

## **PART A**

### **PROGRAM PLANNING FOR IIMI SUDAN: OUTCOME OF NATIONAL WORKSHOP**

by

**M.S. SHAFIQUE**

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## **INTRODUCTION**

A Memorandum of Understanding between the Government of Sudan and the International Irrigation Management Institute (IIMI) was signed on 2 February 1989. With the establishment of IIMI's branch office in July, Sudan became one of the first three locations in the African continent where IIMI will organize multidisciplinary activities focused on irrigation management in a collaborative mode with all relevant organizations.

Considering the existing complexities in the management of the irrigated agriculture sector of Sudan, it was deemed prudent to initiate a process to derive a "demand driven" IIMI program for the next five years. In order to achieve this objective, a national policy workshop was held on 9-10 October 1989.

The strategy paper of the International Irrigation Management Institute does outline the proposed directions during the upcoming 5-10 years. In reality, this paper sets out guidelines to be followed in preparing specific future programs for selected locations. It also provides IIMI's scope of work regarding thematic research, management training, and information services in the field of irrigation management.

Having the proposed strategy as a guideline, this workshop provided a unique forum for Sudanese experts in identifying important irrigation management issues that IIMI should address in the next 5 years. The methodology opted for control deliberations of the workshop within the domain of IIMI's strategy and the resulting recommendations are discussed in the subsequent sections.

## **METHODOLOGY**

In order to plan a national policy workshop, initial discussions were held with selected staff of all relevant organizations based in Wad Medani. After formal and informal consultations with the officials of the Hydraulics Research Station (of the MOI), the Gezira University, the Sudan Gezira Board, and the Agricultural Research Corporation, arrangements regarding the structure of the proposed workshop were finalized.

Workshops in Sudan, like any place elsewhere in the world, traditionally commence with an opening ceremony. High-level officials or politicians are invited to grace such occasions. In most cases, it may make sense to handle such traditional formalities by holding an opening ceremony and then getting down to the business of a workshop. However, there are times when the opposite arrangement becomes more desirable. If it is also aimed to apprise top-level officials from various organizations about the outcome of such activity, a closing ceremony seems to be a better option.

At present, like any new organization in a particular environment, it was considered appropriate to introduce IIMI and the nature of its intended operations to all levels of concerned agencies in Sudan. With such additional potential benefits in mind, the alternative of a closing ceremony was opted for.

Irrigation management requires an interdisciplinary approach. As management problems in the sector of irrigated agriculture often do not fall within the domain of one agency, an inter-organizational character of the planned activity was considered very important. Hence, officials from various agencies and disciplines were identified as the main contributors in this effort. Even a more satisfactory outcome of such planning was a suggestion to include farmers to enable them to benefit from their involvement.

Traditionally, workshops provide forums for individuals to present their research findings or their expert views regarding some preselected topics. Usually, presentation of such findings or views becomes the main feature at such occasions. However, there are also some exceptions to this pattern. As the main purpose of holding a national policy workshop in Sudan was to request Sudanese experts to identify important irrigation management issues that IIMI should address in the coming five years, the activity was conceived to function as a forum for a brainstorming exercise.

In order to control discussions within IIMI's general mandate, and to avoid digressions or deviations from the intended course, it was decided to formulate a desired number of interdisciplinary groups of Sudanese experts from different relevant organizations to prepare working papers for the workshop. Such groundwork turned out to be a useful mechanism to keep discussions within the suggested boundaries identified by the papers.

After discussing with several individuals who are experienced in holding workshops, it was felt that a time frame of two days was readily acceptable. Preparation of a detailed schedule for the workshop was the next step.

The first day was reserved for presentation of working papers followed by extensive discussion. The day's deliberations were divided into three sessions. Each session had one presentation lasting 20 to 30 minutes. It was followed by a thorough discussion for about 2 hours.

In view of the three sessions planned for the first day, there were three groups of experts' organized to prepare three presentations for the day. Each group had seven to eight local experts from different agencies with an interdisciplinary background. In these panels, there were also two very vocal and knowledgeable representatives of the tenants involved.

The schedule for the second day consisted of group discussions to prepare three sets of recommendations. This was planned to incorporate new suggestions made during the deliberations of each session held on the first day. This was followed by another session for presentation of the latest group recommendations to invite additional comments from the participants of the workshop. Finally, these sets of individual group findings were synthesized into a final set of recommendations ready to be presented during the closing ceremony.

