



## **PARTICIPATORY IRRIGATION MANAGEMENT OF the MIDDLE SEBOU IRRIGATED SYSTEM**

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### **SUMMARY**

The large-scale irrigation sector is characterized by the State's direct intervention while small – and medium- scale irrigation is run locally by traditional associations in so far as management and operations of the district are concerned.

The year 1969 saw the promulgation of the Agricultural Investment Code, which was the first legal instrument of its kind to govern management and operations of irrigation schemes and which requires that users basically contribute to the State's financial effort without actually involving them in the implementation of irrigation development projects.

This approach based upon the State's unilateral intervention inevitably resulted in adverse effects (deterioration of equipment and frequent recourse to rehabilitation operations). Faced with this critical situation, the government opted for the development of Participatory Irrigation Management (PIM) as early as 1990.

The adoption of PIM as an irrigation policy was a strategic alternative aiming at revisiting a methodology previously used in the beginning of the 60's--a period when each irrigation development was unilaterally designed, funded and implemented by the State rather than through a participatory approach involving consultation with, organization and commitment of water users.

The Middle Sebou irrigation scheme, located in the Fez area, provides a highly representative illustration of the transition from centralized management to consultative management. Indeed, the development of this 6500- hectare area was carried out through a new development and irrigation management pattern stemming from a partnership holding between the State and water users. This approach is aimed at sharing roles and responsibilities and effectively getting users grouped in Water Users' Associations (WUAs) supervise management of their irrigation systems.

Therefore, the Middle Sebou irrigated system is run through a contractual framework directly by the beneficiaries who are adherents to any of the twelve Water Users' Associations (WUAs) which are structured into two federations.

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## **I. AN OVERVIEW OF IRRIGATION IN MOROCCO**

### **I.1 BACKGROUND INTRODUCTION**

Morocco's climate fluctuates between semi-arid and arid conditions and is typified by a rainfall that varies from one region to another and has increasingly unsteady annual and seasonal patterns, which make irrigation an incontrovertible imperative to boost agricultural production and to enhance farmers' income.

Morocco's irrigated sector is divided into two sub-sectors:

- Large-scale irrigation systems with water supplies from big dams and with considerably sizeable areas recently equipped with modern networks. The irrigable potential area through large-scale hydraulic structures is estimated to amount to 850, 000 hectares.
- Small- and medium-scale irrigation, where the systems are small-sized and are, to a large extent, irrigated using local water resources. The irrigable potential of small- and medium-scale irrigation is estimated to stand at 785, 000 hectares.

### **I.2. BASIC OPERATING STRUCTURE OF IRRIGATION INFRASTRUCTURE.**

Large-scale irrigation infrastructure is characterized by the State's direct intervention through its being a developer, operator and caretaker of the operations of irrigation systems with a view to ensuring their durability. This is not the case of small- and medium-scale irrigation, requiring ongoing consultation with the local population who are already clustered in traditional associations to supervise management, operation and maintenance or even renewal of irrigation infrastructure.

In 1969, within the framework of the Agricultural Investment Code which stipulates that water users must, for their own benefit, contribute towards the State's financial effort, amongst the body of statutory and regulatory provisions adopted then, two of them pertain directly to the management of large-scale irrigation systems.

- A direct contribution, estimated at 30% of the expenditure incurred by development costs calculated on the basis of equipped acreage.
- The payment of an annual water fee was intended to recover 10% of the investment, development amortization costs as well as for all expenditures incurred by operations and maintenance of the irrigation infrastructure. This annual fee per cubic meter of used water was calculated on the basis of an equilibrium price set periodically through a joint decree by the Ministry of Agriculture, the Ministry of Finance and the Ministry of Equipment.

Such a unilateral intervention by the State inevitably led to adverse effects; namely, the increasing importance of the actions the State had to carry out in order to ensure better functioning of irrigation infrastructure on the one hand and the serious lack of interest of water users towards infrastructure, often subjected to recurrent and costlier degradation.

The responsibility of government in such situations was to opt for Participatory Irrigation Management (PIM) as early as 1990.

