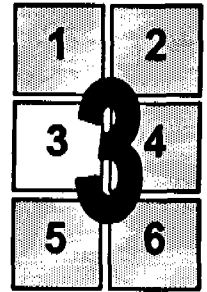


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WHO ORDEV UNDP UNICEF

DRINKING WATER SUPPLY AND SANITATION SECTOR SUPPORT PROJECT IN EGYPT

(UNDP : EGY/82/002 WHO : EGY/CWS/001)

HUMAN RESOURCES DEVELOPMENT



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Regional Office for the Eastern Mediterranean
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DRINKING WATER SUPPLY AND SANITATION SECTOR SUPPORT PROJECT IN EGYPT

HUMAN RESOURCES DEVELOPMENT

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3. Human Resources Development

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In the name of God, the Compassionate, the Merciful



FOREWORD

I am pleased to have the opportunity of contributing a foreword to this series of six booklets prepared to describe the work which has been done under the project, "Drinking Water Supply and Sanitation Sector Support", in Egypt.

It is appropriate that, at the end of the project, we should analyze what has been achieved, what have been the successes and shortcomings of the project, and what lessons we can learn for the future development of the water supply and sanitation sector not only in Egypt, but also in other countries of the Eastern Mediterranean Region.

WHO has executed this project, with the financial support of UNDP and UNICEF, to provide technical support to the Organization for Reconstruction and Development of Egyptian villages (ORDEV), in order to extend water supply and sanitation services to rural communities. WHO has been guided by the approaches of the International Water Supply and Sanitation Decade which have called for the complementarity of sanitation development with that of water supply, the involvement of communities in the planning and execution of projects, the utilization of appropriate technologies, and the training of personnel. The project has covered both software and hardware aspects, has used improved, self-sustaining and affordable methodologies, and, with its inter-sectoral approaches, has achieved a marked success in the rural areas of Egypt where it has been possible to implement demonstration activities.

I commend these booklets as illustrative of the success of this innovative project. If they can in some small way arouse interest in the importance, to us all, of the development of a sustainable programme of water supply and sanitation in rural areas, they will have served their purpose.

A handwritten signature in dark ink, appearing to read 'H. Gezairy'.

Hussein A. Gezairy, M.D., F.R.C.S.
Regional Director for the Eastern
Mediterranean

PREFACE

This booklet is one of a series of six in similar format prepared to demonstrate the objectives, activities and outputs of the project of the Government of the Arab Republic of Egypt, in cooperation with the United Nations Development Programme (UNDP), the United Nations Children's Fund (UNICEF), and the World Health Organization (WHO), for Drinking Water Supply and Sanitation Sector Support project.

The booklets in the series are entitled:

1. Social Aspects and Health Education
2. Sector Information Management
3. Human Resources Development
4. Rural Sanitation Technology
5. Rural Water Supply Technology
6. Leakage Detection and Control

Copies of any of these booklets can be obtained from:

World Health Organization
P.O. Box 1517
Alexandria 21511
Arab Republic of Egypt



ORIENTATION WORKSHOP FOR SECTOR OFFICIALS
SAKARA TRAINING CENTRE, 1988

INTRODUCTION

The activities of the project, "Drinking Water Supply and Sanitation Sector Support", started formally in January 1987, having been preceded by a preparatory phase (Phase I) from October 1984 to May 1985. The project was formulated within the context of the International Drinking Water Supply and Sanitation Decade (IDWSSD), 1981-1990, with the development objective of assisting the Ministry of Local Government to extend water supply and sanitation coverage to Egyptian villages (numbering about 30,000) and to other underserved sections of the population through improved infrastructures, human resources development and transfer of appropriate technology.

It was recognized that activities in the water supply and sanitation sector had been considerably accelerated in the first half of the Decade. The purpose of this project has been to build on this initiative and to support further development through:

- introduction and demonstration of affordable, appropriate technologies based on technical, economical and social feasibility;
- establishment of human resources development specialists and trainers for the planning and organization of training of water supply and sanitation personnel;
- upgrading of local capabilities in operation and maintenance, management, water and waste-water analysis, through appropriate training courses;
- assessment of sector information processes, identification of needs, and development of improved management information systems.