To restrict the deliberations of the workshop to the limits provided by IIMI's strategy, topics selected for each session were as follows:

1. *Presentation for Session 1.*

Topic: Physical, Financial, and Rehabilitation Aspects of Irrigation Management.

2. *Presentation for Session 2.*

Topic: Institutional and Organizational Aspects of Irrigation Management.

### 3. *Presentation for Session 3.*

Topic: Institutional Change and Services for Farmers in Irrigation Management.

All three topics were selected to encompass the seven initial program themes of IIMI, listed as follows:

#### 1. *Working Paper No. 1*

- a) Management of Water Resources for Irrigation.
- b) Management Policies for Maintenance and Rehabilitation (Management of Irrigation Facilities).
- c) Management of Financial Resources for System Sustainability.

#### 2. *Working Paper No. 2*

- a) Institutions for Irrigation Management.
- b) Management of Irrigation Organizations.

#### 3. *Working Paper No. 3*

- a) Management of Irrigation Support Services to Farmers.
- b) Management of Change in the Institutions for Irrigation.

As the subject matter of irrigation management is new to many people, formal and informal means were used to explain its domain. A comprehensive report, based on relevant and available IIMI literature, was compiled to provide background information. Copies of this report were distributed to all members of the three groups entrusted with the preparation of three working/ discussion papers. Some copies of the paper on IIMI's strategy were also provided for more information.

During the early part of September, 2-to-3-hour-long explanatory meetings were held with the members of each group. The purpose of such meetings was to ensure that IIMI's operations based on action research, management training, and the information service in the field of irrigation management were well understood. These meetings with the representatives of various organizations provided an excellent opportunity to explain IIMI's strategy and its activities in an "interactive" mode. This kind of effort also helped to keep the contents of the three working papers and the deliberations during the workshop within IIMI's defined limits of irrigation management.

After the introductory and explanatory meetings, the coordinator of each group arranged three to four additional sessions to reach a common background or consensus to write short reports under subtopics of each presentation. Later, such information was discussed and synthesized by each group. This process resulted in the three working papers inviting further discussion during the first day of the workshop. The discussion which lasted about 6 hours, was recorded on audio-cassettes for future reference.

In addition to Sudanese experts from different field organizations, representatives of many international agencies were invited as observers. This was done to sensitize them about IIMI's future plan of work and to assess their level of interest towards the irrigated sector in Sudan. The following international organizations were represented at the workshop:

1. Arab Organization for Agriculture Development
2. DEMAS of Netherlands
3. European Economic Community
4. Ford Foundation
5. German Consulting Firm
6. USAID
7. USDA
8. World Bank

Local organizations such as the Sudan Gezira Rehabilitation Management Unit (RPMU) and the Advisory Unit for Agricultural Corporations were represented by their top-level officials. Dr. Yakoub Abu Shora Mosa, the Minister for Irrigation and Water Resources, attended the closing ceremony of the workshop.

The level of interest shown was very promising. On the first day, there were more than 70 participants who actively contributed to the workshop deliberations. Attendance on the second day was more than 100. The wide media coverage received was very encouraging.

## **RECOMMENDATIONS**

Prior to this workshop, during IIMI's Internal Program Planning exercise conducted in April 1989, an effort was made to propose a tentative work plan for the years 1990-94. This five year program, (see Appendix A), was submitted with a statement that the proposal was expected to be reviewed after holding a workshop of Sudanese national agencies and the meeting of consultative committee in the early fall of 1989.

The national policy workshop was held as planned. The meeting of the Sudan Consultative Committee, scheduled to be held on 11th October, a day after the workshop had to be postponed because of some disagreement over its membership. Recently, as all parties concerned have agreed to a membership- selection criterion based on an interagency and interdisciplinary principle, differences have been resolved.

In any case, the delay did not affect the outcome of the workshop. The recommendations which are within the framework of IIMI's mandate, as determined by the Institute's strategy, should be considered in formulating yearly work plans in Sudan.

The working papers prepared for the workshop do identify important issues to be addressed. In the light of extensive deliberations, separate group meetings were held on the second day of the workshop. Consequently, three sets of recommendations were prepared and presented for additional input from the participants. These resulting suggestions, given in Appendix B, are the bases of a final set of recommendations.

