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Feasibility Study Wad Meskin Irrigation Project

Final Report

Annex 11: Organization and Management

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Annex 11

Organization and Management

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1. INTRODUCTION

Operation and maintenance of irrigation projects is a tedious job. Wad Meskin irrigation project (7,500 ha) can be considered a rather small project compared to Gezira and Managil (900,000 ha) which is one of the largest irrigation projects in the World under one administration.

The project is irrigated by using two large barrages on the Dinder and Rahad rivers. The waters of the two rivers is directed towards a link canal and then into the main canal of the project. Minor canals off-take from the main canal to constitute the main network of the project. Main off-take and intermediate regulators are located to regulate the required flows to the field.

The personnel needed for operation and maintenance for the project has specific tasks which have to be carried out in a proper manner.

2. OVERALL ORGANIZATION AND MANAGEMENT

According to the privatization policy adopted by the government in the agricultural sector, the role of the government will be mainly to provide irrigation water up to the outlet of the minor canals and collect the land and water charges from the farmers and a general supervision of the agricultural laws and regulations by the farmers. The actual management of the agricultural activities will be dealt with by the farmers through their unions and Water Users Association (WUA) which shall be formed in the project area. The project management shall provide extension services. It shall assist technically in mechanical operations for land preparations, shall assist technically in providing agricultural inputs such as seeds, fertilizers and coordinates with the farmers and shall seek and coordinates financial loans to them from financial institutes.

The main points to be considered in the operation and maintenance of an irrigation project can be summarized as follows:

2.1 UPSTREAM SIDE OF THE PROJECT

1. Assessment of demand and supply.
2. Scheduling to define strictly the working hours.
3. Labor force needed for operation and their classification.
4. Assessment of the operation cost.
5. Flow regulation, coordination, monitoring and evaluation.

2.2 IRRIGATION CANALS AND DRAINS

1. Assessment of demand and supply, design capacity, the design data and area served by each canal together with scheduling and define restrictions accompanied with tables and illustration drawings.
2. Preparation of maps, longitudinal and cross sections.
3. Preparation and training of labour force needed for operation in different levels.
4. Tools and material needed
5. The financial cost of canal and drains operation

2.3 THE GROSS AND CROPPED AREAS

1. Define the gross area
2. Define and locate the cropped area for the whole project down to the level of the minor canal and in all levels the cropped area should be within capacity of the system

3. Definition of the main crops, the rotation and cropping pattern and define the crop factor
4. Compute and tabulate the irrigation water requirement for each crop at the different stage of growth according to the crop factor to each canal to sum it up for the whole project as a daily demand to be satisfied.
   Sustainable use of available irrigation facilities would result in supplying water in right quantity at the right time.
5. Restriction for the use of escapes and drains

2.4 MACHINERY, VEHICLES AND TOOLS

As some of the agricultural operations are mechanized e.g. land preparation, planting and harvesting, the project management shall support farmers technically. Preparation of list of machinery, equipments, vehicles and their spare parts and hence the running cost, for operation purpose and later for maintenance needed is to be made by the project management.

Table 1: Vehicles and light trucks cost

Ref	Description	Quantity	Rate in USD	Value in USD
1	Four wheel drives vehicles	7	50,000.00	350,000.00
2	Four wheel drive pick up	2	35,000.00	70,000.00
3	10 ton truck	1	40,000.00	40,000.00
4	Hi up truck	1	50,000.00	50,000.00
5	Work shop equipment	1	30,000.00	30,000.00
6	Electric generator 250 KVA	1	110,000.00	110,000.00
Total cost for vehicles and light trucks				650,000.00

2.5 THE HYDRAULIC STRUCTURES

Also the financial and running cost should be known. The proper operation methods will minimize the maintenance cost.

2.6 OFFICES, HOUSES, WORKSHOPS ETC.

The numbers, types and distribution of offices, houses, workshops and stores etc. should be determined, located, verified, houses and workshops distributed and hence evaluated to accommodate the labour force and the project requirements. The fixed cost for the offices, houses and workshop are detailed in Annex 7. The running costs should be determined and evaluated.

Table 2: Office Equipment and Furniture

Ref	Description	Quantity	Rate in USD	Value in USD
1	Furniture	1	10,000.00	10,000.00
2	Computers	5	800.00	4,000.00
3	Fax machine	1	1,000.00	1,000.00
4	Photocopier	1	10,000.00	10,000.00
Total cost for Office equipment and furniture				25,000.00

2.7 PERSONNEL

The organization structure should meet the requirements needed by the employer and at the same time satisfy the operations and maintenance requirements. The overall organization and management of the project function and elements can be given within the following management personnel activities:

2.7.1 Project Manager

Due to the complexity of the project in the phase of operation and maintenance, an experienced project manager is needed to supervise manage and follow up the project activities. The irrigation water distribution needs synchronization and harmony. The efficiency of the whole system depends on good management of all the components of the project as one unit.