The shortage of skilled personnel was identified by surveys and studies in the late 1970s as a major constraining factor hampering progress in the water supply and sanitation sector. This problem became

gradually more serious, as additional personnel became needed to cope with the design, construction and, in particular, the operation and maintenance of the many new facilities, some of which were of types not previously introduced into the country. A priority area of attention of the project was accordingly that of assisting in upgrading human resources development programme to increase the availability of trained personnel for the expected increased activity under the International Drinking Water Supply and Sanitation Decade, 1981-1990.

This booklet describes the approaches used in the project in the area of human resources development, the various activities undertaken in different fields of training, the number of persons trained in each category, and the perceived impact of the project inputs. The ways in which the project is linked to other agencies and organizations and the proposed future activities are also described.

SPECIFIC OBJECTIVES

The project's specific objectives relating to human resources development (HRD) and training have been to:

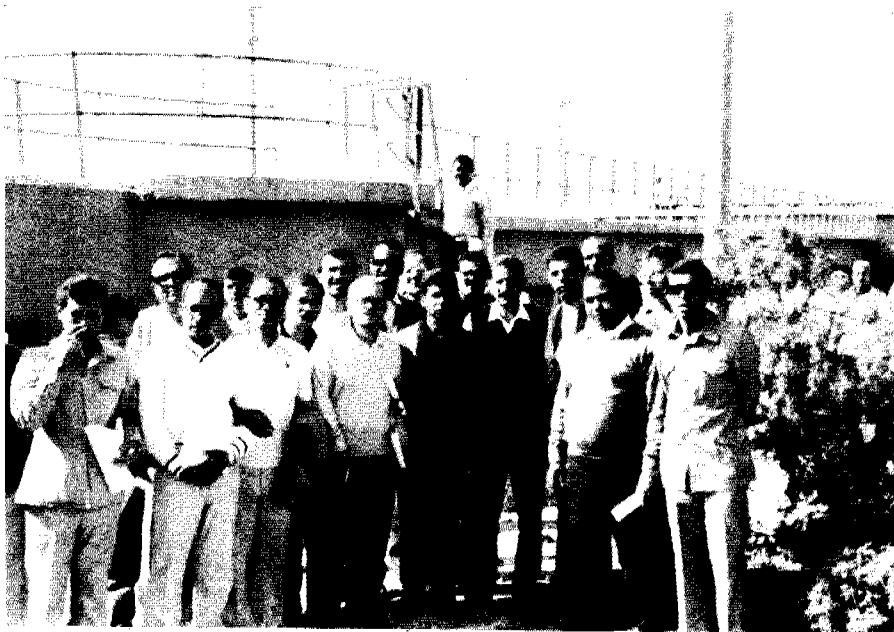
- review the existing situation and assess the HRD needs of the sector;
- establish a Human Resources Development Core Group, based at ORDEV, with members from ORDEV, NOPWASD and the Ministry of Health;
- prepare action programmes for the water supply and sanitation sector and assist in their implementation and follow up, and the monitoring of their progress;
- organize, in cooperation with ORDEV, the Ministry of Health and the governorates, training courses in the fields of:
 - operation and maintenance of water and wastewater treatment plants;
 - drinking-water and wastewater quality surveillance and control;
 - water supply and sanitation management at central and local levels;
 - data collection and computer operation;
 - leakage control and detection;
- assist in the development of curricula, learning materials, task analysis techniques, training methodology, and evaluation tools; and
- advise and assist in the planning and implementation of middle level management courses.

