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INTERNATIONAL REFERENCE CENTRE  
FOR COMMUNITY WATER SUPPLY AND  
SANITATION (IRC)  
MANAGEMENT COMPONENT OF  
THE KAFR EL SHEIKH WATER SUPPLY  
PROJECT, EGYPT

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ABSTRACT

The Kafr El Sheikh Water Supply Project is a comprehensive endeavour to provide the physical and institutional resources for an effective and sustainable water supply system for 2 million persons in a developing rural Governorate in the Delta region of Egypt. The paper describes the aims of the Management Component, the institutional development of an integrated water supply and sewerage company and the main activities to-date. These include training, operational improvements, health education and finance development. Further support is required until all engineering and institutional development work has been completed.

KEYWORDS

Institutional development; management structure; training; operational improvements; finance; tariffs; sustainability.

INTRODUCTION

The Governorate of Kafr El Sheikh is located at the extreme north of the Delta region of Egypt and covers an area of 3,400 sq km (fig. 1), with a population approaching 2.0 million. The entire Governorate lies within the Delta plain, is only marginally above sea level, and is dissected by an extensive system of irrigation canals and drainage channels. In the northern part there are large tracts of sandy soil, which are currently being reclaimed for agricultural purposes, while the southern part is intensively cultivated.

Because the Governorate is bordered on the north by the Mediterranean Sea, groundwater is saline and 97% of potable water is produced at six surface water treatment plants, supplemented by local compact units, all abstracting water from irrigation canals. The concentration of the main production facilities in relatively large plants requires an intensive trunk mains and distribution network to supply customers throughout the Governorate. An integrated water supply system, as has developed in Kafr El Sheikh, is conducive to the adoption of an integrated water company covering the whole of the Governorate, as the

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## DEVELOPMENT OF THE COMPANY

The Kafr El Sheikh Water Supply Company (KWC) was formed on 01 July 1983 by the amalgamation of local water undertakings within the Governorate, but it was not until 01 July 1988 that all water supply services came within its jurisdiction. On 03 December 1990, the Kafr El Sheikh Water Supply and Sewerage Company (KWSC) was established, to take over responsibility for the operation and maintenance of both water supply and sewerage services within the Governorate. During 1991 steps were taken to obtain the additional finance required for the sewerage service and transfer staff and assets from city and district councils. It is anticipated that the formal transfer date will be on 1 July 1992, at the start of the financial year. Since its inception, the Company has been responsible to the Governor for the effective operation and maintenance of services, while the National Organisation for Potable Water and Sanitary Drainage (NOPWASD) has been responsible for the development of major capital schemes. NOPWASD is also involved in the institutional development of the Company and with tariff increases.

## WORK OF MANAGEMENT COMPONENT

### Phase 1

Work commenced in January 1987 in accordance with the Terms of Reference and proposals made by the Consultant KESCON J.V. in their offer for consultancy services of January 1983. These proposals included a review of the 1980 Binnie Taylor Report on Provincial Water Supplies and the preparation of 10 Interim Reports, dealing with the main aspects of the Company's future structure, management and financial affairs. This work was completed in January 1988.

### Phase 2

Work commenced in February 1988 and to December 1991, nineteen Egyptian and European experts have worked a total of 210 man-months, on either a full-time or part-time basis, with all levels of the Company's staff. The main activities have covered institutional and financial development, training, operational improvements and health education

## INSTITUTIONAL DEVELOPMENT

During Management Component, Phase 1 the overall management structure was determined as follows:

- A Headquarters comprising the Chairman's office, Technical and Finance/Administration departments.
- Four decentralised Divisions for operation, maintenance and income collection.

Subsequent organisation structures have followed this form. Locations of offices, principal works and other organisational features are given in Fig. 2.