The main items of the final product were presented in the concluding session of the workshop. Details are given later in the text of this report.

The broad activity areas identified by the participants of the workshop to provide a basis for IIMI's operations in the Sudan during the next five years are:

1. Farmers' role in irrigation management.
2. Inter-institutional cooperation and coordination in the field of irrigation management.
3. Optimization of water use.
4. Reliability, equity, adequacy, and sustainability of irrigation systems.
5. Rehabilitation and modernization of irrigation schemes: needs and objectives.
6. Financing of irrigation schemes.
7. Institutions and management of organizations.
8. Management training.
9. Information Service

## **DETAILS OF SUGGESTED WORK PLAN**

### **1. *Farmers' Role in Irrigation Management***

There is a general realization to seek more farmers' involvement in the management of irrigated agriculture. This involvement can have, for example, the following forms:

- \* Incentives for efficient water use by devising a system of water charges based on the actual amount delivered rather than flat rates being levied at present.
- \* Mechanisms to secure an effective role for the operation and maintenance of Abu VI and Abu XX.
- \* Inducements for shouldering additional responsibilities of cleaning silt and weeds from irrigation channels.
- \* Stimulation by inviting farmers' input in setting objectives, and deciding the types of crops to be planted and the acreage under each crop.
- \* Motivation for the farmers for an efficient use of water at farm level.

### **2. *Inter-institutional Cooperation and Coordination***

Cooperation and coordination between various institutions involved in irrigation management are very essential. This should be done at all levels in order to understand each other better and to improve the existing interagency communications. Some examples are:

- \* Encouragement of joint work to establish liaison, define boundaries of responsibilities, and augment flow of information.
- \* Effective production councils can serve as a useful tool to identify bottlenecks and advise senior staff about possible solutions.
- \* Establishment of a research-extension-farmer linkage.

### **3. *Optimization of Water Use***

Water has become a limiting factor in crop production. It is, therefore, essential to promote effective water-management practices by:

- \* Optimization of cultural practices.
- \* Quantification of the water supplied, conveyed, and utilized.
- \* Zonation of crops to fit different environments.

- \* Reexamination of crop mixes to make more effective use of water.

#### 4. *Reliability, Equity, Adequacy, and Sustainability of Irrigation systems*

- \* Assurance of water delivery in right amount and at the right time.
- \* Equitable water distribution among farmers, specially taking into consideration head-tail effects.
- \* Optimizing operation and maintenance activities.
- \* Institutional changes required for adoption of alternative water-distribution arrangements versus night storage.

#### 5. *Rehabilitation and Modernization of Irrigation Schemes: Needs and Objectives*

After excessive use and continuous operation, irrigation schemes do often need rehabilitation and modernization to enhance inhibited capacities, abate inefficiencies and cope with new developments in relevant technology.

The original needs and objectives should be stated clearly. It is important:

- to know when to rehabilitate or modernize;
- to put the priorities right; and
- to plan the rehabilitation to be sustainable.

#### 6. *Financing of Irrigation Schemes*

The financial aspects are very critical to the success or failure of irrigation schemes. Factors affecting the financial capacities of different institutions have to be studied. These factors are:

- \* Credit in cash and kind.
- \* Pricing and marketing policies.
- \* Cost and net return relationship.
- \* Labor demand and policy.
- \* Compensation arrangements for management shortcomings.

#### 7. *Institutions and Management of Organizations*

- \* Study of institutions involved in irrigation management from different aspects, such as:
  - a) Their role.
  - b) Capacities.
  - c) Performance.
  - d) Interactions.
  - f) Changes to improve their performance.
- \* Investigations about the existing operating modes of:
  - a) The Ministry of Irrigation.
  - b) Agricultural Corporations, such as the Sudan Gezira Board, Rahad Agri. Corporation, etc.
  - c) Tenants.
- \* Evaluation of the existing controlling systems in irrigation management, e.g., inter- and intra-agency communication, flow of information, monitoring, feedback, and accountability.
- \* Diagnostic studies about farmer-managed irrigation systems.

#### 8. *Management Training*

- \* Identification of training needs and assistance in conducting relevant training programs in the field of irrigation management (A similar desire has also been expressed by some international agencies, e.g., EEC and AOAD).

#### 9. *Information Service*

- \* Continuous-updating service regarding regulations in irrigation management.
- \* Because of foreign exchange problems, a number of requests have been made to provide the facility of latest research journals and other relevant literature.