PROJECT APPROACH

The project engaged international and national consultants to advise on various aspects of human resources development, both general and specific. The following assignments were the principal ones carried out by international consultants:

- May 1985. Manpower and Human Resource Development in Egypt, 1980-1985: Drinking Water Supply and Sanitation Decade Survey. F. Heegard.
- February 1986. Review Mission, HRD Component of EGY/CWS/001. N.F. Carefoot.
- August 1987. Human Resources Development Methodology. Donna Flanagan.
- November 1987. National Training Course in Sanitary Engineering Design and Practice. P.F. Hillman.
- December 1987. Human Resources Development and Training. P.F. Hillman.
- July 1988. Human Resources Development and Training. B. Lawrance.
- April 1989. The Operation and Maintenance of Compact Water Treatment Plants. J.M. Jackson.
- December 1989. Manual on Water Treatment Technology with a Focus on Compact Plant Design and Operation and Maintenance. A. Redekopp.

The following sections summarize the activities undertaken in relation to the specific objectives of the project.



MIDDLE - LEVEL MANAGEMENT TRAINING



LEAKAGE REDUCTION TRAINERS
AT DATA COMPUTERIZATION SESSION

1. ESTABLISHMENT OF CORE GROUP

A Human Resources Development (HRD) Core Group was established in August 1987 with six members from ORDEV, and three each from NOPWASD and the Ministry of Health. Previously prepared criteria for selection to the Group were used and a long and careful interview process undertaken. Although the project was unable to identify and select 12 persons, all of the same high level, the Group developed a rapport and a sense of shared purpose through the process of a week-long Training of Trainers (TOT) course which had the following objectives:

- to review the purpose of and methods of systematic performance-based training;
- to provide opportunity for the HRD Core Group members to meet one another and share experiences;
- to discuss and define the role of the HRD Core Group and the responsibilities, and time commitment required by its members;
- to train the Core Group on the methodology of training, and to develop a manual on training methodology.

In addition, the TOT course was conducted in such a way as to offer a model for the training that the Core Group members would themselves conduct later. The evaluation of this course indicated the following:

- All 12 members were able to perform as specified in the performance objectives set for each module.
- The rapport among the Group members and the comprehension of the roles and functions of their respective agencies increased dramatically during the course.
- Discussions on the Group's role showed a definite progression from a rather unclear, unrealistic mentality to an eager and positive focus on realistic ways that the Group might be able to influence the training, planning and management of the human resources in the water supply and sanitation sector.
- The attendance by some Core Group Advisers allowed them the opportunity to participate in the discussions and to identify the concerns and interests of the Group.



TRAINING OF TRAINERS (TOT)

2. SITUATION REVIEW AND ASSESSMENT OF HUMAN RESOURCES NEEDS

There have been several attempts in the recent past to assess the sector human resource situation in Egypt with varying, and sometimes contradictory, results. The World Bank report by Binnie and Taylor at the beginning of the International Drinking Water Supply and Sanitation Decade 1981-1990, estimated, conservatively, that 5000 more professionals and skilled technicians would be needed by 1990 to strengthen the water sector alone. Subsequently, a WHO consultant estimated that at least 23,600 trained water supply and sanitation workers would need to be added by the year 2000. The National Water and Wastewater Committee then carried out its own survey and concluded that the sector faced a shortage of 38,838 workers, plus an additional number of about 10,000 workers for sanitary drainage in Cairo and Alexandria (ref. Sector Review, July 1985).

The WHO survey team collected sample data in the first half of 1985 and recorded several discrepancies between the number of positions allocated and the number of vacancies. In NOPWASD, for example, of the managerial, professional and technical personnel allotted, 40% of the 403 established posts were vacant. These were almost all engineers, mechanics and heavy equipment operators. In another field, the numbers of sanitarians and assistant sanitarians found to be in service with the Ministry of Health in all cities and governorates at the end of 1984 were 3987 and 4384 against established positions of 4825 and 4582 respectively. This combined shortage of 1036 posts represents 11%. At the same time, however, it was reported that there were 650 assistant sanitarians less than in 1980 so that, with the increased rural population, the rural health maintenance workers now had to serve 4000 to 5000 persons each instead of the 3000 as was the case in the 1970s.