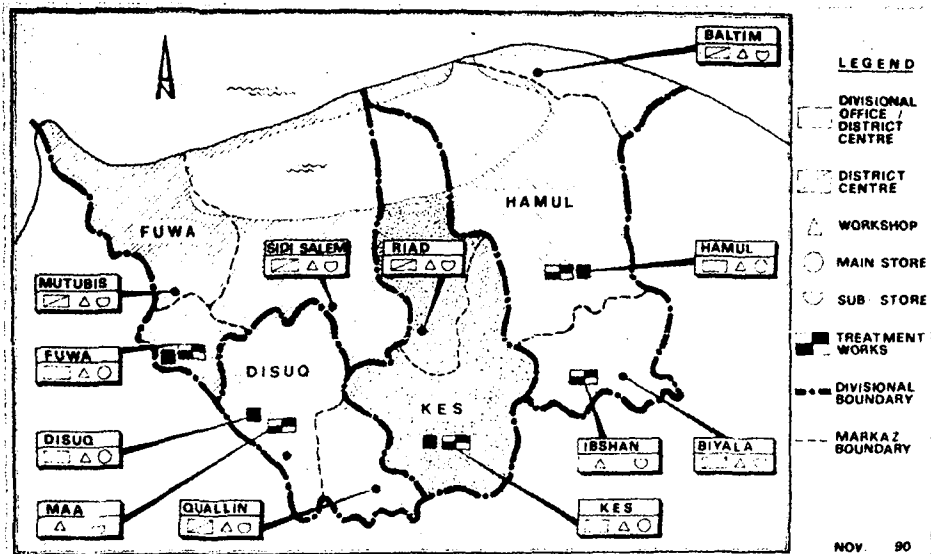


Fig. 2. Locations of offices and principal works.

#### KAFR EL SHEIKH WATER COMPANY

In December 1988, the senior/intermediate staff structure and accompanying job descriptions had been prepared covering 209 posts in the grades of Under Secretary - Class 1, Under Secretary, Director General and Grades 1, 2 and 3.

This was followed in December 1989 by the organisational structure and accompanying task schedules, covering 1116 front line posts in Grades 4, 5 and 6 employed in production, distribution, transport, stores, income and administration. The numbers of posts took account of organisation and methods studies previously undertaken, and described later in this paper.

#### KAFR EL SHEIKH WATER AND SEWERAGE COMPANY

As a result of the decision to establish a company to be responsible for both the water supply and sewerage services, NOPWASD held local consultations and prepared a management structure for the enlarged company in September 1990 (Fig. 3).

This necessitated job descriptions and task schedules for Headquarter's staff to be revised. However, Divisional structures have remained largely unaltered (Fig. 4).

Placement of existing staff against available posts has been made by a staff placement committee appointed by the Company's Chairman and supported by KESCON. The organisation structure for sewerage operations will be prepared after staff and assets have been transferred in July 1992 and requirements assessed.

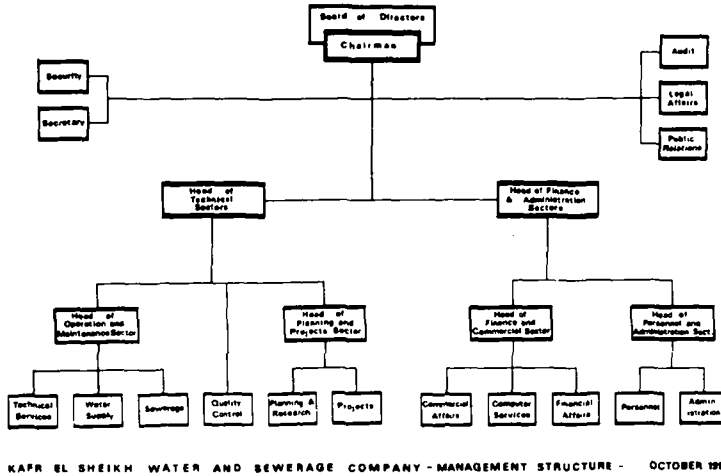


Fig. 3. KWSC headquarter's management structure.

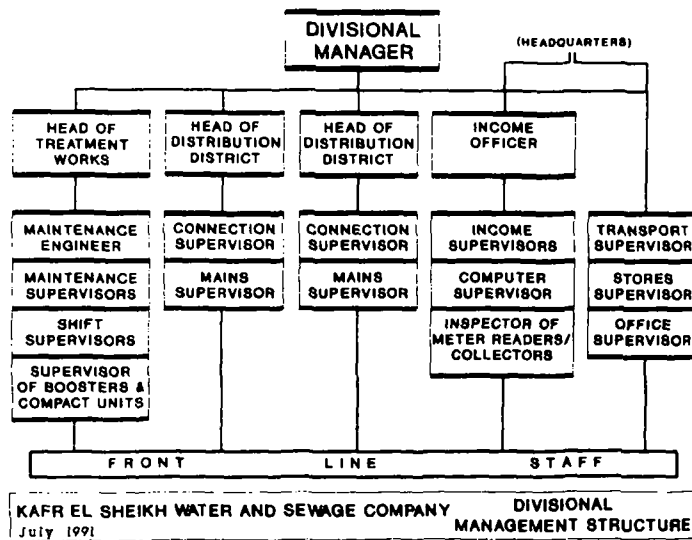


Fig. 4. Divisional management structure.

### TRAINING

In early 1988, the technical training programme at Embaba Water Works of the Greater Cairo Water Supply Organisation, was nearing completion and a senior engineer from this programme joined KESCON's team to develop a technical training programme for engineers of KWSC. By selecting this group of staff for training, two immediate objectives of Management Component Phase 2 were achieved, namely:

- early impact on key staff
- improvement in operation of treatment works.