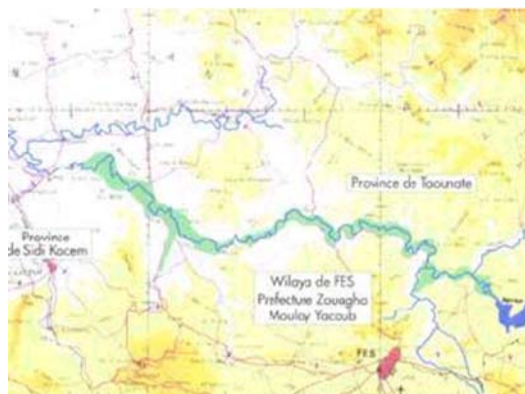
The adoption of PIM was, therefore, a strategic alternative put in ballast by the State. This strategic alternative allowed revisiting the irrigation policies formerly used in the beginning of the 60's and making of irrigation development a sector which was exclusively designed, funded and implemented by the State.

- PIM as a participatory approach involving consultation, organization and commitment of water users within a contractual framework was a constitutionally-based response to management of irrigation systems. PIM would enable:
- To effectively involve users in, and increase their responsibility for irrigation water, development, operations and maintenance of equipment and irrigation infrastructure;
- To promote dialogue and implementation of concerted actions between the State's watershed agencies and farmers in irrigated systems;
- To create good management practices for water resources, equipment and irrigation infrastructure;
- To achieve rational use of both water, soil, equipment and irrigation infrastructure to serve not only the interests of irrigated agriculture, but the interests of the nation as well;
- To increase the returns of water and allocate it efficiently.

## II. DESCRIPTION OF THE MIDDLE SEBOU AND DOWNSTREAM INAOUEN IRRIGATION SYSTEM

### II.1. PROJET AREA

The Middle Sebou and Downstream Inaouen irrigation system covers 15,000 hectares acreage and is located at the piedmont of the Rif mountains, 60 kilometers away from Fez. From an administrative standpoint, this system falls within the jurisdiction of the Fez Wilaya and of the Provinces of Taounate and Sidi Kacem.



This system was split into five main district irrigations for purely economic and technical considerations and development of irrigation infrastructure was carried out in two stages:

- The first phase includes district irrigations I and II extending over an acreage of 6,500 hectares. Development of the irrigation infrastructure was launched in 1994 and completed in 1998. District irrigation II (3,500 hectares) got irrigation water in 1998 and district irrigation III (3000 ha) got it gradually during the 2001/2002 crop year.
- The second phase encompasses irrigation district irrigations I, IV and V covering an acreage of 8,500 hectares. The preliminary study and implementation procedures are being carried out. Effective operation of these irrigation district irrigations is slated for 2007.

Water supply is ensured through pumping stations, strewn all along the banks of the Sebou river whose waters are regulated by Idriss 1st dam—Matmata- with a yearly throughput capacity of 1.2 m<sup>3</sup>. Irrigation water allocated to the system amounts to 130 m<sup>3</sup> yearly.



## II.2. PROJECT COMPONENTS

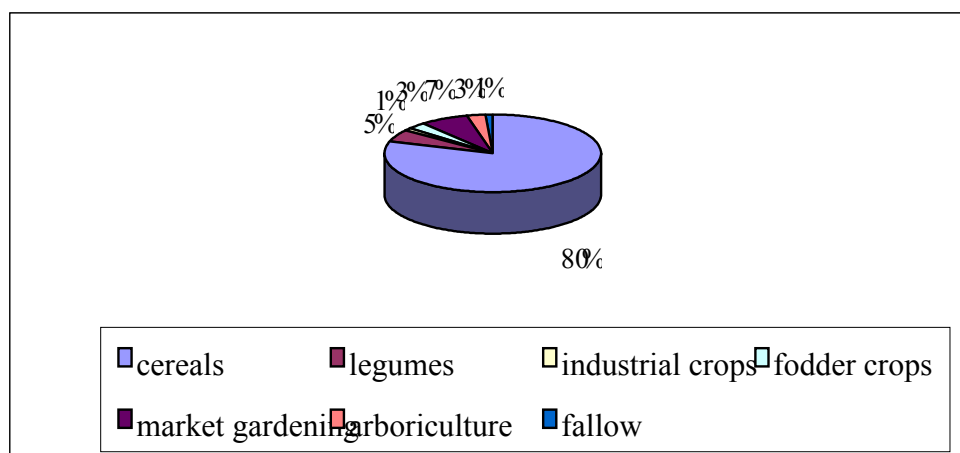
### II.2.1 Hydro-agricultural development

The main hydro-agricultural development activities focused on external and internal developments; namely,

- Construction and fitting of 42 pumping stations (main and booster stations)
- Supply, transport and laying of irrigation canals and pipes;
- Construction of a 90 km power distribution line;
- Steering a cadastre operation (land clearing, deep ploughing, land leveling) over 15,000 hectares;
- Building internal and external drainage networks;
- Construction of a road network.