To summarize, the human resources situation with regard to trained technicians, especially water and sewage plant operators, sanitary engineers, health inspectors/sanitarians and assistant sanitarians, has improved little since the start of the Decade. Although Egypt was well equipped with training facilities, and although as many as two-thirds of all high-school graduates enrolled in technical institutes, the large

majority were not attracted to the sector, and preferred the private sector or to go abroad to work in the Gulf States. The problem in the Water and Sanitation Sector was exacerbated by the lack of career attraction in the public services in the rural areas, and specifically, in the sanitation field which was losing sanitarians to private laboratories as well as to the Gulf States.

In another critical category of personnel, operators of water and wastewater treatment plants, it was found that in spite of the fact that the number of plants, especially the smaller compact plants, was proliferating, there was as yet no local or national training facility operating to train these personnel. Chemists and laboratory technicians, both at plants and in health laboratories, had had no specialized training in testing water and sewage samples, nor in assessing the quality of the sampling done by the assistant sanitarians—an important factor in monitoring water and effluent quality. Visits to selected governorates and to plants and laboratories indicated that proper equipment and chemicals were not always available for the purpose. Higher level officials were often unaware that the technicians were not using proper procedures, and were in some cases themselves not familiar with operational and maintenance practices.

With regard to water and sanitary engineers, only one institution, the High Institute of Public Health, University of Alexandria, was giving advanced degrees in sanitary engineering with graduate courses focused on bacteriological and chemical aspects of water and sewage. The intake of students have, however, been reduced in recent years.

The 1985 Sector Study reviewed the human resources and training needs and found that the estimate for the number of personnel needed to work in sector agencies who require technical training was of the order of 1500 per year, given the rapid expansion of the infrastructure, especially in respect of water and sewage treatment plants requiring skilled operation and maintenance.

USAID has been active in the field of human resources development, since its sector assessment in 1983 which reported that the water and sanitation sector organizations "suffer from severe shortages of experienced and competent staff at all levels". This assessment also stated that "NOPWASD, which held responsibility for providing

national level training in the water and sanitation trades, was not currently pursuing this function to any significant degree". In recent years, USAID has made a long-term effort to upgrade the human resources development and management capacity of the Ministry of Housing and Public Utilities and NOPWASD.

More recent assessments (1990) of personnel needs have provided figures to the effect that NOPWASD alone had an existing staff of 2500 professionals and 1200 technicians in 1990, but estimated that the requirement for the year 2000 would be 3500 and 1500 respectively. Allowing for some wastage, it was calculated that this would mean a need for 725 professional staff and 307 technicians to be trained annually (ref. EEAA consultant communication, 1990). Requirements of other organizations were presumably of the same order of magnitude, indicating that the coming decade would need to be one of intensified human resources development at all levels to meet the challenge presented.

3. PREPARATION OF SECTOR PROGRAMMES

In accordance with the human resource needs of the sector, a number of different curricula and various training materials have been prepared by the staff of the project and consultants. These have included proposals for:

- Refresher Courses for Training of Trainers
- Operation and Maintenance of Compact Water Treatment Plants (Engineers)
- Operation and Maintenance of Compact Water Treatment Plants (Plant Operators)
- Training Course for Sanitarians
- Upgrading of Analytical Skills in Water Quality
- Operation and Maintenance of Stabilization Ponds, coupled with Aquatic Weeds Treatment Ponds
- Operation and Maintenance of Aerated Oxidation Ponds
- Information Management and Data Collection
- Sanitary Engineering Design and Practice
- Management Skills for Middle-Level Management.

4. ORGANIZATION OF TRAINING COURSES

Training courses were organized by the project consultants and national staff in accordance with the prepared programmes. In summary, the following output of trained trainers was achieved by the project in the period 1987 to 1990.

