recherche conjointe
 - d) la coordination;
- iv) faciliter leurs contributions à l'évolution des programmes d'intervention du Bureau régional du CRDI pour l'Afrique du Nord et le Moyen-Orient (BREMO).

Les projets invités traitent d'activités de recherche dans les domaines de la gestion intégrée des ressources naturelles, des études environnementales et des politiques environnementales. Ils illustrent bien les priorités actuelles du programme du BREMO. Ils ont compris (d'Ouest en Est):

- 1- Développement d'un système d'information géographique pour la mise en valeur agricole (SIGMA); Maroc/IAV Hassan II, Canada/U. de Sherbrooke (terminant en 1994).
- 2- SIG pour la gestion de l'activité pastorale dans la steppe algérienne; Algérie/CNTS (commençant en 1994).
- 3- Système d'information à référence spatiale (SIRS) basé sur les données de télédétection pour la conservation des eaux et des sols; Tunisie/ENIT, Canada/U. Laval (terminant en 1994).
- 4- Geographic Information System for Water Resources Management; Egypt/SRI, Canada/GIS Division-EMR (terminant en 1994).
- 5- Water/Land Management; Egypt/U. of Alexandria, Canada/UBC/Guelph (terminant en 1995).
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- 9- Water Harvesting; Canada/U. of Concordia, Jordan/ U. of Jordan, ICARDA (terminant en 1996).
- 10- Agro-Ecological Characterization; Regional/ICARDA (terminant en 1994).
- 11- Terrace (Dryland Resource Management Project Phase II); Yemen/AREA, ICARDA (commençant en 1994).

(Un autre projet initialement au programme, Integrated Watershed Management -Syrie-, n'a pas pu être présenté)

Le programme de la réunion a consisté en 2 jours de présentations sur le concept de chaque projet (ses problématiques, les disciplines concernées, ses objectifs, sa méthodologie, ses problèmes techniques et organisationnels). Les chercheurs principaux participants devaient préparer une communication de 30 minutes sur leur projet. Une période de questions de 15 minutes a suivi chaque communication.

Le jour suivant a été utilisé pour (1) présenter une synthèse de leurs points communs, leur force et leurs faiblesses; (2) proposer et discuter des activités et mécanismes innovateurs en rapport aux objectifs (ii), (iii) et (iv) ci-haut; et (3) élaborer sur le suivi de la réunion par le personnel du BREMO et les projets.

Ces *Actes* rassemblent les discours prononcés par les membres du BREMO participants, suivi par les textes offerts par les chercheurs principaux sur leurs projets. Les points communs, les défis et les recommandations ont été compilés par des rapporteurs choisis parmi les participants. Nous tenons à remercier Robert Valantin, Ferdinand Bonn, Mike Jones, John FitzSimons et Seeman Sarraf pour leur assistance à cet effet.

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WATER/LAND MANAGEMENT : NORTH-WEST COAST -Egypt-

Dr. Fawzi Abdel-Kader, UoA
(University of Alexandria)

Dr. Hans Schreier, UBC
(University of British Columbia)

Dr. John FitzSimons, UoG
(University of Guelph)

Background:

The general development issues facing the north-west coast of Egypt are common to many areas in the middle east and north Africa; the improvement of agricultural production and the well-being of its inhabitants without the degradation of a fragile environment.

As a result of increasing restriction on movement during the past thirty years, the Bedouin population along the NW-Coast of Egypt has been encouraged to evolve from a semi-nomadic agro-pastoral system to a more sedentary agro-pastoral system. Given the population increase, the uncertainty of rainfall and increasing external influences such as tourism development, the transformation has been challenging. Over the past 20 years, the system of water harvesting, storage and redistribution has been greatly expanded and food supplies for both animals and people have been improved through mechanisms such as subsidies, favourable export quotas and direct external aid. However, these changes have been accompanied by increasing degradation of an already fragile environment.

The main questions to be asked are how water use can be further improved, by how much can the biomass production be enhanced, and what are the environmental consequences and sustainability questions in this coastal zone given current inputs and pressures on resources in the region.

Goals:

The overall goal of the project is to examine the bio-physical and socio-economic dynamics of the East Matrouh area of the NW-Coast of Egypt in an integrated and interdisciplinary manner and to evaluate the potential production and carrying capacity of the current system given environmental constraints and the pressures of population growth.

A micro-computer based information system is to be used to integrate biophysical and socio-economic information and to facilitate the evaluation of the resources, generate management options and identify potential environmental consequences if the demand for biomass production continues to increase.