### II.2.2. Agricultural Development

The initially applied cropping system is highly favorable to cereals, grown by almost 98% of farmers and represents 81% of crop rotation, along with a quasi absence of fodder breaks. Plant and animal productions were low.



A quadrennial crop rotation scheme was chosen for this irrigation scheme - with an average intensification of 150%. As far as agricultural development is concerned the following main orientations were targeted:

- Introducing new 'value- added' cash crops such as sugar beet, tobacco - market gardening crops. Aromatic and medicinal plants will probably be cropped as farms are generally small-sized;
- Increasing production of fodder crops since dairy production is high on the agenda;
- Increasing cereal and fruit tree production through applying appropriately-sound techniques;

### **II.3. AIMS OF THE PROJECT**

The main aims of the project are as follows:

- Improving and intensifying crop production ( market gardening, sugar beet, fruit trees) and animal production ( milk, meat);
- Increasing farmers' incomes (from €130 /hectare as a per annum net take-away profit margin prior to the project to around €1,200 / hectare after the project );
- Improving standards of living within the project area through electrification and road infrastructure development;
- Increasing job opportunities (from 25 work days/ per inhabitant /per annum prior to the project to 150 work days/ per inhabitant /per annum after project implementation);
- Creating and enhancing capacity-building of associative movement with a view to enabling water users to undertake tasks relating to management, operation and maintenance of irrigation infrastructure.

### **II.4. COST – PROFITABILITY AND FUNDING SOURCES**

The project cost amounts to 133 million Euros. Economic profitability rate was initially estimated to stand at 11.7% in June 1994.

The cost of the preliminary irrigation batch, estimated to be 54 million Euros, is financed up to 50% by the French Development Agency. The remainder is funded by the Moroccan budget.

### **III. IRRIGATION MANAGEMENT SYSTEM**

The new strategy for irrigation development and management is based upon a partnership scheme involving the State and water users. The purported aim is to share roles and responsibilities and to effectively involve water users, who are members of Water Users Associations (WUAs), in the management of irrigation systems.

### III.1. INSTITUTIONAL ORGANIZATION

#### a) Approach:

The approach adopted for establishing irrigation associations in the perimeter draws upon communication between all stakeholders involved in the project.

In short, this approach draws upon lending an ear to the stakeholders, promoting mutual understanding and taking account of (i) attitudes and knowledge of all concerned parties, particularly those who are influential in communities and local groups and (ii) emergence of new leadership with innovative projects.

The establishment of Water Users Associations (WUAs) was the fruit of consultations and negotiations involving various partners. Meetings were marked by a transparent dialogue and by the concern to promote connivance and togetherness to avoid misunderstandings.