Details of Course	No. of Courses	Output
Operation and maintenance of water and wastewater treatment plants	8	40 engineers 100 technicians
Water and wastewater sampling and testing	4	20 chemists and biologists
Development of managerial skills	2	50 middle-level managers
Data collection and information systems	2	50 data collectors and managers
Computerization and information management	6	14 computer operators
Computer software	2	14 computer operators
Water leakage reduction	3	3 engineers of 3 governorates

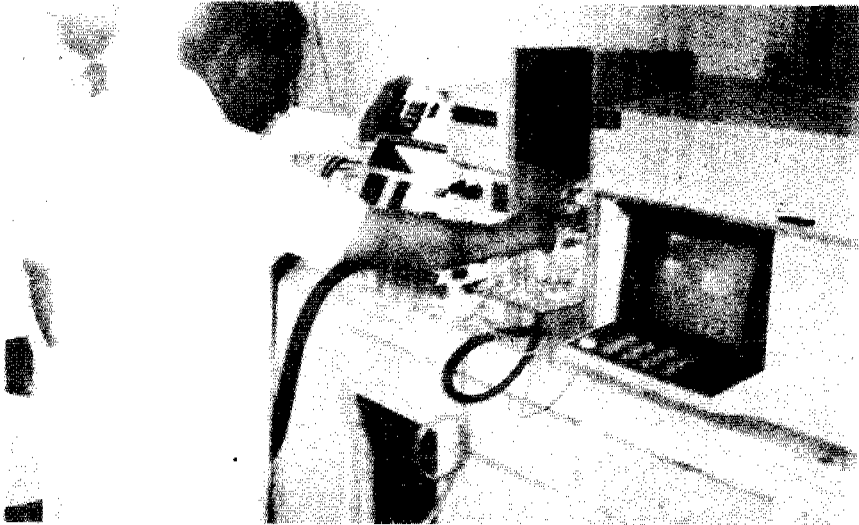
In addition, six study tours were arranged for six high-level managers to visit appropriate installations abroad.

The courses for data collectors, computer operators and engineers on leak reduction have been referred to in other booklets of this series. Some comments follow on the courses dealing with the operation and maintenance of water and wastewater treatment plants, water and sewage examination and treatment, and management.

Courses were held for engineers, chemists and sanitarians in the latter part of 1987. It became clear at the time of the first course for engineers on water treatment that considerable work and effort was needed to prepare materials for future courses. The training to upgrade the skills of chemists and biologists was successful and much of the training material



TRAINING ON WATER QUALITY CONTROL



had been prepared in Arabic. The course for sanitarians was considered to cover much of the essential material required.

Due to the shortage of HRD staff assigned to the project in the first part of 1988 and to the fact that other project personnel were occupied with different activities, not much training activity was undertaken before July, 1988 when steps were taken to introduce revised curricula for the different courses planned. While most of the courses were straightforward, it became apparent that the preparation of material for courses on operation and maintenance of compact water treatment plants would be a long and also difficult task. This was because the instruction material provided by the manufacturers of the units was very poor and contained limited information, and because the treatment plants installed have problems that make normal operation difficult. It was therefore proposed that a consultant be engaged specifically to study this problem and to make proposals for an outline of the content of the courses recommended for engineers and for technicians/operators employed in the operation and maintenance of the compact plants.

This consultancy took place in early 1989 and outlines for the two training courses were accordingly proposed. In addition, the consultant made the following observations and recommendations.

- Engineers and technicians with adequate basic qualifications are available and their knowledge was being supplemented by suitable hands-on training during plant commissioning, but all levels of staff need to obtain extensive instruction in the principles of water quality, and treatment, particularly in the application of chemicals, as well as in other aspects of operation and maintenance, general public health principles, safety on the site, record keeping, etc.;

- The ORDEV local development centre at Sakkara, 'Giza, was an excellent location for holding all types of training courses and, in time, it could become the permanent base for the HRD Core Group established by the project in 1987;

- The various plant manufacturers should be contacted as a matter of urgency for all operating instructions, catalogues, etc., and to ascertain whether any operation and maintenance guidance material had been prepared; and

- Preparation of a comprehensive training manual for compact water treatment plants should be undertaken as soon as possible for use in courses and as a basis for improving the performance of engineers, technicians and operators in the day-to-day operation and maintenance of their plants.