The main responsibilities can be listed as:

- Ensure adequate supply of irrigation water requirements to all farmers in the project in the right time and requirements.
- Follow up and coordinate the activities of the farmers in all the agricultural operations.
- Administer the project through the different divisions within the project.
- Prepare the annual budget for the project.

2.7.2 Irrigation Division Engineer

The project needs a qualified irrigation staff (engineers, technicians, tape men) to look after water regulation and distribution within the network irrigation system and the control structures like regulators within the project. His main responsibilities are;

- Control and distribution of irrigation water with his staff according to the prescribed program.

- Monitoring and recording actual performance standards.
- Administrating the irrigation water control and distribution according to the daily farmer's requirements.
- Follow up with the subdivision engineers the operation and maintenance of the civil and electromechanical works.

2.7.3 Sub-division Engineers

Because the project is considered to be small only three subdivision engineers are needed. In general they are responsible for the operation and maintenance of the civil and mechanical works within their sub divisions. One subdivision will be for the barrages.

2.7.4 The Mechanical Engineer

The main duties of the Mechanical Engineer are:

- Operation and maintenance of all mechanical equipments and gates already installed in the project.
- To provide spare parts in reasonable quantities and in a good time to avoid discontinuity of the irrigation water to the field.

2.7.5 Project Operators (tape men)

Operators (tape men) are needed at the main regulators for good regulation and distribution of the irrigation water on daily basis. They will be required to maintain a log book to properly record all activities especially water levels during their respective shifts and notify any faults which result in low water levels. The operators should contact the technical team when a problem occurs that cannot be safely resolved by them to provide the necessary support.

2.7.6 Technicians

To meet the requirements for the effective maintenance of the project civil or mechanical works a team of skilled and qualified civil and mechanical technicians are to be available. The main responsibility of this team will be to ensure that the project and its canals, equipments, and gates are properly maintained and in full recognition of designer, manufacturer specifications and instructions.

2.7.7 Agricultural Operations Coordinator

The main duties of the agricultural operations coordinator is to decide with the farmers upon the type of crops to be grown, and the area for each crop and their location within the project. This will enable him in collaboration with the irrigation division engineer to prepare the programme of the water delivery into the project canals temporally and spatially. The coordinator will be in close coordination with the farmers during the cultivation period.

3. ORGANIZATION STRUCTURE AND MANAGEMENT PRACTICE

The main objectives of the organization structure for Wad Meskin Irrigation Project aims at establishing an effective organization structure and propose most genuine management practice to operate and maintain it and enable it to achieve its social and economic objectives. All rules and regulations in respect of the management practice, administration, remuneration of the manpower that are currently applied for similar irrigation projects will equally apply to this project. The organization and management of this project will be the primary force for coordinating the human and material resources in order to achieve irrigation targets set for this project.

The operation and control of this new plant would certainly require sound management practice and leadership, as well as the application of various management techniques and planning skills that would motivate rather than alienate the work force of this new project, right from the top management of the project down to the shop floors.

The organization of work, the administration and remuneration system, the human resource policy, the training and development programs are all but essential components of managing this new irrigation project to satisfactory standards that will make possible achievement of total project objectives cost-effectively.

At the outset, the study recommends that recruitment of the technical and supervisory staff of this project to be conducted in the most impartial manner, and be based on qualification and experience of candidates without regard to any other considerations and/or outside pressures. Manpower costs (and payroll) will be estimated on the prevailing Federal Civil Service System, as approved by the Federal System.

3.1 ORGANIZATION STRUCTURE

The organization structuring of this new irrigation project will be the means for attaining irrigation water distribution and targets, allocating work responsibilities, providing a framework for operation and performance assessment of activities and providing mechanism for the efficient operation of the project vis-a-vis:

The major components of the functional organization structure of Wad Meskin irrigation project are reflected on the organization chart as follows:

Figure 1: Wad Meskin Irrigation Project Organization Chart

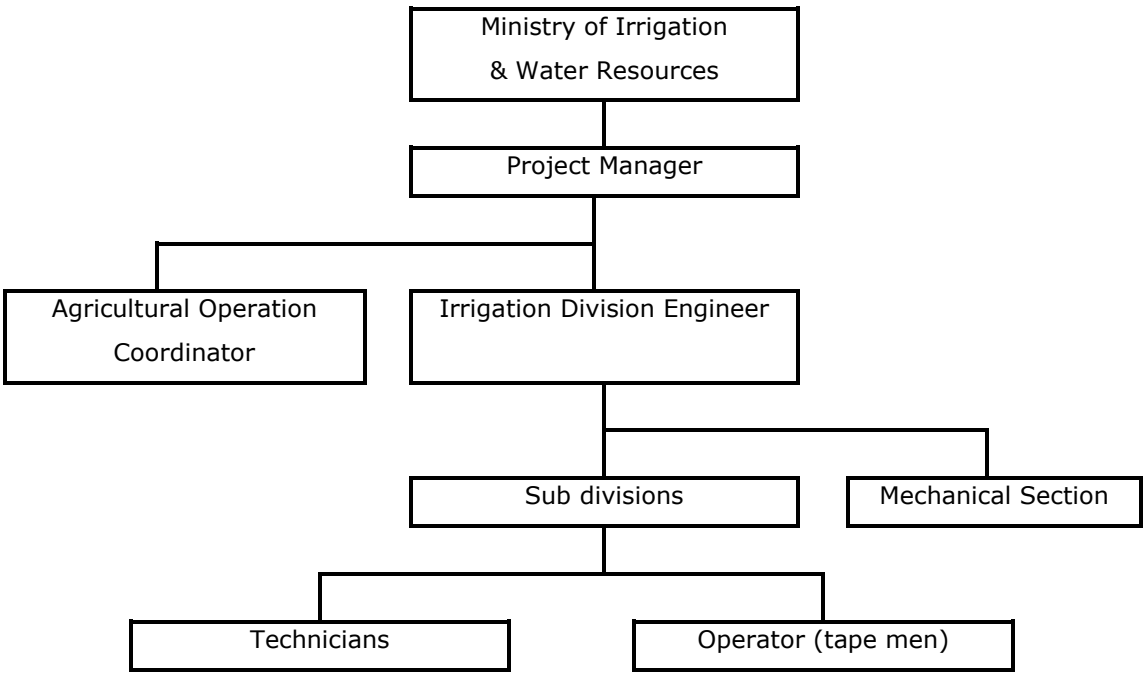

Table 3: Project Jobs and Grades

Ref	Job Title	No. of Posts	Grade
1	Project manager	1	2
2	Division Engineer	1	3
3	Sub division engineer	3	4
4	Agricultural Operations Coordinator	1	4
5	Mechanical Engineer	1	5
6	Administrator	1	5
7	Accountant	1	5
8	Operators (tape men)	12	12
9	Technicians	4	12
10	Store Keeper	1	12
11	Drivers	7	13
12	Skilled workers (civil)	6	13
13	Skilled workers (mech.)	2	13
14	Skilled workers	6	15

3.2 PAY ROLL ESTIMATES

Payroll cost estimate will be calculated on the bases of the following package components:

- Grade average basic
- Cost of living allowance
- Social insurance contribution
- Monthly grant
- Annual leave transport allowance.
- Overtime pay entitlement
- Family grant
- House to office transport
- Accommodation allowance
- Meal allowance
- Incentive payment.

The above pay components represent the minimum package of compensation adopted by the Federal State Government, in accordance with the prevailing Civil Service provisions related to Employment Benefit in Sudan. In accordance with the groupings and manpower classification and management given earlier in para 3.1 above, and the pay-package components given in 3-4 the yearly remuneration of each employee in each of the groupings can be estimated as follows:

Table 4: Cost of Manpower

Ref	Occupation	Quantity	Monthly Rate in SDG	Total yearly Cost in SDG	Total Cost in USD
1	Project Manager	1	1,200.00	15,600.00	6,638.30
2	Division Engineer	1	1,000.00	13,000.00	5,531.91
3	Sub division Engineer	3	800.00	31,200.00	13,276.60
4	Agricultural operations coordinator	1	800.00	10,400.00	4,425.53
5	Mechanical engineer	1	700.00	9,100.00	3,872.34
6	Administrator	1	700.00	9,100.00	3,872.34
7	Accountant	1	700.00	9,100.00	3,872.34
8	Operator	12	600.00	3,600.00	39,829.79
9	Technician	4	600.00	1,200.00	13,276.60
10	Store keeper	1	600.00	,800.00	3,319.15
11	Driver	7	500.00	45,500.00	19,361.70
12	Skilled worker	8	500.00	52,000.00	22,127.66
13	Unskilled worker	6	400.00	31,200.00	13,276.60
14			Total Cost	358,800.00	152,680.85
15			Social Insurance and other benefits @ 25%	89,700.00	38,170.21
16			Grand total cost of manpower	448,500.00	190,851.06

Note:

- Cost is calculated for 13 months a year
- Exchange rate is 1 USD = 2.35 SDG