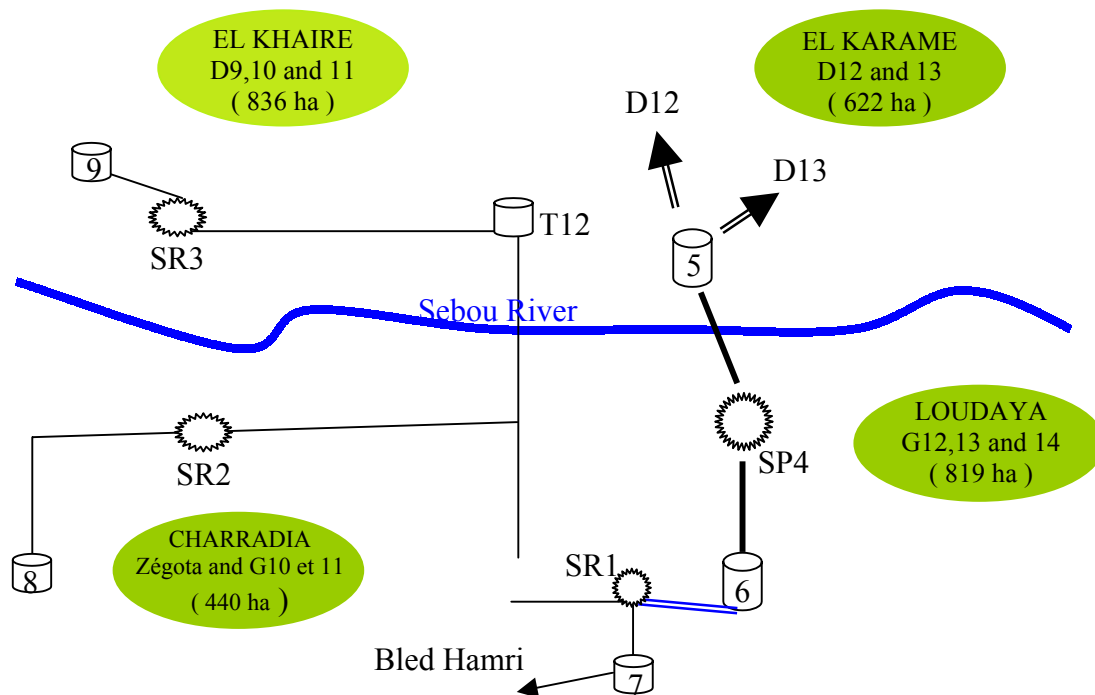
A program of awareness-building meetings was then drawn up in joint collaboration with various representatives of the local population and opinion leaders. Subsequent to this thorough groundwork, the scope of activities was widened to include all concerned parties. This contributed to accurately defining the boundaries of each WUA.



#### b) Institutional Framework

The organizational framework pattern was endorsed subsequent to a series of consultations held with water users. It provided for shouldering the WUAs with tasks relating to (i) technical and financial management of all irrigation infrastructure and pumping units (ii) operation and maintenance of water distribution and drainage networks.

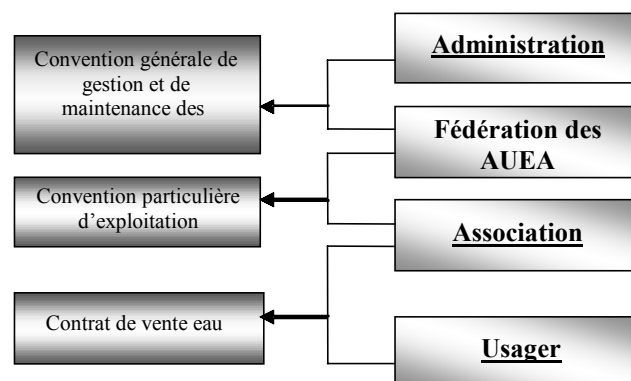
### Synoptic Diagram of District Irrigation II Infrastructures



#### c) Contractualization of relations between the various players

Within a contractualization framework, the WUAs clustered within a federation are entrusted with the responsibility of carrying out operation and maintenance of water infrastructures by the State. Relations between the various partners are governed by:

- The agreement between the administration/federation-WUA together with a general specifications book, which lists down the irrigation infrastructure and equipment put at the disposal of the associations and their federations, the water allocation for each sector, the technical, financial and organizational provisions, the control mechanisms of commitments made as well as the human and logistics support of the administration and its length in time.
- The Federations/ WUAs agreement which defines the responsibilities and obligations of each organization with regard to management, operation
- and maintenance of irrigation infrastructure as well as intervention levels in connection with invoicing and recovery of irrigation water fee.



- Standard procedures of Federations and WUAs which set subscription fees, invoicing and irrigation water fee collection procedures, internal financial and administrative management procedures, as well as the disciplinary provisions related to water service management.
- The water sale contract (User/WUA-Federation) which defines water allocations, distribution modalities, invoicing and irrigation water fee collection procedures.

### **III.2. IRRIGATION MANAGEMENT**

Two management levels have been the focus in each of the two irrigation-based developed districts:

- The upstream level which corresponds to the main water infrastructures shared by WUAs : i.e. pumping and booster stations, pipes, transfer canals , balancing reservoirs, drainage, the external protection system and the roads easing access to the irrigation infrastructure. The federation shoulders the responsibility of managing all these components.
- The downstream distribution level encompasses the whole infrastructure of all irrigation networks, including drainage and earth roads leading to plots allocated to each association in the irrigated system. The infrastructure also incorporates supply canals, water intakes and main pipes operated and maintained by each WUA.