In response to the last point, a consultant was engaged in December 1989 to prepare such a manual and a document has been submitted for discussion and review. It is expected that the manual, or at least parts of it, will be translated into Arabic and made available to the personnel concerned.

The training of middle-level managers was carried out, under a subcontract, by the Institute of Management Development at the American University in Cairo. The course, entitled "Development of Managerial Skills for Middle Level Management" was conducted in two stages and completed in July 1990. The need for this training had been identified by the project as a priority in the water supply and sanitation sector. The courses were designed to strengthen the skills of water supply and sanitation managers and supervisors from central agencies and governorates, and train them to acquire the necessary diagnostic and problem-solving ability to deal with both individual and system needs.



EVALUATION

An evaluation was carried out in 1983 of the preparatory phase of the project when a pilot training activity had been launched with 10 courses for professional, technical and administrative staff. Trainees were drawn from the staff engaged in water supply and sanitation in rural and fringe urban areas. Training was based on a survey of needs which had indicated that there were priority areas where training courses would be useful: these included project management, supervisory skills, maintenance and repair of water supply and sewage disposal equipment, pipe fitting, human resources development, environmental health, water supply technology and rural development.

The evaluation indicated that the first objective of designing and implementing training courses in the priority areas for a total of 169 participants, mostly technicians, from 15 governorates was accomplished. However, the second objective of institutionalizing the programme was not accomplished since the Government of Egypt did not take up and continue the programme, although NOPWASD subsequently did organize a limited number of training courses for governorate personnel. A major difficulty had been that the investment of training skills in the consulting firm to which the training was subcontracted could no longer be used after the contract with WHO had expired. For this reason, in the project developed, attention was given to ensure that the training activities were contained within the framework of government organizations, NOPWASD, ORDEV and the Ministry of Health, using as many national lecturers and tutors as possible so that the acquisition of training skills would not be lost for future programmes.

The policy of the project from the outset, was to carry out training in the context of "Training of Trainers" (TOT). This was made necessary in view of the vast numbers of engineers, technicians and sanitarians that had been identified as being in need of refresher or orientation courses in order that they could perform their duties in the water supply and sanitation sector. The theory was that when a core group of potential trainer representatives from NOPWASD, ORDEV and the Ministry of Health had received thorough grounding in training methodology, these

persons would be able to continue to hold similar courses for other technical personnel in their organizations and ministries. At the same time, the engineers and technicians selected from governorates for training at the central level in different technical areas were chosen, particularly for their potential to conduct similar technical courses within their own governorates and eventually at markaz level. The cascade effect of this approach has many advantages and, in a country such as Egypt with a well-established system of local government and decentralization, it is probably the only practical way of reaching out with the human resources development to cover the whole country. There is, however, a disadvantage in that it is difficult to keep track at the central level of what has actually taken place in the governorates.

Thus, a full evaluation of the effectiveness of the project's activities in human resources development and training of personnel would depend on several eventualities. Firstly, if a national professional employee could be assigned to work with the project for a period of not less than six months, a country-wide survey of project-related training activities and output could most usefully be prepared. It should be recalled that at one time in 1987 there was a national training specialist assigned to the project, but unfortunately the post has been vacant for some time. Secondly, as a less favoured alternative, the project could consider engaging an external consultant to make such a survey, governorate by governorate, together with a national counterpart. This would probably require two to three months, and the assessment concurrently of the needs for trained staff which still remain for different levels and different geographical areas could be included in the terms of reference.

If neither of these proposals is possible, it is to be hoped that such an analysis can be carried out when the Sector Information Management system is properly functioning and providing sector information to the central level on staffing as well as projects.



TRAINING IN LEAKAGE REDUCTION

LINKAGES

The linkages that the project has are shown schematically in the diagram opposite.