The specific aims of the project are:

1. Evaluate the efficiency of the water collection systems in relation to annual variation in aridity.
2. Examine the changes in land use and production systems in terms of efficiency and sustainability.
3. Determine the animal population dynamics in relation to external demands, inherent social values, and economic pressures.
4. Document population growth in relation to resource availability, production potential and constraints.
5. Evaluate extent of land degradation due to crop intensification, mono-cropping and nutrient depletion.
6. Illustrate the effect of external pressures such as tourism and technological change, and
7. Examine the problems, options and consequences of shifting from subsistence pastoralism to a market production system.

A comprehensive resource and socio-economic database is to be developed in a spatially referenced manner for the Wadi Naghamish and this test area will be used to develop modelling and evaluation capabilities for simulating future development scenarios. This is to be accomplished in a way that enables us to compare the production potential and constraints in a rapid and interactive manner in the test area and to use the techniques for spatial extrapolation to the region.

Methodology:

The project has both a research and a training component. The Canadian collaborating institutions will assist in computer training (Geographic Information Systems (GIS) and database management), the use of new techniques for automated monitoring of bio-physical resources and for evaluating production system dynamics and socio-economic conditions at the community, sub-tribal and extended household level.

The following four components of the project are under way:

1. Development of an integrated, geo-referenced database:

The first step was to set up a GIS system (Terrasoft) at the University of Alexandria which will form the integrated platform for all data collection, data management and modelling. A three week training course was successfully completed in June 1993 and the development of a geo-referenced integrated resource database is well on its way. It will consist of climatic, topographic, soil, land use, production systems and socio-economic information. Once completed, this database and platform will be

used for modelling resource options and documenting environmental constraints.

2. Biophysical mapping and monitoring:

A climatic network is being set up that consists of one fully automated weather station, five automated rain gauges that monitor rainfall and intensity, and 30 manual 24 hr. rain gauges. Five cisterns have been selected in the Wadi Naghamish test area and the rainfall input (amount and intensity) and the water accumulation in these underground cisterns is monitored using pressure transducers and dataloggers. Knowing the surface area from which rainwater is directed into the cistern, the amount and duration of rainfall and the amount accumulated in the cisterns will enable us to determine how efficient the collection systems are. We will also be able to monitor how much water is used during the rest of the year once the winter rains are over.

Mapping of soils, vegetation and land use will be completed and attempts will be made to document historic land use changes. Soil fertility and erosion conditions will be examined in the rangeland and cultivated areas and production data will be collected from interviews.

3. Farming Systems/ Socio-Economic Data Collection and Modelling

Surveys, using a variety of both formal and participatory techniques are underway to generate geo-referenced data for a series of extended household level farming systems models comprising interacting crop, animal, off-farm and household components reflecting various household wealth levels and the main agro-ecological zones of the study area. The data cover inputs and outputs from the household systems under "good", "average", and "poor" climatic years, together with the main resource allocation/ production systems decisions expressed in local knowledge/ management systems terms to permit dynamic analysis of system behaviour. On-going training is provided in variety of formal and participatory research techniques and farming systems analysis and modelling.

4. Integration and modelling:

A flowchart (Figure 1) is provided to document the main components of the project and their integration. The key topics to be evaluated are water efficiency, environmental sustainability, carrying and production capacity under various conditions, options for increasing market based activities. We also anticipate developing an annual water management forecasting model for the cistern.

We plan to design a computer based information system for the test area that allows decision-makers and researchers to access the basic data, to evaluate variable interactions, to develop evaluation schemes and to get involved in scenario development.

How can the Water/Land Management Project on the NW Coast of Egypt assist in sharing information and experiences?

Commonalties, Strength and Challenges:

Commonalties:

The resource issues are similar: Water quantity and quality problems, population growth, deterioration of resources and environment. Need to increase biomass production. Need to retain cultural integrity.

Strengths:

Integration of bio-physical and socio-economic evaluation - a holistic approach.
Field monitoring is semi-automated to provide more reliable data on bio-physical processes.
All data is geo-referenced - GIS used as a database and analytic tool.
Computerized database and system will lend itself for innovative modelling approaches.

Challenges:

Difficulty of gathering reliable historic information.
Obtaining reliable production system and socio-economic information from field interviews with Bedouin. Requires innovative participatory approaches and triangulation.

Linkages:

Specific Activities: NW-Coast Project.

Demonstration projects; Once our monitoring program is functioning well (within 6 months) other groups could visit the field installation and get a demonstration of how dataloggers and computers can help in data collection and data integration.

Share experiences and provide information on what kind of field equipment and what kind of techniques work and what does not (GIS, GPS, dataloggers, etc).

Also, within 8-10 months the Alexandria team will be able to provide a short course in the development of an integrated regional GIS resource database.

Regional Level:

Strong potential for coordination of technical cooperation and training activities between projects.

Hold a regional workshop every 18 months. The host should be a group that has completed a project and can show what was done, what worked and what failed. All participants will present an overview of their projects.