#### **a) Operation and Maintenance of Irrigation Infrastructure**

All activities related to operation and maintenance of hydro-agricultural equipment shall be entrusted to WUAs and their federations. WUAs and their federations have recruited their own staff; namely,

- Watermen who ensure appropriate irrigation water distribution, operation and maintenance of irrigation networks and enforcement of water policing;
- Pumping station operators who ensure proper operation, preventive care and maintenance of pumping stations;

The administration has made available to the federation a qualified technical team of engineers, technicians and a management accountant, to serve on a temporary basis and for a limited period of five years so that they could help it to carry out its missions successfully.

#### **b) Pricing of Irrigation Water**

The pricing of irrigation water is adopted based upon applying the principle of real water price. Indeed, the water fee covers all the costs associated with water service; namely, energy, operation costs, maintenance of equipment and repairs.



Each water user must pay:

- a mandatory annual WUA proportionate to the cropped acreage s/he owns within the perimeter;
- a three-month water fee which is proportionate to the amount of water used in compliance with the individual contract signed with the WUA and the federation.



These water fees are set in such a way as to allow for accounts equilibrium and observance of the commitments made by the WUAs and their federations.

#### **IV. ACCOMMODATING MEASURES AND FUTURE PROSPECTS**

##### **IV.1. ACCOMMODATING MEASURES OF THE IMPLEMENTED OF THE PIM**

If Contractualization of relations between the State and organized farmers provides for a five-year transition period, no strategy has as yet been devised to equip the associations with the required training to ease take over of tasks subsequent to the withdrawal of the technical staff afforded to them by the administration despite their being daily supervised by this very technical staff. It is deemed necessary to design a concerted action program targeting the members of the governing board of WUAs, their federations, the watermen and pumping station operators.

This program should be tailor-made to enable the various partners (WUAs and their federations) to undergo an efficient and effective training--- a training that will enable them to successfully take over management, operation and maintenance of the irrigation systems.

The implementation of this program must necessarily identify the tasks each partner should carry out. With these tasks in view, the training program must be, therefore, adjusted in such a way as to appropriately empower the various partners for tasks incumbent upon them.

Strengthening Participatory Irrigation Management requires the following support means and measures:

- Training and readying supervision agents for new relations with WUAs;
- Training board members of WUAs to gain deeper insights into their missions and statutory



functions;

- Training WUAs' technicians (watermen) and those of the federations (pumping station operators) in techniques for operation and management of hydro-agricultural works.
- Emancipating water-user members of these WUAs so that they become real partners of the administration.

#### IV.2. FUTURE PROSPECTS

Success of this new strategy for the enhancement of Participatory Irrigation Management is contingent upon:

- Reforming the legal texts;
- According to the 1969 Agricultural Investment Code, irrigation infrastructure belongs to the State, which in itself is a hindrance to the work of the federation to collect funds for renewal, repair and rehabilitation of water structures which fall within the prerogatives of the State in its capacity as the exclusive owner of the irrigation infrastructure.
- Effective involvement of all stakeholders with regard to pre-feasibility study on irrigation development schemes (choice of area, type of irrigation pattern);
- Opening up an act on voting rights in such a way as to enable all members to be elected taking account of their farm size. In so doing, the board of WUAs will not be monopolized by a particular group of farmers only.
- Disseminating enforcement circulars in order to reinforce or clarify the directives of legal texts, such as exemptions on VAT.
- Promoting sound financial management in connection with opportunities of investment of funds available to WUAs and federations so that they can make their capital yield a fruit and thus increase their income.
- Carrying out irrigation development projects through an integrated framework. Indeed via Participatory Irrigation Management, the institutional and organizational aspects are under better control. Still, a lot remains to be done with regard to increasing the returns of the cubic meter of water. This can only be done through engaging in a partnership scheme involving all concerned parties particularly farmers, administrators and manufacturers.
- Taking account in project design of the environmental component by anticipating and assessing the potential impacts on the ecosystem.