Since the pilot phase of the project was started in 1981 as a collaborative venture between UNDP, UNICEF and WHO, a principal activity was that of training of personnel in the water supply and sanitation sector. The scope of the project was broadened in 1983 to cover other important areas of activity, but the collaboration in training continued and was, in fact, strengthened when the project for "Support to the Drinking Water Supply and Sanitation Sector" started to function under a preparatory phase in 1984 and the implementation phase in 1987. UNDP and UNICEF continued to provide funds for the execution of the project by WHO, with the Organization for the Reconstruction and Development of Egyptian Villages (ORDEV), as the Government Implementing Agency.

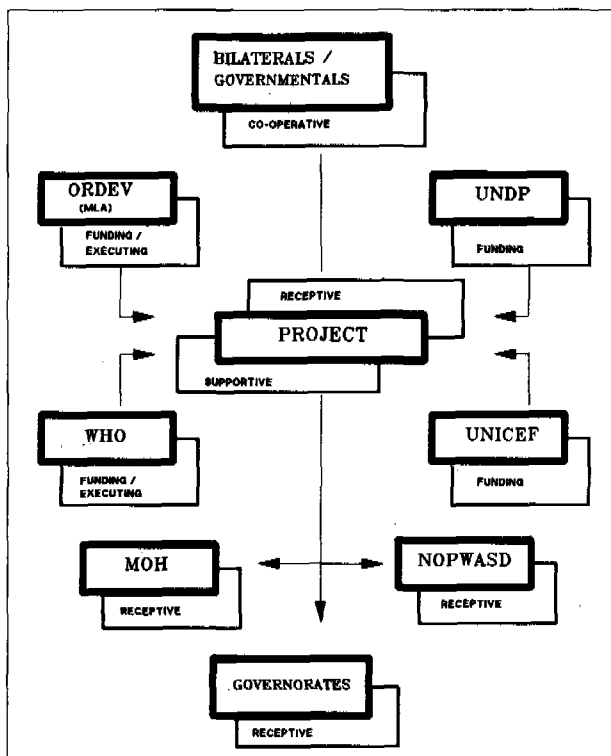
Close linkages have been maintained with ORDEV throughout all aspects of the project, but perhaps more particularly with regard to training. For example, extensive use has been made for presentation of courses at the ORDEV local development centre at Sakkara, Giza Governorate. ORDEV nominated six members of the HRD Core Group and has provided trainers for various aspects of training courses. The Organization has also participated in all the seminars arranged by the project.

NOPWASD has also collaborated closely with the project in respect of human resources development, participating in the HRD Core Group with three members and contributing to courses and seminars. A considerable number of NOPWASD staff have received training in one or other of the technical courses organized by the project. NOPWASD, with its more decentralized system and local offices, has been able to assist the project in its approaches at governorate and markaz levels.

The Ministry of Health, in accordance with its special relationship with WHO, has both supported the project and has benefited from training outputs. The Environmental and Occupational Health Centre at Imbaba has not only provided office space for the project staff, but has

also on numerous occasions made available conference facilities, training course rooms and laboratory accommodation. The Ministry of Health has assisted in training activities, particularly in connection with water quality control and examination of water and sewage, and has played an important role in seminars and committees.

Linkages with governorates as far as training has been concerned have been through the representatives who were selected for training of trainers courses and through subsequent follow-up.



PROJECT LINKAGES

FUTURE ACTIVITIES

The project will continue to organize training courses for technical staff engaged in the water supply and sanitation sector. In particular, efforts will be made to use the manual which has been prepared on water treatment technology for operation and maintenance of compact water treatment plants. In 1989, the lack of operational expertise among staff employed at many of these plants was identified as an important shortcoming. It is considered essential that at least the most relevant parts of this document should be translated into Arabic and made available to all plant operators.

One area of training, which has perhaps received inadequate attention in the past but which has now been initiated under the programme of Social Aspects and Health Education, is that related to the instruction of villagers, and particularly village women and girls, in health and hygiene matters. This assumes special importance as improvements are made in the water supply and sanitation facilities in the different pilot villages, but the health education message in respect of sector activities should be carried to the governorate level through training of trainers courses.

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