The courses covered task analysis, maintenance, water quality and treatment processes, pumping, electrical systems and instrumentation.

Training commenced in October 1988 and was completed in September 1990. The overall number of trainees was 74, of which 63 received certificates on successful completion of the programme.

Other courses have been designed to cater for all levels of staff, from the Chairman to ordinary workers, and have included:

- management training for top management in Cairo
- management development training for senior and intermediate managers by visiting university professors
- training of trainers courses at NOPWASD's Damanhur Training Centre
- distribution operation and leakage control for engineers and supervisors
- water treatment for plant operators.

### OPERATIONAL IMPROVEMENTS

Six organisation and methods studies have been completed. These were designed to study existing methods of working and to recommend improved methods and numbers of staff required. The studies have covered distribution work, meter reading and income collection, production and maintenance staffing, transportation, stores and computer operations.

Protective mechanical and electrical maintenance schedules have been prepared for the six operational treatment works by trainees during the technical training programme. These have not been implemented satisfactorily at most works.

Twenty four hour flow and pressure measurements have been made of sourceworks' outputs and bulk transfers at the Governorate boundary. The estimate of total water produced is 250,000 cu m/day.

Practical improvements have been made to the operation of water treatment processes at the four main treatment works.

Regular reports have been prepared for the management of KWSC on bacteriological sampling and testing, distribution work and the condition of treatment works.

### HEALTH EDUCATION

Recommendations have been made for a pilot health education programme in two villages. These are heavily polluted, with household sewage

tanks discharging into adjacent open drains and water supplies that are continuous but at low pressure. These current conditions will provide a base line from which to measure changes in hygiene behavior with adequate water supply and sanitation. The villages have been surveyed and levelled and estimates made for installation of sewerage systems. Initial implementation meetings have been held, together with negotiations for funding.

#### FINANCE

Development of the Company's financial systems has proceeded without interruption since 1988 for two important reasons:

- the overriding necessity to increase income
- these systems are independent of progress on the construction contracts.

KESCON's current programme includes development of the meter income, payroll/personnel and stores systems, while future work includes purchasing, contracts and tendering procedures and the central accountancy system.

#### Tariffs

Since 1988 KWSC has been advised to adopt a programme of tariff increases that will comply with the terms of the Loan, Financing and Project Agreement, which requires the Company to recover its operation and maintenance costs by the end of 1992. The following basic domestic tariff increases have been approved by the Minister of Reconstruction:

EFFECTIVE DATE	FINANCIAL YEAR	TARIFF (LE/cu m)
1 January 1988	1987/88	0.045
	1988/89	0.06
	1989/90	0.065
	1990/91	0.075
1 January 1991	1990/91	0.09
	1991/92	0.10
1 November 1991	1991/91	0.15

LE: Egyptian pound.

It has been calculated that in 1991, the required charge to recover operation and maintenance costs, is LE 0.21/cu m. Recommendations have also been made to reduce the quantity of water supplied at the basic rate from 30 - 15 cu m per month. This has not yet been accepted.

#### Meter Income System

Development of the income system has been given high priority throughout the project. Following a study of the existing methods of meter reading, computation, billing, collection and recording, a pilot scheme covering 12,000 customers in Disuq city was installed using 286

personal computers. Work commenced in September 1988 and the trial was operational in May 1990.

Currently work is in progress to extend the system to all four Divisional income centres to cover the 168,000 customers within the Governorate. Each centre will be provided with a 386-33 main computer with 3/4 terminals and 2 printers. System operation is entirely in Arabic and has been designed to allow for expansion to cover metering of illegal connections, additional customers following improved water supplies, and population growth.

#### Payroll and Personnel System

This system is based on a single personal computer and is designed to calculate the monthly salaries and additional payments for all staff and to maintain updated personal records. The system is currently undergoing trials.

#### Stores Accountancy System

This system will undertake all stores control calculations and provide information on stock levels, re-order quantities and pricing. Software is currently being developed to meet the Company's requirements. There are at present 4,600 stock items and it has been necessary to prepare a new stores index and revise all commodity codes.

#### THE FUTURE

It is anticipated that the Management Component will continue to give institutional support to KWSC for at least a further two or three years, until all engineering work has been completed and is fully operational. In particular, the completion of the new headquarters' building and district maintenance centres are essential for the proper conduct of the Company's affairs. Further training is required in the use of tools and equipment, supplied under the project for the maintenance of plant and the distribution network.

Special emphasis will also be given to leakage control training, in order to maintain the improved condition of the distribution network after rehabilitation. Further work is also planned on purchasing and contract procedures and the central accountancy system.

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