### **CONCLUDING REMARKS**

Even a cursory look at the final set of recommendations leaves a feeling of too ambitious a program for five years. Instead it sounds more like a 50- year work plan. Based on the impact potential, the capacity and capability of IIMI and its partners along with the financial resources available, these recommendations have to be subjected to another screening process. Perhaps, the Sudan Consultative Committee can be called upon to do just that.



## **The Five-Year Program Proposed in April 1989**

### **SUDAN: PROPOSED COUNTRY PLAN FOR 1990-94**

The proposed country plan is expected to be reviewed after holding a workshop of national agencies and the meeting of the Consultative Committee in early fall, 1989. Hence, the following achievement targets are to initiate a useful discussion in this direction.

#### *Collaborative Field-oriented Management Studies*

- (1) IIMI plans to assist its relevant collaborators to develop a program of continuous monitoring and evaluation of targets for large, medium, and small- scale irrigation schemes. Such an effort is expected to provide a management tool to make necessary adjustments/corrections to improve the performance of irrigation information and control systems in response to changing crop water requirements. The activity is an input under IIMI's theme: management of irrigation organizations.
- (2) IIMI, in collaboration with the Hydraulics Research Station and the Department of Irrigation, hopes to accomplish field testing and implementation of main system operational models for relatively equitable, adequate, and reliable irrigation water supply. A medium-scale or major canal-command area of a large scheme should benefit from the achievement of the proposed activity. This undertaking is in line with IIMI's theme: management of irrigation organizations.
- (3) During 1990, it is planned to identify major physical, socioeconomic and organizational constraints to be addressed by a successful turnover process in the White Nile systems. For the next four years, it should be the stage to field-test an initial proposed methodology for a sustainable farmer-managed irrigation system. Implementation can take a step-by-step approach to benefit from spill overs at the next stage. If agreed, such a strategy may help to evolve a more workable and sustainable FMIS methodology. This component of the country plan should also provide information for thematic research described as: management of change in the institutions for irrigation.
- (4) Indenting for irrigation water distribution is an issue which shares common concern in Sudan. It is planned to develop an indenting scheme in 1990 and its field-testing and general application are proposed during the next four years. The target for such activity is large, medium, and small-scale irrigation schemes. This part of the country plan strengthens the thematic research: management of water resources for irrigation.

- (5) IIMI plans to assist its collaborators to finish a study about systematic field-testing of night storage systems in comparison with other means of water distribution in irrigated agriculture. As many of the tenants have already switched to the continuous water application mode, the results of the study should provide an opportunity for the relevant agency to review its old policy and select a more suitable water distribution water management. This study can be considered in line with IIMI's theme: management of change in the institution for irrigation.
- (6) IIMI aims to finish a study about the economic and social reasons for irrigation application methods currently practiced by tenants. There has been back-and-forth experimentation of small basins and long furrows. Consensus is yet to be achieved in this field. This study should help to provide enough relevant information to recommend one of the above mentioned or any other suitable methods. This study falls under the thematic title: management of water resources for irrigation.
- (7) It is targeted to study the institutional impediments to the development of large-scale irrigation schemes. There is a lot of pressure from donor agencies to bring institutional changes. Sometimes these outside suggestions have proved to be counterproductive. If impediments are identified by the agencies concerned, the acceptance of sustainable change should become a simple matter. This topic comes under the theme: management of change in the institutions for irrigation.
- (8) The identification of management issues for an effective and sustainable irrigation rehabilitation and maintenance programs. IIMI wants to assist its collaborators to undertake such a study and implement its findings during the next five years. This study seems to be in line with the theme: management of irrigation facilities.
- (9) The development and dissemination of a surface irrigation scheduling program will be another of IIMI's objectives to be accomplished during the next five years. This activity is intended to provide improved irrigation water use at farm level and better input for indenting and monitoring of evaluation programs. This activity seems to be a part of the theme: management of water resources for irrigation.
- (10) A number of critical studies of short-duration will be undertaken by IIMI. The details of studies/activities will be given in one-year work plans.

#### *Management Training and Professional Development*

- (1) Close collaboration with the University of Gezira in developing and organizing interdisciplinary short courses in irrigation management.
- (2) An active catalytic role in identifying training needs for the field staff of ministries of agriculture and irrigation.

- (3) Under professional development, the target will be to select ten graduate students from the University of Gezira to conduct research in the field of irrigation management. It is also planned to arrange two postdoctoral fellowships for persons to work on advanced research topics.

#### *Information Services*

- (1) Preparation of database directories on five selected irrigation schemes.
- (2) Research seminars will be organized towards the end of each year. Main contributors planned are to be the staff of IIMI and its collaborators in Sudan.

## **Appendix B**

### **Group Recommendations**

#### **GROUP 1**

##### *Farmers' Roles:*

##### *Examples:*

- \* On-farm water management.
- \* O&M of Abu XX and Abu VI.

##### *Interagency cooperation (MOI, ARC, SGB, GU, SSA)*

- \* At all levels.
- \* Common language base.
- \* Liaison and coordination (encouragement of joint work).

##### *Optimum Water Use*

- \* Extension: Excessive water is as bad as water shortage.
- \* Water is the limiting factor.
- \* To reexamine crop mixes to make more effective use of water.
- \* To increase the crop yield by optimizing inputs including water.
- \* Irrigation extension service.
- \* More accurate estimates of crop water requirements.

##### *Reliability, Equity, Adequacy, and Sustainability of Irrigation Systems*

- \* To make irrigation supplies more dependable and assured (reliable).
- \* To examine equity in water distribution and its socioeconomic impact (water flow measurements and control).
- \* The conveyance system should be adequate to supply water according to crop needs.
- \* Optimizing O&M operations.
- \* Impact of different operational modes and irrigation practices.
- \* Comparative study of strict night storage, continuous, and present-day water distribution practices

##### *Rehabilitation*

- \* What are the bases on which to decide to rehabilitate irrigation systems?
- \* To have the right priorities for various components of irrigation subsystems.
- \* Sustainability of rehabilitation.

##### *Financing*

- \* Identification of ways and means of increasing revenues from irrigation projects.
- \* Assessment of the crop-production process to make it more effective.

## GROUP 2

### "Institutional and Organizational Aspects of Irrigation Management

1. Study the effect of change in sowing dates on irrigation management.
2. Study the management of institutions in view of:
  - a) Their roles.
  - b) Capacities.
  - c) Performance.
  - d) Efficiency.
  - e) Interactions between them.
  - f) Possible changes to better their performance.
3. Study the effect of agricultural practices (e.g., land leveling, spacing, weeding) on irrigation management.
4. Investigation of existing systems of operations in irrigation management:
  - a) MOI.
  - b) agricultural corporations.
  - c) Tenants.
5. Study the rotation by the present number system compared to rotation by minor canals.
6. Examination of the existing controlling systems in irrigation management (e.g., communication, flow of information, monitoring, feedback, accountability).
7. Study the manpower utilization and development in relation to irrigation.
8. Study the role of production councils in irrigation management.

#### *Specific Recommendations:*

1. Initiation of a monitoring unit and follow-up in MOI.
2. Initiation of a data bank unit within the HRS.
3. Continuous updating revisions of regulations of irrigation management and making a volume on all the regulations accessible to all parties.
4. Provision of facilities (financial, transport, equipment, etc.) for multidisciplinary field research.

## **GROUP 3**

- \* Financial Aspects:
  1. Labor demand and supply.
  2. Credit supply under institutions and possible improvements.
  3. Compensation schemes for management shortcomings.
- \* Pricing Policies:
  1. Price levels.
  2. Marketing system and institutions for different crops.
- \* Agricultural Research:
  1. Research-extension-farmer linkages.
  2. Ways of strengthening farming-system research in agricultural research units.
  3. Farming-system research.
- \* Extension:
  1. Social factors affecting farmers' attitudes towards new technologies.
  2. Social services in irrigation schemes.
- \* Water Delivery:
  1. Quantification of water supplied, conveyed, and utilized, (mathematical and physical models).
  2. The institutional changes in adopting night storage versus continuous flow.
  3. On-farm water management.
  4. Operation and maintenance of minor canals by different institutions.
- \* Production Relations:
  1. Production relations in agricultural schemes.
  2. System of land and water charging.
  3. Actual cost of earthmoving in canal clearance.
  4. Diagnostic studies on farmer-managed systems.
- \* Training:
  1. Identification and assessment of training needs and conducting of relevant training in the field of irrigation water management.